



# Decision Document

## *Environmental Protection Act 1986, Part V*

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**Proponent:**      **Robe River Mining Co Pty Ltd**

**Licence:**        **L7774/2000/6**

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**Registered office:**    Level 27, Central Park  
152-158 St Georges Terrace  
PERTH WA 6000

**ACN:**                008 694 246

**Premises address:**    West Angelas Iron Ore Mine  
AML70/248 sections 71, 72 and 79, L47/50, L47/52, L47/53, L47/60,  
L47/409, E47/2963, G47/1236 and G47/1235  
NEWMAN WA 6753

**Issue date:**            Thursday, 26 May 2011

**Commencement date:** Sunday, 29 May 2011

**Expiry date:**            Monday, 28 May 2029

### **Decision**

Based on the assessment detailed in this document the Department of Water and Environmental Regulation (DWER), has decided to issue an amended licence. DWER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:

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Licensing Officer

Decision Document authorised by:

Alana Kidd  
Delegated Officer



# Contents

Decision Document	1
Contents	2
1 Purpose of this Document	2
2 Administrative summary	2
3 Executive summary of proposal	3
4 Decision table	10
5 Advertisement and consultation table	16
6 Risk Assessment	17
Appendix A	18
Appendix B	21
Appendix C	26
Appendix D	30
Appendix E	42
Appendix F	44
References	46

## 1 Purpose of this Document

This decision document explains how the department has assessed and determined the application and provides a record of DWER’s decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DWER’s assessment and decision making under Part V of the *Environmental Protection Act 1986* (EP Act). Other approvals may be required for the proposal, and it is the proponent’s responsibility to ensure they have all relevant approvals for their Premises.

## 2 Administrative summary

Administrative details																	
Application type	Works Approval <input type="checkbox"/> New Licence <input type="checkbox"/> Licence amendment <input checked="" type="checkbox"/> Works Approval amendment <input type="checkbox"/>																
Activities that cause the premises to become prescribed premises	<table border="1"> <thead> <tr> <th>Category number(s)</th> <th>Assessed design capacity</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>35,000,000 tonnes per year</td> </tr> <tr> <td>6</td> <td>11,840,000 tonnes per year</td> </tr> <tr> <td>12</td> <td>10,000,000 tonnes per year</td> </tr> <tr> <td>52</td> <td>90 megawatts</td> </tr> <tr> <td>54</td> <td>610 cubic metres per day</td> </tr> <tr> <td>64</td> <td>11,500 tonnes per year</td> </tr> <tr> <td>73</td> <td>18,300 cubic metres in aggregate</td> </tr> </tbody> </table>	Category number(s)	Assessed design capacity	5	35,000,000 tonnes per year	6	11,840,000 tonnes per year	12	10,000,000 tonnes per year	52	90 megawatts	54	610 cubic metres per day	64	11,500 tonnes per year	73	18,300 cubic metres in aggregate
	Category number(s)	Assessed design capacity															
	5	35,000,000 tonnes per year															
	6	11,840,000 tonnes per year															
	12	10,000,000 tonnes per year															
	52	90 megawatts															
	54	610 cubic metres per day															
64	11,500 tonnes per year																
73	18,300 cubic metres in aggregate																
Application verified	Date: 27/07/2017																
Application fee paid	Date: 9/08/2017																
Works Approval has been complied with	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>																
Compliance Certificate received	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>																



Commercial-in-confidence claim	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Was the proposal referred under Part IV of the <i>Environmental Protection Act 1986</i> ?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input checked="" type="checkbox"/>
Is the proposal subject to Ministerial Conditions?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		Ministerial statement No: 970 and 1015 EPA Report No: 1508 and 1551
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the <i>Environmental Protection Act 1986</i> )?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	Regulatory Services (Water) consulted Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
If Yes, include details here, eg Site is subject to SO <sub>2</sub> requirements of Kwinana EPP.		

### 3 Executive summary of proposal

Robe River Mining Co Pty Ltd (Licensee) operates the West Angelas Iron Ore Mine (Premises), which has been assessed as a prescribed premises as it meets the requirements of categories 5, 6, 12, 52, 54, 64 and 73 under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations). The Premises has been in operation since 2000.

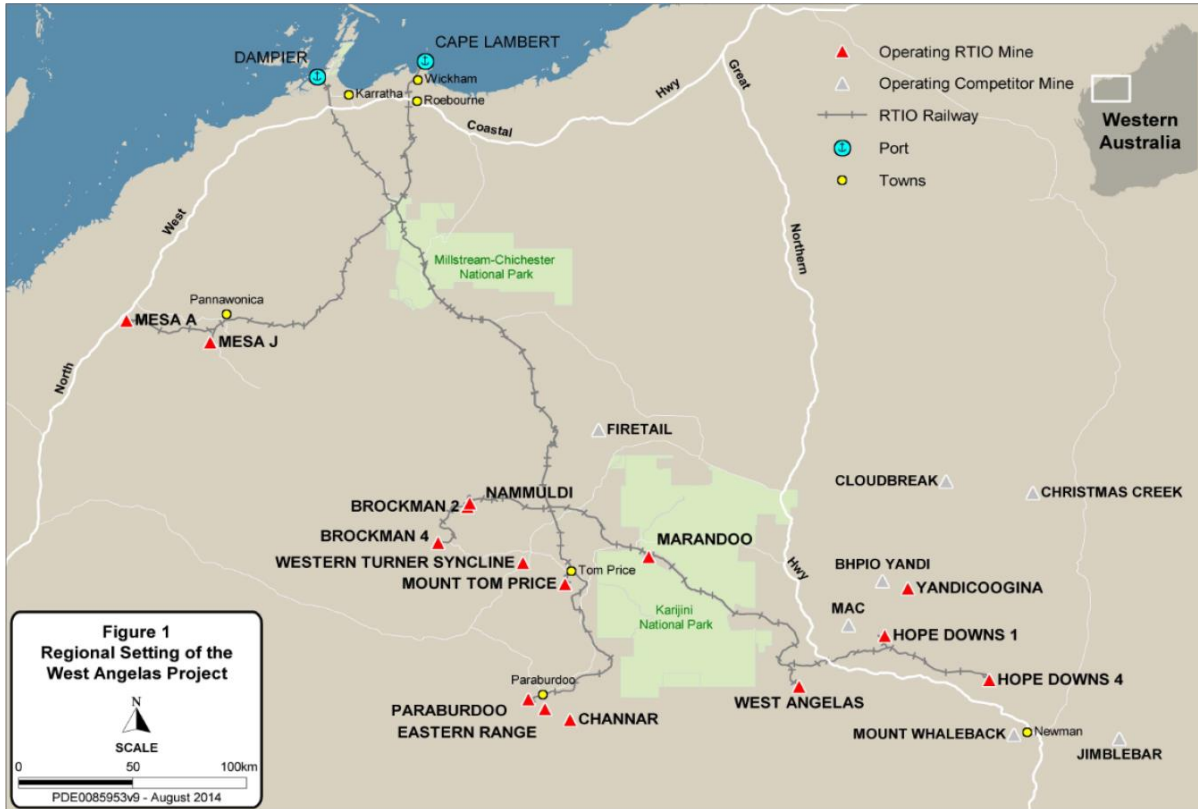
The Premises includes the following infrastructure:

- Light/heavy vehicle maintenance workshop;
- Fixed plant and crusher;
- Stackers;
- Reclaimers;
- Train load-out facility;
- Wastewater treatment plants (WWTPs) - Mine WWTP, Village WWTP1 and Village WWTP2;
- Ammonium nitrate storage facility;
- Landfill;
- Landfarm;
- Supply warehouse;
- Bulk fuel storage and distribution facility;
- Power station;
- Administration buildings; and
- Accommodation Village.

The Premises is located approximately 120 kilometres (km) north-west of Newman in the Pilbara region of Western Australia (Figure 1). Pastoral activities in the region have historically been limited to grazing of cattle on Juna Downs Station, which is located approximately 20 km to the north of the Premises.



The nearest operating mines are Mining Area C (operated by BHP Billiton Iron Ore Pty Ltd) 35 km to the north-east, Hope Downs 1 and Yandicoogina (both operated by Rio Tinto Iron Ore (RTIO)) 45 km and 65 km to the north-east respectively.



**Figure 1: Regional location of West Angles**

The primary activities on the Premises are described below.

### **Premises description**

#### Category 5

Iron ore is mined using conventional open cut mining methods of drilling and blasting. Iron ore is mined from above and below the water table. Mining operations currently occur in four deposits (Deposits A, B, E and F). The ore is screened into two sizes (high grade fine product and lump product) and transported via railway to port facilities located at Dampier and Cape Lambert. Production of saleable ore at the Premises is 35 million tonnes per annum (mtpa).

#### Category 6

The Licensee discharges excess dewatering water into an ephemeral tributary of Turee Creek. Dewatering water is used on site in the first instance to supply water for operational purposes (processing and dust control) and only excess dewatering water that exceeds the operational water requirement, is then discharged to a natural drainage line. Discharge occurs through a sediment trap and discharge outlet directly to the north of Deposit A. Discharge water is estimated to extend up to 12 km from the discharge outlet at a maximum discharge of 6 gigalitres (GL) per annum (GL/a) or 6 mtpa.



#### Category 12

The Licensee operates mobile crushing and screening plants on the Premises. A nominal design capacity of 10 mtpa applies in case multiple plants are required onsite simultaneously to process materials other than ore.

#### Category 52

The West Angelas Power Station (WAPS) includes two 45 megawatts (MW) dual fuel open cycle generation turbines (OCGTs), a process water treatment plant, diesel storage and conveyance infrastructure, evaporation pond, stormwater sedimentation pond, a workshop, administration complex and a small WWTP (3 cubic metres (m<sup>3</sup>) per day (m<sup>3</sup>/day)). The WAPS WWTP is below the threshold under Schedule 1 of the EP Regulations, and as such is not included in the scope of this assessment.

#### Category 54

The Licensee operates three WWTPs (Village WWTP1, Village WWTP2 and Mine WWTP). Sewage and wastewater from the Accommodation Village is directed to Village WWTP1 and Village WWTP2. The Village WWTPs are located approximately 7 km from the main mining operations. Sewage and wastewater from the main buildings at the mine are directed to the Mine WWTP. The combined design capacity for the Village WWTPs is 560 m<sup>3</sup>/day and the Mine WWTP has a design capacity of 50 m<sup>3</sup>/day, giving category 54 a total capacity of 610 m<sup>3</sup>/day.

All three WWTPs irrigate to sprayfields. The Village WWTPs irrigation area is 12 hectares (ha) and the Mine WWTP disposes of treated wastewater to a 1.5 ha irrigation area.

#### Category 64

The Deposit A and Deposit B putrescible landfills accept putrescible waste (such as general waste, cardboard, wooden pallets), Inert Waste Type 1 (e.g. waste bricks, concrete and other household type wastes), Inert Waste Type 2 and clean fill and utilise a large drive-in trench for waste disposal, which is covered at regular intervals.

Inert waste such as rubber (tyres), conveyor belts, demolition waste including concrete rubble and unrecoverable steel, and small amounts of wooden pallets (putrescible waste) are disposed of at the Deposit A waste dump landfill. The Deposit A waste dump landfill is located at the toe of the north waste-rock dump.

The Deposit A and Deposit B putrescible landfills have a capacity of 2,000 tonnes per annum (tpa) and 8,000 tpa respectively and the Deposit A waste dump landfill accepts up to 1,500 tpa. The design capacity of category 64 is therefore 11,500 tpa.

#### Category 73

The fuel hub consists of 3 x 4.9 megalitre (ML) vertical steel diesel storage tanks within containment bunds and unloading facilities for 16 rail tank cars. The tanks are equipped with actuated inlet and discharge valves to facilitate management of the diesel supply to and from the tanks. From the storage tanks, diesel is loaded into road tankers by loading pumps consisting of four centrifugal pumps, one of which acts as standby.

2 x 110 kilolitre (kL) horizontal diesel storage tanks service the WAPS. The Premises design capacity for category 73 is 18,300 m<sup>3</sup> in aggregate.

### **Location and siting**

#### Sensitive Land Uses

The workforce for the Premises is located approximately 16 km north-west of Deposit A. As the Accommodation Village is operated by the Licensee, it is not considered by DWER to be a sensitive land use or receptor for the purposes of assessing the risks of emissions and discharges associated with the operation of the prescribed activities.



### Specified Ecosystems

The *Guidance Statement: Environmental Siting* describes specified ecosystems as areas of high conservation value and special significance that may be impacted as a result of activities upon or emissions and discharges from prescribed premises. The specified ecosystems relevant to the Premises are identified below.

The Premises exists within the Proclaimed Pilbara Groundwater and Pilbara Surface Water Areas under the *Rights in Water and Irrigation Act 1914* (RIWI Act).

