



Decision Document

Environmental Protection Act 1986, Part V

Licensee: Edna May Operations Pty Ltd

Licence: L8422/2010/2

Registered office: 22 Wolfram Street
WESTONIA WA 6423

ACN: 136 365 001

Premises address: Edna May Gold Project
M77/88, M77/110, M77/124, G77/122 and L77/18
Warrachuppin Road
WESTONIA WA 6423

Issue date: Thursday, 2 May 2013

Commencement date: Thursday, 2 May 2013

Expiry date: Monday, 1 May 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.

Decision Document prepared by:

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Licensing Officer

Decision Document authorised by:

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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>5</td> <td>3 200 000 tonnes per annual period</td> </tr> <tr> <td>6</td> <td>1 900 000 tonnes per annual period</td> </tr> <tr> <td>61</td> <td>Up to 100 000 KL per annual period</td> </tr> <tr> <td>64</td> <td>5 000 tonnes per annual period</td> </tr> </tbody> </table>	Category number(s)	Assessed design capacity	5	3 200 000 tonnes per annual period	6	1 900 000 tonnes per annual period	61	Up to 100 000 KL per annual period	64	5 000 tonnes per annual period
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	5	3 200 000 tonnes per annual period									
	6	1 900 000 tonnes per annual period									
61	Up to 100 000 KL per annual period										
64	5 000 tonnes per annual period										
Application verified	Date: N/A										
Application fee paid	Date: N/A										
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											
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 checked="" type="checkbox"/> No <input type="checkbox"/> Referral decision No: Managed under Part V <input checked="" 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

The Edna May Gold Project (the Project) is operated by Edna May Operations Pty Ltd and owned by Evolution Mining, who acquired the mine in November 2011. The premises is located 300 kilometres east of Perth.

The Project is in an area with a long history of mining and exploration activity. The operations consists of an open cut mine, mine dewatering, a Carbon-in-Leach plant for gold (comprising a crushing circuit, milling circuit and leach and adsorption circuit) two waste rock landforms and one integrated waste landform which includes the tailings storage facility and noise bunds. There is also a trial tungsten plant using a gravity forced configuration to separate concentrate from tailings.

The Project area is located in the northern extremity of the Westonia Greenstone Belt, and lies less than 1 kilometre north of the Westonia town site, in the Shire of Westonia. Tenements total approx 770 ha and are located on Crown Reserve 14983 and a freehold lot owned by Edna May Operations Pty Ltd. The tenements border other freehold farmland lots used for cereal cropping.

The Westonia area is dominated by a gently undulating landscape averaging about 340 m above sea level. It is predominantly covered by highly weathered rocks, laterite, drift sand soils, and in the salt lake areas, by calcrete and thin evaporite deposits. Soils in the area are moderately to strongly alkaline and variable in salinity.

The geological stratigraphy is dominated by an extensive high magnesium mafic-ultramafic volcanic sequence, intruded by the locally termed Edna May Gneiss (EMG) within the Project area. The EMG is an irregular, but broadly conformable body, which has been traced over 1 400 m and averages 100 m in thickness. The EMG is composed of quartzo-feldspathic gneiss and holds most of the gold mineralisation.

The climate at Westonia is characterised by low to moderate winter rainfall and hot dry summers. Average annual rainfall is 327 mm. Winds are moderate and follow a seasonal pattern.

Groundwater in the Westonia area occurs in weathered and fractured bedrock aquifers, with depth to groundwater varying between 28 – 40 m below ground level (mbgl). Salinity averages around TDS 25,000 mg/L. All groundwater extracted from production and dewatering bores is used in processing and dust suppression.

There are no permanent surface water bodies or seasonal wetlands near the Project area. Ephemeral creeks in the general area drain into a number of salt lakes; the nearest of which is Lake Mount Brown, located approximately 50 km north of the Project area.

A small ephemeral drainage line, which carries surface water, is located to the north of the pit and runs in a north-westerly direction. This area is gazetted under the Public Plan for Warralakin and Westonia (Drainage Reserve 18796), and was created in the 1930s for the purpose of disposing of pit water from the then Westonia mine. The drain terminates over a low yield unconfined aquifer, and is estimated to be active for a 1:20 year rainfall event. Most surface water flows are expected to occur as broad, shallow sheet flows as a result of rainfall.

The licensee has submitted a request to amend their licence to relocate the landfill facility and to include category 61 on their licence to allow a septage waste disposal facility. The requested changes have been included in the amended licence. The licence has also been updated in line with the current licence format. This decision document includes the assessment for the amendment as well as for the global changes pertaining to the new format.



