

Permit¹

Environmental Protection Act 1994 Environmental Authority (Site Specific) Mining Lease

Permit¹ Number: EPML00732813 – Ensham Mine

This permit is issued by the administering authority to authorise the activity specified in the permit in accordance with the conditions specified in the permit. This decision was made pursuant to Section 258 of the Environmental Protection Act 1994.

Takes Effect From: 27 May 2013

Details

Permit Holder(s)	Name	Address
Principal Holder	Bligh Coal Limited	C/- Idemitsu Australia Resources P/L
Joint Holder/s	Idemitsu Australia Resources Pty Ltd	Level 28, AMP Place
	LG International (Australia) Pty Ltd	10 Eagle Street Brisbane QLD 4000

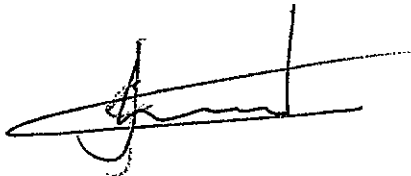
Activity(s)	Location(s)
ERA 5 Mining Black Coal <i>Environmental Protection Regulation 2008 – Schedule 6</i>	ML7459 (incl. SA No. 3) ML7460
ERA 8(1)(c) Chemical Storage <i>Environmental Protection Regulation 2008 – Schedule 2</i>	ML70049 ML70326
ERA 16 – Extracting and screening activities <i>Environmental Protection Regulation 2008 – Schedule 2</i>	ML70365 ML70366 ML70367
ERA 17 Abrasive Blasting <i>Environmental Protection Regulation 2008 – Schedule 2</i>	
ERA 18 Boiler-making or engineering <i>Environmental Protection Regulation 2008 – Schedule 2</i>	
ERA 21 Motor Vehicle Workshop Operation <i>Environmental Protection Regulation 2008 – Schedule 2</i>	
ERA 56 Regulated Waste storage <i>Environmental Protection Regulation 2008 – Schedule 2</i>	
ERA 60 Waste Disposal <i>Environmental Protection Regulation 2008 – Schedule 2</i>	
ERA 62 Waste transfer station operation <i>Environmental Protection Regulation 2008 – Schedule 2</i>	
ERA 63(2(b)) Sewage Treatment <i>Environmental Protection Regulation 2008 – Schedule 2</i>	

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation



The anniversary date of the environmental authority is *30 May* each year.

The environmental authority is subject to the attached conditions of approval.



Christopher Loveday
Delegate
Department of Environment and Heritage Protection
27 May 2013

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Additional advice about the approval

1. This approval pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for this activity that might be required by other state and/or Commonwealth legislation. Other legislation administered by the administering authority for which a permit may be required includes but is not limited to the:
 - *Strategic Cropping Land Act 2011*;
 - *Wild Rivers Act 2005*;
 - *Aboriginal Cultural Heritage Act 2003*;
 - *Land Protection (Pest and Stock Route Management) Act 2002*;
 - *Nature Conservation Act 1992*;
 - *Vegetation Management Act 1999*;
 - *Mineral Resources Act 1989*;
 - *Water Act 2000*;
 - *Forestry Act 1959*; and
 - *Environmental Protection and Biodiversity Conservation Act 1999*.
2. This approval pursuant to the *Environmental Protection Act 1994* does not absolve the need for the environmental authority holder to adhere to any provision of the *Environmental Protection Act 1994* or of any relevant State and/or Commonwealth legislation. Such provisions include but are not limited to are:
 - Financial assurance Part 7 and section 367 *Environmental Protection Act 1994*;
 - General environmental duty section 319 *Environmental Protection Act 1994*; and
 - Duty to notify of environmental harm section 320 *Environmental Protection Act 1994*.
3. If there is any inconsistency between a standard environmental condition referred to in the *Code of Environmental Compliance for Exploration and Mineral Development Projects* and an additional condition in this environmental authority, the additional condition prevails to the extent of any inconsistency.
4. This environmental authority consists of the following Schedules and Appendices:

Schedule	Department Interest
Schedule A	General
Schedule B	Air
Schedule W	Water
Schedule C	Dams & levees
Schedule D	Noise and vibration
Schedule E	Waste
Schedule F	Land
Schedule G	Community Definitions
Appendix 1	Release points (RP) and monitoring points (MP) for Ensham mine.
Appendix 2	Groundwater monitoring locations.
Appendix 3	(Groundwater Trigger Levels (Background Groundwater Monitoring Report)).

Department Interest – General

Financial assurance

- A1** Provide a financial assurance in the amount and form required by the administering authority prior to the commencement of activities proposed under this environmental authority.

NOTE: The calculation of financial assurance for condition A1 must be in accordance with the administering authority's Guideline – Calculating financial assurance for mining projects, and may include a performance discount. The amount is defined as the maximum total rehabilitation cost for complete rehabilitation of all disturbed areas, which may vary on an annual basis due to progressive rehabilitation. The amount required for the financial assurance must be the highest total rehabilitation cost calculated for any year of the Plan of Operations and calculated using the formula: (Financial Assurance = Highest total annual rehabilitation cost x Percentage required).

- A2** The financial assurance is to remain in force until the administering authority is satisfied that no claim on the assurance is likely.

NOTE: Where progressive rehabilitation is completed and acceptable to the administering authority, progressive reductions to the amount of financial assurance will be acceptable where rehabilitation has been completed in accordance with the acceptance criteria defined within this environmental authority.

Prevent and/or minimise likelihood of environmental harm

- A3** In carrying out the environmentally relevant activities, you must take all reasonable and practicable measures to prevent and/or minimise the likelihood of environmental harm being caused. Any environmentally relevant activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this authority.

NOTE: This authority authorises the environmentally relevant activity. It does not authorise environmental harm unless a condition contained within this authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

Maintenance of measures, plant and equipment

- A4** The environmental authority holder must ensure:
- a) that all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority are installed;
 - b) that such measures, plant and equipment are maintained in a proper condition; and
 - c) that such measures, plant and equipment are operated in a proper manner.

Monitoring and records

- A5** Record, compile and keep for a minimum of five (5) years all monitoring results required by this environmental authority and make available for inspection all or any of these records upon request by the administering authority.
- A6** Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

Notification of emergencies, incidents and exceptions

- A7** All reasonable actions are to be taken to minimise environmental harm, or potential environmental harm, resulting from any emergency, incident or circumstances not in accordance with the conditions of this environmental authority.
- A8** As soon as practicable after becoming aware of any emergency, incident or information about circumstances which results or may result in environmental harm not in accordance with the conditions of this environmental authority, the administering authority must be notified in writing.
- A9** Not more than ten (10) business days following the initial notification of an emergency, incident or information about circumstances which result or may result in environmental harm, written advice must be provided to the administering authority in relation to:
- a) proposed actions to prevent a recurrence of the emergency or incident;
 - b) the outcomes of actions taken at the time to prevent or minimise environmental harm; and
 - c) proposed actions to respond to the information about circumstances which result or may result in environmental harm.
- A10** As soon as practicable, but not more than six (6) weeks following the initial notification of an emergency, incident or information about circumstances which result or may result in environmental harm, environmental monitoring must be performed and written advice must be provided of the results of any such monitoring performed to the administering authority.
- A11** Contaminants must not be released to the receiving environment unless they are in accordance with the contaminant limits authorised by this environmental authority.
- A12** This environmental authority does not authorise environmental harm unless a condition contained within the authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

Definitions

A13 Words and phrases used throughout this environmental authority are defined in Definitions section of this environmental authority. Where a definition for a term used in this environmental authority is sought and the term is not defined within this environmental authority, the definitions in the *Environmental Protection Act 1994*, its Regulations and Environmental Protection Policies must be used.

A14 Scope of activity

This environmental authority authorises the mining of 12 million tonnes of run of mine (ROM) coal per annum.

Department Interest – Air

Dust nuisance

B1 The release of dust or particulate matter or both resulting from the mining activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.

B2 When requested by the administering authority or as a result of a complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer), dust and particulate monitoring must be undertaken, and the results thereof notified to the administering authority within fourteen (14) days following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place. Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:

- a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with *Australian Standard AS 3580.10.1 of 2003* (or more recent editions); and
- b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, at a nuisance sensitive or commercial place downwind of the site, cannot be exceeded more than five (5) times per year, when monitored in accordance with:
 - i. Australian Standard AS 3580.9.6 of 2003 (or more recent editions) Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet -Gravimetric method; or
 - ii. any alternative method of monitoring PM10 which may be permitted by the *Air Quality Sampling Manual* as published from time to time by the administering authority.

B3 If monitoring indicates exceedence of the relevant limits in condition B2, then the environmental authority holder must:

- a) address the complaint including the use of appropriate dispute resolution if required; and
- b) immediately implement dust abatement measures so that emissions of dust from the activity do not result in further environmental nuisance.

Odour nuisance

- B4** The release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the mining activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.
- B5** When requested by the administering authority, odour monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.
- B6** If the administering authority determines the odour released to constitute an environmental nuisance, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement odour abatement measures so that emissions of odour from the activity do not result in further environmental nuisance.

Department Interest: Water

W1 Contaminant Release

Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters as a result of the authorised mining activities, except as permitted under the conditions of this environmental authority.

- W2** Unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in Table 1 and depicted in Appendix 1 attached to this environmental authority.

Table 1 Mine affected water release points, sources and receiving waters

Release Point (RP)	Easting (GDA94)	Northing (GDA94)	Mine Affected Water Source and Location	Monitoring Point	Receiving waters description
RP 1 Nogoia River	653741	7401338	Ramp 24 Fill Point Dam and Ramp 4 Dam	End of pipe	Nogoia River
RP 2 Boggy Creek	654270	7412235	Ramp 8 Dam	End of pipe	Boggy Creek

- W3** The release of mine affected water to internal water management infrastructure that is installed and operated in accordance with a water management plan that complies with conditions W31 to W36 inclusive is permitted.
- W4** The release of mine affected water to waters in accordance with condition W2 must not exceed the release limits stated in Table 2 when measured at the monitoring points specified in Table 1 for each quality characteristic.

Table 2 Mine affected water release limits

Quality Characteristic	Release Limits	Monitoring frequency	Comment
Electrical conductivity (uS/cm)	Release limits specified in Table 4 for variable flow criteria.	Daily during release (the first sample must be taken within 2 hours of commencement of release)	
pH (pH Unit)	6.5 - 9.0	Daily during release (the first sample must be taken within 2 hours of commencement of release)	
Turbidity (NTU)	360	Daily during release (the first sample must be taken within 2 hours of commencement of release)	Turbidity is required to assess ecosystems impacts and can provide instantaneous results.
Suspended Solids (mg/L)	150	Daily during release (the first sample must be taken within 2 hours of commencement of release)	Suspended solids are required to measure the performance of sediment and erosion control measures.
Sulphate (SO ₄ ²⁻) (mg/L)	Release limits specified in Table 4 for variable flow criteria	Daily during release (the first sample must be taken within 2 hours of commencement of release)	Drinking water environmental values from NHMRC 2006 guidelines OR ANZECC.