The Premises is situated within the Turee Creek East catchment. The east branch of Turee Creek (an ephemeral tributary of the Ashburton River) flows generally westward across the Premises, continuing west south-westerly through Karijini National Park, before merging with Turee Creek.

The Premises is not located within any tenure managed by the Department of Biodiversity, Conservation and Attractions (DBCA). The boundary of Karijini National Park is located approximately 12 km west of the WAPS and the Newman Water Reserve a Priority 1 Drinking Water Source Area (PDWSA) is approximately 75 km to the south-east of the Premises.

The Fortescue Marsh a Priority 1, Priority Ecological Community (PEC) and nationally important wetland is located approximately 86 km to the north-east of the Premises.

The Priority 1 PEC of the West Angelas Cracking-Clays (DBCA, 2017a) is located within the Premises and the Priority 1 PEC of the Brockman Iron cracking clay communities of the Hamersley Range is located approximately 14 km north-east of the WAPS.

The Priority 3 PEC of the Coolibah-lignum flats: sub type 1: Coolibah and mulga (*Acacia aneura*) woodland over lignum and tussock grasses on clay plains (Coondewanna Flats and Wanna Munna Flats) (DBCA, 2017a) is located approximately 10 km north of the Premises. The Priority 1 PEC of the Coolibah-lignum flats: sub type 2: Coolibah woodland over lignum (*Duma florulenta*) over swamp wandiree (Lake Robinson is the only known occurrence) (DBCA, 2017a) is located approximately 12 km north of the Premises.

The Declared Rare Flora *Thryptomene wittveri* is located just outside the Premises. *Lepidium catapycnon* (previously a Declared Rare Flora, now a Priority 4 Flora) (DBCA, 2017b) is located within the Premises.

### Terrestrial Fauna

Threatened fauna, listed under the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Conservation Act 1999* have been recorded in the region, including the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantius*); Ghost Bat (*Macroderma gigas*); and Fork-tailed Swift (*Apus pacificus*). Priority fauna listed under the *Wildlife Conservation Act 1950* have been recorded in the region, including the Pilbara Barking Gecko (*Underwoodisaurus seorsus*); and the Priority 4 Western Pebble-mound Mouse (*Pseudomys champmani*) (Rio Tinto, 2017b).

### Topography

The Premises is located within the Pilbara and Gascoyne bioregions and lies at the eastern end of the Hamersley subregion of the Pilbara Bioregion. Local topography is mainly low to moderate relief hills, ridges and scree slopes separated by Quaternary alluvial sheet-wash plains (Rio Tinto, 2017b).

### Geology

The main structural feature of the West Angelas region is the regional, east-west trending Wonmunna Anticline. The centre of the regional anticline contains a low-lying plateau of Jeerinah Formation. The



Jeerinah Formation is bounded to the north and south by valleys of Marra Mamba Iron Formation and overlying Wittenoom Formation. The valleys are bounded by high ridges of Brockman Iron Formation (Rio Tinto, 2017b).

#### Groundwater

Groundwater flow in the West Angelas area is characterised by steep hydraulic gradients across the Jeerinah Formation, representative of relatively low permeability on a regional scale and flat hydraulic gradients across the Mount Newman Member of the Marra Mamba Iron Formation and the overlying West Angelas Member of the Wittenoom Formation (Rio Tinto, 2017b).

Groundwater levels in the central plateau are relatively shallow, ranging between 10 – 20 metres (m) below ground level (bgl). Groundwater levels are generally very deep ranging between 90 – 140 mbgl (Rio Tinto, 2017b). Groundwater salinity (total dissolved solids (TDS)) is 500 – 1,000 mg/L, which is considered marginal (Salinity status classification).

#### Meteorology

The region experiences an arid climate, consisting of hot summers and mild winters. Rainfall in the region is infrequent and generally results from scattered thunderstorms and tropical cloud bands which produce heavy localised falls over short periods of time. The evaporation rate in the region greatly exceeds the average annual rainfall, which contributes to the arid environment in the area.

#### **Part IV of the EP Act**

The development of the West Angelas Iron Ore Project was authorised by the Minister for Environment (Minister) under Part IV of the EP Act upon issue of Ministerial Statement (MS) 514 on 28 June 1999.

A subsequent proposal to include the development of Deposit E and contemporise conditions of MS 514 under section 45 of the EP Act, developed the Report and Recommendations of the Environmental Protection Authority (EPA) Report 1508. MS 970 for the development of iron ore mines at Deposit 'A', 'B' and 'E', waste dumps, ore processing operation and associated infrastructure was signed by the Minister on 11 June 2014 and replaced and superceded all previous conditions of MS 514.

A revised proposal for the development of Deposits A west and F and additional infrastructure such as waste rock dumps, access roads, accommodation and other supporting infrastructure was submitted as an Assessment on Proponent Information (API) to the EPA. The API document was reviewed by the EPA and the Report and Recommendations of the EPA (EPA Report 1551) was released to the Minister on 17 June 2015. MS 1015 for the revised proposal to be implemented was signed by the Minister on 21 August 2015.

#### EPA Report 1508

The Minister's decision that changes to approval conditions may be implemented was informed by an EPA assessment (Assessment Number 1914), which produced EPA Report 1508. The EPA recommended to the Minister that implementation conditions 1 to 17 and proponent commitments 1 to 19 of MS 514 be deleted and replaced with consolidated, contemporary style conditions 1 to 9 under MS 970.

#### MS 970

MS 970 has conditions relating to the following:

- Condition 5: Environmental Management Program, which consists of the following Management Plans:
  - Groundwater Management Plan;
  - Surface Water Management Plan;
  - Vegetation and Flora Management Plan;
  - Fauna Management Plan;



- Dust Management Plan;
  - Waste Management Plan; and
  - Rail Management Plan.
- 
- Condition 6: Groundwater – monitoring of groundwater level elevation and quality as outlined in the Groundwater Management Plan to ensure that groundwater abstraction and dewatering activities have minimal adverse impacts on the availability and quality of groundwater resources and the dependent ecology.
  - Condition 7: Surface Water Drainage - monitoring of the quality and quantity of water discharge as outlined in the Surface Water Management Plan to ensure that surface water drainage and discharge has minimal adverse impacts on existing surface water drainage patterns or the water dependent ecosystems.
  - Condition 8: Conservation Significant Communities and Species – implement the proposal in accordance with the Vegetation and Flora Management Plan and Fauna Management Plan to ensure clearing activities have minimal adverse impacts on conservation significant communities and species.
  - Condition 9: Rehabilitation and closure – ensuring the mine is closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed post-mining outcomes and land uses.

#### EPA Report 1551

The Minister's decision that the revised proposal may be implemented subject to conditions was informed by an EPA assessment (Assessment Number 2046), which produced EPA Report 1551. In its assessment the EPA determined that the following were key environmental factors relating to the proposal:

- Flora and Vegetation – direct impacts from the clearing of flora and vegetation within the development envelopes; and
- Offsets (Integrating factor) – to counterbalance the significant residual impacts to native vegetation in 'good to excellent' condition.

Matters addressed in the conditions include the following:

- The continued implementation of MS 970, particularly condition 5 which requires the implementation of a Vegetation and Flora Management Plan, condition 7 Surface Water Drainage, and condition 8 Conservation Significant Communities and Species; and
- The implementation of a new offset condition (10) to counterbalance the significant residual impact of the additional clearing of 3,223 ha of 'good to excellent' condition vegetation.

#### MS 1015

In addition to the conditions imposed under MS 970, MS 1015 has the following condition:

- Condition 10: Offsets – contribution of funds to offset clearing of 'good to excellent' condition native vegetation, including the loss of habitat for conservation significant species in the Hamersley Interim Biogeographic Regionalisation of Australia (IBRA) subregion.

#### **Other approvals**

##### *Iron Ore (Robe River) Agreement Act 1964*

The Premises is regulated by the *Iron Ore (Robe River) Agreement Act 1964*, which is administered by the Department of Jobs, Tourism, Science and Innovation.

##### RIWI Act

The Licensee holds the following Groundwater Licences (GWL) under the RIWI Act:

- GWL98740 for the abstraction of 5,380,000 kL from the mine for dewatering and water supply purposes; and
- GWL103136 for the abstraction of 3,102,500 kL from the Turee B Borefield for water supply purposes.





Groundwater abstraction and quality are managed in accordance with the existing GWLs and associated Groundwater Operating Strategy. An application to increase the annual dewatering amount will need to be submitted to DWER's Regulatory Services (Water).

#### Clearing

Clearing is not authorised under L7774/2006/6. Clearing is authorised under MS 970 and MS 1015.

#### **This amendment – October 2017**

A licence amendment application was submitted by the Licensee on 30 June 2017 for the following:

- Increase in the design capacity for category 6 (from 6 GL/a to 11.84 GL/a) to allow for a dewatering discharge outlet at Deposit B (DEPB), which will discharge up to 5.84 GL/a;
- Approval for a waste dump landfill at DEPB. This landfill will not increase the design capacity for category 64 as existing landfill facilities are nearing capacity;
- Removal of previous condition 22 for tyre storage and disposal;
- Removal of previous condition 25 relating to the monitoring of the surface water discharge extent (saturation zone). This condition has been retained (as condition 24) as detailed in Appendix D under "Discharge water saturation zone"; and
- Removal of previous conditions 26 to 30 for the construction and commissioning of the WAPS.

During this amendment the following changes have also been made to the Licence:

- Definitions updated;
- Removal of previous condition 1;
- Removal of previous condition 3 as it has been merged into condition 1;
- Removal of previous condition 12;
- Inclusion of conditions 19 to 21 for the construction and operation of the DEPB dewatering discharge point;
- Update to condition 22, 23 and 24 to include the DEPB dewatering discharge point;
- Administrative update to Table 3 to remove reference to 'Bo' (which is not an element) and change to 'B' for Boron;
- Inclusion of condition 30 for the submission of a compliance document following construction of the DEPB dewatering discharge point;
- Update to condition 32 for the Annual Audit Compliance Report;
- Attachments 4 and 5 updated; and
- Removal of Attachment 7.

DWER's assessment and decision making are described in section 4 of this document.



## 4 Decision table

All applications are assessed in line with the EP Act, the EP Regulations and *Guidance Statements: Decision Making and Risk Assessments*. Where other references have been used in making the decision they are detailed in the Decision Document.

DECISION TABLE			
Licence section	Condition number	Justification (including risk description & decision methodology where relevant)	Reference documents
<b>Definitions</b>	N/A.	<p>During the October 2017 amendment the definitions for 'Annual Audit Compliance Report', 'Department' and 'SO<sub>2</sub>' have been included and the definitions for 'Annual Period', 'CEO', 'CEO for the purposes of notification' and 'NATA' updated.</p> <p>Other definitions have been added or removed in accordance with changes made to the Licence during this amendment.</p>	N/A.
<b>General conditions</b>	Licence conditions 7, 8 and 9.	DWER's assessment and decision making for stormwater management and hydrocarbon and chemical storage at the Premises are detailed in Appendix A.	<p>General provision of the <i>Environmental Protection Act 1986</i>.</p> <p>Department of Mines and Petroleum code of practice for the storage and handling of dangerous goods.</p> <p>Australian Standards 1940-2004 The storage and handling of flammable and combustible liquids.</p>
<b>Premises operation</b>	Licence conditions 2 – 6 and 10 – 18.	The process plant (including conveyors, stackers, reclaimers, stockpiles and train load-out facility) at the Premises meet the description and production or design capacity of a category 5 prescribed premises, as described in Schedule 1 of the EP Regulations. Dust and noise associated with the process plant has been assessed in the relevant sections of this document.	<p>General provisions of the <i>Environmental Protection Act 1986</i>.</p> <p><i>Environmental Protection (Unauthorised Discharges)</i></p>



<b>DECISION TABLE</b>			
<b>Licence section</b>	<b>Condition number</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
		<p>The Licensee also operates a number of facilities that meet the description or design capacity of categories of prescribed premises, as described in Schedule 1 of the EP Regulations.</p> <p>The location of DWER's assessment and decision making on the operation of these facilities is shown below:</p> <ul style="list-style-type: none"> <li>• Category 6: mine dewater infrastructure as detailed in Appendix D (point source emissions to surface water);</li> <li>• Category 12: mobile crushing and screening plants as detailed in Appendix B (Premises operation);</li> <li>• Category 52: WAPS as detailed in Appendix C (point source emissions to air);</li> <li>• Category 54: WWTPs as detailed in Appendix B (Premises operation) and Appendix E (emissions to land);</li> <li>• Category 64: putrescible and waste dump landfills as detailed in Appendix B (Premises operation); and</li> <li>• Category 73: bulk fuel facility as detailed in Appendix A (General condition – hydrocarbons and chemicals).</li> </ul> <p>DWER's assessment and decision making with respect to Premises operation are detailed in Appendix B.</p>	<i>Regulations 2004.</i>
<b>Emissions general</b>	N/A.	No conditions relating to general emissions.	N/A.
<b>Point source emissions to air including monitoring</b>	Licence conditions 25, 26 and 29.	DWER's assessment and decision making with respect to point source air emissions associated with the WAPS are detailed in Appendix C.	<p>General provisions of the <i>Environmental Protection Act 1986.</i></p> <p>National Environment Protection (Ambient Air Quality) Measure.</p>
<b>Point source</b>	Licence conditions 19	DWER's assessment and decision making with respect to point	General provisions of the



