

Permit

Environmental Protection Act 1994

Environmental authority EPML00942413 Oaky Creek Coal Mine

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EPML00942413

Environmental authority takes effect on 22 December 2023.

Environmental authority holder(s)

Name(s)	Registered address
Oaky Creek Holdings Pty Limited	Level 44 Gateway Building 1 Macquarie Place SYDNEY NSW 2000
SCAP Oaky Creek Pty Ltd	Level 33 225 George St SYDNEY NSW 2000
ICRA OC Pty Ltd	240 Queen St BRISBANE CITY QLD 4000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 13 - Mining black coal	ML1832, ML2004, ML70241, ML70327, ML70424
Ancillary 08 - Chemical Storage 3 - Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c)	ML1832, ML2004, ML70241, ML70327, ML70424
Ancillary 31 - Mineral processing 2(b) - Processing, in a year, the following quantities of mineral products, other than coke - more than 100,000t	ML1832, ML2004, ML70241, ML70327, ML70424
Ancillary 55 - Other waste reprocessing or treatment 2(a) - Operating a facility for receiving and either reprocessing or treating, in a year, the following quantity of category 2 regulated waste - 5,000t or less	ML1832, ML2004, ML70241, ML70327, ML70424
Ancillary 60 - Waste disposal 1(a) - Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(a) - less than 50,000t	ML1832, ML2004, ML70241, ML70327, ML70424

Environmentally relevant activity/activities	Location(s)
Ancillary 63 - Sewage Treatment 1(b-i) - Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 but not more than 1500EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	ML1832, ML2004, ML70241, ML70327, ML70424
Ancillary 64 - Water treatment 4(b) - Carrying out, in a day, advanced treatment of 5ML or more of water, allowing the release of waste to waters other than seawater	ML1832, ML2004, ML70241, ML70327, ML70424

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority – on the nominated day; or
- b) if the authority states a day or an event for it to take effect – on the stated day or when the stated event happens; or
- c) otherwise – on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

The anniversary day of this environmental authority is the same day each year as the effective date. The payment of the annual fee will be due each year on this day.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.



Signature

22 December 2023

Date

Dr Alison Cummings

Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

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Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Conditions of environmental authority

The environmentally relevant activity(ies) conducted at the location as described above must be conducted in accordance with the following site-specific conditions of approval. This environmental authority consists of the following Schedules and Appendices:

Schedule A	General
Schedule B	Air
Schedule C	Water
Schedule D	Groundwater
Schedule E	Sewage Effluent
Schedule F	Noise and Vibration
Schedule G	Waste
Schedule H	Land
Schedule I	Regulated structures
Schedule J	Community

Definitions

Figure 1: Water Release Points and Monitoring Locations

Figure 2: G5 progressive certification area as approved 16 December 2020

Figure 3: Grasstree progressive certification area as approved 16 December 2020

Figure 4: Areas of mine rehabilitated using Internally Drained Rehabilitation (IDR) methodology up to 14 August 2014

Figure 5: A5 Landform (2001 IDR Section), A6 Landform (2009 IDR Section) and A6 North Seismic certification area as approved 16 June 2022

Figure 6: G4 East certification area as approved 29 June 2023

Figure 7: OC1 LW 22_25 certification area as approved 29 June 2023

Figure 8: Final Landform Design

Appendix 1, Attachment A: Watercourse Subsidence

Appendix 2: Rehabilitation Requirements

Appendix 3: Erosion Classification Framework

Conditions of environmental authority:

Agency interest: General	
Condition number	Condition
A1	This environmental authority authorises environmental harm referred to in the conditions. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	Prevent and /or minimise likelihood of environmental harm In carrying out the environmentally relevant activities, the environmental authority holder must take all reasonable and practicable measures to prevent and / or to 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.
A3	Maintenance of measures, plant and equipment 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.
A4	Documentation and record keeping 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.
A5	Monitoring All monitoring required by the conditions of this environmental authority must be carried out, interpreted, and recorded by an appropriately qualified person.
A6	Upon request from the administering authority, copies of monitoring results, records, registers, management plans and reports required by the conditions of this environmental authority must be made available and provided to the administering authority within: a) ten (10) business days; or b) an alternative timeframe agreed between the administering authority and the environmental authority holder.
A7	Notification of emergencies, incidents and exceptions 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	The holder of this environmental authority must notify the administering authority by written notification as soon as practicable after becoming aware of any emergency, incident or information about circumstances (nominally within twenty-four (24) hours) which results or may result in environmental harm not in accordance with the conditions of this environmental authority.
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	Activity Contaminants must not be released to the receiving environment unless they are in accordance with the contaminant limits authorised by this environmental authority.
A12	Coal Extraction The environmental authority holder is approved for a coal extraction rate of up to 15.9 million tonnes per annum (Mtpa) of run-of-mine (ROM) ore in accordance with this environmental authority.
A13	Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed subsequent to the issue of this environmental authority, the holder of this environmental authority must: a) comply with the amended or changed standard, policy or guideline within two years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, or where the amendment or change relates specifically to regulated structures referred to in Conditions G35 to G38, the time specified in that condition; and b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Agency interest: Air	
Condition number	Condition
B1	Dust nuisance The release of dust or particulate matter or both resulting from the resource activities must not cause an environmental nuisance, at any 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 sensitive or commercial 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 <i>Australian Standard AS 3580.10.1 of 2003</i> (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, when monitored in accordance with: i) <i>Australian Standard AS 3580.9.6 of 2003</i> (or more recent editions) <i>Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet -Gravimetric method</i>; 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 exceedance 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.
B4	Odour nuisance The release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the resource activity must not cause an environmental nuisance at any 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 monitoring 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.
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Agency interest: Water	
Condition number	Condition
C1	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 resource activities, except as permitted under the conditions of this environmental authority.
C2	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 C1: Mine Affected Water Release Points, Sources and Receiving Waters and as illustrated in Figure 1: Water Release Points and Monitoring Locations attached to this environmental authority.
C3	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 C48 to C49 inclusive is permitted.
C4	The release of mine affected water to waters in accordance with Condition C2 must not exceed the release limits stated in Table C2: Mine Affected Water Release Limits when measured at the monitoring points specified in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters for each quality characteristic.
C5	The release of mine affected water to waters from the release points must be monitored at the locations specified in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters for each quality characteristics and at the frequency specified in Table C2: Mine Affected Water Release Limits and Table C3: Release Contaminant Trigger Investigation Levels. <i>NOTE: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event Condition C5 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.</i>

Table C1: Mine Affected Water Release Points, Sources and Receiving Waters

Release Point (RP)	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Mine Affected Water Source and Location	Monitoring Point	Receiving waters description
RP 1	-23.068742	148.493333	G3 – coal handling and preparation area, industrial area and administration area	End of Pipe	Oaky Creek
RP 2	-23.069704	148.504191	OC1 – Oaky No 1	End of Pipe	Oaky Creek
RP 3	-23.064192	148.490447	G9 open cut mine to the north of Oaky Creek	End of Pipe	Oaky Creek
RP 4	-23.096867	148.490447	A3 open cut mine to south of Oaky Creek	End of Pipe	Sandy Creek
RP 5	-23.066032	148.492578	Oaky Settlement Pond 2 (Lake Leghorn) - CPP surface run-off	End of Pipe to drain and then Oaky Creek	Oaky Creek

Table C2: Mine Affected Water Release Limits

Quality Characteristic	Release Limits	Monitoring frequency	Comment
Electrical conductivity ($\mu\text{S}/\text{cm}$)	Release limits specified in Table C4 for variable flow criteria.	Continuous data to be monitored during release for pH, EC and flow using in-situ instruments.	–
pH (pH Unit)	6.0 (minimum) 9.0 (maximum)	Daily samples if continuous data is unavailable, when safe to do so and access permits. (the first sample must be taken within two (2) hours of commencement of release)	–
Sulphate (SO_4^{2-}) (mg/L)	Release limits specified in Table C4 for variable flow criteria.	Composite sample* (first sample within two (2) hours of commencement of release)	Drinking water environmental values from NHMRC 2006 guidelines or ANZECC.