- W5** The release of mine affected water to waters from the release points must be monitored at the locations specified in Table 1 for each quality characteristics and at the frequency specified in Table 2 and Table 3.

Note: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition W5 is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

Table 3 Release contaminant trigger investigation levels

Quality Characteristic	Trigger Levels* (µg/L)	Monitoring Frequency
Aluminium	300	Commencement of release and thereafter weekly during release
Ammonia	900	
Arsenic	13	
Cadmium	0.2	
Chromium	1.0	
Copper	10	
Fluoride (total)	2000	
Iron	300	
Molybdenum	34	
Nitrate	1100	
Selenium	10	
Silver	1	
Sodium	TBA	
Petroleum hydrocarbons (C6-C9)	20	
Petroleum hydrocarbons (C10-C36)	100	
Uranium	20	
Vanadium	20	
Zinc	20	

Note:

1. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
2. The quality characteristics required to be monitored as per Table 3 can be reviewed once the results of two years monitoring data is available, or if sufficient data is available to adequately demonstrate negligible environmental risk, and it may be determined that a reduced monitoring frequency is appropriate or that certain quality characteristics can be removed from Table 3 by amendment.

* Trigger levels derived from Receiving Environment Monitoring Report.

- W6** If quality characteristics of the release exceed any of the trigger levels specified in Table 3 during a release event, the environmental authority holder must compare the down stream results in the receiving waters to the trigger values specified in Table 3 and:
1. where the trigger values are not exceeded then no action is to be taken; or
 2. where the down stream results exceed the trigger values specified Table 3 for any quality characteristic, compare the results of the down stream site to the data from background monitoring sites and;
 - (a) if the result is less than the background monitoring site data, then no action is to be taken; or
 - (b) if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
 - (i) details of the investigations carried out; and
 - (ii) actions taken to prevent environmental harm.

Note: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with W6 2(b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

- W7** If an exceedence in accordance with condition W6 2(b) is identified, the holder of the authority must notify the administering authority within 14 days of receiving the result.

W8 Mine Affected Water Release Events

The environmental authority holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in Table 4.

- W9** Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with condition W2 must only take place during periods of natural flow events in accordance with the receiving water flow criteria for discharge specified in Table 4 for the release point(s) specified in Table 1.

- W10** The release of mine affected water to waters in accordance with condition W2 must not exceed the Electrical Conductivity and Sulphate release limits or the Maximum Release Rate (for all combined release point flows) for each receiving water flow criteria for discharge specified in Table 4 when measured at the monitoring points specified in Table 1.

Table 4 Mine affected water release during flow events

Receiving waters	Release point (RP)	Gauging Station	Gauging Station Easting (GDA94)	Gauging Station Northing (GDA94)	Receiving water flow recording frequency	Receiving water flow criteria for discharge (m ³ /s)	Maximum release rate (for combined RP flows) (m ³ /s)	Electrical conductivity release limits (µS/cm)
Nogoa River	RP1	"GS2" DNRM Gauging Station 130219A Nogoa River at Duck Ponds	650392	7402391	Continuous (minimum daily)	Medium Flow 10m ³ /sec	0.417m ³ /sec	1,500µS/cm Sulphate 1000mg /L
						Medium Flow 10m ³ /sec	0.135m ³ /sec	4,000µS/cm Sulphate 1000mg /L
						Medium Flow 10m ³ /sec	0.065m ³ /sec	8,000µS/cm Sulphate 1000mg /L
						Medium Flow 20m ³ /sec	0.270m ³ /sec	4,000µS/cm Sulphate 1000mg /L
						Medium Flow 20m ³ /sec	0.130m ³ /sec	8,000µS/cm Sulphate 1000mg /L
						Medium Flow 20m ³ /sec	0.103m ³ /sec	10,000µS/cm Sulphate 1000mg /L
						Medium Flow 40m ³ /sec	0.541m ³ /sec	4,000µS/cm Sulphate 1000mg /L
						Medium Flow 40m ³ /sec	0.260m ³ /sec	8,000µS/cm Sulphate 1000mg /L
						Medium Flow 40m ³ /sec	0.206m ³ /sec	10,000µS/cm Sulphate 1000mg /L
						Medium Flow 75m ³ /sec	1.014m ³ /sec	4,000µS/cm Sulphate 1000mg /L
						Medium Flow 75m ³ /sec	0.487m ³ /sec	8,000µS/cm Sulphate 1000mg /L
						Medium Flow 75m ³ /sec	0.387m ³ /sec	10,000µS/cm Sulphate 1000mg /L
						High Flow 120m ³ /sec	1.622m ³ /sec	4,000µS/cm Sulphate 1000mg /L
						High Flow 120m ³ /sec	0.779m ³ /sec	8,000µS/cm Sulphate 1000mg /L
						High Flow 120m ³ /sec	0.619m ³ /sec	10,000µS/cm Sulphate 1000mg /L

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						Flood Flow 250m ³ /sec	1.29m ³ /sec	10,000µS/cm Sulphate 1000mg/L
						Flood Flow 400m ³ /sec	2.06m ³ /sec	10,000µS/cm Sulphate 1000mg/L
						Flood Flow 510m ³ /sec	2.6 m ³ /sec	10,000µS/cm Sulphate 1000mg/L
Boggy Creek	RP2	"GS3" Ramp 9 crossing of Boggy Ck at Yongala	655397	7414473	Continuous (minimum daily)	No/Low Flow <1.0m ³ /sec for a period of 28 days after natural flow events that exceed 2m ³ /sec	0.2m ³ /sec	Electrical Conductivity 340µS/cm Sulphate 250mg/L
						Medium Flow 2 m ³ /sec	1.125m ³ /sec	Electrical Conductivity 1,500µS/cm Sulphate 700mg/L
						Medium Flow 2 m ³ /sec	0.391m ³ /sec	Electrical Conductivity 3,000µS/cm Sulphate 700mg/L
						Medium Flow 2 m ³ /sec	0.170m ³ /sec	Electrical Conductivity 6,000µS/cm Sulphate 700mg/L
						Medium Flow 4 m ³ /sec	0.194m ³ /sec	Electrical Conductivity 10,000µS/cm Sulphate 700mg/L

W11 The daily quantity of mine affected water released from each release point must be measured and recorded at the monitoring points in Table 1.

W12 Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build up of sediment in such waters.

W13 Notification of Release Event

The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after commencing to release mine affected water to the receiving environment. Notification must include the submission of written advice to the administering authority of the following information:

- a) release commencement date/time;
- b) expected release cessation date/time;
- c) release point/s;
- d) release volume (estimated);
- e) receiving water/s including the natural flow rate; and
- f) any details (including available data) regarding likely impacts on the receiving water(s).

Note: Notification to the administering authority must be addressed to the Manager and Project Manager of the local Administering Authority via email or facsimile.

W14 The environmental authority holder must notify the administering authority as soon as practicable (nominally within twenty-four (24) hours after cessation of a release event) of the cessation of a release notified under condition W13 and within 28 days provide the following information in writing:

- a) release cessation date/time;
- b) natural flow volume in receiving water;
- c) volume of water released;
- d) details regarding the compliance of the release with the conditions of Department Interest: Water of this environmental authority (i.e. contamination limits, natural flow, discharge volume);
- e) all in-situ water quality monitoring results; and
- f) any other matters pertinent to the water release event.

Note: Successive or intermittent releases occurring within twenty-four (24) hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with conditions W13 and W14, provided the relevant details of the release are included within the notification provided in accordance with conditions W13 and W14.

W15 Notification of Release Event Exceedence

If the release limits defined in Table 2 are exceeded, the holder of the environmental authority must notify the administering authority within twenty-four (24) hours of receiving the results.

W16 The authority holder must, within twenty-eight (28) days of a release that exceeds the conditions of this authority, provide a report to the administering authority detailing:

- a) the reason for the release;
- b) the location of the release;
- c) all water quality monitoring results;
- d) any general observations;
- e) all calculations; and
- f) any other matters pertinent to the water release event.

W17 Monitoring of Water Storage Quality

Water storages stated in Table 5 which are associated with the release points must be monitored for the water quality characteristics specified in Table 6 at the monitoring locations and at the monitoring frequency specified in Table 5.

Table 5 Water storage monitoring

Water Storage Description	Easting (GDA94)	Northing (GDA94)	Monitoring Location	Frequency of Monitoring
Ramp 24 Fill Point Dam	652651	7398309	Southern side of Nogoia River - within 100m of pump intake point	Quarterly
Ramp 4 Dam	653862	7403555	Northern side of Nogoia River - within 100m of pump intake point	
Ramp 8 Dam	654250	7412550	Northern side of Nogoia River - Western side of Boggy Creek, access via Ramp 8	
Ramp 22 Pit	649737	7397641	Southern side of Nogoia River - Access via Ramp 22 to electric pontoon pumps	
Ramp 3-4 Drain	653767	7401989	Northern side of Nogoia River - Drain between Ramp 3 and Ramp 4 on Western edge of Haul Road. Sample at pump intake at Ramp 3	

W18 In the event that waters storages defined in Table 5 exceed the contaminant limits defined in Table 6, the holder of the environmental authority must implement measures, where practicable, to prevent access to waters by all livestock.

Table 6 Onsite water storage contaminant limits

Quality Characteristic	Test Value	Contaminant Limit
Aluminium (mg/L)	Maximum	5 ¹
Arsenic (mg/L)	Maximum	0.5 ¹
Cadmium (mg/L)	Maximum	0.01 ¹
Cobalt (mg/L)	Maximum	1 ¹
Copper (mg/L)	Maximum	1 ¹
Electrical Conductivity (µS/cm)	Maximum	5970 ¹
Fluoride (mg/L)	Maximum	2 ¹
Lead (mg/L)	Maximum	0.1 ¹
Nickel (mg/L)	Maximum	1 ¹
pH (pH unit)	Range	6.5 – 8.5
Sulphate (mg/L)	Maximum	1000 ¹
Zinc (mg/L)	Maximum	20 ¹

Note: Total measurements (unfiltered) must be taken and analysed.

¹ Contaminant limit based on ANZECC & ARMCANZ (2000) stock water quality guidelines

Receiving Environment Monitoring and Contaminant Trigger Levels

W19 The quality of the receiving waters must be monitored at the locations specified in Table 8 for each quality characteristic and at the monitoring frequency stated in Table 7.