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<b>Licence section</b>	<b>Condition number</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
<b>emissions to surface water including monitoring</b>	– 24.	source emissions to surface water associated with excess mine dewater to Turee Creek is detailed in Appendix D.	<i>Environmental Protection Act 1986.</i>  <i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i>  MS 970.
<b>Point source emissions to groundwater including monitoring</b>	N/A.	There are no point source emissions to groundwater during operations at the Premises.  Recharge to the aquifer is expected to occur as infiltration from creek flows following rainfall events and to a lesser extent from other aquifers.  No conditions relating to point source emissions to groundwater or the monitoring of these emissions are required to be added to the Licence.	General provisions of the <i>Environmental Protection Act 1986.</i>  <i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i>  MS 970.
<b>Emissions to land including monitoring</b>	Licence conditions 1 to 6.	DWER's assessment and decision making with respect to the WWTPs irrigation sprayfields are detailed in Appendix E.	General provisions of the <i>Environmental Protection Act 1986.</i>  <i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i>
<b>Fugitive emissions</b>	N/A.	DWER's assessment and decision making with respect to fugitive (dust) emissions are detailed in Appendix F.	General provisions of the <i>Environmental Protection Act 1986.</i>  <i>Environmental Protection (Unauthorised Discharges) Regulations 2004.</i>



DECISION TABLE			
Licence section	Condition number	Justification (including risk description & decision methodology where relevant)	Reference documents
Odour	N/A.	<p>There are no significant odour emissions associated with the Premises. The Delegated Officer notes that minor odour emissions may occur from the operation of the WWTPs and putrescible landfills. The nearest sensitive receptor is located greater than 30 km away, which is considered a sufficient distance to prevent odour impacts to amenity.</p> <p>In accordance with the <i>Guidance Statement: Risk Assessments</i> the Delegated Officer has not undertaken an assessment of odour emissions from the Premises as there is not considered to be a receptor at risk of being impacted by odour emissions from the Premises. As previously noted, the onsite Accommodation Village is not considered by DWER to be a sensitive receptor for the purpose of assessing emissions and discharges from the activities undertaken on the Premises.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i>.</p> <p><i>Guidance Statement: Risk Assessments</i>.</p>
Noise	N/A.	<p><u>Emission Description</u> <i>Emission:</i> Noise and vibrations from operation of equipment and vehicles at the Premises.</p> <p><i>Impact:</i> Impacts to amenity of sensitive receptors and noise and vibration impacts on fauna.</p> <p><i>Controls:</i> The Premises is located greater than 30 km away from the nearest sensitive receptor and the Licensee has committed to complying with the <i>Environmental Protection (Noise) Regulations 1997</i>.</p> <p><u>Risk Assessment</u> <i>Consequence:</i> The Delegated Officer notes the distance to the nearest sensitive receptor and determined that there should be minimal impacts to amenity and fauna. Therefore, the Delegated Officer considers the consequence to be slight.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i>.</p> <p><i>Environmental Protection (Noise) Regulations 1997</i>.</p>



<b>DECISION TABLE</b>			
<b>Licence section</b>	<b>Condition number</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
		<p><i>Likelihood:</i> The Delegated Officer has determined that amenity and fauna impacts from noise emissions will not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be unlikely.</p> <p><i>Overall Risk Rating:</i> The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for noise emissions during operation to be <b>low</b>.</p> <p><u>Regulatory Controls</u> The <i>Environmental Protection (Noise) Regulations 1997</i> provides adequate regulatory control.</p>	
<b>Monitoring general</b>	Licence conditions 27 to 29.	General monitoring conditions are included on the existing Licence to ensure monitoring is carried out in accordance with the relevant standard and submitted to a laboratory with National Association of Testing Authorities (NATA) accreditation.	General provisions of the <i>Environmental Protection Act 1986</i> .
<b>Monitoring of inputs and outputs</b>	N/A.	No conditions relating to monitoring of inputs and outputs have been specified on the Licence.	N/A.
<b>Process monitoring</b>	N/A.	No conditions relating to process monitoring have been specified on the Licence.	N/A.
<b>Ambient quality monitoring</b>	N/A.	Refer to Appendix D – dewatering discharge monitoring.  Groundwater monitoring and vegetation monitoring obligations within MS 970.	MS 970.
<b>Meteorological monitoring</b>	N/A.	Monitoring of meteorological conditions are not required to adequately manage emissions from the Premises and are therefore not required on the Licence.	N/A.
<b>Improvements</b>	N/A.	No conditions relating to improvements are required for the Licence.	N/A.



<b>DECISION TABLE</b>			
<b>Licence section</b>	<b>Condition number</b>	<b>Justification (including risk description &amp; decision methodology where relevant)</b>	<b>Reference documents</b>
<b>Information</b>	Licence conditions 30 to 32.	<p>The existing Licence has conditions relating to the submission of an Annual Environmental Report and Annual Audit Compliance Report by the 30 April each year.</p> <p>During this amendment (October 2017) condition 30 has been included for the submission of the compliance document following the construction of the DEPB dewatering discharge point.</p> <p>During this amendment (October 2017) reference to the Annual Audit Compliance Report in condition 32 has been removed. The Licensee is required to access the form from the Department's website.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i>.</p> <p>Rio Tinto, 2017b.</p>
<b>Licence Duration</b>	N/A.	Licence L7774/2000/6 expires on 28 May 2029.	N/A.



## 5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
12/10/2017	Licensee provided with draft licence and decision document for comment	<p>The Licensee responded on 17/10/2017 with the following comments and waived the remaining comment period.</p> <p>The Licensee requested that "within 7 days" be removed from condition 30 stating that it <i>"sometimes may take us several days to have a compliance document signed by a relevant manager and removing this would help reduce the risk of an administrative non-compliance that has no environmental risk"</i> (Rio Tinto, 2017f).</p> <p>The Licensee also provided an updated map for Attachment 5 and requested this be used as a slight error was found with the prescribed premises boundary in the draft version.</p>	<p>Condition 30 was updated to remove reference to "within 7 days".</p> <p>Attachment 5 was updated as per the Licensee's request.</p>





## 6 Risk Assessment

Note: This matrix is taken from the Guidance Statement: Risk Assessments

Table 1: 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



## Appendix A

### General conditions

#### Stormwater management

##### Emission Description

*Emission:* Potentially contaminated and sediment laden stormwater from operational areas (processing areas, workshops, power station, landfill and mobile crushing and screening areas).

*Impact:* Contamination of surrounding land and ephemeral water drainage lines. Potential impacts on the ecology of land and surface water from the addition of nutrients, heavy metals and/or hydrocarbons. Increased turbidity and downstream sedimentation impacting aquatic ecosystems and water quality.

##### *Controls:*

- Stormwater not expected to be contaminated is directed to a drainage system, which flows to the ephemeral tributary of Turee Creek to the west of the operations. This system is designed to be slow moving to allow suspended solids to settle out, as well as flowing through a large settlement pond prior to release to the creek;
- Contaminated water from heavy vehicle/light vehicle washdown facilities and water treatment systems are directed to a collection sump, where it passes through a sediment trap and oily water separator system before entering the water treatment ponds and then used for dust suppression on site;
- The workshop areas drain to high density polyethylene (HDPE) lined holding ponds on site where the water is treated through an oily water separator before it is utilised for dust suppression on site;
- The WAPS pad is designed so that stormwater runoff flows into drains that discharge to the sedimentation pond, which has been designed to contain a 100 year Average Recurrence Interval (ARI) storm event of 72 hour duration;
- Potentially contaminated stormwater at the WAPS is directed to an oily-water separator (target of 10 mg/L Total Recoverable Hydrocarbons (TRH)) prior to discharge to the sedimentation pond;
- Mobile plant areas are located at least 50 m from any permanent water bodies;
- Mobile plant areas are contained so no contaminated runoff leaves the Premises and contaminated water is collected in sumps and removed via truck to a suitably licensed disposal/remediation facility;
- Uncontaminated stormwater is diverted away from the mobile plant areas and landfill by windrows to avoid contamination; and
- Stormwater falling in the tipping area is retained on site and either evaporates or infiltrates.

##### Risk Assessment

*Consequence:* The Delegated Officer notes that the east branch of Turee Creek flows westward across the Premises and that a Priority 1 PEC (West Angelas Cracking-Clays) is located within the Premises and has determined that impacts from discharges of contaminated and/or sediment laden stormwater could result in short term impacts to the Priority 1 PEC. Therefore, the Delegated considers the consequence to be major.

*Likelihood:* The Delegated officer has considered the Licensee controls and determined that an impact to sensitive receptors from the discharge of contaminated and/or sediment laden stormwater will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.



*Overall Risk:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for discharges of contaminated and/or sediment laden stormwater to the environment to be **medium**, subject to regulatory controls.

#### Regulatory Controls

The Delegated Officer is not imposing any additional conditions on the Licence as sufficient regulatory controls already apply as detailed below:

- Conditions 7 and 8 of the existing licence relate to stormwater management and a concentration limit of 30 mg/L for TRH in waters discharged from the Premises; and
- The general provisions of the EP Act with respect to the causing of pollution and environmental harm apply, as will the provisions of relevant subsidiary legislation, including the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.

#### **Hydrocarbons and chemicals**

##### Emission Description

*Emission:* Infiltration of hydrocarbons to soil from leaks and spills from bulk fuel facilities. Hydrocarbon spills outside of containment infrastructure during refuelling and fuel transfer activities, workshops and wash-down bays.

*Impact:* Contamination of terrestrial ecosystems and potential loss of habitat adjacent to where the spillage occurred.

*Controls:* Hydrocarbon management at the Premises is undertaken in accordance with legislative requirements, codes of practice, Australian Standards, Rio Tinto Standards and Rio Tinto Health, Safety, Environment, Quality (HSEQ) procedures.

##### Risk Assessment

*Consequence:* The Delegated Officer has determined that the impact from spills and leaks of hydrocarbons at the Premises could result in mid level on-site impacts and low level off-site impacts on a local scale. Therefore, the Delegated considers the consequence to be moderate.

*Likelihood:* The Delegated officer has considered the frequent use and size of the fuel storage facilities and determined that an environmental impact from spills and leaks of hydrocarbons/chemicals could occur at some time. Therefore, the Delegated Officer considers the likelihood of the consequence to be possible.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for leaks and spills of hydrocarbons/chemicals to the environment at the Premises to be **medium**.

#### Regulatory Controls

The Delegated Officer is not imposing any additional conditions on the Licence as sufficient regulatory controls already apply as detailed below:

- Condition 9 on the existing licence relates to waste management from ancillary operations;
- The storage of environmentally hazardous chemicals is adequately regulated by the *Dangerous Goods Safety Act 2004* and associated Regulations administered by the Department of Mines, Industry Regulation and Safety; and
- The general provisions of the EP Act with respect to the causing of pollution and environmental harm apply, and discharges of hydrocarbons may be subject to the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.



During this amendment previous condition 12 has been removed as the general provisions of the EP Act with respect to the causing of pollution and environmental harm apply.

Previous condition 12 specified:

*The Licensee shall utilise, and maintain, protective bunding, skimmers, silt traps, neutralisation pits, fuel and oil traps, drains and sealed collection sumps around the process plant, maintenance workshops, laboratory and power generation areas to enable recovery of spillages and protection of surrounding soils and groundwater.*



## Appendix B

### Premises operation

#### Category 12 – Mobile crushing and screening plants

During this amendment (October 2017), the emissions and discharges associated with the operation of the mobile crushing and screening plants within the Premises have been reassessed.

Fugitive dust is the primary emission associated with the operation of the mobile crushing and screening plants. Dust management at the Premises including the mobile crushing and screening plants have been assessed in Appendix F. Stormwater management at the mobile plant areas has also been considered, as there is the potential for surface water, groundwater and vegetation to be impacted by stormwater runoff contaminated with hydrocarbons and/or sediment. This assessment is detailed in Appendix A.

