



Decision Document

Environmental Protection Act 1986, Part V

Proponent: **Pilbara Manganese Pty Ltd**

Licence: **L6131/1990/13**

Registered office: 28 Ventnor Avenue
WEST PERTH WA 6005

ACN: 074 106 577

Premises address Woodie Woodie Manganese Project
Mining Tenements G45/332, G45/333, G45/334, G45/335, G45/336, 45/37-
40, G46/4-5, L46/29, M45/107, M45/429-433, M45/517, M45/600-602,
M45/1218, M45/637-641, M46/92-93, M46/108, M46/137, M46/150,
M46/161-162, M46/383 and M46/384
MARBLE BAR WA 6760

Issue date: Thursday, 26 September 2013

Commencement date: Tuesday, 1 October 2013

Expiry date: Saturday, 30 September 2028

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER 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: Cathy Scheib/Suzy Roworth
Licensing Officer

Decision Document authorised by: Alana Kidd
Manager Licensing



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1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER’s decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER’s assessment and decision making under Part V of the *Environmental Protection Act 1986*. 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>05</td> <td>5,000,000 tonnes per annual period</td> </tr> <tr> <td>06</td> <td>55,188,000 tonnes per annual period</td> </tr> <tr> <td>54</td> <td>150 cubic metres per day</td> </tr> <tr> <td>73</td> <td>2,144 cubic metres</td> </tr> <tr> <td>89</td> <td>1,000 tonnes per annual period</td> </tr> </tbody> </table>	Category number(s)	Assessed design capacity	05	5,000,000 tonnes per annual period	06	55,188,000 tonnes per annual period	54	150 cubic metres per day	73	2,144 cubic metres	89	1,000 tonnes per annual period
	Category number(s)	Assessed design capacity											
	05	5,000,000 tonnes per annual period											
	06	55,188,000 tonnes per annual period											
	54	150 cubic metres per day											
73	2,144 cubic metres												
89	1,000 tonnes per annual period												
Application verified	Date: N/A												
Application fee paid	Date: N/A												
Works Approval has been complied with	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>												
Compliance Certificate received	Yes <input checked="" type="checkbox"/> (A941586)												
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 to the Environmental Protection Authority (EPA) under Part IV of the <i>Environmental Protection Act 1986</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Is the proposal subject to Ministerial Conditions?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
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 type="checkbox"/> No <input checked="" type="checkbox"/>	Department of Water consulted Yes <input type="checkbox"/> No <input checked="" 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 ₂ requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

Pilbara Manganese Pty Ltd (PMPL) own and operate the Woodie Woodie Manganese Project (Woodie Woodie) located approximately 400km south east of the town of Port Hedland in the Pilbara region of Western Australia. The site consists of a number of leases and covers a total area of 13,327 hectares. PMPL is a wholly owned subsidiary of Consolidated Minerals Pty Ltd. The site has been operational since February 1991 when the licence was originally issued.

The site has the capacity to process up to 5,000,000 tonnes of ore per year and ore is mined from a variety of pits at any one time, dependent upon market requirements. The mined ore is transported to the centrally located beneficiation plant where it is blended, crushed, screened and washed before being put through a heavy media separation plant where lump manganese product is produced via a drum separator and fines manganese via a cyclone.

Course and fines waste rock streams are produced, with coarse waste stream stockpiled near the beneficiation plant and tailings being retreated using a screw classifier to remove all remaining manganese material before entering the in-pit tailings storage facility (TSF). Currently PMPL utilise Demon Pit TSF, Dartmoor Pit TSF, Malta Pit TSF and Area 1 Pit TSF for tailings storage.

The site undertakes dewatering to enable mining to occur below the water table and has a capacity to dewater up to 55,188,000 tonnes per year. Some of the water is recycled through the plant and TSF and the remaining dewater is discharged from a sedimentation pond to various discharge points leading to the local creek systems.

A wastewater treatment plant (WWTP) with the capacity to treat up to 150 m³/day is located at the camp. Increases in the size of the irrigation area have recently been made to ensure soil is not overloaded.