Table 7 Receiving waters contaminant trigger levels

Quality Characteristic	Trigger Level (µg/L)	Monitoring Frequency
pH	6.5 – 8.5	Daily during release
Electrical Conductivity (µS/cm)	500	
Suspended Solids (mg/L)	1000	
Sulphate (SO ₄ ²⁻) (mg/L)	250	
Sodium (mg/L)	TBA*	Commencement of release and thereafter weekly during release

Note: 1. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.

* Quality characteristics required to be monitored as stated. Trigger level to be reviewed once the results of appropriate monitoring data is available.

Table 8 Receiving water upstream background sites and down stream monitoring points

Monitoring Points	Receiving Waters Location Description	Easting (GDA94)	Northing (GDA94)
Monitoring points for RP1 – Nogoia River discharge point			
<i>Upstream background monitoring point</i>			
MP2	Nogoia River adjacent to the Duckponds Gauging Station	650481	7402384
<i>Downstream monitoring point</i>			
MP3	Nogoia River – downstream Ensham lease boundary	654688	7400679
Monitoring points for RP2 – Boggy Creek discharge point			
<i>Upstream background monitoring point</i>			
MP4	Boggy Creek – Ramp 9 crossing at Yongala	655397	7414473
<i>Downstream monitoring point</i>			
MP3	Nogoia River – downstream Ensham lease boundary	654688	7400679

NOTE:

- The upstream monitoring point should be within 10km of the release point.*
- The downstream point should not be greater than 1.6km from the release point.*
- The data from background monitoring points must not be used where they are affected by releases from other mines.*

W20 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in Table 7 during a release event the environmental authority holder must compare the down stream results to the upstream results in the receiving waters and:

- where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action is to be taken; or
- where the down stream results exceed the upstream results complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:
 - details of the investigations carried out; and
 - actions taken to prevent environmental harm.

Note: Where an exceedence of a trigger level has occurred and is being investigated, in accordance with W20(2) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

W21 Receiving Environment Monitoring Program (REMP)

The environmental authority holder must maintain and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site.

For the purposes of the REMP, the receiving environment is the waters of the Nogoa River, downstream of Ensham Coal Mine to Riley's Crossing of the Mackenzie River and downstream of the Comet River junction. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.

W22 The REMP must:

- a) Assess the condition or state of receiving waters, including upstream conditions, spatially within the REMP area, considering background water quality characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality); and
- b) Be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected; and
- c) Include monitoring from background reference sites (e.g. upstream or background) and downstream sites from the release (as a minimum, the locations specified in Table 8); and
- d) Specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site specific background reference values in accordance with the *Queensland Water Quality Guidelines* 2006. This should include monitoring during periods of natural flow irrespective of mine or other discharges; and
- e) Include monitoring and assessment of dissolved oxygen saturation, temperature and all water quality parameters listed in Table 2 and 3); and
- f) Include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ 2000, BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*); and
- g) Include, where appropriate, monitoring of macroinvertebrates in accordance with the AusRivas methodology, and
- h) Apply procedures and/or guidelines from ANZECC & ARMCANZ 2000 and other relevant guideline documents; and
- i) Describe sampling and analysis methods and quality assurance and control; and
- j) Incorporate stream flow and hydrological information in the interpretations of water quality and biological data.

W23 A report outlining the findings of the REMP, including all monitoring results and interpretations in accordance with conditions W21 and W22 must be prepared annually and made available on request to the administering authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

W24 Water Reuse

Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party for the purpose of:

- i) supplying stock water subject to compliance with the quality release limits specified in Table 9; or
- ii) supplying irrigation water subject to compliance with quality release limits in Table 10; or
- iii) supplying water for construction and/or road maintenance in accordance with the conditions of this environmental authority.

Table 9 Stock water release limits

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	5000

Table 10 Irrigation water release limits

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.5	9.0
Electrical Conductivity	µS/cm	N/A	Site specific value to be determined in accordance with ANZECC & ARMCANZ (2000) Irrigation Guidelines

W25 Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as dams or tanks, for the purpose of supplying water to adjoining properties. The volume, pH and electrical conductivity of water transferred to adjoining properties must be monitored and recorded.

- W26** If the responsibility for mine affected water is given or transferred to another person in accordance with conditions W24 or W25:
- a) the responsibility for the mine affected water must only be given or transferred in accordance with a written agreement (the third party agreement); and
 - b) the third party agreement must include a commitment from the person utilising the mine affected water to use it in such a way as to prevent environmental harm or public health incidents and specifically make the persons aware of the General Environmental Duty (GED) under section 319 of the *Environmental Protection Act 1994*, environmental sustainability of the water disposal and protection of environmental values of waters; and
 - c) the third party agreement must be signed by both parties to the agreement.

W27 Water General

All determinations of water quality and biological monitoring must be:

- a) performed by a person or body possessing appropriate experience and qualifications to perform the required measurements;
- b) made in accordance with methods prescribed in the latest edition of the administering authority's Water Quality Sampling Manual;
- c) collected from the monitoring locations identified within this environmental authority, within six (6) hours of each other where possible;
- d) carried out on representative samples; and
- e) analysed at a laboratory accredited (e.g. NATA) for the method of analysis being used..

Note: Condition W28 (b) requires the Monitoring and Sampling Manual to be followed and where it is not followed because of exceptional circumstances this should be explained and reported with the results.

- W28** The release of any contaminants as permitted by this environmental authority, directly or indirectly to waters, other than internal water management infrastructure that is installed and operated in accordance with a water management plan that complies with conditions W31 to W36 inclusive:
- a) must not produce any visible discolouration of receiving waters; and
 - b) must not produce any slick or other visible or odorous evidence of oil, grease or petrochemicals nor contain visible floating oil, grease, scum, litter or other objectionable matter.

W29 Annual Water Monitoring Reporting

The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format with each annual return:

- a) the date on which the sample was taken;
- b) the time at which the sample was taken;
- c) the monitoring point at which the sample was taken;
- d) the measured or estimated daily quantity of the contaminants released from all release points;
- e) the release flow rate at the time of sampling for each release point;
- f) the results of all monitoring and details of any exceedences with the conditions of this environmental authority; and
- g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

W30 Activities within watercourses

Destroying native vegetation, excavating, or placing fill in a watercourse, lake or spring necessary for and associated with mining operations must be undertaken in accordance with the administering authority's *Guideline - Activities in a Watercourse, Lake or Spring associated with Mining Activities*.

W31 Water Management Plan

A Water Management Plan must be developed by an appropriately qualified person and implemented by the permit holder.

W32 The Water Management Plan must:

- a) provide for effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and
- b) be developed in accordance with the administering authority's guideline *Preparation of water management plans for mining activities* and include:
 - i. a study of the source of contaminants;
 - ii. a water balance model for the site;
 - iii. a water management system for the site;
 - iv. measures to manage and prevent saline drainage;
 - v. measures to manage and prevent acid rock drainage;
 - vi. contingency procedures for emergencies; and
 - vii. a program for monitoring and review of the effectiveness of the water management plan.

- W33** The Water Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:
- a) assess the plan against the requirements under condition W32;
 - b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and
 - c) identify any amendments made to the water management plan following the review.
- W34** The holder of this environmental authority must attach to the review report required by condition W33, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates:
- a) to ensure compliance with this environmental authority; and
 - b) to prevent a recurrence of any non-compliance issues identified.
- W35** The review report required by condition W33 and the written response to the review report required by condition W34 must be submitted to the administering authority with the subsequent annual return under the signature of the appointed signatory for the annual return.
- W36** A copy of the Water Management Plan must be provided to the administering authority on request.
- W37 Saline Drainage**
The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of saline drainage.
- W38 Acid Rock Drainage**
The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of acid rock drainage.
- W39 Stormwater and Water sediment controls**
An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.
- W40** Stormwater, other than mine affected water, is permitted to be released to waters from:
- i) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by condition W39; and
 - ii) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with conditions W31 to W36 inclusive, for the purpose of ensuring water does not become mine affected water.

- W41** The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters.
- W42** Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or receiving waters.

Sewage effluent

- W43** Sewage effluent used for dust suppression or irrigation must not exceed sewage release limits defined in Table 11 (Sewage effluent quality standards).

Table 11 (Sewage effluent quality standards)

Quality	Release limit	Units	Limit type	Monitoring frequency
5 Day BOD	20	mg/L	max	On release
pH	6 - 8		range	On release
Free Chlorine residuals	1.0	mg/L	max	On release
Faecal coliforms (based on the average of a minimum of 5 samples)	1,000	Colonies per 100ml	max	On release

Groundwater

- W44** Groundwater affected by mining activities must be monitored at the locations and frequencies and for the parameters defined in Table 12 (Groundwater monitoring locations). The groundwater monitoring locations are shown in Appendix 2. If, based on assessment of the monitoring results by a suitably qualified person, the Ensham mine is demonstrated to have adversely affected the use of privately owned bores listed in Table 12 (Groundwater monitoring locations), the holder of the environmental authority will provide an equivalent (in quality and quantity), alternative water supply to the owner of the bore/s for the impact caused by the Ensham mine. Monitoring of bores owned by private landholders is subject to the landholder providing access to the bore and ensuring that the bore is in a suitable condition such that it is able to be monitored.