The Delegated Officer has determined that the operation of the mobile crushing and screening plants will not increase the overall risk of fugitive emissions (dust) and impacts of stormwater at the Premises. The previous condition 1 has been removed from the Licence during this amendment and is consistent with the *Guidance Statement: Risk Assessments*.

Previous condition 1 specified:

*The Licensee shall only operate the Mobile Crushing and Screening Plant in accordance with the Iron Ore (WA) Mobile Crushing and Screening Management Plan (RTIO-HSE-0235877).*

#### Category 54 - WWTP

The Premises has three WWTPs (Village WWTP1, Village WWTP2 and Mine WWTP), which trigger category 54 under Schedule 1 of the EP Regulations. Sewage and wastewater from the Accommodation Village is directed to Village WWTP1 and Village WWTP2. The Village WWTPs are located approximately 7 km from the mine. Sewage and wastewater from the main buildings at the mine are directed to the Mine WWTP. The expected water quality performance standards for the WWTPs are outlined in Table 2.

**Table 2: WWTPs performance standards for water quality**

Parameter	Expected performance standard		Australian Guidelines*
	Village WWTPs	Mine WWTP	
Biochemical Oxygen Demand (mg/L)	<20	20	20-30
Total Suspended Solids (mg/L)	<30	30	25-40
Total Nitrogen (mg/L)	<20	35	20-50
Total Phosphorus (mg/L)	<6	9	6-12
Residual free Chlorine (mg/L)	>0.2-2.0		N/A
pH (pH units)	6.5-8.5	6-9	6-9
<i>E.coli</i> (cfu/100mL)	<1 000	<1 000	10 <sup>5</sup> -10 <sup>6</sup>

\* Refers to Secondary Treatment of wastewater – NWQMS 1997

#### Emission Description

*Emission:* Untreated sewage gaining access to the environment from rupture of pipes, overtopping and holding tank failure.

*Impact:* Contamination of soil and vegetation adjacent to the discharge area from the increase in nutrient levels.



*Controls:*

- The WWTPs are constructed to contain sewage;
- Emergency overflow from the Effluent Tank is directed into the lined emergency overflow sump;
- Process electrical interlocks ensure feed to overfull tanks are stopped and that the feed tank buffer storage is filled prior to discharge to lined and fenced overflow lagoons;
- There are high level alarms with an audible siren, flashing strobe and panel indication lights;
- The drying beds are made of concrete and have inbuilt drainage to recirculate liquid draining from the sludge back into the process; and
- After draining and drying the sludge solids are removed for disposal to the Premises putrescible landfill.

Risk Assessment

*Consequence:* The Delegated Officer has determined that the impact from the WWTPs from pipe rupture, overtopping and/or holding tank failure will result in low level on-site impacts. Therefore, the Delegated considers the consequence to be minor.

*Likelihood:* The Delegated Officer has considered the expected performance standards of the WWTPs, Licensee's controls and existing Licence conditions and determined that an environmental impact from the WWTPs due to pipe rupture, overtopping and/or holding tank failure will only occur in exceptional circumstance. Therefore, the Delegated Officer considers the likelihood of the consequence to be rare.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk from the WWTPs due to pipe ruptures, overtopping and/or holding tank failure is **low**.

Regulatory Controls

Condition 3 of the existing licence requires the Licensee to monitor the WWTPs water quality on a quarterly basis and report these results in the Annual Environmental Report, including an assessment and comparison against the NWQMS 1997 and all recorded monitoring data.

The Delegated Officer is not imposing any additional conditions on the Licence as sufficient regulatory controls already apply.

**Category 64 - Landfills**

There are currently three putrescible landfills (two at Deposit A and one at Deposit B) at the Premises. The putrescible landfills accept putrescible waste (such as general waste, cardboard, wooden pallets), Inert Waste Type 1 (e.g. waste bricks, concrete and other household type wastes), Inert Waste Type 2 and clean fill.

Inert waste such as rubber (tyres), conveyor belts, demolition waste including concrete rubble and unrecoverable steel, and small amounts of wooden pallets (putrescible waste) is currently disposed of at the Deposit A waste dump landfill, which is located at the toe of the north waste-rock dump.

Emission Description

*Emission:* Potential leachate generation and windblown waste from putrescible and waste dump landfills.

*Impact:* Contamination of the surrounding environment including soil and groundwater causing potential death of vegetation and fauna. Impacts to ecosystems receiving groundwater discharge from the addition of hydrocarbons, nutrients and heavy metals.



*Controls:* The following management measures are implemented at the putrescible landfills:

- Waste is compacted and covered, at least weekly with a minimum of 200 mm of inert incombustible fill;
- Tipping area is not greater than 30 m in length and 2 m above the ground level in height;
- As far as practicable, materials which are suitable for recycling are segregated and held for removal from site rather than being placed in the landfills;
- No hazardous materials or tyres are disposed of to the putrescible landfills;
- Signage is erected at the entrance demonstrating what can and cannot be disposed of at the landfills; and
- The landfills are surrounded by a 1.8 m high, cyclone mesh fence with lockable gates, which is regularly inspected for damage and cleared of any windblown waste.

At the Deposit A waste dump landfill the following measures are in place:

- Material is placed at the toe and the deposition of waste-rock by mining operations covers the waste with approximately 15 m of this rock at regular intervals; and
- No putrescible (other than wooden pallets) or hazardous materials are disposed of at this waste dump landfill.

#### Risk Assessment

*Consequence:* The Delegated Officer has determined that the environmental impact associated with landfill leachate could result in low level on-site impacts and minimal off-site impacts at a local scale. Therefore the Delegated Officer considers the consequence to be minor.

*Likelihood:* The Delegated Officer has considered the depth to groundwater (Deposit B putrescible landfill - 115 m, Deposit A putrescible landfills - 240 m and Deposit A waste dump landfill – 120 m), Licensee controls (windrows for stormwater management etc.), existing Licence conditions (waste acceptance criteria) and determined that an impact to groundwater and aquatic ecosystems will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for leachate from the landfills during operation to be **medium**.

#### Regulatory Controls

The Delegated Officer is not imposing any additional conditions on the Licence as sufficient regulatory controls already apply through existing conditions 10 to 18, which relate to the management of the Premises putrescible and waste dump landfills including the types of waste that may be accepted for disposal, tipping area and cover requirements, stormwater management and positioning of waste so as to minimise environmental risks.

#### **Additional activities:**

Additional activities which are occurring at the Premises, but are not within the scope of this assessment include:

- Mining ore from open pits. This activity is not regulated under Part V of the EP Act;
- Abstraction of groundwater. This activity is regulated under the RIWI Act; and
- Soil bioremediation facilities (Landfarm). As these facilities do not receive liquid waste from other Premises, it does not trigger category 61 under Schedule 1 of the EP Regulations. The Licensee should note that the discharge of hydrocarbons to the environment is an unauthorised discharge under the *Environmental Protection (Unauthorised Discharges) Regulations 2004* and the facilities should be operated to comply with the *Assessment and*



*management of contaminated sites and the National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEMP).*

### **This amendment – October 2017**

#### **Deposit B waste dump landfill:**

During this amendment the Licensee is proposing to construct a waste dump landfill at DEP. The existing category 64 design capacity of 11,500 tonnes per annual period will not increase with the construction of the DEP waste dump landfill as this waste dump landfill will replace the existing Deposit A waste dump landfill which is reaching capacity.

The application (Rio Tinto, 2017c) states that the DEP waste dump landfill will accept rubber (conveyor belts including those on low grade steel spools, screen mats and tyres), wooden packaging, broken wooden pallets (putrescible waste), inert plastics, concrete rubble and steel products that are unable to be recycled or otherwise disposed of.

Approved waste will be deposited at the toe of the waste dump and covered over with clean fill as the waste dump progresses. Waste will be deposited at the toe of each consecutive lift as part of bench progression and covered over at final landform.

#### Emission Description

*Emission:* Discharge of waste (putrescible, inert) onto land.

*Impact:* Contamination of the surrounding environment, through leachate coming into contact with soil, surface water and groundwater.

*Controls:* The DEP waste dump landfill will be located within the footprint of the existing DEP waste dump. It will be sited in an area separated from surface water bodies (>200 m away) and groundwater (>50 mbgl) to reduce the impact of these areas. Stormwater run-off during periods of high surface water sheet flows will be diverted around the waste dump landfill through the use of existing earthen bunds surrounding the perimeter of the waste dump. There will be no hazardous waste placed in the DEP waste dump landfill and the waste material being disposed of (rubber, concrete, wooden pallets etc.) is not expected to generate wind-blown rubbish. The DEP waste dump landfill will not be fenced, however will be within an operational area of the Premises and feral animals or vermin are not expected to be an issue due to the nature of the waste.

#### Risk Assessment

*Consequence:* The Delegated Officer has determined that the environmental impact associated with landfill leachate could result in minimal on-site impacts. Therefore the Delegated Officer considers the consequence to be slight.

*Likelihood:* The Delegated Officer has considered the depth to groundwater (>50 mbgl), the nature of the waste in that it predominately constitutes inert waste and existing Licence conditions and determined that an impact to soil, surface water and groundwater from leachate will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for leachate from the waste dump landfill during operation to be **low**.





### Regulatory Controls

The Delegated Officer is not imposing any additional conditions on the Licence as sufficient regulatory controls already apply through existing conditions 15 to 18, which relate to the management of the waste dump landfill including waste acceptance, stormwater management, cover and positioning requirements.

### **Tyre storage and disposal:**

During this amendment the Licensee has requested (Rio Tinto, 2017a) that conditions relating to tyre storage and disposal (previous condition 22) be removed. The Licensee has stated that *“Due to the size of the operational fleet and the required service schedule, it is impractical for the Licensee to store less than 100 used tyres at the premise. The storage and disposal of used tyres is adequately covered by the waste dump landfill conditions and Part 6 – Tyres of the Environmental Protection Regulations 1987”*.

Rio Tinto, 2017e states that used ‘scrap’ light vehicle (LV) and heavy vehicle (HV) tyres are disposed of at the waste dump landfills after being re-treaded / reused as much as possible. *“Approximately 25 to 50 LV scrap tyres and 15 to 30 scrap HV tyres waiting to be buried”* at the waste dump landfill are stored in laydown yards at the tyre bay, which is part of the main workshop. New and reusable LV and HV tyres (on and off rims) are also stored at multiple workshop yards (some on hardstand areas in racks) for later use.

The Licensee has also stated (Rio Tinto, 2017e) that *“Even though the number of tyres stored onsite at any one time may exceed 100, the number of scrap tyres awaiting disposal is below this number when new and reusable tyres are taken into account. Given this we believe Category 57 is not required on the site licence”*.

The Delegated Officer has determined that previous condition 22 relating to tyre storage and disposal can be removed as the storage and disposal of tyres is adequately regulated under Part 6 of the EP Regulations.

Previous condition 22 specified:

*The Licensee shall ensure that the following criteria is met when tyres are stored and buried at the premises:*

- (i) the quantity of used tyres stored at the premises shall not exceed 100 at any one time;*
- (ii) the tyres are buried as soon as practicable after placement in the waste dumps;*
- (iii) a minimum depth of 100 mm of soil cover is maintained over the buried tyres following disposal;*
- (iv) batches of tyres are separated from each other by at least 100 mm of soil with each batch consisting of not more than 1,000 whole tyres or 40 m<sup>3</sup> of tyre pieces;*
- (v) tyres are buried with a minimum cover to tyre ratio of 4 to 1. That is 4 m<sup>3</sup> of soil or rubble cover to 1 m<sup>3</sup> of tyre waste; and*
- (vi) tyres are buried under a final cover of not less than 2 metres of soil.*



## Appendix C

### Point source emissions to air including monitoring

Point source air emissions occur from the WAPS two OCGTs. Each OCGT is fitted with an 18 m height exhaust stack (1.62 m radius) and both stacks are fitted with air emissions sampling points.

Oxides of Nitrogen (NO<sub>x</sub>) are expected to be the primary gaseous emission of concern from the WAPS given its potential for human health impacts. Emission of other pollutants such as sulphur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone and volatile organic compounds (VOC) are likely to be insignificant given the low sulphur content of natural gas and diesel in Western Australia and the low predicted emission rates for other pollutants.

During commissioning of the WAPS, the Licensee undertook air emissions monitoring with the results shown in Table 3.