* **Two (2) day** composite sample consisting of no less than **twelve (12) hourly** increments where the duration of the release exceeds **twelve (12) hours** – or no less than a single sample where the release duration is less than **twelve (12) hours**.

Table C3: Release Contaminant Trigger Investigation Levels

Quality Characteristic	Trigger Levels (µg/L)	Comment on Trigger Level (all 80 th percentile)	Monitoring Frequency
Aluminium	600	Based on 80 th percentile of background levels.	Commencement of release and thereafter weekly during release
Arsenic	13	For aquatic ecosystem protection, based on SMD guideline	
Cadmium	0.2	For aquatic ecosystem protection, based on SMD guideline	
Chromium	1	For aquatic ecosystem protection, based on SMD guideline	
Copper	3*	Interim guideline, based on 80 th percentile of Sandy Creek background levels.	
Iron	580	Based on 80 th percentile of background levels.	
Lead	4	For aquatic ecosystem protection, based on SMD guideline	
Mercury	0.2	For aquatic ecosystem protection, based on LOR for CV FIMS	
Nickel	11	For aquatic ecosystem protection, based on SMD guideline	
Zinc	8*	Interim guideline, for aquatic ecosystem protection, based on SMD guideline.	
Boron	370	For aquatic ecosystem protection, based on SMD guideline	
Cobalt	90	For aquatic ecosystem protection, based on low reliability guideline	
Manganese	1900	For aquatic ecosystem protection, based on SMD guideline	
Molybdenum	34	For aquatic ecosystem protection, based on low reliability guideline	
Selenium	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Silver	1	For aquatic ecosystem protection, based on LOR for ICPMS	
Uranium	1	For aquatic ecosystem protection, based on LOR for ICPMS	
Vanadium	10	For aquatic ecosystem protection, based on LOR for ICPMS	
Ammonia	900	For aquatic ecosystem protection, based on SMD guideline	
Nitrate	1100	For aquatic ecosystem protection, based on ambient Qld WQ Guidelines (2006) for TN	
Petroleum hydrocarbons (C ₆ -C ₉)	20		
Petroleum hydrocarbons (C ₁₀ -C ₃₆)	100		
Fluoride (total)	2000	Protection of livestock and short term irrigation guideline	

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 C3** can be reviewed once the results of **two (2) 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 C3** by amendment.
3. LOR – typical reporting for method stated. ICPMS/CV FIMS – analytical method required to achieve LOR.
4. SMD – slightly moderately disturbed level of protection, guideline refers ANZECC & ARM CANZ (2000).

C6	If quality characteristics of the release exceed any of the trigger levels specified in Table C3: Release Contaminant Trigger Investigation Levels during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in Table C3: Release Contaminant Trigger Investigation Levels and: 1) where the trigger values are not exceeded then no action is to be taken; or 2) where the downstream results exceed the trigger values specified Table C3: Release Contaminant Trigger Investigation Levels for any quality characteristic, compare the results of the downstream site to the data from background monitoring sites (upstream) 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 exceedance of a trigger level has occurred and is being investigated, in accordance with Condition C6 2) b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.
C7	If an exceedance in accordance with Condition C6 2) b) is identified, the holder of this environmental authority must notify the administering authority within fourteen (14) days of receiving the result.
C8	Mine Affected Water Release Events The 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 C4: Mine Affected Water Release during Flow Events.
C9	Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with Condition C2 must only take place during periods of natural flow events in accordance with the receiving water flow criteria for discharge specified in Table C4: Mine Affected Water Release during Flow Events for the release point(s) specified in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters.
C10	The release of mine affected water to waters in accordance with Condition C2 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 C4: Mine Affected Water Release during Flow Events when measured at the monitoring points specified in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters.

C11	Mine Affected Water Release from RP5 The release of mine affected water which has an EC concentration between 10,000 and 15,000 $\mu\text{S}/\text{cm}$ and/or a concentration of sulphate between 5,000 and 6,000 mg/L, must only occur: a) From the location RP5, as specified in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters; b) When no releases of mine affected water are occurring from the locations RP1, RP3 and RP4 specified in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters; c) When the receiving water flow criteria stated in Table C4: Mine Affected Water Release during Flow Events is met; and d) When the EC value recorded at MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, is less than or equal to 2,000 $\mu\text{S}/\text{cm}$.
C12	For the duration of a release of mine affected water in accordance with Condition C11, EC must be continuously monitored at location MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points.
C13	For Condition C12, continuous monitoring means equipment availability 95% of time within a one (1) hour period.

C14	If during the release in accordance with Condition C11, the continuous monitoring in accordance with Condition C12 indicates an EC concentration greater than 2,000 µS/cm at monitoring location MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, the holder of this environmental authority must: a) compare the EC concentration recorded at MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, to the EC concentration recorded at the upstream background monitoring point MP1, as specified in Table C6 and; b) if the EC concentration recorded at MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, is less than or equal to the EC concentration recorded at the upstream background monitoring point MP1, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, then no action is to be taken; or c) if the EC concentration recorded at MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, is greater than the EC concentration recorded at the upstream background monitoring point MP1, as specified in Table C6, then: i. determine the cause of the exceedance at monitoring location MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, including a review of EC concentration and flow rates at receiving environment monitoring points MP1 and MP4, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points; ii. investigate the nature and extent of any environmental harm caused and detail any actions taken to prevent environmental harm; iii. implement the necessary abatement measures to prevent further exceedances of EC 2,000 µS/cm at MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points; and iv. provide the findings of the investigation to the administering authority within twenty-eight (28) days of the exceedance of 2,000µS/cm at monitoring location MP5, as specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points.
C15	The daily quantity of mine affected water released from each release point must be measured and recorded at the monitoring points in Table C1: Mine Affected Water Release Points, Sources and Receiving Waters.
C16	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.