Table 12 (Groundwater monitoring locations)

Location	Monitoring Point	Easting (GDA94)	Northing (GDA94)	Aquifer	Parameters	Frequency
Nogoa River channel	Bore EC01	650018.8	7403061.2	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	Every 3 months
	Bore EC02	650355.8	7402927.7	Alluvium	pH, EC, water level	
	Bore EC03	650338.7	7402548.2	Alluvium		
	Bore EC04	650600.9	7402332.7	Alluvium		
	Bore EC05	650505.5	7402065.2	Alluvium		
	Bore EC06	650805.2	7402076.2	Alluvium		
	Bore EC07	650974.2	7401744.2	Alluvium		
	Bore EC08	651378.4	7401755.2	Alluvium		
	Bore EC09	651362.9	7401496.7	Alluvium		
	Bore EC09A	651356.2	7401502.0	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	Every 3 months
	Bore EC10	651618.4	7401418.7	Alluvium	pH, EC, water level	
	Bore EC11	651518.4	7401190.0	Alluvium		
	Bore EC12	651664.0	7400916.2	Alluvium	pH, EC, Na, Mg, Ca, Cl, HCO ₃ , SO ₄ , Total Fe	
	Bore EC13	651518.4	7400773.2	Alluvium	pH, EC, water level	
	Bore EC14	651678.0	7400650.2	Alluvium		
	Bore EC15	651950.1	7400541.7	Alluvium		
	Bore EC16	652379.8	7400993.7	Alluvium		
	Bore EC17	652797.6	7400706.2	Alluvium		
	Bore EC18	652832.9	7400919.7	Alluvium		
	Bore EC19	653128.8	7401328.0	Alluvium		
	Bore EC20	652316.1	7400687.7	Alluvium		
	Bore EC22	651694.6	7400490.7	Alluvium		
	Bore EC23	651684.2	7400420.7	Alluvium		
	Bore GW1	653934	7400423	Alluvium		
	Bore GW2	651462	7402401	Alluvium		
Nogoa River floodplain	DERM bore 13020177	650665.7	7402645.2	Alluvium	pH, EC, water level	Every 3 months
Private	Weir Bore	643983	7402238	Coal Measures	pH, EC,	Every 3 months,

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Location	Monitoring Point	Easting (GDA94)	Northing (GDA94)	Aquifer	Parameters	Frequency
Property				Overburden	water level	if required by property owner
	Jamar stockyard bore	642016	7399091	Coal Measures Overburden		
	100169	645116	7411290	Understood to be in the Coal Measures Overburden		
	100037	645259	7411381	Understood to be in the Coal Measures Overburden		
	132290	640966	7396404	Understood to be in the Coal Measures Overburden		
	37512	638173	7391640	Understood to be in the Coal Measures Overburden		
	103685	646319	7390738	Understood to be in the Coal Measures Overburden		
	Bore RN100036	634003	7411732	To be advised		
	Bore RN103024	636088	7412591	To be advised		

W45 Subject to requirements of condition W47, if the groundwater investigation trigger levels defined in Table 13 (Groundwater investigation trigger levels) are exceeded then the environmental authority holder must complete an investigation into the potential for environmental harm and notify the administering authority with twenty-eight (28) days of receiving the analysis results.

Table 13 (Groundwater investigation trigger levels)

Table 13 (Groundwater investigation trigger levels)

Parameter	Unit	Trigger Levels	Limit Type
pH	pH Units	6.5 – 8.5	Minimum/Maximum
Electrical Conductivity	µS/cm	mean ± 3s [#]	DERM (2010) ¹
Total Dissolved Solids	mg/L	mean + 3s [#]	DERM (2010) ¹
Calcium	mg/L	mean + 3s [#]	DERM (2010) ¹
Magnesium	mg/L	mean + 3s [#]	DERM (2010) ¹
Sodium	mg/L	mean + 3s [#]	DERM (2010) ¹
Potassium	mg/L	mean + 3s [#]	DERM (2010) ¹
Chlorine	mg/L	mean + 3s [#]	DERM (2010) ¹
SO ₄	mg/L	mean + 3s [#]	DERM (2010) ¹
CO ₃	mg/L	mean + 3s [#]	DERM (2010) ¹
HCO ₃	mg/L	mean + 3s [#]	DERM (2010) ¹
Iron	mg/L	mean + 3s [#]	DERM (2010) ¹
Aluminium	mg/L	5	ANZECC (2000) Livestock Drinking Water Level
Silver	mg/L	0.002	Based on available dataset upper limit
Arsenic	mg/L	0.5 – 5.0	ANZECC (2000) Livestock Drinking Water Level
Mercury	mg/L	0.002	ANZECC (2000) Livestock Drinking Water Level
Antimony	mg/L	0.005	Based on available dataset upper limit
Molybdenum	mg/L	0.15	ANZECC (2000) Livestock Drinking Water Level
Selenium	mg/L	0.1	Based on available dataset upper limit
Total Petroleum Hydrocarbons C6-C9 (silica gel)*	µg/L	≤20 (LOR)	Laboratory limit of reporting (LOR)
Total Petroleum Hydrocarbons C10-C14 (silica gel)*	µg/L	≤50 (LOR)	Laboratory limit of reporting (LOR)
Total Petroleum Hydrocarbons C15-C28 (silica gel)*	µg/L	≤100 (LOR)	Laboratory limit of reporting (LOR)
Total Petroleum Hydrocarbons C29-C36 (silica gel)*	µg/L	≤50 (LOR)	Laboratory limit of reporting (LOR)

Note: All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.

* TPH analysis with silica gel clean-up. If monitoring requirements change to TRH according to the National Environment Protection Measures (NEPM) the trigger levels should remain unchanged.

Specific limits for individual monitoring points apply. Trigger levels applied to individual bores at the time of submission of the Background Groundwater Monitoring Program are included in Appendix 3 with recognition that as the volume of groundwater data increases, these limits will be modified when applied to ongoing sampling results.

¹ DERM (2010) "Guideline – Recording Interpretation and Analysis of Monitoring Results, ERA 60 – Waste Disposal".

W46 Subject to requirements of condition W48, groundwater levels and groundwater drawdown fluctuations, not resulting from the pumping of licensed bores, must be notified within twenty-eight (28) days to the administering authority following completion of monitoring.

Background groundwater monitoring program

- W47** A background groundwater monitoring program must be maintained and implemented to include bore(s) that are located an appropriate distance from potential sources of impact from mining activities to provide the following:
- a) representative groundwater samples from the aquifers potentially affected by mining activities;
 - b) routine sampling to determine background groundwater data as far as practicable;
 - c) background groundwater data in hydraulically isolated background bore(s) that have not been affected by any mining activities.
- W48** The groundwater monitoring data must be reviewed on an annual basis. The review must include the assessment of groundwater levels and quality data and the suitability of the monitoring network. The assessment must be submitted to the administering authority within twenty-eight (28) days of receiving the report.
- W49** The following information must be recorded in relation to all groundwater water sampling:
- a) the date on which the sample was taken;
 - b) the time at which the sample was taken;
 - c) the monitoring point at which the sample was taken; and
 - d) the results of all monitoring.

Department Interest – Dams and levees

All dams

- C1** The holder of this environmental authority must ensure that each dam is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.
- C2** The hazard category of each dam must be assessed by a suitably qualified and experienced person at least once per year, based on documented evidence sufficient to define or confirm the current nature and extent of environmental consequences for potential failure of that dam. Hazard category is to be determined in accordance with the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland 1995*.
- C3** Dams having a hazard category assessed as significant or high, must be specifically authorised by this environmental authority.

- C4** The condition of dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person. The methods of monitoring and frequency of monitoring shall be as assessed by that suitably qualified and experienced person, based on the hazard category and particular circumstances of each dam.
- C5** In the event of early signs of loss of structural or hydraulic integrity, the holder of this environmental authority must immediately take action to prevent or minimise any actual or potential environmental harm, and report in writing any findings and actions taken to the administering authority within twenty eight (28) days of that event.
- C6** The holder of this environmental authority must not abandon any dam but must decommission each dam such that ongoing environmental harm is prevented.
- C7** As a minimum, decommissioning must be conducted such that each dam is:
- a) either:
 - i. a stable landform, that no longer contains flowable substances, or
 - ii. approved or authorised under relevant legislation for a beneficial use, or
 - iii. is a void authorised by the administering authority to remain after decommissioning; and
 - b) compliant with the rehabilitation requirements of this environmental authority.

Certification and operation

- C8** Documentation required by the conditions in this schedule must be kept available for inspection by the administering authority for a period of five (5) years after the conclusion of the environmentally relevant activity in respect of which this environmental authority has been granted.
- C9** The holder of this environmental authority must not commence construction of a regulated dam unless:
- a) the holder has submitted to the administering authority two (2) copies of a design plan, together with the certification of a suitably qualified and experienced person that the design of the regulated dam will deliver the performance stated in the design plan and that it will be compliant in all respects with this environmental authority, and
 - b) at least twenty (20) business days has passed since the receipt of those documents, or the administering authority notifies the holder that a design plan and certification in accordance with this environmental authority, has been received.

- C10** Each design plan for a regulated dam under this environmental authority, must consider the likely outcomes for releases to the environment using estimates of likely contaminant concentrations using data from contact testing, output from modelling on site and modelling for flows in the nearby watercourses.
- C11** Each design plan for a regulated dam under this environmental authority, must include the outcomes from water balance modelling of the worst case scenarios of wet season storage and discharges. This information must be presented graphically at a suitable time step and be able to compare the incident rainfall, runoff and environmental releases for all regulated dams.
- C12** When construction or modification of any regulated dam is complete, the holder of this environmental authority must submit to the administering authority two (2) copies of a set of 'as constructed' drawings, together with the certification of a suitably qualified and experienced person that the dam 'as constructed' will deliver the performance stated in the design plan and that it will be compliant in all respects with this environmental authority.
- C13** The holder of this environmental authority must ensure that there is always a current operational plan for each regulated dam, which may form part of other plans required by legislation.
- C14** The operational plan shall at least cover all matters relevant to the operation and maintenance of the regulated dam so that it is compliant in all respects with this environmental authority.
- C15** The holder of this environmental authority must ensure that, where a current operational plan covers decommissioning and rehabilitation, operations are consistent with the objectives in any design plan for the dam.
- C16** The holder of this environmental authority must notify the administering authority immediately of the level in any regulated dam reaching the mandatory reporting level (MRL), and confirm in writing within seven (7) days.

Annual inspection and report

- C17** The holder of this environmental authority must arrange for each regulated dam to be inspected annually by a suitably qualified and experienced person, in accordance with the following conditions.
- C18** At each annual inspection, the condition of each regulated dam must be assessed, including the structural, geotechnical and hydraulic adequacy of the dam and the adequacy of the works with respect to dam safety, and any recommended actions conveyed immediately to the holder of this environmental authority.

- C19** The holder of this environmental authority must immediately act upon recommendations arising from an annual inspection on condition and adequacy of a dam.
- C20** At each annual inspection, the adequacy of the available storage against the design storage allowance (DSA) specified must be assessed and, if a MRL is required, it must be determined and marked on each regulated dam.
- C21** A final assessment of adequacy of available storage in each regulated dam must be based on a dam level observed within the month of October, accepted as valid by the suitably qualified and experienced person, and resulting in an estimate of the level in that dam as at 1 November.
- C22** For each annual inspection, two (2) copies of a report certified by the suitably qualified and experienced person, including any recommended actions to be taken to ensure the integrity of each regulated dam, must be provided to the administering authority by 1 December.

Flood protection levee – Additional conditions

- C23** The design plan in accordance with condition C9 must include:
- a) drawings describing the location and dimensions of the levee and the mining excavations in the vicinity of the levee, including confirmation the levee meets the specified design requirements in condition C24; and
 - b) a documented procedure for surveillance of the levee and any adjacent mining excavation slopes to detect and report to the administering authority any ground movement that compromises or may compromise the integrity of the levee.
- C24** Design requirements for the levee and adjacent mining excavation include:
- a) the design level of the levee crest shall be at least one (1) metre above the estimated 1 in 1,000 ARI flood event for the adjacent watercourses; and
 - b) mining excavation slopes adjacent to the levee must remain stable and are to be designed with a factor of safety of one point five (1.5) (calculated from the levee toe) or above based on an accepted stability analysis.
- C25** The flood protection levee authorised under this environmental authority must be constructed and maintained such that:
- a) it does not result in increased erosion of the bank or bed of the Nogoia River;
 - b) it does not significantly impact upon riparian or existing remnant vegetation; and
 - c) the levee itself will not erode during any flood events up to the 1 in 1,000 ARI event.