**Table 3: Air emissions monitoring results (WAPS Commissioning Report)**

Fuel	Parameters	Gas Turbine 1	Gas Turbine 2	Specification
Gas	NO <sub>x</sub> as NO <sub>2</sub> (mg/Nm <sup>3</sup> )	30.1	33.9	51.32
	SO <sub>2</sub> (mg/Nm <sup>3</sup> )	<2.9	<2.9	10.79
	Total VOCs propane (mg/Nm <sup>3</sup> )	1.0	2.2	37.09
	CO (mg/Nm <sup>3</sup> )	24.1	14.9	47.50
	Total particulates PM <sub>10</sub> (mg/Nm <sup>3</sup> )	<0.167	<0.4	10.80
Diesel	NO <sub>x</sub> as NO <sub>2</sub> (mg/Nm <sup>3</sup> )	130	<b>181</b>	174.50
	SO <sub>2</sub> (mg/Nm <sup>3</sup> )	<3	<3	11.59
	Total VOCs propane (mg/Nm <sup>3</sup> )	<6.86	<6.86	7.24
	CO (mg/Nm <sup>3</sup> )	<b>44</b>	<b>70</b>	31.25
	Total particulates PM <sub>10</sub> (mg/Nm <sup>3</sup> )	<0.167	<0.167	19.63

Existing Licence conditions 25 and 26 require the Licensee to undertake stack testing on Gas Turbine Generator (GTG) 1 and GTG2 on an annual basis. The 2016 Annual Environmental Report provided the first annual stack testing monitoring for the WAPS. Air emissions monitoring for GTG1 and GTG2 are shown below in Table 4.

**Table 4: Air emissions monitoring for GTG1 and GTG2 during the annual stack testing programme**

	Volumetric Flow Rate (m <sup>3</sup> /s)	Moisture Content (%H <sub>2(g)</sub> ) of stack gas)	Sulphur dioxide (SO <sub>2</sub> )		Oxides of Nitrogen (NO <sub>x</sub> ) as NO <sub>2</sub>		Carbon monoxide (CO)	
			mg/m <sup>3</sup>	g/s	mg/m <sup>3</sup>	g/s	mg/m <sup>3</sup>	g/s
GTG1	81.7	6.0	<3	<0.2	20	1.7	32	3.3
GTG2	78.3	6.0	<3	<0.2	22	1.7	28	2.8

#### Emission Description

*Emission:* Emissions to air from the WAPS stacks (GTG1 and GTG2) include that of NO<sub>2</sub>, SO<sub>2</sub>, CO and VOCs.

*Impact:* Reduction in local air quality and potential impacts to human health. The nearest sensitive receptor is the accommodation village at Mining Area C, which is 35 km north-east and hence impacts to human health are unlikely.



**Controls:** The Licensee has implemented the following controls to minimise the risk of air emission for the WAPS stacks:

- Emission reducing technology including Dry Low Emission (DLE) burners fitted to ensure air emission quality meets *National Environment Protection (Ambient Air Quality) Measure (NEPM)* guidelines;
- Annual stack sampling measuring of NO<sub>x</sub>, SO<sub>2</sub>, CO, volumetric flow rate and moisture content with results reported in the Annual Environmental Report; and
- Routine maintenance of the equipment.

Risk Assessment

**Consequence:** The Delegated Officer has determined that the environmental impact associated with the operation of the WAPS will result in minimal on-site impacts. Therefore the Delegated Officer considers the consequence to be slight.

**Likelihood:** The Delegated Officer has considered the location of the WAPS in relation to the nearest sensitive receptor, Licence Holder’s controls and existing Licence conditions and determined that an impact to public health or the environment will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

**Overall Risk Rating:** The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for the operation of the WAPS is **low**.

Regulatory Controls

The Delegated Officer is not imposing any additional conditions on the Licence as sufficient regulatory controls already apply through existing conditions 25 and 26, which require the Licensee to monitor GTG1 and GTG2 on an annual basis and present this information in the Annual Environmental Report including an assessment and comparison against the appropriate NEPM guidelines and all recorded monitoring data.

Monitoring during operation is necessary to ensure local air quality is maintained above the NEPM guidelines. The requirement for, or specifications of, condition 26 will be reviewed by DWER once there is sufficient data from previous years’ for a comparison to be made.

**During this amendment – October 2017**

Previous conditions 26 to 30 have been removed. A compliance document (WAPS Compliance Document) was received on 18 March 2015 and an updated Commissioning Report (WAPS Commissioning Report) received on 17 March 2017.

Previous condition 26 specified:

*The Licensee shall construct the West Angelas Power Station in accordance with the documentation detailed in Table 3 (Attachment 6).*

**Table 3: Construction requirements<sup>1</sup>**

<b>Document</b>	<b>Parts</b>	<b>Date of Document</b>
<i>Works Approval Application Form.</i>	<i>All</i>	<i>11 October 2011</i>
<i>Works Approval Application, Power System Upgrade – West Angelas Power Station: Construction and Commissioning. Rio Tinto Iron Ore (RTIO-HSE-0123651).</i>	<i>All, including Drawings and Appendices</i>	<i>15 December 2011</i>
<i>West Angelas Power Station Environmental</i>	<i>All, including</i>	<i>17 August 2010</i>



Noise Assessment. SVT Engineering Consultants.	Drawings and Appendices	
West Angelas Power Station – Air Quality Assessment. Sinclair Knight Merz.	All, including Drawings and Appendices	26 July 2010
Email correspondence from Lisa Last, Rio Tinto Iron Ore, titled “West Angelas Power Station and WWTP works approval application – further information required”.	All	16 December 2011
Email correspondence from Katrina Burke, Rio Tinto Iron Ore, titled “Power Station Upgrade Project – Works Approval Application Response to DEC. West Angelas Power Station: Permanent Infrastructure”.	All	15 March 2012
Email correspondence from Katrina Burke, Rio Tinto Iron Ore, titled “W5116/2011/1 – West Angelas Power Station works approval – RTIO response to queries”.	All	2 April 2012
West Angelas Power Station - Works Approval Amendment. Rio Tinto Iron Ore (RTIO-HSE-0238089).	All, including Drawings and Appendices	9 October 2014
Commissioning Plan for the West Angelas Power Station. UGL (Document No: 3200-0448-PLN-004)	All, including Drawings and Appendices	14 November 2014
Compliance Statement – Works Approval W5116/2011/1 – West Angelas Iron Ore Mine – Power Upgrade. Rio Tinto Iron Ore (Ref. RTIO-HSE-0252715).	All, including Drawings and Appendices	18 March 2015
Email correspondence from Kate Philp, Rio Tinto Iron Ore, titled “RE: West Angelas Power Station W5116 amendment query”.	All	23 March 2015
Letter and Form P4 from Sean Savage, Rio Tinto Iron Ore, titled “West Angelas PS – W5116 – Commissioning extension request – Nov 2015”.	All	27 November 2015
Signed Application Form (Part 10)	All	4 December 2015

Note 1: Where the details and commitments of the documents listed in condition 26 are inconsistent with any other condition of this Licence, the conditions of this Licence shall prevail.

Previous condition 27 specified:

The Licensee shall undertake commissioning in accordance with the Commissioning Plan for the West Angelas Power Station (Document No: 3200-0448-PLN-004).

Previous condition 28 specified:

The Licensee shall submit a commissioning report for the West Angelas Power Station to the CEO by 30 July 2016.

Previous condition 29 specified:

The Licensee shall ensure the commissioning report required in Condition 27 includes:

- (i) a summary of the emissions testing and monitoring results outlined in Section 4.3 of the Commissioning Plan for the West Angelas Power Station (Document No: 3200-0448-PLN-004);



- (ii) *a list of any original testing or monitoring reports submitted to the Licensee from third parties for the commissioning period;*
- (iii) *a summary of the environmental performance of West Angelas Power Station as installed, against the design specification set out in the works approval application; and*
- (iv) *a review of performance against the Licence conditions; and where they have not been met, measures proposed to meet the design specification and/or Licence conditions, together with timescales for implementing the proposed measures.*

Previous condition 30 specified:

*The Licensee shall undertake commissioning of the West Angelas Power Station until 30 September 2016.*



## Appendix D

### Point source emissions to surface water including monitoring

The West Angelas deposits lie in the upper catchment of the Turee Creek East, a highly ephemeral tributary of the Ashburton River. The upper catchment has a complex drainage pattern characterised by intermittent flow and infrequent wide-spread flooding, depending on the occurrence of high rainfall events.

The Licensee discharges excess dewatering water from Deposit A into an ephemeral tributary of the Turee Creek East Branch. Water flows down a weakly defined drainage line for approximately 350 m before merging with the tributary that flows to the Turee Creek East Branch. Discharge water is estimated to extend up to 12 km from the discharge outlet at the maximum discharge of 6 GL/a. Water discharged into the creek system is expected to be contained within the creek bed, between banks for the entire inundation footprint.

#### Emission Description

*Emission:* Discharge of dewatering water into a tributary of Turee Creek East. Based on measured groundwater quality, excess water being discharged is fresh with calculated TDS ranging between 280 and 560 mg/L and pH between 7.1 and 8.1.

*Impact:* Contamination of surface water channels and potential impacts on the ecology of surface water from the addition of nutrients and heavy metals. The creek ecosystem should not be adversely affected by the quality of the dewatering water as it is near potable if not potable.

*Controls:* Key management and monitoring measures from the Environmental Management Plan include, but are not limited to the following:

- Dewatering water is used on site in the first instance to supply water for operational purposes (processing and dust suppression) wherever possible. If the volume exceeds the site requirements it is discharged into natural channels;
- All site personnel and contractors receive an environmental induction, which includes a section on the importance of water conservation;
- Water use efficiency is monitored;
- The quantity of water discharged to the environment is monitored to ensure discharge water does not exceed the carrying capacity of the receiving creekline;
- Water quality sampling is undertaken to ensure any water discharged to the natural environment does not exceed the ANZECC 2000 guidelines;
- The discharge outlet conforms to the *Pilbara Iron Sediment and Drainage Control Design Criteria* to reduce erosion, sediment loads and associated water quality impacts; and
- The potential increase in the distribution and abundance of weeds is managed in accordance with a site specific Weed Management Plan.

#### Risk Assessment

*Consequence:* The Delegated Officer has determined that the environmental impact associated with the discharge of excess dewatering water to a tributary of Turee Creek will result in minimal off-site impacts on a local scale. Therefore the Delegated Officer considers the consequence to be minor.

*Likelihood:* The Delegated Officer has determined that an impact to the ecology of the surface water and/or creek ecosystem will not occur in most circumstances. The 2016 Annual Environmental Report showed that the dewatering discharge water quality was below the appropriate ANZECC 2000 water quality trigger values during the reporting period. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.



**Overall Risk Rating:** The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for the discharge of excess mine dewater from Deposit A to a tributary of Turee Creek to be **medium**.

#### Regulatory Controls

The Licence has existing conditions 22 and 23 requiring the management of the Turee Creek discharge point and monitoring of dewatering discharge water. The Licensee is required to include a comparison of the dewatering water monitoring results against the appropriate ANZECC 2000 guideline and previous years monitoring data in the Annual Environmental Report.

MS 970 also has conditions relating to monitoring of dewatering onsite, specifically potential impacts to groundwater. MS 970 condition 6-1 requires the Licensee to “...*manage groundwater abstraction and dewatering activities to ensure minimal adverse impacts on the availability and quality of groundwater resources and the dependent ecology*” and condition 6-2 to monitor groundwater to ensure the requirements of 6-1 are met. MS 970 condition 7-1 also requires the Licensee to “...*manage surface water drainage and discharge to ensure minimal adverse impacts on existing surface water drainage patterns or the water dependent ecosystems*” and condition 7-2 to monitor surface waters in accordance with a Surface Water Management Strategy to ensure the requirements of 7-1 are met. In this Strategy, it is stated that discharge water is monitored according to the Part V Licence.

#### **This amendment - October 2017**

##### **DEPB dewatering outlet:**

During this amendment the Licensee is proposing to construct an additional dewatering discharge outlet at the Premises. The DEPB dewatering outlet will be designed to discharge up to 16 megalitres (ML) per day (ML/day) or 5.84 GL/a of excess water from dewatering activities at DEPB to a local ephemeral tributary of Turee Creek East.

The existing category 6 design capacity of 6 GL/a will be increased under this amendment to 11.84 GL/a to include the existing discharge from the Turee Creek dewatering discharge point (Deposit A) and the DEPB outlet.

The application (Rio Tinto, 2017b) states that the DEPB outlet will make use of existing infrastructure in the area including an existing pipeline and cleared alignment, turkey's nest, small drainage channel and a major diversion drain as shown in Figures 2 and 3. Dewatering water will be used on-site in the first instance to supply water for operational purposes. The extracted water will be directed via the existing pipeline alignment to the turkey's nest for operational use, as and when required, and the remaining flow will be directed to the DEPB outlet which will then discharge to a local ephemeral tributary that joins Turee Creek East.

Surface water quality monitoring and aquatic fauna baseline surveys have not been undertaken within Turee Creek East given the absence of permanent (perennial) surface water flows, permanent or semi-permanent surface water features or other sensitive receptors.