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			
Licence section	Condition number	Justification (including risk description & decision methodology where relevant)	Reference documents
General conditions	N/A	No additional conditions are deemed necessary under General conditions.	
Premises operations	L1.2.1 – 1.2.2	L1.2.1 and 1.2.2 have been added to the licence to ensure pipelines are managed appropriately and that saline water used for dust suppression is applied so as to avoid damage to surrounding vegetation.	Application supporting documentation
	L1.2.3 Table 1.2.1	L1.2.3 and Table 1.2.1 have been included to ensure the licensee manages containment infrastructure to limit impacts to the environment.	Edna May Operations; <i>Landfill Management Plan</i> , October 2014
	L1.2.5 Table 1.2.2	L1.2.5 and Table 1.2.2 have been included to allow the licensee to operate a class II putrescible landfill and three liquid waste ponds. The landfill is limited to 5000 tonnes per annual period and the liquid waste facility is limited to 215,000 litres per annual period. Both facilities will only be accepting waste generated at the Edna May premises and the attached workers' village.	Edna May Operations; <i>Groundwater Monitoring Contingency Plan</i> , October 2014
	L1.2.6 – 1.2.8	Licence conditions 1.2.5 to 1.2.7 have been included in the licence to ensure the licensee manages the landfill and bioremediation facility (emission point reference E2) to limit the possible effects of dust, odour and windblown waste.	General provisions of the <i>Environmental Protection Act 1986</i>
	L1.2.9	Licence condition 1.2.9 has been included to ensure the licensee manages the tailings storage facility (emission point reference E1) to limit the possible effects of stormwater contamination and groundwater contamination.	



DECISION TABLE			
Licence section	Condition number	Justification (including risk description & decision methodology where relevant)	Reference documents
Emissions general	L2.1.1	Descriptive limits will be set through condition 2.2.1 and Table 3.8.1 of the licence and therefore a condition regarding recording and investigation of exceedances of limits or targets has been included.	N/A
Point source emissions to air including monitoring	N/A	As no conditions were applied to the licence for Point source emissions to air, the section has been removed.	General provisions of the <i>Environmental Protection Act 1986</i>
Point source emissions to surface water including monitoring	N/A	As no conditions were applied to the licence for Point source emissions to surface water, the section has been removed.	General provisions of the <i>Environmental Protection Act 1986</i>
Point source emissions to groundwater including monitoring	N/A	As no conditions were applied to the licence for Point source emissions to groundwater, the section has been removed.	General provisions of the <i>Environmental Protection Act 1986</i>
Emissions to land including monitoring	L2.1.1, L3.2.1 Table 2.2.1 Table 3.2.1	DER's assessment and decision making are detailed in Appendix A.	Application supporting documentation <i>Edna May Gold Project Integrated Waste Landform-Tailings Storage facility Mining Proposal (Coffey Mining, 2009).</i>
Odour	N/A	As no conditions were applied to the licence for odour, the section has been removed.	General provisions of the <i>Environmental</i>



DECISION TABLE			
Licence section	Condition number	Justification (including risk description & decision methodology where relevant)	Reference documents
			<i>Protection Act 1986</i>
Noise	N/A	As no conditions were applied to the licence for noise, the section has been removed.	General provisions of the <i>Environmental Protection Act 1986</i>
Monitoring general	L3.1.1 to 3.1.4	Generic conditions designed to ensure all sampling done by the licensee meets NATA and manufacturers' standards.	General provisions of the <i>Environmental Protection Act 1986</i>
Monitoring of inputs and outputs	N/A	As no conditions were applied to the licence for Monitoring of inputs and outputs, the section has been removed.	N/A
Process monitoring	N/A	As no conditions were applied to the licence for Process monitoring, the section has been removed.	N/A
Ambient quality monitoring	L3.3.1 Table 3.3.1	Groundwater monitoring condition and table have been added to the licence to ensure management activities outlined in Appendix A are effective.	General provisions of the <i>Environmental Protection Act 1986</i>
Meteorological monitoring	N/A	As no conditions were applied to the licence for Meteorological monitoring, the section has been removed.	N/A
Improvements	N/A	As no conditions were applied to the licence for Improvements, the section has been removed.	N/A
Information	L4.1 to 4.3	Generic conditions designed to ensure the licensee records all monitoring information and reports to the DER in the form of an AER and an AACR.	General provisions of the <i>Environmental Protection Act 1986</i>



DECISION TABLE			
Licence section	Condition number	Justification (including risk description & decision methodology where relevant)	Reference documents
Licence Duration	N/A	The licence expiry date will be amended to May 2028, which aligns with the mining tenement expiry dates.	N/A



5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
07/01/2016	Proponent sent a copy of draft instrument	Proponent replied with a number of updates to the groundwater monitoring scheme due to inactive bores and new bores being drilled.	All comments were implemented into the licence changes.