The November 2015 amendment implemented the following changes:

- Addition of a sampling point at the extended WWTP irrigation area;



- Addition of the Topvar dewatering pipeline and discharge location into Brumby Creek which was constructed and authorised under Works Approval W5821/2015/1; and
- Addition of a new pit (Hunter SE) to the dewatering sources, through an existing sedimentation pond (Cracker sedimentation pond, W1) which is adjacent to the new pit. Hunter SE is one of three pits within the Hunter extension project, and the only one of the three requiring dewatering. Discharging of dewater from Hunter is already approved through the emission point W2, but discharging to the Cracker sedimentation pond removes the need to dig a trench to the Hunter sedimentation pond. Both the Cracker and Hunter sedimentation ponds discharge to the Muddauthera Creek system. All dewatering will remain within the approved discharge limit.

The Topvar Discharge Point has been established on Brumby Creek, around 4km downstream of the current Paystar discharge Point. The reason for this location is to avoid recirculation of the groundwater back into the active mining area. The discharge point consists of the pipeline outlet and heaped boulders to spread the impact zone of the discharge and minimize the chance of erosion to the creek beds. Boulder-sized sandstone from the Topvar Pit was used to construct rock armouring, which is approximately 20m in length and 12m in width. In addition, elbows have been placed on the end of the pipeline to reduce water velocity upon exiting the pipeline. Fortnightly water quality analysis has been conducted as per the works approval conditions.

It is expected that approximately 300-600L/s will be pumped to the discharge point. The discharge point will be in operation for approximate 5 years while the Topvar Mining area is active. The Pits that will be mined during this time will be, Topvar, Cracker, Eat and Big Mack. It is expected that the location of the bore will allow for adequate dewatering of all these pits.

January 2016 amendment

An additional five General Purpose tenements were added (G45/332, G45/333, G45/334, G45/335, G45/336) onto the Woodie mining corridor. M45/1218 was also included as this tenement is included within the Hunter operation and looks as if historically it has been missed. The Greensnake landfill has been added as per works approval W5832/2015/1. IR1 was been removed as the Bioremediation Facility has been constructed.

April 2016 amendment

Licensee advised that the site is going into Care & Maintenance. The proponent has requested that the tailings inspections be reduced from daily to weekly when the facilities are inactive. The proponent has also requested that the weather stations at Telfer be used to measure site rainfall and evaporation rather than the site weather stations, which will be decommissioned (this change does not require any amendment to the licence conditions). As part of this amendment, redundant conditions were also removed.

The key emissions associated with the project relate to point source emissions to surface water through the dewatering discharge. Other matters considered relevant to the DER include tailings storage and management, waste management and disposal, and fugitive dust emissions generated through mining operations. The DER considers that the Woodie Woodie operations are acceptable subject to the implementation of management commitments detailed by the licensee and compliance with conditions of licence L6131/1990/13.



4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L= Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
General conditions	L1.2.1	<p>Generic changes have been made to the General Conditions of this Licence as part of Departmental reform and updates to licence templates. These changes include removing conditions referencing the Code of Practice for the Storage and handling of dangerous goods. Woodie Woodie do not store environmentally hazardous materials in bulk, other than those substances covered under their Dangerous Goods Licence.</p> <p>L1.1.5, 1.2.1 and 1.2.3 have been removed as these are not risk based or enforceable and are considered redundant conditions.</p> <p>No other changes have been applied to this section.</p>	<p>General provisions of the <i>Environmental Protection Act 1986</i></p> <p><i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i></p>
Premises operation	L1.3.1 – 1.3.12	<p>DER's risk assessment and decision making are detailed in Appendix A.</p> <p><u>Management of Waste</u> Conditions 1.3.7 – 1.3.10 are included in the licence detailing the location, waste type, process limits and specifications for the landfilling of wastes. Condition 1.3.12 has been added to the licence detailing the requirements for the irrigation of treated wastewater from the WWTP. No changes were made to these conditions under the November 2015 amendment.</p> <p>The Greensnake landfill was added during the January 2016 amendment is managed under existing licence conditions.</p> <p>During the April 2016 amendment the frequency of the tailings inspections required in</p>	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		by condition 1.3.5 have been reduced from daily to weekly. All processing and tailings deposition has ceased and all tailings pipelines have been flushed with clean process water. There may, however, be times when the Fines Plant will be operational for short periods of time, which will result in deposition to the TSF. When this occurs the inspections will revert to daily and this has been stipulated in condition 1.3.5.	
Emissions general	L2.1.1	General emission conditions are included in the Licence as standard. Condition L2.1.1 requires the Licensee to record and investigate the exceedance of any descriptive or numerical limit specified in section 2 of the Licence.	N/A
Point source emissions to air including monitoring	L – no conditions	There are no point source emissions to air associated with this premises and as such no licence conditions are required.	General provisions of the <i>Environmental Protection Act 1986</i> <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>
Point source emissions to surface water including monitoring	L2.2.1 – L2.2.2	Excess dewatering water is discharged to natural drainage lines via 12 discharge points. DER's risk assessment and decision making with respect to these discharges are detailed in Appendix B.	
Point source emissions to groundwater including monitoring	L – no conditions	There are no point source emissions to groundwater associated with this premises and as such no licence conditions are required.	
Emissions to land including monitoring	L2.3.1 – L2.3.2	PMPL operate a wastewater treatment plant from which treated wastewater is discharged to a dedicated irrigation area. DER's risk assessment and decision making with respect to discharges to land are detailed in Appendix C.	
Fugitive emissions	L – no conditions	<u>Emission Description</u> <i>Emission:</i> Dust emissions can be generated from mining of manganese ore, materials handling, ore stockpiles, operation of the processing plant (e.g. crushing and screening), and movement of vehicles and open areas. <i>Impact:</i> Manganese ore from the premises has been characterised as having a high	