The DEPB borefield consists of three production bores (WB13WAB001, WB13WAB002, WB13WAB003). The 2016 DEPB groundwater data is presented in Table 5 and Table 6 shows the water quality results for the existing Turee Creek discharge point for 2016 (2016 Annual Environmental Report), which is indicative of the quality of water that will be discharged from DEPB.

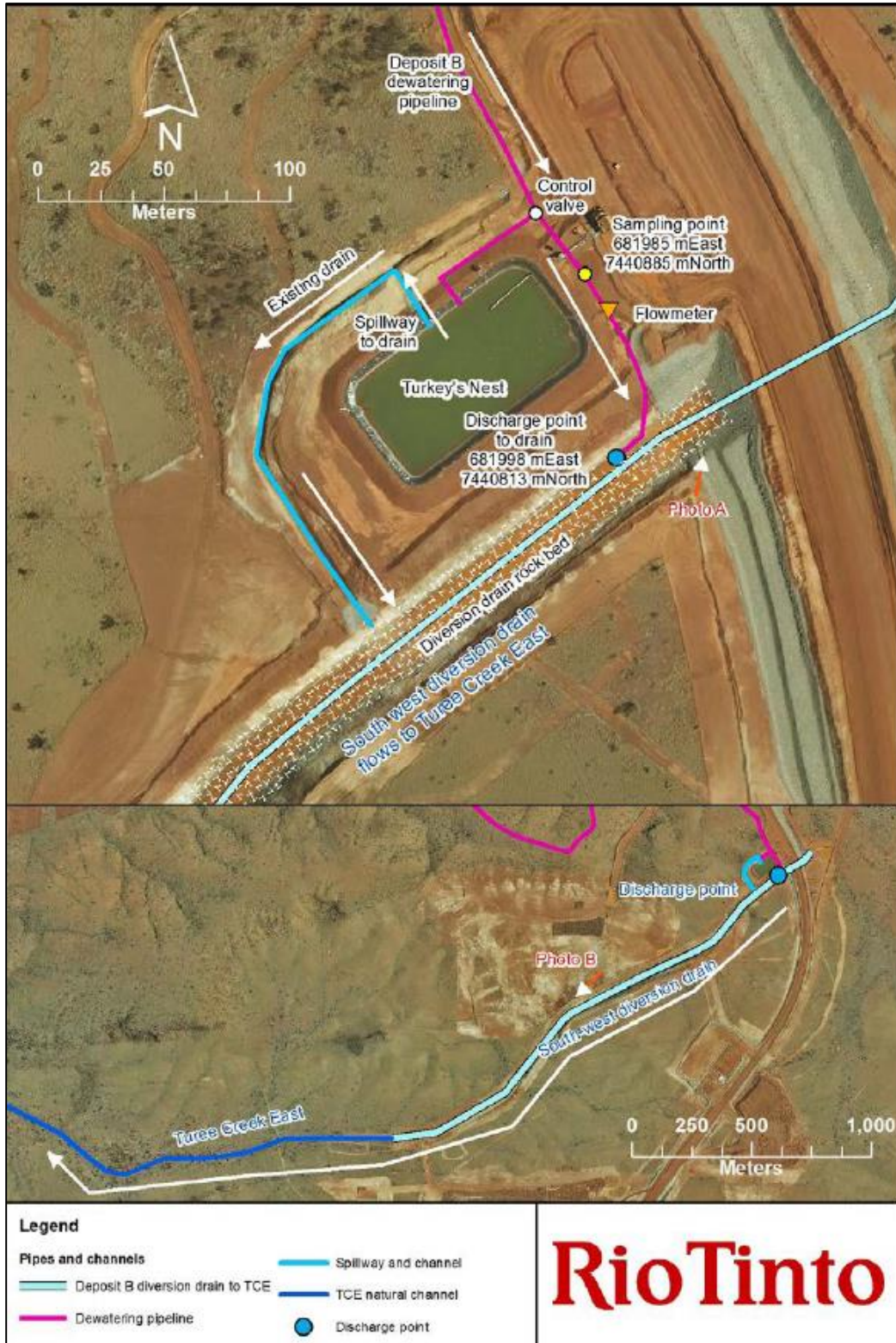


Figure 2: Proposed dewatering infrastructure at DEP B



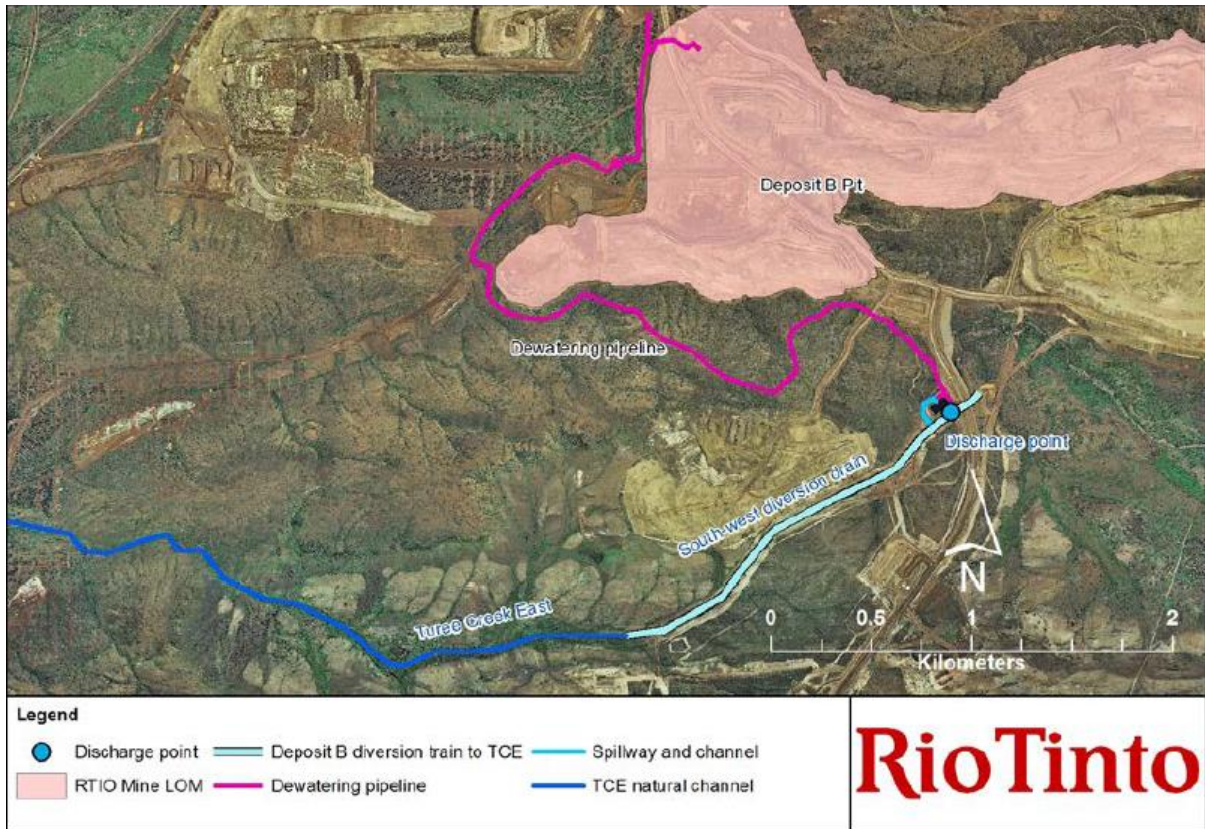


Figure 3: Extent of DEPB dewatering pipeline



Table 5: 2016 groundwater data from DEPB production bores

Analyte mg/L	ANZECC (2000) 95% TV	WB13WAB001				WB13WAB002				WB13WAB003		
		Q1-16	Q2-16	Q3-16	Q4-16	Q1-16	Q2-16	Q3-16	Q4-16	Q1-16	Q3-16	Q4-16
Aluminium, Al	0.055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Antimony, Sb		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Arsenic, As	0.024	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Barium, Ba		0.0072	0.0065	0.0061	0.0065	0.015	0.0173	0.0156	0.0167	0.0142	0.016	0.0165
Bicarbonate, HCO <sub>3</sub>		286	285	325	298	284	269	265	250	282	254	226
Boron, B	0.37	0.216	0.228	0.247	0.237	0.205	0.246	0.238	0.202	0.199	0.212	0.199
Cadmium, Cd	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Calcium, Ca		76	76	90	85	64	62	65	67	76	73	48
Carbonate, CO <sub>3</sub>		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloride, Cl		77	76	100	95	125	123	127	135	126	105	112
Chromium, Cr	0.001	0.0005	0.0011	0.0004	0.0009	0.0006	0.0008	0.0006	0.0006	0.0009	0.0008	<0.0002
Cobalt, Co		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Copper, Cu	0.0014	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005
Fluoride, F		0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.2
Iron, Fe		0.025	0.003	0.012	0.003	0.012	0.011	0.008	0.005	0.078	0.031	1.76
Lead, Pb	0.0034	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, Mg		75	77	88	81	70	72	70	70	76	77	79
Manganese, Mn	1.9	0.0047	<0.0005	0.0016	<0.0005	0.0015	<0.0005	0.0008	<0.0005	0.0041	0.002	0.822
Mercury, Hg	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel, Ni	0.011	0.0016	<0.0005	0.0009	<0.0005	0.001	<0.0005	<0.0005	0.0005	0.0008	0.0018	<0.0005
Nitrate, NO <sub>3</sub>	0.7	1.85	1.7	1.73	1.6	2.83	3.36	3.77	3.39	1.89	2.37	0.01



Analyte	ANZECC (2000) 95% TV	WB13WAB001				WB13WAB002				WB13WAB003		
		Q1-16	Q2-16	Q3-16	Q4-16	Q1-16	Q2-16	Q3-16	Q4-16	Q1-16	Q3-16	Q4-16
mg/L												
Total Nitrogen, N	0.3	2.1	2	2.1	1.9	2.8	4.2	5	4	2.4	2.8	0.4
Total Phosphate, P	0.01	<0.01	0.02	<0.01	0.05	<0.05	0.19	<0.02	0.01	0.01	<0.01	0.01
Potassium, K		1	1	2	2	10	9	9	10	8	7	8
Selenium, Se	0.011	0.0019	0.0021	0.0022	0.0023	0.0028	0.0027	0.0027	0.0028	0.0026	0.0025	0.0004
Silicon, Si		20.9	21.2	21.5	21.8	8.14	8.19	8.3	8.4	9.21	10.5	3.37
Silver, Ag	0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium, Na		74	73	92	77	82	83	84	84	86	88	89
Sulphate, SO4		297	266	355	266	201	181	199	184	244	324	220
Tin, Sn		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium, U		0.00072	0.00079	0.00087	0.00087	0.00037	0.00031	0.00029	0.00031	0.00061	0.0005	<0.0001
Zinc, Zn	0.008	0.794	<0.001	0.797	0.004	0.002	0.002	0.01	0.002	0.002	0.21	0.001
TRH		<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12

\*Production bore WB13WAB003 was dry in Q2 2016



**Table 6: 2016 water quality results from the existing Turee Creek discharge point**

Parameter	21/02/2016	13/04/2016	26/07/2016	27/10/2016
Electrical Conductivity ( $\mu\text{S}/\text{cm}$ )	936	784	798	979
pH (pH units)	7.97	8.25	8.25	8.33
Total Recoverable Hydrocarbons (mg/L)	<0.12	<0.12	<0.12	<0.12
Sodium (mg/L)	59	50	56	74
Potassium (mg/L)	12	9	10	15
Calcium (mg/L)	45	38	41	45
Magnesium (mg/L)	47	40	43	50
Chlorine (mg/L)	144	101	116	165
Carbonate (mg/L)	<1	1	<1.0	2
Bicarbonate (mg/L)	138	130	163	116
Sulfate (mg/L)	109	77	102	120
Nitrate (mg/L)	6.35	5.58	5.52	3.36
Aluminium (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050
Boron (mg/L)	0.24	0.23	0.26	0.26
Iron (mg/L)	0.004	0.002	<0.002	0.012
Copper (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Zinc (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic (mg/L)	<0.0002	<0.0002	<0.0002	<0.0002
Chromium (mg/L)	0.0007	0.0009	0.0006	0.0005
Lead (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001
Cadmium (mg/L)	<0.00005	<0.00005	<0.00005	<0.00005
Mercury (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (mg/L)	0.0020	0.0017	0.0016	0.0016
Manganese (mg/L)	<0.0005	<0.0005	<0.0005	0.0019
Total Suspended Solids (mg/L)	<5	<5	<5	<5

Emission Description

*Emission:* Excess mine dewater discharged via the DEP outlet to a local ephemeral tributary that joins Turee Creek East.

*Impact:* Change to the hydrologic regime of Turee Creek East from an ephemeral hydrologic regime to a perennial hydrologic regime and potential impacts to groundwater and creekline vegetation.