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 to land including monitoring

Tailings from the project are deposited into a Tailings Storage Facility (TSF), consisting of one large cell constructed from waste rock. The final TSF footprint will be approximately 152 ha, comprising 77 ha of land under tailings with the remainder consisting of the embankments constructed from waste rock. At final design height, tailings will have a surface area of approximately 96 ha. The final depth of tailings will range from 23 m to 29 m and the final embankment crest level will be RL362m. The final design storage life of the TSF is 9 years, estimated on a peak production rate of 3.2 Mtpa and a tailings in situ density of 1.3 t/m³. The maximum tailings storage is estimated at 22 x10⁶ m³.

Base and Embankment Construction

The TSF has been constructed on a natural clay substrate of relatively low permeability, without engineered floor liners, in accordance with design parameters provided in the works approval application and subsequent correspondence. Permeability of the substrate within the TSF was approximately 1x10⁻⁸ m/s prior to construction. No near-surface gravels or sand layers were encountered during construction. The TSF has been constructed with a compacted clay cut-off wall and a compacted clay zone within the perimeter embankment. Appropriate soil compliance testing was conducted during construction and results submitted to DER in the works approval compliance certificate.

Starter embankments were constructed from mine waste obtained from the pit during the pit cut-back. The initial Works Approval W4546/2009/1 authorised the construction of embankments to RL342 m. Works Approval W5015/2011/1 approved a raising of the TSF as a staged embankment construction has been designed to utilise the downstream construction method as defined in the *Edna May Gold Project Integrated Waste Landform - Tailings Storage facility Mining Proposal* (Coffey Mining, 2009). The staged construction aims to provide additional capacity on an “as required” basis, generally aimed at providing an additional 1.5 to 2 years storage capacity with each lift.

The TSF is located within a surface drainage diversion berm adequate to contain at least 1:100 ARI flood event. Drainage within the berm passes through settlement ponds before it is diverted to an existing drainage line west of Warrachoppin Rd.

Underdrainage and Decant System

The TSF has been constructed with two seepage control systems in place. A continuous upstream perimeter drain in the form of a cut-off trench has been constructed under the main embankment adjacent to the upstream toe drain to intercept horizontal seepage through the near surface foundation. The cut-off trench was excavated to 1 m and is founded in suitable clay.

A decant underdrainage system has been installed, designed to recover water and assist with the consolidation of the tailings. The decant system comprises a decant accessway constructed from mine waste, and central decant structure constructed from slotted concrete well sections (1.8 m in diameter) stacked vertically and surrounded by filter rock material. Reclaim water collecting within the decant structure is pumped back to the process plant directly from the decant tower by submersible pump located within the decant tower structure. Underdrainage consisting of slotted pipe, geotextile and aggregate was constructed to cover an area in the base of the TSF equivalent to that of a normal expected operating decant pond (nominal radius 90 m). The underdrainage pipe system conveys seepage water through the outfall pipe in the embankment via cement-bentonite collar to a seepage collection pond at the northwest corner of the TSF. Water is pumped from the seepage collection pond back to the process plant by pump located at the seepage collection pond.

The seepage collection pond is lined with 1.5 mm HDPE liner. The underdrainage system was inspected by DER inspectors and by appropriately qualified engineers prior to commissioning and the results submitted to DER as part of the compliance certificate for W4546/2009/1.



An additional downstream (outside) perimeter seepage interception ditch has been constructed around the TSF. This ditch returns seepage flow to the seepage collection pond.

Tailings Discharge and Management

Tailings produced in the processing circuit are collected in the tailings hopper located at the processing plant. Tailings discharged into the TSF will typically contain 33 000 mg/L TDS, 50 mg/L WADCN (Weak Acid Dissociable Cyanide) and have a pH of 8.5-9. The tailings also contain low levels of molybdenum, lead, bismuth, mercury and silver. The pH of decant water within the TSF is approximately 5.

Tailings are pumped through polyethylene pipe to the TSF for permanent disposal. The pipeline is located within bunded works of compacted clay, designed to contain spillage from a failure in the pipeline. The discharge of tailings into the TSF are conducted in accordance with the operating manuals produced by Coffey Mining Pty Ltd and submitted to DER as required by W4546/2009/1. The manuals describe the design and operation of the TSF with a focus on maximising consolidation of tailings through removal of water from the tailings.