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
		<p>manganese content with low iron and phosphorus. Prolonged exposure to manganese in occupation settings is associated with neurotoxicity, however there is no clear evidence of neurotoxicity from exposure to lower concentrations of airborne manganese in community settings. Dust containing particles of less than 10 micrometres in diameter has been associated with diminishing lung function and dust in high volumes does interfere with comfort and amenity for the public. Dust also has the potential to smother and impact the health of flora and vegetation. Given the mining operations are extremely isolated with the nearest town (Marble Bar) being located 100 km away and no sensitive premises located within 10km the key receptor has been considered to be vegetation.</p> <p><i>Controls:</i> The Licensee has implemented the following controls:</p> <ul style="list-style-type: none"> • Regular deployment of water carts; • Water sprays on conveyors; and • Covers on road trains and transfer points. <p><u>Risk Assessment</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low</p> <p><u>Regulatory Controls</u> PMPL are required to comply with the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>. Given this, and the control measures currently being deployed on site, no further regulatory controls are considered necessary.</p> <p><u>Residual Risk</u> <i>Consequence:</i> Minor <i>Likelihood:</i> Rare <i>Risk Rating:</i> Low</p>	
Odour	L – no conditions	There are no significant odour emissions associated with this premises. As such, no licence conditions are detailed in the licence for odour.	N/A



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
Noise	L – no conditions	Given the extremely isolated nature of the premises with no nearby sensitive premises there are no noise conditions required for this licence. Compliance with the <i>Environmental Protection (Noise) Regulations 1997</i> is required.	<i>Environmental Protection (Noise) Regulations 1997</i>
Monitoring general	L3.1.1 – 3.1.4	Standard monitoring conditions for the collection, handling and analysis of samples and calibration of monitoring equipment are detailed in the licence. No changes were made under the November 2015 or January 2016 amendment.	N/A
Monitoring of inputs and outputs	L3.4.1	Condition 3.4.1 is included in the licence for monitoring of the cumulative volume of wastewater discharged to the irrigation area and the volume of waste disposed to landfill. No changes were made under the November 2015 or January 2016 amendment.	
Process monitoring	L3.5.1	Condition 3.5.1 requiring process monitoring of tailings deposition to the TSFs is included in the Licence–No changes were made under the November 2015 or January 2016 amendment.	
Ambient quality monitoring	L3.6.1	A risk assessment for point source emissions to surface water and site processes (management of TSF) was undertaken and is detailed through Appendix A and B. Condition 3.6.1 is included on the licence to ensure monitoring at reference and downstream sites occurs and, by comparison of the two, notable impacts to the environment can be detected. Monitoring of surface waters, sediments, groundwater and vegetation health are included.	
Meteorological monitoring	L – no conditions	There is no requirement for meteorological monitoring as part of this licence.	N/A
Improvements	L – no conditions	The improvement condition has been removed from the licence as the Workshop Bioremediation Facility has been completed. Conditions related to the bioremediation facility have however been retained considering the previous risk identified.	Woodie Woodie Mine Site (L6131/1990/13) Improvement Reference IR1 dated 23 December 2015
Information	L4.1.1 – 4.1.3	Standard conditions for records management, reporting and notification are included in the licence. L4.1.1 has however been removed as this condition is considered not	N/A