Rio Tinto, 2017e states that riparian vegetation along Turee Creek East within the modelled extent of surface water discharge supports two of the three common Pilbara species known to be phreatophytic: *Eucalyptus victrix* (facultative phreatophyte or vadophyte) and potentially *Eucalyptus camaldulensis* (facultative phreatophyte). *Eucalyptus victrix* and *Eucalyptus camaldulensis* display a moderate level of flooding tolerance, and are able to tolerate temporary inundation. Prolonged / permanent inundation of ephemeral creeks as a result of discharge is expected to result in inevitable changes to riparian vegetation including the following:

- changes in riparian vegetation community structure;
- changes in the health of the dominant riparian tree species *Eucalyptus victrix* and *Eucalyptus camaldulensis* (if present), which may include:
  - declining health (decreasing biomass / abundance) or death of species susceptible to waterlogging stress (*Eucalyptus victrix*); and



- increasing biomass / abundance or artificial recruitment of species tolerant to waterlogging (*Eucalyptus camaldulensis*).
- establishment or increasing biomass / abundance of other species which are tolerant to waterlogging (particularly sedges and rushes);
- enhanced potential for weed ingress / proliferation; and
- drought stress and potential mass senescence on cessation of discharge.

**Controls:**

The Licensee has stated that the following controls will be implemented (Rio Tinto, 2017b):

- Existing south-west diversion drain has been blasted into a rock basement and consists of a hard rock and coarse gravel bed suitable for controlling the proposed flow rate of 185 litres per second;
- Drain bed acts as a 2 km length of gravel and rock (rip-rap) control between the outlet of the pipeline and the natural channel of Turee Creek East downstream, which will help prevent erosion and the transport of sediment to Turee Creek East;
- DEPB outlet will be situated at the bed level of the diversion channel;
- DEBP outlet will be 2 km upstream of the confluence of the diversion channel and natural watercourse, the flow velocity will be attenuated by the time it reaches the natural creek bed;
- Flow meter will be installed near the outlet to record monthly discharge volumes; and
- Off-take valve along the pipeline, upstream of the discharge point for water quality sampling.

**Risk Assessment**

*Consequence:* The Delegated Officer has considered the Licensee's controls (diversion drain), groundwater quality, water quality from the existing dewater discharge point and that the Licensee has stated (Rio Tinto, 2017e) that the PEC of the West Angelas Cracking-Clays is separated from riparian vegetation communities of Turee Creek East and determined that low level onsite impacts and minimal off-site impacts at a local scale would occur from the discharge of excess mine dewater from DEPB. Therefore the Delegated Officer considers the consequence to be minor.

*Likelihood:* The Delegated Officer has determined that an impact to a sensitive receptor will not occur in most circumstances. The Licensee has existing regulatory requirements under Part IV of the EP Act relating to groundwater, surface water and vegetation. The 2016 Annual Environmental Report showed that the existing dewatering discharge water quality was below the appropriate ANZECC 2000 water quality trigger values during the reporting period. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for the discharge of excess mine dewater from DEPB to a tributary of Turee Creek East to be **medium**.

**Regulatory Controls**

The Licence has existing conditions 22 and 23 requiring the management of the Turee Creek discharge point and monitoring of dewatering discharge water. The Licensee is required to include a comparison of the dewatering water monitoring results against the appropriate ANZECC 2000 guideline and previous years monitoring data in the Annual Environmental Report.

During this amendment, the Licensee's controls for the construction of the DEPB outlet have been conditioned on the Licence through conditions 19 and 20 and were derived from the Licensee's obligation within Rio Tinto, 2017b. Condition 21 has also been included to allow the operation of the DEPB outlet following the submission of the compliance document required by condition 30.



Condition 22 has been updated to ensure that all dewatering discharge to Turee Creek flows through the Turee Creek and DEPB dewatering discharge points.

The Licensee has stated (Rio Tinto, 2017e) that no surface water quality monitoring has been undertaken within Turee Creek East given the absence of permanent (perennial) surface water flows, permanent or semi-permanent surface water features or other sensitive receptors. During this amendment condition 23 has been updated to include the DEPB dewatering discharge point in the monitoring requirements for dewatering discharge. This will provide baseline data for DEPB and allow a comparison to the ANZECC 2000 water quality trigger values to be made.

The Licensee has existing requirements relating to groundwater and surface water within MS 970, which are regulated under Part IV of the EP Act as defined below:

- MS 970 condition 6-1 for groundwater states *“manage groundwater abstraction and dewatering activities to ensure minimal adverse impacts on the availability and quality of groundwater resources and the dependent ecology”*.
- MS 970 condition 7-1 for surface water drainage states *“manage surface water drainage and discharge to ensure minimal adverse impacts on existing surface water drainage patterns or the water dependent ecosystems”*.

The Licensee has stated (Rio Tinto, 2017e) that they *“will continue to monitor the structure, cover and health of riparian vegetation communities within the extent of surface water discharge”*, which is required under MS 970.



**Discharge water saturation zone:**

During this amendment the Licensee has requested (Rio Tinto, 2017a) that previous condition 25 which requires the quarterly monitoring of the saturation zone distance be removed to avoid duplication with Part IV of the EP Act.

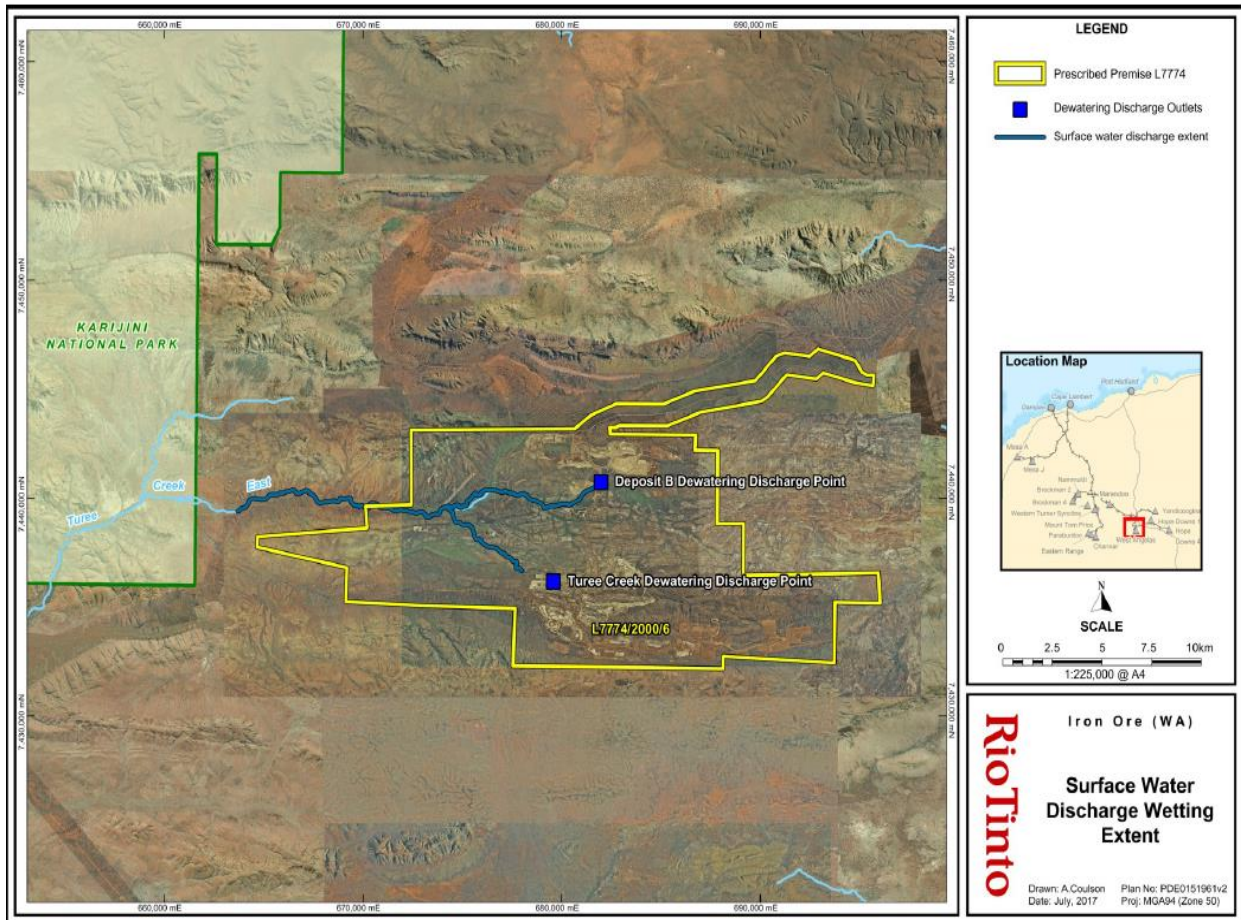
Rio Tinto, 2017b states “*Dewatering water artificially discharged to Turee Creek East at an approximately constant rate will flow along the surface of the creek until the inflow (surface water discharge) is balanced by outflow (infiltration and evaporative), defined as the maximum discharge extent. Modelling of the discharge extent was undertaken for a number of scenarios*” as shown in Table 7.

Rio Tinto, 2017d states that for discharge rates of less than 9 ML/day, flow will not reach the confluence with the Turee Creek East tributary that receives flow from the existing dewater discharge (from Deposit A). However, for discharge rates 12 – 16 ML/day from DEP, flow will extend beyond the confluence with the Turee Creek East tributary and interact with flows from the existing discharge point.

With the addition of the DEP outlet and based on a “*discharge of up to 12 GL/a, the maximum surface discharge extent is modelled to extent up to 22 km*” (Rio Tinto, 2017d) as shown in Figure 4. It should be noted that the DEP outlet is approximately 20 km east of Karijini National Park.

**Table 7: Estimated discharge extent from DEP outlet for various discharge rates**

Surplus volume	Surface flow expression from DEP outlet (km)	Distance from Karijini National Park (km)
DEP outlet – 4 ML/day	4.1	19.9
DEP outlet – 6 ML/day	6.7	17.3
DEP outlet – 9 ML/day	9.4	14.6
DEP outlet – 12 ML/day Existing Turee Creek dewatering discharge point – 16 ML/day	19.0	5.0
DEP outlet – 16 ML/day Existing Turee Creek dewatering discharge point – 16 ML/day	21.8	2.2



**Figure 4: Surface water discharge extent from the DEP B outlet and the Turee Creek dewatering discharge point**

Rio Tinto, 2017e states “Condition 5 of MS 970 requires the Licensee to implement an Environmental Management Program, including (but not limited to) a Surface Water Management Plan. Condition 7-1 of MS 970 requires that ‘the proponent shall manage surface water discharge to ensure minimal adverse impacts on existing surface water drainage patterns or the water dependent ecosystems’. To verify that the requirements of condition 7-1 are met, condition 7-2 of MS 970 requires that ‘the proponent shall undertake monitoring of the quality and quantity of water discharge as outlined in the Surface Water Management Plan approved as part of the Environmental Management Program required by condition 5’. The existing approved Surface Water Management Plan specifies quarterly monitoring of the extent of saturation”.

#### Risk Assessment

**Consequence:** The Delegated Officer has considered the water quality, vegetation, change to the hydrologic regime, distance to Karijini National Park and combination of two discharge points and determined that minimal off-site impacts at a local scale would occur from the discharge of excess mine dewater to a tributary of Turee Creek. Therefore the Delegated Officer considers the consequence to be minor.

**Likelihood:** The Delegated Officer has determined that an impact to a sensitive receptor will not occur in most circumstances. The Licensee has existing regulatory requirements under Part IV of the EP





Act relating to groundwater, surface water and vegetation. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

**Overall Risk Rating:** The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for the discharge of excess mine dewater from the two dewatering discharge points to a tributary of Turee Creek to be **medium**, subject to regulatory controls.

**Regulatory Controls**

Section 4.2.5 of the MS 970 approved Environmental Management Program (West Angelas EMP) details the surface water monitoring program for the Premises, which is shown below in Table 8. For discharge volume it stipulates a frequency of quarterly for extent of saturation with the procedure “visual inspection as per the Part V operating licence”.