Table C4: Mine Affected Water Release during Flow Events

Receiving waters/ stream	Release Point (RP)	Gauging station	Gauging Station Latitude (decimal degree, GDA94)	Gauging Station Longitude (decimal degree, GDA94)	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m³/s)	Maximum release rate (for all combined RP flows)	Electrical Conductivity and Sulphate Release Limits (End of Pipe)
Oaky Creek	RP1 RP2 RP3 RP4	Oaky Out	- 23.06269 7	148.59329 1	Continuous (minimum daily)	Low Flow For a period of 28 days after natural flow events that exceed 0.8 m³/s	4ML/day	Electrical conductivity (µS/cm): <720 Sulphate (SO₄²⁻): <250 mg/L
						Flow Event > 1 m³/s	7.5 m³/s	Electrical conductivity (µS/cm) <10,000 Sulphate (SO₄²⁻) (mg/L) <5000
Oaky Creek	RP5	Oaky Out	- 23.06269 7	148.59329 1	Continuous (minimum daily)	Low Flow for a period of 28 days after natural flow events that exceed 0.8 m³/s	4ML/day	Electrical conductivity (µS/cm): <720 Sulphate (SO₄²⁻): <250 mg/L
						Flow Event > 1 m³/s	7.5 m³/s	Electrical conductivity (µS/cm) <15,000 Sulphate (SO₄²⁻) (mg/L) <6000

C17	Notification of Release Event The environmental authority holder must notify the administering authority via WaTERS as soon as practicable and no later than twenty-four (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 rate; e) release volume (estimated); f) receiving water/s including the natural flow rate; and g) any details (including available data) regarding likely impacts on the receiving water(s).
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C18	The environmental authority holder must notify the administering authority via WaTERS 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 C17 and within twenty-eight (28) days provide the following information in writing: a) release cessation date/time; b) natural flow rate in receiving water; c) volume of water released; d) details regarding the compliance of the release with the conditions of Agency 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 C17 and C18, provided the relevant details of the release are included within the notification provided in accordance with Conditions C17 and C18.
C19	Release Notification – potentially-affected stakeholder/s The environmental authority holder must notify all potentially affected stakeholders on commencement (within two (2) hours or another time frame as agreed to in writing with the relevant potentially affected stakeholder) of releasing mine affected water to the receiving environment. Notification must be in the form agreed to by the potentially affected stakeholder. Notification must include the following information unless otherwise agreed to by the potentially affected stakeholder: a) release commencement date/time; b) release location (release point/s); c) release rate; d) receiving waters for the release; e) receiving waters flow rate; f) water quality of the release including salinity and pH; and g) estimated duration of release.

C20	Notification of Release Event Exceedance If the release limits defined in Table C2: Mine Affected Water Release Limits are exceeded, the holder of this environmental authority must notify the administering authority within twenty-four (24) hours of receiving the results.
C21	The environmental 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.
C22	Receiving Environment Monitoring and Contaminant Trigger Levels The quality of the receiving waters must be monitored at the locations specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points and depicted in Figure 1: Water Release Points and Monitoring Locations for each quality characteristic and at the monitoring frequency stated in Table C5: Receiving Waters Contaminant Trigger Levels.
C23	The 80th percentile of electrical conductivity (EC) values recorded at the downstream monitoring point MP4 listed in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points must not exceed 2000 µS/cm at any time during the release.

C24	If quality characteristics of the receiving water at the downstream monitoring point MP4 specified in Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points, exceed any of the trigger levels specified in Table C5: Receiving Waters Contaminant Trigger Levels during a release event, the environmental authority holder must compare the downstream results to the upstream results in the receiving waters and: a) 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 b) where the downstream 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: i) details of the investigations carried out; and ii) actions taken to prevent environmental harm. NOTE: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with condition C24 of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.
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Table C5: Receiving Waters Contaminant Trigger Levels

Quality Characteristic	Trigger Level		Monitoring Frequency
	No/Low Flow	Flow Event	
pH	6.5 – 9.0		Continuous in-situ monitoring during release*
Electrical Conductivity (µS/cm)	720	2000	
Suspended solids (mg/L)	1000		Daily during the release
Sulphate (SO ₄ ²⁻) (mg/L)	500	1000	

* During release the 80th percentile value will be calculated hourly based on the cumulative data set until that time.

Table C6: Receiving Water Upstream Background Sites and Down Stream Monitoring Points

Monitoring Points	Receiving Waters Location Description	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)
Upstream Background Monitoring Points			
MP1 (Oaky Creek In)	Oaky Creek – at Oaky In (upstream reference site, refer to Figure 1)	-23.060284	148.487535
MP2 (Sandy Creek)	Sandy Creek – at Sandy Creek In (refer to Figure 1)	-23.085144	148.516330
MP3 (Cattle Creek)	Cattle Creek – upstream at the northern mine lease boundary (refer to Figure 1)	-23.015643	148.576739
Downstream Monitoring Point			
MP4 (Oaky Creek Out)	Oaky Creek at Oaky Out	-23.062697	148.593291
MP5	Oaky Creek at 300 meters downstream from the RP5	-23.064352	148.497390

C25	The release of reverse osmosis (RO) product water from the Reverse Osmosis Water Treatment Plant (ROWTP) is authorised subject to Conditions C26 to C44 of this environmental authority.
C26	The release of RO product water to waters must only take place in accordance with criteria in Table C7: Reverse Osmosis Product Water Release Criteria and Monitoring Points and subject to the contaminant release limits specified in Table C8: Reverse Osmosis Product Water Release Limits . Discharges must occur through a flow controlled discharge device at a rate that does not cause soil and sediment erosion.
C27	The quantity of contaminants released from the release points in Table C7: Reverse Osmosis Product Water Release Criteria and Monitoring Points must be measured and recorded at the monitoring points and at the frequency specified in Table C7: Reverse Osmosis Product Water Release Criteria and Monitoring Points and depicted in Figure 1 .
C28	The release of RO product water to waters must not: a) cause erosion to the bed and bank of the receiving waters; b) cause a build-up of sediment in the receiving waters; and c) during no flow conditions, cause an adverse impact to aquatic biota.

Table C7: Reverse Osmosis Product Water Release Criteria and Monitoring Points

Receiving Water Description	RO Release and Monitoring Point and Description	Latitude (GDA94)	Longitude (GDA94)	Frequency of Monitoring	Maximum Release Rate
Oaky Creek	ROP1 (Lake Leghorn - RO Product Water Storage Facility)	-23.066032	148.492578	Water samples for laboratory analysis to be taken weekly during active release only.	4ML/day
Oaky Creek	ROP2 (Lake Leghorn – RO Product Water End of Pipe)	-23.066032	148.492578	Real-time data to be monitored during active release for pH, EC and flow using in-situ RO Plant Product Tank instruments.	
Oaky Creek (via Sandy Creek)	ROP3 (A3 Pit – RO Product Water End of Pipe)	-23.096965	148.489596	If real-time data is unavailable, daily monitoring of pH, EC and flow must occur as soon as possible after commencement, when safe access permits.	
Oaky Creek (via Sandy Creek)	ROP4 (Oaky No.1– RO Product Water End of Pipe)	-23.0795	148.5048	Water samples for laboratory analysis to be taken weekly during active release only	