DECISION TABLE			
Works Approval / Licence section	Condition number W = Works Approval L = Licence	Justification (including risk description & decision methodology where relevant)	Reference documents
	L4.2.1 – 4.2.3 L4.3.1	enforceable. The Licensee has notified DER that the site has entered Care & Maintenance. Therefore, a requirement has been added to Table 4.3.1 to ensure that DER is notified when recommencement of operations occur.	
Licence Duration	N/A	The licence has been updated to expire 30 September 2028 in accordance with the <i>Guidance Statement: Licence duration</i> and the notice of amendment.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
19/11/2015	Licensee sent a copy of draft amended instrument	Pilbara Manganese replied on 20/11/2015 with minor comments.	DER addressed comments in draft and issued Licence.
4/2/2016	Licensee sent a copy of 21 day drafts	Pilbara Manganese waived 21 days 18/2/2016	N/A.
16/06/2016	Licensee sent a draft copy of amended instrument	Completed waiver received.	N/A.



6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High



Appendix A

Emissions Risk Assessment

General Conditions

Operation

Emission Description

Emission: Spillage of hydrocarbons and chemicals following incorrect storage and use onsite.

Impact: Stormwater and soil can be contaminated with hydrocarbon and chemicals and may then enter the environment, which can have an adverse effect on water quality and health of flora and fauna.

Controls: The Licensee has the following controls in place:

- Double skinned tanks or bunding with 110% containment (PC Fuel Farm) for bulk hydrocarbon storage;
- Spill procedures and spill kits;
- Bunding for workshop and bioremediation areas; and
- Water from vehicle wash down is directed to oil/water separator.

Risk Assessment

Consequence: Minor

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

The *Environmental Protection (Unauthorised Discharges) Regulations 2004* and general provisions of the Act apply.

Residual Risk

Consequence: Minor

Likelihood: Rare

Risk Rating: Low

Premises Operation

Operation

Emission Description

Emission: Tailings held in TSF's are a waste product from mining and may contain heavy metals and accumulation of soluble salts. Seepage from tailings at TSF's into groundwater may occur over time as tailings are deposited into the facility.

Impact: The average tailings slurry is comprised of 20-35% solids (high water content) and there is moderate permeability of the walls and base of pits used for TSF ranging from 1.16×10^{-6} to 1.16×10^{-4} m/s. Depth to groundwater is approximately 250 m relative level (mRL) with pit depths ranging from 203 m to 245 mRL. One pit (Demon) which is being used as TSF did require dewatering during mining. Analysis of tailings solids and leachate from Camp East TSF in March 2012, indicate minor changes to geochemical properties, especially a re-distribution of soluble salts and associated metals and metalloids upon storage in the TSF. Key observations include:

- Significant accumulation of soluble salts in slime tailings;
- Lower salinity levels in sand tailings;
- Decrease ratio of chloride to sulphate;



- Some alkali-soluble metals: Arsenic; Molybdenum; Selenium; and Uranium, had partially leached from the surface of sand tailings; and
- A small amount of soluble Chromium (in hexavalent form) had accumulated in slime tailings.

Hydrogeological assessment of the in-pit TSF (Chris D, Demon, Homestead, Malta and Dartmoor) undertaken in 2011 concluded that there was very little impact to the groundwater system as a result of deposition of tailings with chemistry within the tailings stream and the groundwater around each of the pits being of similar composition.

Contamination of groundwater and surrounding soil from soluble salts, metals and metalloids may impact the quality of groundwater causing adverse effects to groundwater dependant ecosystems and other water users. Groundwater flow has been modelled to discharge at the Oakover River; a semi-permanent water body.

Controls: The Licensee has outlined the following controls:

- Maximising water return to process plant;
- Installation of monitoring bores to record standing water levels and water quality;
- Maintaining groundwater level greater than 4 m below surface as surrounding vegetation may be adversely affected should groundwater levels reach this level; and
- Remedial actions and notification to DER if groundwater level increases to within 6 m of the surface.

Risk Assessment

Consequence: Moderate

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

Condition 1.3.2 ensures tailings are disposed to authorised containment structures with appropriate specifications. The freeboard has been based on assessments undertaken by the Licensee for In-Pit TSFs Works Approval W5216/2012/1. Condition 1.3.3 is included in the licence detailing that the supernatant ponds are minimised as far as practicable to reduce seepage. Condition 1.3.4 is included in the licence requiring the licensee to undertake an annual water balance for the TSF to determine levels of seepage. Condition 1.3.5 requires the licensee to undertake inspection of the freeboard capacity. Condition 1.3.6 specifies a groundwater level limit of no less than 4 m below ground level to prevent impacts to vegetation and condition 1.3.7 specifies actions to be taken if groundwater levels rise to within 6 m of the ground surface.