Flood protection levee – Surveillance and remedial works

- C26** The condition of constructed levees including the surface area between the downstream toe of the levee and the end wall crest of the open-cut mining pit should be monitored for surface cracks and must at a minimum be inspected and assessed by a suitably qualified and experienced person at least once per year between the months of May and October inclusive (i.e. during the 'dry' season and before the onset of the 'wet' season), and at any time if alarming, unusual or otherwise unsatisfactory conditions are observed.
- C27** For each flood protection levee annual inspection, two copies of the surveillance report, including any recommendations for remedial works, must be provided to the administering inspection within twenty-eight (28) days of the date of inspection.
- C28** Remedial works identified as being required for the flood protection levee during the inspections and assessments conducted under conditions C26 and C27, must be notified in writing to the administering authority within fifteen (15) business days of the completion of the inspections, and commenced within twenty-eight (28) days unless otherwise agreed in writing by the administering authority.
- C29** The annual return for this environmental authority shall be accompanied by a report, by a suitably qualified and experienced person, that certifies that the documented procedure for surveillance of the levee has been applied in accordance with the procedure, that there has been no erosion, cracking or vertical or horizontal deformation that has impacted on the integrity of the levee, and that the levee has been maintained in accordance with the certified design plan.

Regulated dams – Location and basic specifications

- C30** The following are the only regulated dams authorised under this environmental authority, and those dams are to be located within the control points defined in Table 14 (Location of regulated dams).

Table 14 (Location of regulated dams)

Name of regulated dam	Easting (GDA94)	Northing (GDA94)
Northern Flood Protection Levee	651117	7405591
	651160	7404548
	651600	7403725
	651655	7402768
	652414	7402045
	653545	7402072
	653578	7403413
Southern Flood Protection Levee	649460	7399042
	650238	7400726
	652960	7400527
	653694	7399903
	653315	7398692
	651751	7397325

C31 The following are the only regulated dams authorised under this environmental authority, and those dams are to accord with the basic specifications in Table 15 (Basic specification of regulated dams).

Table 15 (Basic specification of regulated dams)

Name of regulated dam	Maximum surface area of dam (ha)	Maximum volume of dam (ML)	Maximum height of Dam (m)	Purpose of dam
Northern Flood Protection Levee	N/A	N/A	8	Flood protection for mine workings
Southern Flood Protection Levee	N/A	N/A	6.5	Flood protection for mine workings

C32 The following are the only regulated dams authorised under this environmental authority, and those dams are to accord with the hydraulic specifications in Table 16 (Hydraulic performance of regulated dams) below.

Table 16 (Hydraulic performance of regulated dams)

Regulated Dam	Design Storage Allowance	Spillway or Protection Critical Design Event	Mandatory Reporting Level
Northern Flood Protection Levee	N/A	AEP 0.001 (1-in-1,000) plus 1 metre minimum freeboard	N/A
Southern Flood Protection Levee	N/A	AEP 0.001 (1-in-1,000) plus 1 metre minimum freeboard	N/A

Department Interest – Noise and vibration

Noise nuisance

- D1** Noise from activities must not cause an environmental nuisance at any sensitive receptor or commercial place.
- D2** All noise from activities must not exceed the levels for the time periods specified in Table 17 (Noise limits) at any sensitive receptor or commercial place.

Table 17 (Noise limits)

Noise Level dB(A)	7am – 6pm	6pm – 10pm	10pm – 7am
<i>Noise measured at a 'Noise sensitive place'</i>			
L _A 10, adj, 10 mins	B/g + 5	B/g + 5	B/g + 3
L _A 1, adj, 10 mins	N/A	N/A	B/g + 8
<i>Noise measured at a 'Commercial place'</i>			
L _A 10, adj, 10 mins	B/g + 10	B/g + 10	B/g + 5

Noise monitoring

- D3** When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results notified within fourteen (14) days to the administering authority. Monitoring must include:
- L_A 10, adj, 10 mins
 - L_A 1, adj, 10 mins
 - the level and frequency of occurrence of impulsive or tonal noise;
 - atmospheric conditions including wind speed and direction;
 - effects due to extraneous factors such as traffic noise; and
 - location date and time of recording.

- D4** Noise is not considered to be a nuisance under condition D1 if monitoring shows that noise does not exceed the levels in the time periods specified in Table 17 (Noise limits).
- D5** The method of measurement and reporting of noise monitoring must comply with the current edition of the administering authority's *Noise Measurement Manual*.
- D6** If monitoring indicates exceedence of the relevant limits in condition D4, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement noise abatement measures so that emissions of noise from the activity do not result in further environmental nuisance.

Vibration nuisance

- D7** Vibration from the licensed activities must not cause an environmental nuisance at any sensitive or commercial place.
- D8** When requested by the administering authority, vibration monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.
- D9** If the environmental authority holder can provide evidence through monitoring that the limits defined in Table 18 (Vibration limits) are not being exceeded then the environmental authority holder is not in breach of condition D7. Monitoring must include:
- a) location of the blast(s) within the mining area (including which bench level); and
 - b) atmospheric conditions including temperature, relative humidity and wind speed and direction; and
 - c) location, date and time of recording.

Table 18 (Vibration limits)

Location	Vibration measured
Sensitive or commercial place	5 mm/s peak particle velocity for nine (9) out of ten (10) consecutive blasts and not greater than 10 mm/s peak particle velocity at any time

- D10** If monitoring indicates exceedence of the relevant limits in Table 18 (Vibration limits), then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement vibration abatement measures so that vibration from the activity does not result in further environmental nuisance.

Airblast overpressure nuisance

- D11** The airblast overpressure level from blasting operations on the premises must not exceed the limits defined in Table 19 (Airblast overpressure level) at any nuisance sensitive or commercial place.

Table 19 (Airblast overpressure level)

Location	Airblast Overpressure Measured
Sensitive or commercial place	Air blast overpressure level of 115 db (Linear peak) for nine (9) out of ten (10) consecutive blasts initiated and not greater than 120 db (Linear peak) at any time.

- D12** When requested by the administering authority, airblast overpressure monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.
- D13** Airblast overpressure monitoring must include the following descriptors, characteristics and conditions:
- a) location of the blast(s) within the mining area (including which bench level);
 - b) atmospheric conditions including temperature, relative humidity and wind speed and direction; and
 - c) location, date and time of recording.
- D14** If monitoring indicates exceedence of the relevant limits in Table 19 (Airblast overpressure level), then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required; and
 - b) immediately implement airblast overpressure abatement measures so that airblast overpressure from the activity does not result in further environmental nuisance.
- D15** The method of measurement and reporting of airblast overpressure levels must comply with the current edition of the administering authority's *Noise Measurement Manual*.

Department Interest – Waste

E1 Storage of tyres

Scrap tyres stored awaiting disposal or transport for take-back and recycling, or waste-to-energy options must be stored in stable stacks and at least 10m from any other scrap tyre storage area, or combustible or flammable material, including vegetation.

E2 All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10m radius of the scrap tyre storage area.

E3 Disposing of scrap tyres resulting from the authorised activities in spoil emplacements is acceptable, provided tyres are placed as deep in the spoil as reasonably practicable. A record must be kept of the number and location for tyres disposed.

E4 Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.

Waste Management

- E5** A Waste Management Plan, in accordance with the *Environmental Protection (Waste Management) Policy 2000*, must be implemented and must cover:
- a) describe how Ensham mine recognise and apply the waste management hierarchy;
 - b) identify characterisations of wastes generated from the project and general volume trends over the past five (5) years;
 - c) a program for safe recycling or disposal of all wastes - reusing and recycling where possible;
 - d) waste commitments with auditable targets to reduce, reuse and recycle;
 - e) The waste management control strategies must consider:
 - the type of wastes;
 - segregation of the wastes;
 - storage of the wastes;
 - transport of the wastes;
 - monitoring and reporting matters concerning the waste;
 - emergency response planning;
 - disposal, reused and recycling options;
 - f) identify the potential adverse and beneficial impacts of the wastes generated;
 - g) detail the hazardous characteristics of the waste generated (if any);
 - h) cover a disposal procedure for hazardous wastes ;
 - i) outline the process to be implemented to allow for continuous improvement of the waste management systems;
 - j) identify responsible staff (positions) for implementing, managing and reporting the Waste Management Plan; and
 - k) cover a staff awareness and induction program that encourages re-use and recycling.
- E6** Waste must not be burned or allowed to be burned on the licensed site unless by approval of the administering authority.
- E7** A designated area must be set aside for the segregation of economically viable, recyclable solid and liquid waste.

- E8** Records must be kept for five (5) years, and must include the following information:
- a) date of pickup of waste;
 - b) description of waste;
 - c) cross reference to relevant waste transport documentation;
 - d) quantity of waste;
 - e) origin of the waste;
 - f) destination of the waste; and
 - g) intended fate of the waste, for example, type of waste treatment, reprocessing or disposal.

NOTE: Records of documents maintained in compliance with a waste tracking system established under the *Environmental Protection Act 1994* or any other law for regulated waste will be deemed to satisfy this condition.

- E9** Records of trade and regulated wastes or material leaving the mining lease for recycling or disposal, including the final destination and method of treatment, must be in accordance with the *Environmental Protection (Waste Management) Policy 2000*.
- E10** All regulated waste received at and removed from the site must be transported by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- E11** Except as otherwise provided by the conditions of this authority, all waste removed from the site must be taken to a facility that is lawfully allowed to accept such waste under the provisions of the *Environmental Protection Act 1994*.

Department Interest – Land

Preventing contaminant release to land

- F1** Contaminants must not be released to land in manner which constitutes nuisance, material or serious environmental harm.

Bord and pillar – factors of safety

- F2** The holder of the environmental authority will determine relevant pillar and roadway dimensions to ensure that the following factors of safety are achieved:
- 2.11 for bord and pillar workings beneath the Nogoia River anabranch;
 - 2.11 for access roadways beneath the Nogoia River to connect the bord and pillar and longwall mining areas; and
 - 1.6 for all other bord and pillar workings beneath the floodplain of the Nogoia River.
- F3** Operational management protocols must be put in place to ensure that minimum pillar and roadway dimensions calculated to achieve the factors of safety in condition F2 are achieved during the life of the bord and pillar operation.