Table C8: Reverse Osmosis Product Water Release Limits

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.0	9.0
Electrical Conductivity	µS/cm	150	700
Total Dissolved Solids (TDS)	mg/L	N/A	450
Sodium (Na)	mg/L	N/A	200
Calcium (Ca)	mg/L	5	150
Magnesium (Mg)	mg/L	N/A	100
Chloride (Cl)	mg/L	N/A	250
Sulphate (SO ₄ ²⁻)	mg/L	N/A	200

C29	Notification of Reverse Osmosis Product Water Release Event The environmental authority holder must notify the administering authority as soon as practicable and no later than twenty-four (24) hours after commencing to release RO product 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).
C30	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 C29 and within twenty-eight (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 Agency 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. <i>NOTE: Successive or intermittent releases occurring within forty-eight (48) hours of the cessation of any individual release for the purpose of maintenance activities can be considered part of a single release event and do not require individual notification for the purpose of compliance with Conditions C29 and C30, provided the relevant details of the release are included within the notification provided in accordance with Conditions C29 and C30.</i>
C31	Notification of Reverse Osmosis Product Water Release Event Exceedance If the release limits in Table C8: Reverse Osmosis Product Water Release Limits are exceeded at the monitoring points specified within Table C7: Reverse Osmosis Product Water Release Criteria and Monitoring Points, the holder of the environmental authority must notify the administering authority within twenty-four (24) hours of receiving the results.

C32	The authority holder must, within twenty-eight (28) days of a release of RO product water that exceeds the conditions of this authority, provide a report to the administering authority detailing: a) the location of the release; b) volume of water released; c) the quality of the water released; d) the quality of the water in the receiving environment; e) any impacts on aquatic biota; f) the cause of the exceedance; and g) any other matters pertinent to the water release event.
C33	Receiving Environment Monitoring Program (REMP) Reporting Requirements A discussion of impacts of RO product water releases on the receiving environment must be included with the annual REMP Results Report required by Condition C41.
C34	The environmental authority holder must complete and submit an investigation into the movement of the wetting front resulting from the RO product water releases with the annual REMP Results Report required by Condition C41 of this environmental authority.
C35	Brine and Waste Management Plan The environmental authority holder must implement the Brine and Waste Management Plan (BWMP) to ensure that impacts on the environment on and off-site are minimised. The BWMP must include as a minimum: a) identification and characterisation of liquid and solid wastes generated by the ROWTP, including volumes generated; b) a program for safe disposal of all wastes generated, including details of waste management control strategies and methods and identification of beneficial uses for waste products generated; c) monitoring and reporting matters concerning the brine and waste, including groundwater monitoring in compliance with Conditions C59 to C65 of this environmental authority; d) emergency response planning, annual review and continuous improvement; and e) identification of responsible staff (positions) for implementing, managing and reporting associated with the BWMP.
C36	Brine produced by the ROWTP must be disposed within in-pit storages and/or underground storages such that the brine is fully contained within the sites mine water management system.

C37	Receiving Environmental Monitoring Program (REMP) The environmental authority holder must develop and implement a REMP to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised resource activity. This must include monitoring of the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water and/or RO Product Water is being discharged from the site. For the purposes of the REMP, the receiving environment is the waters of Sandy Creek, Oaky Creek and connected or surrounding waterways within 100m upstream of the confluence of Oaky Creek and German Creek. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised resource activity that will potentially be directly affected by an authorised release of mine affected water or RO product water.
C38	The REMP must be maintained by a person possessing appropriate qualifications and experience in the field of hydrology and surface water monitoring program design.
C39	The REMP required by Condition C37 must address, but not be limited to, the following: a) a description of potentially affected receiving waters including key communities and background water quality characteristics based on accurate and reliable monitoring data that takes into consideration any temporal variation (e.g. seasonality); b) a description of applicable environmental values, including but not limited to: i) hydrology (flow, duration, periodicity connectivity with groundwater systems); ii) physiochemical properties; iii) aquatic ecosystem parameters including flow and fauna habitat; and iv) geomorphological features; c) a description of water quality objectives to be achieved (i.e. as scheduled pursuant to the <i>Environmental Protection (Water and Wetland Biodiversity) Policy 2019</i>); d) any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment within which the REMP is proposed; e) water quality targets within the receiving environment to be achieved, and clarification of contaminant concentrations or levels indicating adverse environmental impacts during the REMP; f) monitoring for any potential and adverse environmental impacts caused by the release including impacts to bank stability and erosion; g) monitoring of stream flow hydrology; h) an assessment of bank stability and an evaluation of water course bank slumping; i) monitoring of physical chemical parameters including, as a minimum, those specified in Table C5 - Receiving Waters Contaminant Trigger Levels of this environmental authority and dissolved oxygen saturation to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZG2018 guidelines for slightly to moderately disturbed ecosystems; j) monitoring of contaminants should consider the limits specified in Table C3 - Release Contaminant Trigger Investigation Levels of this environmental authority to assess the

	extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ 2000 guidelines for slightly to moderately disturbed ecosystems; k) monitoring of metals/metalloids in sediments with consideration of ANZECC & ARMCANZ 2000 guidelines, BATLEY and the most recent version of AS5667.4 Guidance on Sampling of Bottom Sediments; l) monitoring biological indicators (including but not limited to vertebrate and invertebrate species) for permanent, semi-permanent water holes and water storages using sampling techniques sufficient to reliably detect significant differences between impacts (test) and unimpacted sites; m) monitoring of a selection of zooplankton species to assess health (e.g. exoskeleton density) in respect to the availability of calcium and magnesium; n) the methods for analysis and interpretation of all monitoring results; o) the locations of monitoring points (including the locations of proposed background and downstream impacted sites for each release point); p) the frequency of scheduling of sampling and analysis sufficient to determine water quality objectives and to derive site specific reference values within two (2) years (depending on wet season flows) in accordance with the <i>Queensland Water Quality Guidelines 2009</i>. For ephemeral streams, this should include periods of flow irrespective of mine or other discharges; q) specify sampling and analysis methods and quality assurance and control; r) any historical data sets to be relied upon; s) description of the statistical basis on which conclusions are drawn; t) any control or reference sites; and u) record of planned and unplanned releases to watercourses, procedures for event monitoring, monitoring methodology used and procedure to establish background surface water quality.
C40	The REMP Design Document must be updated and resubmitted to the administering authority whenever the release activities change or the program is modified. The REMP Design Document must describe how the REMP will address the criterion in Conditions C37 and C39 of this environmental authority. Due consideration must be given to any comments made by the administering authority on the amended REMP Design Document and subsequent implementation of the program. NOTE: For guidance in preparing a REMP Design Document, please refer to the Receiving environment monitoring program guideline – for use with environmentally relevant activities under the <i>Environmental Protection Act 1994</i> (ESR/2016/2399) , which is available on the department's website at www.des.qld.gov.au.
C41	An annual REMP Results Report must be prepared and submitted to the administering authority by 30 October each year reporting on how the criterion in Conditions C37 and C39 has been achieved.