Condition 3.6.1 is included in the licence requiring the Licensee to monitor ambient groundwater quality (parameters: SWL, pH, TDS, TN, As, Cu, Mo, Se, U and CrIV) around the TSFs on a quarterly basis, compare results against targets and previous year's results, and report the results through the Annual Environmental Report (AER). Metal/Metalloid triggers were previously set based on Department of Health, 2014, Non-potable Groundwater Use, *Contaminated sites ground and surface water chemical screening guidelines* as no other groundwater users have been identified within 5km of premises. These targets will be incorporated by PMPL into a groundwater and surface water management plan and are no longer specified in the Licence.

Residual Risk

Consequence: Moderate

Likelihood: Rare

Risk Rating: Moderate

Emergency situation

Emission Description



Emission: Tailing effluent and slurries may contain elevated levels of sediments and heavy metals. Spills from pipelines and other infrastructure may result in release of this material into nearby surface water or soils.

Impact: Contamination from heavy metals and sediments into surface water may impact the quality of water causing adverse effects to vegetation and fauna.

Controls: The Licensee has outlined the following controls:

- Pipeline is in a bunded corridor with scour sumps to capture any tails or return water leakage;
- Control room informed immediately if a leak or rupture occurs with emergency line on standby; and
- Pipeline designed and constructed across water courses to consider peak flow event including double corrugated iron sleeve and burial downstream of road.

Risk Assessment

Consequence: Moderate

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

Condition 1.3.1 is included in the Licence requiring pipelines with either automatic cut-outs or secondary containment. Condition 1.3.2 details the minimum freeboard requirements for the TSFs and condition 1.3.5 requires the Licensee to undertake inspections of infrastructure on a weekly basis while the facilities are inactive.

Residual Risk

Consequence: Minor

Likelihood: Rare

Risk Rating: Low



Appendix B

Point source emission to surface water

Emission Risk Assessment **Operation**

Emission: Dewatering effluent to surface water creeks on site. Dewatering is required to allow for the mining of Manganese at Woodie Woodie. Dewater can contain high levels of suspended solids, nutrients and metals. Dewater is discharged to surface water from sedimentation ponds through 12 emission points located within the premises boundary. The emission points include the Muddauthera Creek (W1-W4), Warri Warri Creek (W5-W6) and Brumby Creek (W7-W12). The locations and frequency of discharge change depending on which pit is being mined. During the November 2015 amendment, the Topvar dewatering point was added following its implementation under Works Approval W5821/2015/1. In addition, a new pit (Hunter SE) was added to the approved dewatering sources, through an existing sedimentation pond (Cracker sedimentation pond, W1) which is adjacent to the new pit. Hunter SE is one of three pits within the Hunter extension project, and the only one of the three requiring dewatering. Discharging of dewater from Hunter is already approved through the emission point W2, but discharging to the Cracker sedimentation pond removes the need to dig a trench to the Hunter sedimentation pond. Both the Cracker and Hunter sedimentation ponds discharge to the Muddauthera Creek system.

Impact: Historical monitoring results from Woodie Woodie (1993-2012) generally indicate that the water quality for dewater discharged is fresh to slightly brackish, neutral to slightly alkaline with a high nitrate/nitrite concentration. Dewater is discharged to ephemeral creeks Muddauthera Creek, Warri Warri Creek and Brumby Creek. These Creeks drain to the Oakover River which is approximately 10km downstream and a semi-permanent water body. Studies undertaken by the Licensee and reported to the DER in 2011 concluded that dewatering water did not affect the quality of water or vegetation of the Oakover River or its tributaries. High levels of suspended solids, nutrients and some metals can adversely affect flora, fauna, livestock and other water users. Cattle are known to congregate around areas of dewater discharge.

Controls: The Licensee has in place the following controls:

- Dewater is piped to a sedimentation pond to allow suspended solids to settle out, prior to being discharged to watercourses;
- Water quality monitoring is undertaken on a monthly basis (when accessible) for a range of physical and chemical parameters at the point of discharge, downstream and at background sites;
- Vegetation health monitoring is undertaken on a six monthly basis at a number of downstream and background locations;
- All dewatering will remain within the approved discharge limit; and
- Woodie Woodie will develop a groundwater and surface water management plan which incorporates appropriate target levels that, if exceeded, will action investigation and management measures.