Topsoil

- F4** Topsoil resources that are suitable for use in rehabilitation must be salvaged ahead of mining disturbance (or spoil placement) for strategic use in rehabilitation of the mine spoil dump area. This topsoil removal relocation must be documented in a topsoil management plan.

Rehabilitation landform criteria

- F5** All areas significantly disturbed by mining activities must be rehabilitated to a stable landform with a self-sustaining vegetation cover in accordance with Table 20 (Landform design criteria) which will be populated and submitted in conjunction with an environmental authority amendment application required by condition F7.
- F6** Progressive rehabilitation must commence within three (3) years when areas become available within the operational land.
- F7** A Rehabilitation Management Plan proposing completion criteria for all mining areas must be developed by **29 March 2013** and submitted to the administering authority for review and comment. The Rehabilitation Management Plan must, at a minimum:
- a) map existing areas of rehabilitation;
 - b) develop design objectives for rehabilitation of disturbed areas and post mining land uses across the mine;
 - c) specify spoil characteristics, soil analysis, soil separation for use on rehabilitation;
 - d) detail rehabilitation methods applied to areas;
 - e) detail landform design criteria including end of mine design;
 - f) detail how landform design will be consistent with surrounding topography;
 - g) identify success criteria for areas and itemize revegetation criteria;
 - h) explain planned native vegetation rehabilitation areas and corridors;
 - i) identify at least a minimum of three (3) reference and three (3) rehabilitation sites to be used to develop rehabilitation success criteria;
 - j) describe rehabilitation indicators and the monitoring program to be used;
 - k) develop a contingency plan for rehabilitation maintenance or redesign;
 - l) describe end of mine landform design planning and post mining land uses across the mine; and
 - m) include a cost benefit analysis/triple bottom line assessment (or a comparative alternative assessment method) of the proposed final landform design criteria and alternatives.

Residual void outcome

- F8** Residual voids must not cause any serious environmental harm to land, surface waters or any recognised groundwater aquifer, other than the environmental harm constituted by the existence of the residual void itself and subject to any other condition within this environmental authority.



- F9** An investigation into residual voids proposing acceptance criteria to meet the outcomes in condition F8 and landform design criteria must be developed by **29 March 2013** and submitted to the administering authority for review and comment. On acceptance of the criteria proposed in the residual void management plan, the criteria must be specified in the environmental authority. The investigation must at a minimum include the following:
- a) a study of options available for minimising final void area and volume;
 - b) design criteria for rehabilitation of final voids;
 - c) a void hydrology study, addressing the long-term water balance in the voids, connections to groundwater resources and water quality parameters in the long term;
 - d) a pit wall stability study, considering the effects of long-term erosion and weathering of the pit wall and the effects of significant hydrological events;
 - e) a study of void capability to support native flora and fauna; and
 - f) a proposal/s for end of mine void rehabilitation success criteria and final void areas and volumes.
- F10** The rehabilitated landform criteria and residual void outcomes must be reviewed every three (3) years from the **29 March 2013** submission date. Any amendments to rehabilitation criteria and landform designs must be re-submitted to the administering authority.

Rehabilitation Monitoring Program

- F11** Once rehabilitation has commenced, the holder of the environmental authority must conduct a Rehabilitation Monitoring Program on a yearly basis, which must include sufficient spatial and temporal replication to enable statistically valid conclusions as established under the rehabilitation program.
- F12** The Rehabilitation Monitoring Program must be developed and implemented by a person possessing appropriate qualifications and experience in the field of rehabilitation management, nominated by the environmental authority holder.
- F13** The Rehabilitation Monitoring Program must be included in the Plan of Operations and updated with each subsequent Plan of Operations, describing:
- a) how the rehabilitation objectives as per condition F7 will be achieved; and
 - b) verification of rehabilitation success.

Post Closure Management Plan

- F14** A Post Closure Management Plan for the site must be prepared at least 18 months prior to the final coal processing on site and implemented for a nominal period of:
- a) at least thirty (30) years following final coal processing on site; or

- b) a shorter period if the site is proven to be geotechnically and geochemically stable and it can be demonstrated to the satisfaction of the administering authority that no release of contaminants from the site will result in environmental harm.

F15 The Post Closure Management Plan must include the following elements:

- a) operation and maintenance of:
 - i. wastewater collection and reticulation systems;
 - ii. wastewater treatment systems;
 - iii. the groundwater monitoring network;
 - iv. final cover systems; and
 - v. vegetative cover.
- b) monitoring of:
 - i. surface water quality;
 - ii. groundwater quality;
 - iii. seepage rates;
 - iv. erosion rates;
 - v. the integrity and effectiveness of final cover systems; and
 - vi. the health and resilience of native vegetation cover.

Tailings storage facility

F16 The management of tailings disposal must be in accordance with the following:

- a) all tailings material must be progressively characterised during disposal for acid generating capacity and selected metals and salts. Samples shall be tested for the following parameters: pH, Electrical Conductivity (EC), Acid Neutralising Capacity (ANC), Net Acid Generation (NAG) (reporting NAG capacity and NAG pH after oxidation), Total Sulphur (S), Chromium Reducible Sulphur (Scr), Boron (B) Cadmium (Cd), Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na), Zinc (Zn) and Sulphate (SO₄);
- b) the sample parameters in a) above can be reviewed following 6 months of mine coal wash plant operation, and if it can be demonstrated that certain individual sample parameters are not present in sufficient quantities to warrant further monitoring, these can be removed from a) above;
- c) one tailing sample will be collected each and every week while the mine coal wash plant is operational and the sample will be stored. After 4 samples have been collected the samples will be composited and the composite sample characterised as outlines in (a) above. Subject to operation of the coal wash plant, a minimum of 1 composite tailing sample will undergo characterisation per month. Subject to operation of the coal wash plant a minimum of 12 composite tailing samples will undergo characterisation per year;
- d) records must be kept of the tailings disposal to indicate locations and characteristics of tailings stored within the tailings storage facility;
- e) where the acid producing potential of tailings material has not been conclusively determined, geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies; and
- f) tailings identified as potentially acid producing will be covered or placed to minimise surface oxidation. The maximum duration of surface exposure of these materials is one (1) month.

Mine Waste

- F17** A Mining Waste Management Plan together with the certification by an appropriately qualified person must be developed and implemented during the continuation of the environmental authority. The Mining Waste Management Plan must at a minimum include:
- a) characterisation programs to ensure that all mining waste is progressively characterised during disposal for net acid producing potential, salinity and the following parameters: pH, Electrical Conductivity (EC), Acid Neutralising Capacity (ANC), Net Acid Generation (NAG) (reporting NAG capacity and NAG pH after oxidation), Total Sulphur (S), Chromium Reducible Sulphur (Scr), Boron (B) Cadmium (Cd), Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na), Zinc (Zn) and Sulphate (SO₄);
 - b) individual parameters in a) above can be removed following sufficient mine waste characterisation to demonstrate that certain individual parameters are not present in sufficient quantities to warrant further characterisation;
 - c) characterisation programs to ensure that the physical properties of the mining waste is progressively characterised during disposal;
 - d) the availability or leachability of metals from the mining waste;
 - e) quantification of PAF from mining waste present;
 - f) review impacts of the PAF mining waste on the rehabilitation;
 - g) management actions for mining waste that has been identified as having a high availability or leachability of metals;
 - h) management actions for mining waste that has been defined as PAF;
 - i) identification of environmental impacts and potential environmental impacts;
 - j) control measures for routine operations to minimise likelihood of environmental harm;
 - k) contingency plans and emergency procedures for non-routine situations; and
 - l) periodic review of environmental performance and continual improvement.

Storage and handling of flammable and combustible liquids

- F18** All flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of AS 1940 – *Storage and Handling of Flammable and Combustible Liquids*.
- F19** Spillage of all flammable and combustible liquids must be controlled in a manner that prevents environmental harm.

Storage and handling of chemicals

- F20** All chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of the relevant Australian Standard.
- F21** Spillage of all chemicals must be controlled in a manner that prevents environmental harm.

Infrastructure

- F22** All infrastructure, constructed by or for the environmental authority holder during the licensed activities including water storage structures, must be removed from the site prior to surrender, except where agreed in writing by the post mining land owner / holder.

NOTE: *This is not applicable where the landowner / holder is also the environmental authority holder.*

Exploration

- F23** Disturbance due to exploration activities in areas not authorised to be mined must be rehabilitated in accordance with provisions detailed in the *Code of Environmental Compliance for Exploration and Mineral Development Projects*.

Department Interest – Community

Complaint response

- G1** All complaints received must be recorded including details of complainant, reasons for the complaint, investigations undertaken, conclusions formed and actions taken. This information must be made available for inspection by the administering authority on request.
- G2** The holder of this environmental authority must record the following details for all complaints received and provide this information to the administering authority on request:
- a) time, date, name and contact details of the complainant;
 - b) reasons for the complaint;
 - c) conclusions formed; and
 - d) any actions taken

Definitions

Words and phrases used throughout this licence are defined below except where identified in the *Environmental Protection Act 1994 (EP Act 1994)* or subordinate legislation. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the *Macquarie Dictionary*.

“20th percentile flow” means the 20th percentile of all daily flow measurements (or estimations) of daily flow over a 10 year period for a particular site. The 20th percentile calculation should only include days where flow has been measured (or estimated), i.e. not dry weather days.

“acceptance criteria” means the measures by which actions implemented are deemed to be complete. The acceptance criteria indicate the success of the decommissioning and rehabilitation outcomes or remediation of areas which have been significantly disturbed by the environmentally relevant activities. Acceptance criteria may include information regarding:

- a) stability of final land forms in terms of settlement, erosion, weathering, pondage and drainage;
- b) control of geochemical and contaminant transport processes;
- c) quality of runoff waters and potential impact on receiving environment;
- d) vegetation establishment, survival and succession;
- e) vegetation productivity, sustained growth and structure development;
- f) fauna colonisation and habitat development;
- g) ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes;
- h) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;
- i) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;
- j) resilience of vegetation to disease, insect attack, drought and fire; and
- k) vegetation water use and effects on ground water levels and catchment yields.

“accepted engineering standards” in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the Australian National Committee on Large Dams (ANCOLD), guidelines published by Queensland government departments, and relevant Australian and New Zealand Standards.

“acid rock drainage” means any contaminated discharge emanating from a mining activity formed through a series of chemical and biological reactions, when geological strata is disturbed and exposed to oxygen and moisture as a result of mining activity.

“administering authority” means the Department of Environment and Heritage Protection or its successor.

“administering authority” means the Department of Environment and Heritage Protection or its successor.

“airblast overpressure” means energy transmitted from the blast site within the atmosphere in the form of pressure waves. The maximum excess pressure in this wave, above ambient pressure is the peak airblast overpressure measured in decibels linear (dB).