C42	Water Reuse Mine affected water and/or RO product 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: a) supplying stock water subject to compliance with the quality release limits specified in Table C9: Stock Water Release Limits; or b) supplying irrigation water subject to compliance with quality release limits in Table C10: Irrigation and Fire suppression Water Release Limits; or c) supplying water for dust suppression, construction and/or road maintenance in accordance with the conditions of this environmental authority; or d) supplying water for rural fire fighting purposes in the region.
C43	Mine affected water and RO product 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 irrigation areas and for fire-fighting purposes. The volume, pH and electrical conductivity of water transferred to irrigation areas and for fire-fighting purposes must be monitored and recorded
C44	If the responsibility for mine affected water and/or RO product water is given or transferred to another person in accordance with Conditions C42 or C43 of this environmental authority, then: a) the responsibility for the mine affected water and RO Product 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 and RO Product 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 <i>Environmental Protection Act 1994</i>, 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.

Table C9: Stock Water Release Limits

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	5,000

Table C10: Irrigation and Fire suppression Water Release Limits

Quality characteristic	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	>150	5,000 Site and vegetation species specific value determined in accordance with ANZECC & ARMCANZ (2000) Irrigation Guidelines

C45	Water General All determinations of water quality and biological monitoring must be: a) made in accordance with methods prescribed in the latest edition of the administering authority's Monitoring and Sampling Manual; b) collected from the monitoring locations identified within this environmental authority, within four (4) hours of each other where possible; c) carried out on representative samples; and d) analysed at a laboratory accredited (e.g. NATA) for the method of analysis being used. NOTE: Condition C45 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.
C46	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 C48 to C49 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.
C47	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 mine affected water 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 exceedances of 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.
C48	Water Management Plan A Water Management Plan that complies with the requirements of Condition C49 must be developed and implemented for all stages of the resource activities on the site.
C49	The Water Management Plan must: a) provide for effective management of actual and potential environmental impacts resulting from water management associated with the resource activities carried out under this environmental authority; b) be developed in accordance with administering authority's guideline <i>Preparation of water management plans for mining activities</i> (or more recent editions) 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; and viii. Include details of the management methodology for brine produced by the ROWTP;
C50	The Water Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person.
C51	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.
C52	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.
C53	Stormwater and Water Sediment Controls An Erosion and Sediment Control Plan must be developed and implemented for all stages of the resource activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.

C54	All reasonable and practicable erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the movement of sediment, including: a) all clean waters, from undisturbed areas, kept separate from dirty waters from disturbed areas; b) water from disturbed catchments diverted into the mine water management system and sedimentation dams; c) new sedimentation dams designed to capture the sediment volume calculated for the catchment area for a twenty-four (24) hour storm event with a recurrence interval of 1 in 10 years ; and d) sediment shall be excavated from sediment dams as required to maintain design capacity. e) an audit schedule must be completed to ensure erosion and sediment control measures are maintained.
C55	Stormwater, other than mine affected water, is permitted to be released to waters from: a) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by Condition C53; and b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with Conditions C48 to C49 inclusive, for the purpose of ensuring water does not become mine affected water.
C56	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.
C57	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.

Agency interest: Groundwater	
Condition number	Condition
D1	Contaminants from the activity must not be released to groundwater.
D2	Groundwater, affected by the resource activities must be monitored at the locations and frequencies defined in Table D1: Groundwater monitoring locations and frequencies .
D3	If the groundwater investigation trigger levels defined in Table D2: 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 within twenty-eight (28) days of receiving the analysis results.
D4	Groundwater levels, affected by the resource activities must be monitored at the locations and frequencies defined in Table D3: Groundwater levels .

Table D1: Groundwater monitoring locations and frequencies

Monitoring Points	Latitude (GDA94)	Longitude (GDA94)	Frequency
Monitoring Point G1 BH 11 (P13202)	-23.054860	148.530569	Annually
Monitoring Point G2 BH 12 (P13203)	-23.050977	148.486111	Annually
Monitoring Point G3 BH 13 (P13469)	-23.088235	148.485623	Annually
Monitoring Point G4 BH 14 (P13305)	-23.091233	148.474146	Annually

Table D2: Groundwater investigation - trigger levels

Parameter	Unit	Trigger Levels	Limit Type
pH	pH Units	6.5 - 8.5	Minimum/Maximum
Electrical Conductivity	µS/cm	33,500	Max
Total Dissolved Solids	ppm	23,000	Max
Magnesium	mg/L	1,500	Max
Sodium	mg/L	9,000	Max
Potassium	mg/L	-	For interpretation purposes only
Chloride	mg/L	-	For interpretation purposes only

Parameter	Unit	Trigger Levels	Limit Type
SO ₄ ²⁻	mg/L	3,500	Max

Table D3: Groundwater levels

Monitoring Points	Latitude (GDA94)	Longitude (GDA94)	Surface RL (m)	Frequency
Monitoring Point G1 BH 11 (P13202)	-23.054860	148.530569	169.7	Annually
Monitoring Point G2 BH 12 (P13203)	-23.050977	148.486111	181.6	Annually
Monitoring Point G3 BH 13 (P13469)	-23.088235	148.485623	184.5	Annually
Monitoring Point G4 BH 14 (P13305)	-23.091233	148.474146	190.2	Annually

D5	Groundwater levels and groundwater drawdown fluctuations in excess of two (2) m per year , not resulting from the pumping of licensed bores, must be notified within seven (7) days to the administering authority following completion of monitoring.
D6	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 with the annual return.
D7	Groundwater Monitoring 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.
D8	The method of water sampling required by this environmental authority must comply with that set out in the latest edition of the administering authority's <i>Monitoring and Sampling Manual</i> .

Agency interest: Sewage Effluent	
Condition number	Condition
E1	The daily operation of the sewage treatment plant and pollution control equipment must be carried out by a person(s) with appropriate experience and/or qualifications to ensure the effective operation of that treatment system and control equipment.
E2	Pipelines and fittings associated with the treated sewage effluent discharge system must be clearly identified.
E3	Treated effluent from the sewage treatment plant must only be discharged from the authorised discharge point, as specified in Table E1: Effluent discharge locations of this environmental authority.
E4	All effluent released from the sewage treatment facilities must be monitored at the frequency and for the parameters specified in Table E2: Sewage effluent quality limits of this environmental authority.