Risk Assessment

Consequence: Moderate

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

Water quality monitoring on a monthly and quarterly basis has taken place from 1993 to 2011 with no reported direct impacts to aquatic ecosystems. Based on these monitoring results, site specific limits



and targets were developed, based on 90th and 10th percentile of long term reference data. Where long term reference data was not used, the ANZECC (2000) default trigger values for freshwater ecosystems (95% level of ecosystem protection) were used. The specific trigger levels developed will be adopted into the Woodie Woodie groundwater and surface water management plan, with the developed limits remaining in the Licence.

Condition 2.3.1 is included in the Licence, detailing the location of authorised emission points. Condition 2.2.2 specifies the Total Suspended Solids (TSS) limit that may be discharged to surface water. TSS was set as a limit as it was considered to be the parameter of primary concern for the discharge of dewater. Ambient monitoring for surface waters downstream and at background sites through condition 3.6.1 is also included in the Licence.

Residual Risk

Consequence: Minor

Likelihood: Unlikely

Risk Rating: Moderate



Appendix C

Emissions to Land

Wastewater treatment plant

The site has a wastewater treatment plant (WWTP) that services the premises accommodation and office facilities. The WWTP consists of ten primary concrete tank modules that contain the anaerobic and aerobic bioreactors, the clarification chamber, the disinfection chamber and the pump out chamber. The design capacity allows for the treatment and disposal of 150 cubic metres per day. The treated effluent from the WWTP is irrigated to the designated irrigation area which is appropriately signed and fenced to ensure no unauthorised access.

Emission Risk Assessment Operation

Emission: Treated effluent discharged to the environment through sprinklers within an irrigation field.

Impact: Effluent contains high levels of nutrients which can cause eutrophication in water bodies which can impact ecosystem processes and function. A number of ephemeral water bodies are located within the premises boundary. The irrigation of treated wastewater can also encourage excess growth of weeds.

Controls: The Licensee has outlined the following controls:

- Daily inspections of the WWTP and irrigation area;
- Regular maintenance to WWTP, sprinkler heads, fencing and other infrastructure;
- Quarterly monitoring of treated effluent quality targeted in-line with Table 3 below; and
- Nutrient loading below licence limits.

Table 3: WWTP Irrigation Water Quality Criteria

Parameter	Targeted quality	effluent	Guideline*	Percentage of guideline
pH	6.5-8.5			
Biochemical Oxygen Demand	30 mg/L		20-30 mg/L	100%
Total Nitrogen	15 mg/L		20-50 mg/L	30%
Total Phosphorus	5 mg/L		6-12 mg/L	42%
Total Suspended Solids	40 mg/L		25-40 mg/L	100%
<i>E.coli</i>	10 ⁵ org/100mL		10 ⁵ – 10 ⁶ org/100mL	10%

*Australian Water Quality Management Strategy “Australian Guidelines for Sewage Systems – Effluent Management” (ANZECC 1997)

Risk Assessment

Consequence: Minor

Likelihood: Unlikely

Risk Rating: Moderate

Regulatory Controls

Conditions 2.3.1, 2.3.2 and 3.3.1 specify the location of the emission points, limits and monitoring required for the WWTP and emissions to land. Effluent quality targets are being incorporated into site-specific procedures by PMPL and are no longer specified in the Licence.

Residual Risk

Consequence: Minor



Likelihood: Rare

Risk Rating: Low

**Emission Risk Assessment
Operation**

Emission: Hydrocarbon contaminated wash down water from vehicle and machinery wash down facilities.

Impact: Hydrocarbon in wash-down water can be released into soils and water bodies. Contamination of groundwater and surface water, adversely impacting the health of flora and fauna.

Controls: The licensee has outlined the following controls:

- Vehicle wash-downs are undertaken in a wash-down facility with an oil/water separator;
- The oil/water separator drains to a lined clay sediment pond;
- The oil/water separator is routinely monitored and maintained; and
- Monitoring of treated oily water is undertaken quarterly.

Risk Assessment

Consequence: Minor

Likelihood: Rare

Risk Rating: Low

Regulatory Controls

Condition 2.3.2 specifies a Total Recoverable Hydrocarbon (TRH) limit of 15 mg/L.

Residual Risk

Consequence: Minor

Likelihood: Rare

Risk Rating: Low