“ambient (or total) noise” at a place, means the level of noise at the place from all sources (near and far), measured as the Leq for an appropriate time interval.

“Annual Exceedence Probability” or **“AEP”** means the probability that at least one event in excess of a particular magnitude will occur in any given year.

“ANZECC” means the *Australian and New Zealand Guidelines for Fresh Marine Water Quality 2000*.

“authority” means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

“appropriately qualified person” means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods or literature.

“assessed” or **“assess”** by a suitably qualified and experienced person in relation to a hazard assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- a) exactly what has been assessed and the precise nature of that assessment;
- b) the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- c) the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

“associated works” in relation to a dam, means:

- (a) operations of any kind and all things constructed, erected or installed for that dam; and
- (b) any land used for those operations.

“authority” means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

“competent person” means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

"bed and banks" for a waters, river, creek, stream, lake, lagoon, pond, swamp, wetland or dam means land over which the water of the waters, lake, lagoon, pond, swamp, wetland or dam normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed and banks that is from time to time covered by floodwater.

"beneficial use" in respect of dams means that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:

- a) of benefit to that owner in that it adds real value to their business or to the general community,
- b) in accordance with relevant provisions of the *Environmental Protection Act 1994*,
- c) sustainable by virtue of written undertakings given by that owner to maintain that dam, and
- d) the transfer and use have been approved or authorised under any relevant legislation.

"blasting" means the use of explosive materials to fracture-

- a) rock, coal and other minerals for later recovery; or
- b) structural components or other items to facilitate removal from a site or for reuse.

'certification', "certifying" or 'certified' by a suitably qualified and experienced person in relation to a design plan or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- a) exactly what is being certified and the precise nature of that certification.
- b) the relevant legislative, regulatory and technical criteria on which the certification has been based;
- c) the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- d) the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

“chemical” means –

- a) an agricultural chemical product or veterinary chemical product within the meaning of the *Agricultural and Veterinary Chemicals Code Act 1994* (Commonwealth); or
- b) a dangerous good under the dangerous goods code; or
- c) a lead hazardous substance within the meaning of the *Workplace Health and Safety Regulation 1997*; or
- d) a drug or poison in the *Standard for the Uniform Scheduling of Drugs and Poisons* prepared by the Australian Health Ministers' Advisory Council and published by the Commonwealth; or
- e) any substance used as, or intended for use as –
 - i. a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product; or
 - ii. a surface active agent, including, for example, soap or related detergent; or
 - iii. a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide; or
 - iv. a fertiliser for agricultural, horticultural or garden use; or
- f) a substance used for, or intended for use for –
 - i. mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater; or
 - ii. manufacture of plastic or synthetic rubber.

“commercial place” means a work place used as an office or for business or commercial purposes, which is not part of the mining activity and does not include employees accommodation or public roads.

“construction” or “constructed” in relation to a dam includes building a new dam and modifying or lifting an existing dam, but does not include investigations and testing necessary for purposes of preparing a design plan.

“contaminated” means the substance has come into contact with a contaminant.

“contaminant” A contaminant can be –

- a) a gas, liquid or solid; or
- b) an odour; or
- c) an organism (whether alive or dead), including a virus; or
- d) energy, including noise, heat, radioactivity and electromagnetic radiation; or
- e) a combination of contaminants.

“dam” means a land-based structure or a void that is designed to contain, divert or control flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

"design plan" is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include all investigation and design reports, plans and specifications sufficient to hand to a contractor for construction, and planned decommissioning and rehabilitation outcomes; so as to address all hazard scenarios that would be identified by a properly conducted hazard assessment for the structure. Documentation must be such that a 'suitable qualified and experience person' could conduct an independent review without seeking further information from the designer.

"design storage allowance" or "DSA" means an available volume, estimated in accordance with the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland* (DME 1995), that must be provided in a dam as at the first of November each year in order to prevent a discharge from that dam to a probability (AEP) specified in that guideline. The DSA is estimated based on 100% runoff of wet season rainfall at the relevant AEP, taking account of process inputs during that wet season, with no allowance for evaporation.

"effluent" treated waste water discharged from sewage treatment plants.

"environmental authority" means an environmental authority granted in relation to an environmentally relevant activity under the *Environmental Protection Act 1994*.

"environmental authority holder" means the holder of this environmental authority.

"environmentally relevant activity" means an environmentally relevant activity as defined under Section 18 of the *Environmental Protection Act 1994* and listed under Schedule 2 of the *Environmental Protection Regulation 2008*.

"financial assurance" means a security required under the *Environmental Protection Act 1994* by the administering authority to cover the cost of rehabilitation or remediation of disturbed land or to secure compliance with the environmental authority.

"flowable substance" means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.

"foreseeable future" is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptable probability of failure before that time.

“hazard” in relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

“hazard category” means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland* (DME 1995).

“hazardous waste” means any substance, whether liquid, solid or gaseous, derived by or resulting from, the processing of minerals that tends to destroy life or impair or endanger health.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland* (DME 1995).

“infrastructure” means water storage dams, roads and tracks, buildings and other structures built for the purpose and duration of the conduct of the environmentally relevant activities, but does not include other facilities required for the long term management of the impact of those activities or the protection of potential resources. Such other facilities include dams other than water storage dams, waste dumps, voids, or stockpiles and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.

“lake” includes –

- a) lagoon, swamp or other natural collection of water, whether permanent or intermittent; and
- b) the bed and banks and any other element confining or containing the water.

“L_A 10, adj, 10 mins” means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10% of any 10-minute measurement period, using Fast response.

“L_A 1, adj, 10 mins” means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1% of any 10-minute measurement period, using Fast response.

“L_A, max adj, T” means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

"land capability" as defined in the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (DME 1995).

"land suitability" as defined in the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (DME 1995).

"land use" term to describe the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

"levee", "dyke" or "bund" means a long embankment that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.

"mandatory reporting level" or "MRL" means a warning and reporting level determined in accordance with the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland* (DME 1995). An MRL is the lowest level required in a regulated dam to allow either of the following to be retained:

- a) the runoff from a 72 hour duration storm at the AEP specified in Table 15 of this environmental authority;
or
- b) a wave allowance at that AEP as estimated using a recognised engineering method.

"mg/L" means milligrams per litre.

"mine affected water" —the following types of water:

- i) pit water, tailings dam water, processing plant water;
- ii) water contaminated by a mining activity which would have been an environmentally relevant activity under Schedule 2 of the *Environmental Protection Regulation 2008* if it had not formed part of the mining activity;
- iii) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated, excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an Erosion and Sediment Control Plan to manage runoff containing sediment only, provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water;
- iv) groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated;
- v) groundwater from the mine's dewatering activities;
- vi) a mix of mine affected water (under any of paragraphs i)-v)) and other water.

“mineral” means a substance which normally occurs naturally as part of the earth’s crust or is dissolved or suspended in water within or upon the earth’s crust and includes a substance which may be extracted from such a substance, and includes—

- a) clay if mined for use for its ceramic properties, kaolin and bentonite;
- b) foundry sand;
- c) hydrocarbons and other substances or matter occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connection with mining for shale or coal or for the purpose of enhancing the safety of current or future mining operations for coal or the extraction or production of mineral oil there from;
- d) limestone if mined for use for its chemical properties;
- e) marble;
- f) mineral oil or gas extracted or produced from shale or coal by in situ processes;
- g) peat;
- h) salt including brine;
- i) shale from which mineral oil may be extracted or produced;
- j) silica, including silica sand, if mined for use for its chemical properties;
- k) rock mined in block or slab form for building or monumental purposes;

but does not include—

- l) living matter;
- m) petroleum within the meaning of the Petroleum Act 1923;
- n) soil, sand, gravel or rock (other than rock mined in block or slab form for building or monumental purposes) to be used or to be supplied for use as such, whether intact or in broken form;
- o) water.

“natural flow” means the flow of water through waters caused by nature.

“nature” includes:

- a) ecosystems and their constituent parts; and
- b) all natural and physical resources; and
- c) natural dynamic processes.

“noxious” means harmful or injurious to health or physical well being, other than trivial harm.

“offensive” means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

“operational land” means the land associated with the project for which this environmental authority has been issued.

“operational plan” means a document that amongst other things sets out procedures and criteria to be used for operating a dam during a particular time period. The operational plan as defined herein may form part of a plan of operations or plan otherwise required in legislation.

“peak particle velocity (ppv)” means a measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second (mms^{-1}).

“protected area” means - a protected area under the *Nature Conservation Act 1992*; or
- a marine park under the *Marine Parks Act 1992*; or
- a World Heritage Area.

“progressive rehabilitation” means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining operations are ongoing.

“receiving environment” means all groundwater, surface water, land, and sediments that are not disturbed areas authorised by this environmental authority.

“receiving waters” means all groundwater and surface water that are not disturbed areas authorised by this environmental authority.

“reference site” (or analogue site) may reflect the original location, adjacent area or another area where rehabilitation success has been completed for a similar biodiversity. Details of the reference site may be as photographs, computer generated images and vegetation models etc.

“regulated dam” means any dam in the significant or high hazard category as assessed using the *Site Water Management Technical Guideline for Environmental Management of Exploration and Mining in Queensland* (DME 1995).

“regulated waste” means non-domestic waste mentioned in schedule 7 of the Environmental Protection Regulation 2008 (whether or not it has been treated or immobilised), and includes:

- a) for an element – any chemical compound containing the element; and
- b) anything that has contained the waste.

"rehabilitation" the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

"representative" means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.

"residual void" means an open pit resulting from the removal of ore and/or waste rock which will remain following the cessation of all mining activities and completion of rehabilitation processes.

"saline drainage" The movement of waters, contaminated with salt(s), as a result of the mining activity.

"self sustaining" means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

"sensitive place" means;

- a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- b) a motel, hotel or hostel; or
- c) an educational institution; or
- d) a medical centre or hospital; or
- e) a protected area under the Nature Conservation Act 1992, the Marine Parks Act 1992 or a World Heritage Area; or
- f) a public park or gardens.

"sewage" means the used water of person's to be treated at a sewage treatment plant.

“significant disturbance” – includes land

- a) if it is contaminated land; or
- b) it has been disturbed and human intervention is needed to rehabilitate it.
 - i. to a state required under the relevant environmental authority; or
 - ii. if the environmental authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Some examples of disturbed land include:

- a) areas where soil has been compacted, removed, covered, exposed or stockpiled;
- b) areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion; (vegetation & topsoil)
- c) areas where land use suitability or capability has been diminished;
- d) areas within a watercourse, waterway, wetland or lake where mining activities occur;
- e) areas submerged by tailings or hazardous contaminant storage and dam walls in all cases;
- f) areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after mining activities have ceased; or
- g) areas where land has been contaminated and a suitability statement has not been issued.