Table E1: Effluent discharge locations

Authorised Discharge Points	Location
Oaky Surface STP	Sewage Treatment Plant
Oaky No.1 STP	Sewage Treatment Plant
Oaky North STP	Sewage Treatment Plant

Table E2: Sewage effluent quality limits

Quality characteristics	Release limit	Units	Limit type	Monitoring frequency
5 day Biochemical Oxygen Demand	30	mg/L	max	Quarterly
pH	6.0 to 8.5	pH Units	range	Monthly
Free Chlorine Residual	3	mg/L	max	Monthly
Thermotolerant coliforms	100	Cfu/100mL ²	max	Monthly

E5	Treated sewage effluent released directly from the sewage treatment facilities for dust suppression or irrigation must not exceed sewage effluent release limits defined in Table E2: Sewage effluent quality limits of this environmental authority.
E6	Treated sewage effluent used for dust suppression or irrigation must not cause spray drift or over spray to any sensitive or commercial place.
E7	When conditions prevent the irrigation of treated effluent to land (such as during or following rain events), the contaminants must be directed to a wet weather storage or alternative measures must be taken to store/lawfully dispose of effluent (such as wet weather storage or tanking off site to another treatment plant or sewer). A record must be kept of any removal or discharge off site, including destination, transporter, dates and volumes.
E8	Treated sewage effluent must not be released from the site to any waters or the bed and banks of any waters.
E9	Water or storm water contaminated by sewage treatment activities must not be released to any waters or the bed and banks of any waters.
E10	The irrigation of treated sewage effluent must be carried out in a manner such that: a) vegetation is not damaged; b) soil erosion and soil structure damage is avoided; c) there is no surface ponding of effluent; d) percolation of effluent beyond the plant root zone is minimised; e) the capacity of the land to assimilate nitrogen, phosphorus, salts, organic matter as measured by oxygen demand and water is not exceeded; and f) the quality of groundwater is not adversely affected.
E11	The following information must be recorded in relation to all effluent 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; d) the measured or estimated daily flow of effluent at the time of sampling; and e) the results of all monitoring.

Agency interest: Noise and Vibration	
Condition number	Condition
F1	Noise nuisance Noise from the mining activities must not cause an environmental nuisance at any sensitive or commercial place.
F2	All noise from the resource activities must not exceed the levels specified in Table F1: Noise limits at any sensitive or commercial place.
F3	Noise monitoring 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: a) L_{A10}, adj, 10 mins; b) L_{A1}, adj, 10 mins; c) the level and frequency of occurrence of impulsive or tonal noise; d) atmospheric conditions including wind speed and direction; e) effects due to extraneous factors such as traffic noise; and f) location date and time of recording.
F4	Noise is not considered to be a nuisance under Condition F1 if monitoring shows that noise does not exceed the following levels in the time periods specified in Table F1: Noise limits .

Table F1: Noise limits

Noise level dB(A)	Monday to Sunday (including public holidays)		
	7am - 6pm	6pm - 10pm	10pm - 7am
	Noise measured at a 'Sensitive Receptor'		
L_{A10} , adj, 10 mins	B/g + 5	B/g + 5	B/g + 3
L_{A1} , adj, 10 mins	B/g + 10	B/g + 10	B/g + 8
	Noise measured at a 'Commercial place'		
	L_{A10} , adj, 10 mins	B/g + 10	B/g + 5
	L_{A1} , adj, 10 mins	B/g + 15	B/g + 10

F5	The method of measurement and reporting of noise monitoring must comply with the current edition of the administering authority's <i>Noise Measurement Manual</i> (ESR/2016/2195).
F6	If monitoring indicates exceedance of the relevant limits in Condition F4 of this environmental authority, 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.
F7	Vibration nuisance Vibration from the resource activities must not cause an environmental nuisance, at any sensitive or commercial place.
F8	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.
F9	Vibration monitoring must include the following descriptors, characteristics and conditions: a) location of the blast(s) within the resource activity 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.
F10	If monitoring indicates exceedance of the relevant limits in Table F2: 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.

Table F2: 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

NOTE: The method of measurement and reporting of vibration levels must comply with the latest edition of the administering authority's vibration and air blast overpressure monitoring guideline.

F11	Airblast overpressure nuisance The airblast overpressure level from blasting operations on the premises must not exceed the limits defined in Table F3: Airblast overpressure level at any sensitive or commercial place.
F12	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.
F13	Airblast overpressure monitoring must include the following descriptors, characteristics and conditions: a) location of the blast(s) within the resource activity 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.
F14	If monitoring indicates exceedance of the relevant limits in Table F3: Airblast overpressure level of this environmental authority, 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.
F15	The method of measurement and reporting of airblast overpressure levels must comply with the current edition of the administering authority's <i>Noise Measurement Manual</i> (ESR/2016/2195).

Table F3: 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.

Agency interest: Waste	
Condition number	Condition
G1	General For the purpose of Conditions G2 to G12 of this environmental authority, effluent, waste rock, spoil, overburden, rejects and tailings generated on Mining Lease (ML) 1832, ML2004, ML70241, ML70327 and ML70424 are not defined as 'waste'.
G2	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 ten (10) m from any other scrap tyre storage area, or combustible or flammable material, including vegetation.
G3	All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a ten (10) m radius of the scrap tyre storage area.
G4	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.
G5	Scrap tyres resulting from the resource activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.
G6	Waste Management The holder of this environmental authority must develop and implement a Waste Management Plan for all mining activities at the licenced place, that must at a minimum: a) include a description of the mining activity that may generate waste; b) identify characterisations of wastes generated from the resource activities and general volume trends over the past five (5) years; c) include a program for safe recycling or disposal of all wastes - reusing and recycling where possible; d) include waste commitments with auditable targets to reduce, reuse and recycle; e) include waste management control strategies that consider: i) the type of wastes; ii) segregation of the wastes; iii) storage of the wastes; iv) transport of the wastes; v) monitoring and reporting matters concerning the waste; vi) emergency response planning; vii) disposal, reused and recycling options; and

	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) include a staff awareness and induction program that encourages re-use and recycling.
G7	Landfill General and regulated waste generated on site must only be disposed of into the waste disposal trench facility on ML1832, ML2004, ML70241, ML70327 and ML70424, or removed from site.
G8	Waste Disposal All reasonable and practicable fire prevention measures must be implemented and maintained, around all waste laydown areas.
G9	Waste must not be burned or allowed to be burned on the licensed site unless by approval of the administering authority.
G10	A designated area must be set aside for the segregation of economically viable, recyclable solid and liquid waste.
G11	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. <i>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.</i>
G12	Records of trade and regulated wastes or material leaving the relevant tenure for recycling or disposal, including the final destination and method of treatment, must be in accordance with the <i>Waste Reduction and Recycling Act 2011</i>.

Agency interest: Land	
Condition number	Condition
H1	Preventing contaminant release to land Contaminants must not be released to land in a manner which constitutes nuisance, material or serious environmental harm.
H2	Topsoil Topsoil must be strategically stripped ahead of the resource activities in accordance with a Topsoil Management Plan.
H3	A topsoil inventory which identifies the topsoil requirements for the Oaky Creek Coal Mine project and availability of suitable topsoil, incorporating the volume and location of topsoil stockpiles, on site must be detailed in the Topsoil Management Plan.
H4	Chemical Storage Chemicals and fuels stored must be effectively contained and controlled in a manner that prevents environmental harm and where relevant, meet Australian Standards, where such a standard is applicable.
H5	Spillage of all chemicals and fuels must be controlled in a manner that prevents environmental harm.
H6	All explosives, corrosive substances, toxic substances, gases and dangerous goods must be stored and handled in accordance with the relevant Australian Standard, where such a standard is applicable.
H7	Spill Kit An appropriate spill kit, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes, chemicals and flammable and combustible liquids associated with the activity must be kept at the site.
H8	Anyone operating with wastes, chemicals or flammable and combustible liquids under this approval must be trained in the use of the spill kit.
H9	Infrastructure All infrastructure that is constructed by or for the environmental authority holder during the resource 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. <i>NOTE: This is not applicable where the landowner/holder is also the environmental authority holder.</i>
H10	Ventilation shafts must be sealed post resource activities. Prior to lease relinquishment, the environment authority holder must provide the administering authority with a seal design for each ventilation shaft. The design must be developed by a qualified engineer, recognised by a credible external accreditation body.