**Table 8: Surface water monitoring program**

Topic	Frequency	Parameters	Procedure	Purpose
Surface water quality	Quarterly	TPH in surface water	Water quality sampling and analysis as per the Part V operating licence	To ensure surface water quality is not compromised.
Drainage management system	Opportunistically	Surface water flows are maintained	Visual inspection	To monitor the effectiveness of the on-site drainage management systems.
	Opportunistically	Integrity of drainage management systems	Visual inspection	To monitor the integrity of the on-site drainage management systems
Discharge volume	Monthly	Discharge volume	Water quantity sampling as per the Part V operating licence	To track instantaneous and cumulative discharge volumes and ensure compliance with licence conditions.
	Quarterly	Extent of saturation	Visual inspection as per the Part V operating licence	To track extent of saturation and ensure compliance with licence conditions.
Discharge water quality	Monthly	EC, pH and temperature	Water quality sampling and analysis as per the Part V operating licence	To ensure compliance with licence conditions and ensure no unacceptable change in downstream surface water quality as a result of discharge.
	Quarterly	TPH, Na, K, Ca, Mg, Cl, CO <sub>3</sub> , HCO <sub>3</sub> , SO <sub>4</sub> , NO <sub>3</sub> , Metals and TSS		
Discharge outlet	Opportunistically	Integrity of erosion control structures and evidence of erosion	Visual inspection (as per the Part V operating licence)	To monitor the integrity of erosion control structures.

*Riparian vegetation along drainage lines receiving discharge to be monitored as specified in the Vegetation and Flora Management Plan.*

*Mulga adjacent to the rail to be monitored as specified in the Vegetation and Flora Management Plan.*

*Weeds will be monitored and managed as specified in the Vegetation and Flora Management Plan.*

*Potential surface water contamination will be managed as specified in the Waste Management Plan.*

The Delegated Officer has decided to retain previous condition 25, (now re-numbered as condition 24) and has updated this condition to include the DEPB dewatering discharge point to ensure there is no impact to sensitive receptors (i.e. Karijini National Park). The Licensee is required to monitor the extent of the discharge water saturation zone quarterly from the existing Turee Creek dewatering discharge point and the DEPB dewatering discharge point and report this information in the Annual Environmental Report.



## Appendix E

### Emissions to land including monitoring

#### WWTPs

All three WWTPs irrigate to sprayfields. The Village WWTPs both irrigate to a 12 ha sprayfield and the Mine WWTP disposes of treated wastewater to a 1.5 ha sprayfield.

#### Emission Description

*Emission:* Discharge from the WWTPs to the irrigation sprayfields.

*Impact:* Contamination of surrounding environment and potential impacts on the ecology of ground and surface water from the addition of nutrients and heavy metals.

*Controls:* The Licensee implements the following management measures:

- Heavy duty impact sprinklers are utilised to provide an even spray radius and distribution;
- The flow and pressure are designed to prevent pooling and remain below the Department of Health recommended maximum limit of 10 mm per day;
- The sprayfields are bunded to prevent stormwater from entering/exiting the site;
- The sprayfields are sized appropriately to ensure that nutrient loadings are consistent with the relevant Water Quality Protection Note; and
- Every day maintenance procedures.

The WWTPs and sprayfields are sited so as to minimise potential environmental risk and amenity impacts such as odour.

Environmental siting of the Village WWTPs:

- Depth to groundwater is >3 mbgl; and
- There are no major drainage channels present in the spray irrigation area, however, ephemeral drainage lines are present approximately to the 95 m east and 60 m west of the area.

Environmental siting of the Mine WWTP:

- Depth to groundwater is >50 mbgl; and
- There are no surface water features in the vicinity of the Mine WWTP.

#### Risk Assessment

*Consequence:* The Delegated Officer has considered the siting of the WWTPs and irrigation sprayfields, the high evaporation rates experienced in the Pilbara region, depth to groundwater and distance to surface water/drainage channels and determined that there will be low level on-site impacts as a result of the irrigation of treated wastewater. Therefore the Delegated Officer considers the consequence to be minor.

*Likelihood:* The Delegated Officer has considered the Licensee's controls (sprinklers, inspections and maintenance) and determined that an environmental impact will not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for discharges to land to be **medium**.



### Regulatory Controls

The Delegated Officer is not imposing any additional conditions on the Licence as there are sufficient regulatory controls through existing conditions 1 to 6, which require the following:

- Licensee to monitor the WWTPs water quality on a quarterly basis and report these results in the Annual Environmental Report including an assessment and comparison against the NWQMS 1997 and all recorded monitoring data; and
- Disposal of sludge and biosolids in accordance with the *Western Australian guidelines for biosolids management* and to ensure sludge is stored within a hardstand area or drying bed.

The general provisions of the EP Act with respect to the causing of pollution and environmental harm applies, as does the provisions of relevant subsidiary legislation, including the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.



## Appendix F

### Fugitive (dust) emissions

#### Emission Description

*Emission:* Fugitive dust may result from the daily operation at the Premises where sources of dust can be attributed to stockpiles, materials handling and crushing, and vehicle movements on dirt roads. Dust is also generated during periods of high winds and low rainfall. The dust emissions should be relatively inert being predominately iron ore.

*Impact:* Dust emissions can be harmful to human health and the environment. Dust containing particles less than 10 micrometres in diameter have been associated with diminishing lung function and dust in high volumes does interfere with comfort and amenity for the public.

Localised impacts on vegetation from dust deposition can occur due to dust forming a physical barrier, restricting photosynthesis and respiration. Dust can also be abrasive to the leaf surface which may result in decreased productivity and changes to the vegetation structure. Fauna can also be impacted upon by dust emissions either directly or indirectly as the vegetation is used for habitat or a source of food. Any impact to flora is likely to be reversed during rainfall events during the wet season, thus long term impacts are not likely.

*Controls:* The nearest human receptors are located at Mining Area C (operated by BHP Billiton Iron Ore Pty Ltd), located approximately 35 km from the Premises. Mining Area C is also an iron ore mine so health impacts from off-site sources are highly unlikely.

The Licensee implements the following controls to limit the creation and spread of dust:

- Rotating sprinklers over stockpiles;
- Water carts operating on both day and night shifts;
- Deluge sprays while tipping and crushing;
- Sprinklers operating on reclaimers and train load out;
- Spray bars installed along the conveyor belts;
- Coverings on transfer points;
- The use of skirtings and dust filters; and
- Dust extraction systems maintained as required.

#### Risk Assessment

*Consequence:* The Delegated Officer has considered the distance to the nearest sensitive receptor (approximately 35 km) and determined that minimal impacts to the health of this receptor will occur. The Delegated Officer has determined that minimal on-site impacts to vegetation will occur. Even in areas most impacted by dust, it is likely that the natural dust tolerance of Pilbara vegetation species will prevent widespread vegetation impacts. Therefore the Delegated Officer considers the consequence to be slight.

*Likelihood:* The Delegated Officer has considered the Licensee's controls to manage dust and determined that adverse impacts to the environment from fugitive dust emissions will not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of the consequence to be unlikely.

*Overall Risk Rating:* The Delegated Officer has compared the consequence and likelihood ratings described above through the Risk Rating Matrix (Table 1) and determined the overall rating of risk for fugitive dust emissions to be **low**.



### Regulatory Controls

The Delegated Officer is not imposing any specified conditions relating to fugitive dust emissions as the risk has been assessed as low given the location of the Premises relative to the nearest sensitive receptor. The Delegated Officer considers that the general provisions of the EP Act provides a sufficient regulatory control for the management of dust.



## References

	Document Title	In text ref	Availability
1	Assessment and management of contaminated sites, Contaminated sites guidelines, Department of Environment Regulation, December 2014	Assessment and management of contaminated sites	accessed at <a href="http://www.der.wa.gov.au">http://www.der.wa.gov.au</a>
2	Department of Parks and Wildlife Threatened and Priority Flora List 8 March 2017	DBCA, 2017b	accessed at <a href="https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants">https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants</a>
3	<i>Guidance Statement: Decision Making</i> , Department of Environment Regulation, February 2017	<i>Guidance Statement: Decision Making</i>	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
4	<i>Guidance Statement: Environmental Siting</i> , Department of Environment Regulation, November 2016	<i>Guidance Statement: Environmental Siting</i>	
5	<i>Guidance Statement: Regulatory principles</i> , Department of Environment Regulation, July 2015	<i>Guidance Statement: Regulatory principles</i>	
6	<i>Guidance Statement: Risk Assessments</i> , Department of Environment Regulation, February 2017	<i>Guidance Statement: Risk Assessments</i>	
7	<i>Guidance Statement: Setting conditions</i> , Department of Environment Regulation, October 2015	<i>Guidance Statement: Setting conditions</i>	
8	Licence Amendment Supporting Documentation – L7774/2000/6 West Angelas – Deposit B Dewatering Outlet (RTIO-HSE-0311860), Rio Tinto, 30 June 2017	Rio Tinto, 2017b	DWER records (A1464339)
9	Licence Amendment Supporting Documentation – L7774/2000/6 West Angelas – Deposit B Waste Dump Landfill (RTIO-HSE-0311861), Rio Tinto, 30 June 2017	Rio Tinto, 2017c	DWER records (A1464339)
10	Ministerial Statement 970	MS 970	accessed at
11	Ministerial Statement 1015	MS 1015	<a href="http://www.epa.wa.gov.au">www.epa.wa.gov.au</a>
12	National Environment Protection (Ambient Air Quality) Measure	NEPM guidelines	accessed at <a href="http://www.nepc.gov.au">http://www.nepc.gov.au</a>
13	National Environment Protection (Assessment of Site Contamination) Measure 1999	ASC NEPM	



Document Title	In text ref	Availability
14 National Water Quality Management Strategy, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand and Conservation Council and Agriculture and Resources Management Council of Australia and New Zealand, 2000	ANZECC 2000	accessed at <a href="http://www.environment.gov.au">http://www.environment.gov.au</a>
15 National Water Quality Management Strategy, Australian Guidelines for Sewerage Systems - Effluent Management, Agriculture and Resource Management Council of Australia and New Zealand and Australian and New Zealand Environment and Conservation Council, 1997	NWQMS 1997	accessed at <a href="http://www.agriculture.gov.au">http://www.agriculture.gov.au</a>
16 Priority Ecological Communities for Western Australia Version 27, Species and Communities Branch, Department of Biodiversity, Conservation and Attractions, 30 June 2017	DBCA, 2017a	accessed at <a href="https://www.dpaw.wa.gov.au">https://www.dpaw.wa.gov.au</a>
17 RE: Application Notification – L7774/2000/6 – Application for an Amendment to Licence – Request for Further Information, received from Jennifer Major (RTIO), dated 18 July 2017	Rio Tinto, 2017d	DWER records (A1487430)
18 RE: Application Notification – L7774/2000/6 – Application for an Amendment to Licence – Request for Further Information, received from Jennifer Major (RTIO), dated 27 September 2017	Rio Tinto, 2017e	DWER records (A1530624)
19 RE: Application Notification – L7774/2000/6 – Notice of Proposed Amendment to Licence received from Sean Savage (RTIO), dated 17 October 2017	Rio Tinto, 2017f	DWER records (A1541950)
20 Report and recommendations of the Environmental Protection Authority, West Angelas Iron Ore Project – inquiry under s46 of the <i>Environmental Protection Act 1986</i> to amend Ministerial Statement 514, Robe River Mining Co Pty Ltd, Report 1508, April 2014	EPA Report 1508	accessed at <a href="http://www.epa.wa.gov.au">www.epa.wa.gov.au</a>



Document Title	In text ref	Availability
21 Report and recommendations of the Environmental Protection Authority, West Angelas Deposit A west and Deposit F – Revised Proposal, Robe River Mining Co Pty Ltd, Report 1551, June 2015	EPA Report 1551	
22 Salinity status classifications, by total salt concentration, Department of Water and Environmental Regulation	Salinity status classification	accessed at <a href="http://www.water.wa.gov.au/water-topics/water-quality/managing-water-quality/understanding-salinity">http://www.water.wa.gov.au/water-topics/water-quality/managing-water-quality/understanding-salinity</a>
23 West Angelas Operations Environmental Management Program, Robe River Mining Company Pty Ltd, Last updated: November 2013	West Angelas EMP	DWER records (A1536436)
24 West Angelas <i>Environmental Protection Act 1986</i> (EP Act) Part V Licence L7774/2000/6 – Amendment Application including Application Form, Rio Tinto, 30 June 2017	Rio Tinto, 2017a	DWER records (A1464339)
25 West Angelas Power Station (W5116/2011/1) Commissioning Report – Updated Emissions Testing Results, Rio Tinto, 17 March 2017	WAPS Commissioning Report	DWER records (A1395866)
26 West Angelas Power Station W5116/2011/1 – Works Approval Compliance Document, Rio Tinto, 18 March 2015	WAPS Compliance Document	DWER records (A884047)
27 Western Australian guidelines for biosolids management, Department of Environment and Conservation, December 2012	Western Australian guidelines for biosolids management	accessed at <a href="http://www.der.wa.gov.au">http://www.der.wa.gov.au</a>
28 2016 Annual Environment Report for L7774/2000/6 – West Angelas Iron Ore Mine, Rio Tinto, 30 April 2017	2016 Annual Environmental Report	DWER records (A1419536)