However, the following areas are not included:

- a) areas off lease (e.g. roads or tracks which provide access to the mining lease);
- b) areas previously significantly disturbed which have achieved the rehabilitation outcomes;
- c) by agreement with the administering authority, areas previously significantly disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
- d) areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement with the landowner. The agreement to leave permanent infrastructure must be recorded in the Landowner Agreement and lodged with the administering authority; and
- e) disturbances that pre-existed the grant of the tenure unless those areas are disturbed during the term of the tenure.

“spillway” means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.

"stable" in relation to land, means land form dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

"suitably qualified and experienced person" in relation to dams means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, OR registered as a National Professional Engineer (NPER) with the Institution of Engineers Australia, OR holds equivalent professional qualifications to the satisfaction of the administering authority for the Act; AND the administering authority for the Act is satisfied that person has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

1. knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
2. a total of five years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry, and
3. a total of five years of suitable experience and demonstrated expertise each, in three of the following categories:
 - a) investigation and design of dams;
 - b) Construction, operation and maintenance of dams;
 - c) hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology;
 - d) hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes;
 - e) hydrogeology with particular reference to seepage, groundwater;
 - f) solute transport processes and monitoring thereof; and
 - g) dam safety.

"tolerable limits" means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values. For example, a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing pondage and limiting infiltration and percolation.

"trivial harm" means environmental harm which is not material or serious environmental harm and will not cause actual or potential loss or damage to property of an amount of, or amounts totalling more than \$5,000.

"void" means any man-made, open excavation in the ground.

"waste" as defined in section 13 of the *Environmental Protection Act 1994*.

"water" means –

- a) water in waters or spring;
- b) underground water;
- c) overland flow water; or
- d) water that has been collected in a dam.

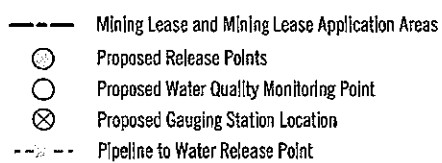
"waste water" means used water from the activity, process water or contaminated storm water.

"watercourse" means a river, creek or stream in which water flows permanently or intermittently in a visibly defined channel (natural, artificial or artificially improved) with:

- a) continuous bed and banks;
- b) an extended period of flow for some months after rain ceases, and
- c) an adequacy of flow that sustains basic ecological processes and maintains biodiversity.

"waters" includes all or any part of a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and banks of a watercourse, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater.

"µg/L" means micrograms per litre.



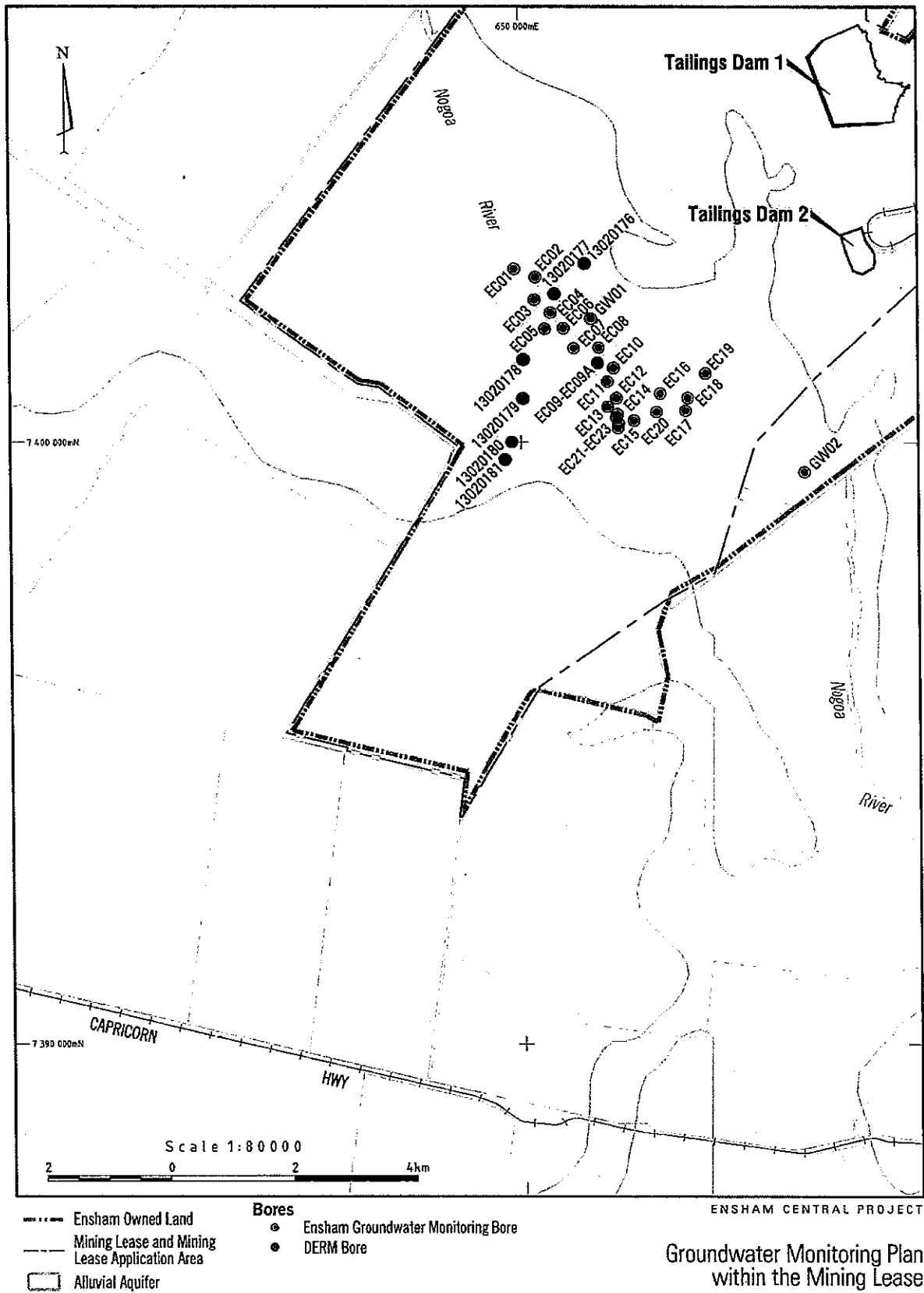
Proposed Water Release Points and Water Quality Monitoring Locations

Ensham
 REIGUS ECU

Hansen Bailey |

FIGURE 1

Appendix 2 (Groundwater monitoring locations)



Environmental Authority (Site Specific) Mining Lease
Permit¹ Number: EPML00732813

Appendix 3 (Groundwater Trigger Levels (Background Groundwater Monitoring Report))

Monitoring	pH	EC	TDS	Ca	Mg	Na	K	Cl	SO ₄	CO ₃	HCO ₃	Fe
Units	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Limit type	range	max	max	max	max	max	max	max	max	max	max	max
Bore EC01	6.2 – 8.1	62,981	43,934	1,344	2,162	10,714	15	21,212	2,040	8	2,739	3.66
Bore EC02	6.7 – 7.9	17,092	13,992	149	356	2,720	9	4,413	390	9	1,547	3.82
Bore EC03	5.6 – 8.2	48,046	40,928	1,800	2,186	5,672	24	16,647	1,749	9	1,214	21.21
Bore EC04	6.6 – 8.0	5,763	3,563	275	222	761	9	1,304	173	9	1,519	3.45
Bore EC05	6.9 – 8.2	53,642	38,430	1,360	1,853	8,209	27	18,939	1,783	9	1,220	2.02
Bore EC06	6.3 – 7.8	6,176	4,608	426	317	625	26	1,794	143	9	1,409	7.55
Bore EC07	6.3 – 8.1	30,191	18,412	1,149	1,264	4,964	23	11,930	1,080	9	896	11.31
Bore EC08	6.8 – 7.7	2,502	1,552	136	82	342	13	502	11	10	807	14.08
Bore EC09	6.2 – 8.3	50,525	42,532	1,737	1,829	6,807	15	17,961	1,607	10	869	13.43
Bore EC09A	5.9 – 8.2	47,110	35,183	1,406	1,926	6,346	21	15,881	1,446	9	1,291	21.83
Bore EC10	6.5 – 8.4	7,640	3,637	203	227	832	7	1,583	162	9	563	1.15
Bore EC11	6.0 – 8.2	27,783	18,583	838	807	3,362	21	7,820	695	9	1,070	33.45
Bore EC12	5.2 – 8.7	16,732	11,326	1,017	1,086	1,594	18	6,768	359	8	615	31.05
Bore EC13	5.7 – 8.4	33,755	28,172	1,209	953	4,386	32	10,567	858	9	1,144	10.16
Bore EC14	5.9 – 8.2	11,814	10,211	608	512	1,237	26	3,646	227	9	838	12.57
Bore EC15	6.6 – 8.1	4,280	2,577	258	218	249	6	1,176	79	1	559	2.41
Bore EC16	6.4 – 8.5	1,844	1,106	32	27	386	7	281	23	9	750	9.47
Bore EC17	6.1 – 7.8	2,698	2,173	146	96	327	7	550	425	1	464	9.94
Bore EC18	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
Bore EC19	7.0 – 8.1	629	429	21	32	63	1	26	18	1	241	0.05
Bore EC20	6.2 – 7.6	1,326	753	88	53	122	6	196	49	1	409	0.92
Bore EC22	6.2 – 8.5	6,859	6,020	320	342	792	11	2,256	1,727	9	694	2.45
Bore EC23	9.2 – 8.5	9,019	6,352	420	438	1,037	8	2,710	183	1	1,024	1.21
Bore GW1	7.1 – 8.8	15,634	9,003	182	460	2,189	10	4,178	284	93	2,043	1.25
Bore GW2	6.7 – 7.9	5,078	2,448	57	30	120	8	1,051	143	10	599	2.08
DERM 13020177	6.2 – 9.1	7,092	3,747	60	124	1,060	3	1,561	471	10	748	5.77
Weir Bore	6.5 – 9.4	3,264	1,872	39	56	568	12	879	110	79	1,035	1.30
Jamar	7.1 – 8.6	6,595	3,624	108	81	1,160	18	2,101	3	1	538	8.04
100169	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
100037	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
132290	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
37512	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
103685	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
RN100036	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²
RN103024	²	²	5,000 ¹	1,000 ¹	²	²	²	²	1,000 ¹	²	²	²

¹ ANZECC Water Quality Guidelines (2000) Stockwater used in the absence of sufficient data to support a site specific trigger value.

² Additional data required to set a trigger value

END OF ENVIRONMENTAL AUTHORITY

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