H11	Rehabilitation Subject to the provisions of Conditions H37, H38 and H39, all areas significantly disturbed by resource activities must be rehabilitated in accordance with Appendix 2: Rehabilitation Requirements and Figure 8 – Final Landform Design .
H12	Progressive rehabilitation must commence within two (2) years when areas become available within the operational land.
H13	A Rehabilitation Plan must be developed by an appropriately qualified person and implemented, and must include: a) rehabilitation objectives to achieve the rehabilitation goals for all disturbed areas, including residual voids; b) detailed rehabilitation methods for each disturbed area; c) rehabilitation indicators to measure the success of the rehabilitation against the rehabilitation objectives; d) final completion criteria that will achieve the rehabilitation goals and objectives; and e) details of appropriate monitoring and maintenance of rehabilitation.
H14	The environmental authority holder must notify the administering authority of any changes to the Rehabilitation Plan.
H15	Residual void outcome 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.
H16	Prior to lease relinquishment, a qualified engineer (recognised by a credible external accreditation body) must undertake a geotechnical assessment on all final voids. The assessment must investigate final void geotechnical stability and the subsequent report must make recommendations for management of stability and safety.
H17	Mining Waste For the purpose of Conditions H17 to H25, waste rock, spoil and overburden generated on ML1832, ML2004, ML70241, ML70327 and ML70424 are defined as 'mining waste'.

H18	Mining Waste Management A Mining Waste Management Plan 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 contaminants: Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na) and Sulphate (SO_4^{2-}); b) characterisation programs to ensure that the physical properties of the mining waste is progressively characterised during disposal; c) the availability or leachability of metals from the mining waste; d) quantification of PAF from mining waste present; e) review impacts of the PAF mining waste on the rehabilitation; f) management actions for mining waste that has been identified as having a high availability or leachability of metals; g) management actions for mining waste that has been defined as PAF; h) identification of environmental impacts and potential environmental impacts; i) control measures for routine operations to minimise likelihood of environmental harm; j) contingency plans and emergency procedures for non-routine situations; and k) periodic review of environmental performance and continual improvement.
H19	The management of mining waste emplacement must be in accordance with the following: a) all mining waste must be progressively characterised prior to emplacement for net acid producing potential and the following contaminants: Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na) and Sulphate (SO_4^{2-}); b) records must be kept of the waste rock, spoil or overburden emplacement to indicate locations and characteristics of mining waste located on Mining Lease (ML) 1832, ML2004, ML70241, ML70327 and ML70424; and c) where the acid producing potential of mining waste material has not been conclusively determined, geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies.

H20	Tailings The environmental authority holder will develop, implement and maintain a Coarse and Fine Reject Waste Management Plan. The Coarse and Fine Reject Waste Management Plan will include at a minimum: a) chemical analysis of tailings material to determine the net acid producing potential prior to placement in mining voids; b) the availability or leachability of metals from the tailings; c) placement strategies of tailings in mining voids to enable successful rehabilitation outcomes in accordance with conditions of this environmental authority; d) identification of environmental issues and potential environmental impacts; e) control measures for routine operations to minimise the likelihood of environmental harm; f) contingency plans and emergency procedures for non-routine situations; and g) periodical review of environmental performance and continual improvement.
H21	The management of tailings disposal must be in accordance with the following: a) all tailings material must be progressively characterised, both annually or when changing to a different coal seam, prior to disposal within mining voids for net acid producing potential and the following contaminants: Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na) and Sulphate (SO₄²⁻); b) records must be kept of the tailings disposal to indicate locations and characteristics of tailings disposed of within mining voids; and c) 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.
H22	Tailings and reject produced by the coal preparation plant must be disposed of in mining voids. Reject may be used for construction or repair in existing reject disposal areas.
H23	Tailings or reject must not be disposed of on ML70327 or ML70424.
H24	Coarse Reject material from processing must be tested for Net Acid Producing Potential (NAPP) prior to use on road construction or repair and must not be used if the pH is greater than or equal to 5 and a NAPP value less than or equal to 2kg H₂SO₄/tonne (calculated using oxidisable sulfur).
H25	Prior to commencement of rehabilitation of any areas used for the disposal of reject or tailings, a plan showing the design criteria for the final landform must be submitted to the administering authority.
H26	Exploration Disturbance due to exploration activities in areas not authorised to be mined must be rehabilitated within two (2) years in accordance with provisions detailed in the <i>Eligibility criteria and standard conditions for exploration and mineral development projects (ESR/2016/1985 Version 2)</i>.

H27	Boreholes must be rehabilitated in accordance with the <i>Eligibility criteria and standard conditions for exploration and mineral development projects (ESR/2016/1985 Version 2)</i> .
H28	Subsidence A Subsidence Management Plan must be implemented and maintained during the continuation of this environmental authority. The subsidence management plan must, at a minimum: a) map existing areas of subsidence; b) map proposed areas of subsidence; c) identify the impacts of subsidence on the mining leases; d) detail rehabilitation and treatment methods applied to areas already subsided; e) detail rehabilitation and treatment methods proposed to be applied to future subsidence areas; and f) detail drainage and surface water ponding management to be applied to subsided land.
H29	The holder of this environmental authority must arrange for each subsided longwall panel to be inspected annually by an appropriately qualified person, in accordance with Conditions H33 through H36 , inclusive, of this environmental authority.
H30	Prior to the commencement of activities that result in subsidence of a watercourse or adjoining floodplain, the subsidence management plan must be developed and implemented to provide for the proper and effective management of the actual and potential environmental impacts resulting from the mining activity and to ensure compliance with the conditions of this environmental authority.