Tailings are deposited sub aerially and spirally around the TSF, through active discharge points located at manually controlled spigots on a perimeter discharge line. Tailings are deposited in discrete layers at approx 45% solids to promote low velocity discharge. Discharge points are moved regularly to ensure an even tailings beach is developed and maintained and the length of time between tailings deposition cycles will be maximised to allow for drying time. Sloped beaches ensure that a surface water pond is maintained around the central decant structure. The supernatant pond is kept away from the containment embankments at all times.

The TSF is able to contain a considerable body of water during a rainstorm. The compliance documentation states that a minimum operational (wall) freeboard is 300 mm and the minimum total (beach + wall) freeboard is 500 mm, and that a minimum freeboard of 663 mm above normal decant pond operating level will be adequate to contain a 1 in 100 year Annual Exceedance Probability 72-hour rainfall event.

Groundwater Monitoring

Currently Groundwater monitoring is undertaken in accordance with conditions of the groundwater well licence issued by the Department of Water and the DER licence. Initial results indicated that groundwater has historically been impacted by mining activity at the site.

Dewatering Operations

In 1987, ACM Gold Ltd constructed two of three existing evaporation ponds that were last used during the period 1987 – 1990. In 2005, Catalpa were issued approval (W51/04) to discharge mine dewater to these ponds to enable intensive drilling from the base of the pit, subsequent to confirmation of integrity. To facilitate the temporary dewatering, Catalpa constructed an additional 36 ha of temporary evaporation ponds in 2005.

Ancillary Operations

Associated facilities constructed at the premises include the plant workshop (with washdown slab), warehouse, offices, laboratory, plant amenities, fuel and lubricant storage, power supply, explosives storage, water supplies, landfill, and bioremediation.

Workshop Washdown

Waste water from the workshop washdown slab is collected in a sump fitted with an oil-water separator. Waste water from the laboratory and plant amenities is treated in septic tanks with effluent disposed to the TSF.



Hydrocarbon Storage

Fuels and lubricants are stored within a bunded area in accordance with relevant Dangerous Goods Legislation and licences, Australian Standards, and manufacturer's safety data sheets. Two x 65 000 litre fuel tanks and oil storage capacity of 15 000 litres on site with appropriate pumping infrastructure and bunding. Bulk fuel, oil and waste material tanks are fitted with excess flow valves and located above ground in impermeable bund enclosures. These bunds shall retain a minimum of 110% of the total capacity of the tanks in the bund. Waste tanks for hydrocarbons, coolants are located in separate bunded compartments to prevent cross contamination of materials. Sumps are installed at low points of each bund to facilitate evacuation of spilled material or water. All re-fuelling stations are constructed of impermeable materials and capable of containing and controlling potential spills. All pipe work and pumps are above ground and within bunded enclosures. Pipes and tanks are labelled as to contents and direction of flow noted on pipes. Appropriate isolation valves are installed to minimise spills and provide protection of systems. All hydrocarbon storage drums are stored in impermeable bunded enclosures. New and in-use products in drums are stored separately from waste drums. All drums containing waste materials will be labelled with contents and dates and stored within bunded areas.

Emission Description

Emission: Soil and surface water contaminated with hyper saline water and sedimentation through uncontrolled discharges from storage facilities or pipelines. Soil and surface water contaminated with hydrocarbons from ancillary operations.

Impact: Contamination of surrounding land and surface water drainage systems. Potential impacts on ecology of surface water and vegetation from hypersaline waters, discharged hydrocarbons and sedimentation.

Controls: The site is designed to capture all areas of contamination and direct uncontaminated stormwater away from areas of contamination. Surface water is managed under the proponents documents 'Edna May Operations; *Landfill Management Plan*, October 2014' and 'Edna May Operations; *Groundwater Monitoring Contingency Plan*, October 2014'.

Risk Assessment

Consequence: Minor

Likelihood: Rare

Risk Rating: Low

Regulatory Controls

Condition 2.2.1 and Table 2.2.1 have been added to the licence to ensure emissions are discharged into defined areas.

Condition 3.2.1 and Table 3.2.1 have been added to the licence to record the amounts of tailings discharged into the TSF, solid waste to landfill, contaminated soils to bioremediation and liquid waste to the liquid waste ponds.

Residual Risk

Consequence: Minor

Likelihood: Rare

Risk Rating: Low