H31	A watercourse subsidence management plan, for the subsidence of a watercourse or adjoining floodplain, must be developed to the satisfaction of the administering authority in accordance with Appendix 1, Attachment A of this environmental authority or any updates that become available from time to time and must include at least the following components: a) condition of the existing watercourse (including a baseline assessment); b) the proposed impacts of subsidence on the watercourse and floodplain including but not limited to: i) physical condition of surface drainages: 1) erosion; 2) areas susceptible to higher levels of erosion such as watercourse confluences; 3) incision processes; 4) stream widening; 5) tension cracking Lowering of bed and banks; 6) creation of in stream waterholes; 7) changes to local drainage patterns; ii) overland flow: i) capture of overland flow by subsided long-wall panels; ii) increased overbank flows due to lowering of high bank of watercourses; iii) the portion of local and large scale catchment likely to be captured by subsided long-wall panels and the associated impacts on downstream users; iii) water quality: i) surface water; ii) groundwater; iii) overland flow water detained in subsided long-wall panels; iv) land condition: current land condition to be impacted by subsidence; v) infrastructure: detail of existing infrastructure (pipelines, railway, power lines and haul roads) should be identified where there is a potential impact from effects of land subsidence; c) proposed options for mitigating any impacts associated with subsidence and how these mitigation methods will be implemented; d) a risk assessment; e) a monitoring, evaluation and maintenance program; f) cumulative Impacts on watercourse or catchments; g) impacts on groundwater; and h) impact mitigation techniques required to be undertaken within the watercourse and floodplain of the watercourse.
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H32	The holder of this environmental authority must not commence subsidence of a longwall panel that will result in the subsidence of a watercourse or adjoining floodplain unless: a) the holder has submitted to the administering authority two copies of a watercourse subsidence management plan together with certification of an appropriately qualified person that the plan is compliant in all respects with this environmental authority and in accordance with engineering best practice; and b) at least twenty-eight (28) days has passed since the submission of the subsidence management plan.
H33	At each annual inspection required under Condition F30 the condition of each subsided longwall panel must be assessed, including the structural, geotechnical and hydraulic adequacy of the subsided longwall panel and the adequacy of the works with respect to the subsidence management plan.
H34	For each inspection required under Condition H29 two copies of a report certified by the appropriately qualified person, including any recommendations to ensure the integrity of each subsided longwall panel must be provided to the administering authority within twenty (20) business days of receipt of the inspection report.
H35	The report required under Condition H34 must detail any remedial works that have occurred and the resultant outcome from such works.
H36	The holder of the environmental authority, if directed by the administering authority, must carry out any remedial works deemed necessary by the administering authority to minimise impact on the physical integrity of the landscape from the effects of subsidence.
H37	Progressive certification a) Progressive certification of the application areas approved on 16 December 2020 are depicted in: i. Figure 2 – Progressive Rehabilitation Certified Area of G5S (total area 60.8ha); and ii. Figure 3 – Progressive Rehabilitation Certified Area of Grasstree (total area 72.0ha). b) Progressive certification of the application areas approved on 16 June 2022 are depicted in: i. Figure 5: A5 Landform (2001 IDR Section) (total area 128.67ha) , A6 Landform (2009 IDR Section) (total area 71.41ha) and A6 North Seismic certification area (total area 232.68ha). c) Progressive certification of the application areas approved on 29 June 2023 are depicted in i. Figure 6: G4 East certification area (total area 47.80ha)). ii. Figure 7: OC1 LW 22_25 certification area (total area 860.68ha).
H38	The progressive certification areas specified in Condition F38 must be maintained in accordance with the completion criteria of safe, stable, non-polluting and self-sustaining as detailed in Appendix 2: Rehabilitation Requirements , until the surrender of this environmental authority is approved by the administering authority.

H39	Internally Drained Rehabilitation (IDR) Land rehabilitated using IDR and depicted in Figure 4: Areas of mine rehabilitated using Internally Drained Rehabilitation (IDR) methodology up to 14 August 2014 must comply with the rehabilitation goals approved at the time rehabilitation works were completed. <i>NOTE: IDR was a requirement of the Oaky Creek Environmental Authority until 14 August 2014. Areas rehabilitated prior to August 2014, shown in Figure 6, were implemented in accordance with the IDR methodology at the time of rehabilitation works.</i>
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Agency interest: Regulated Structures	
Condition number	Condition
I1	Assessment of consequence category The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933) at the following times: a) prior to the design and construction of the structure, if it is not an existing structure; or b) prior to any change in its purpose or the nature of its stored contents.
I2	A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence assessment for more than one structure.
I3	Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933).
I4	Design and construction¹ of a regulated structure Conditions I5 to I9 inclusive do not apply to existing structures.
I5	All regulated structures must be designed by, and constructed ² under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933).
I6	Construction of a regulated structure is prohibited unless the holder has: a) submitted a consequence category assessment report and certification to the administering authority; b) received certification from a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant condition of this authority.
I7	Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan in the form set out in the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933), and must be recorded in the Register of Regulated Structures.
I8	Regulated structures must:

¹ Construction of a dam includes modification of an existing dam — refer to the definitions.

² Certification of design and construction may be undertaken by different persons.

	a) be designed and constructed in accordance with and conform to the requirements of the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933); b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of: i) floodwaters from entering the regulated dam from any watercourse or drainage line; and ii) wall failure due to erosion by floodwaters arising from any watercourse or drainage line. c) for regulated dams that are dams associated with a failure to contain – seepage: have the floor and sides of the dam designed and constructed to prevent or minimise the passage of the wetting front and any entrained contaminants through either the floor or sides of the dam during the operational life of the dam and for any period of decommissioning and rehabilitation of the dam.
I9	Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that: a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and b) construction of the regulated structure is in accordance with the design plan.
I10	Operation of a regulated structure, except for an existing structure, is prohibited unless: a) the holder has submitted to the administering authority: i) one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with Condition I7; ii) a set of 'as constructed' drawings and specifications; iii) certification of those 'as constructed drawings and specifications' in accordance with Condition I9; iv) where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan; v) the requirements of this authority relating to the construction of the regulated structure have been met; vi) the holder has entered the details required under this authority, into a Register of Regulated Structures; and vii) there is a current operational plan for the regulated structures.
I11	For existing structures that are regulated structures: a) where the existing structure that is a regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, the holder must submit to the administering authority within twelve (12) months of the commencement of this condition a copy of the certified system design plan including that structure; and

	b) there must be a current operational plan for the existing structures.
I12	Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in a manner that is consistent with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.
I13	Mandatory reporting level Conditions I14 to I17 inclusive only apply to regulated structures which have not been certified as low consequence category for 'failure to contain – overtopping'.
I14	The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.
I15	The holder must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.
I16	The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.
I17	The holder must record any changes to the MRL in the Register of Regulated Structures.
I18	Design Storage Allowance The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.
I19	By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the Design Storage Allowance (DSA) volume for the dam (or network of linked containment systems).
I20	The holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.
I21	The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.
I22	Annual Inspection report Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.
I23	At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and include recommended actions to ensure the integrity of the regulated structure.

I24	The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933).
I25	The holder must: a) Within twenty (20) business days of receipt of the annual inspection report, provide to the administering authority: i) The recommendations section of the annual inspection report; ii) If applicable, any actions being taken in response to those recommendations; and b) If, following receipt of the recommendations and (if applicable) actions, the administering authority requests a full copy of the annual inspection report from the holder, provide this to the administering authority within ten (10) business days of receipt of the request.
I26	Transfer arrangements The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.
I27	Decommissioning and rehabilitation Dams must not be abandoned but be either: a) decommissioned and rehabilitated to achieve compliance with Condition I28; or b) be left in-situ for a beneficial use(s) provided that: i) it no longer contains contaminants that will migrate into the environment; ii) it contains water of a quality that is demonstrated to be suitable for its intended beneficial use(s); and iii) the administering authority, the holder of the environmental authority and the landholder agree in writing that the dam will be used by the landholder following the cessation of the environmentally relevant activity(ies).

I28	After decommissioning, all significantly disturbed land caused by the carrying out of the environmentally relevant activity(ies) must be rehabilitated to meet the following final acceptance criteria: a) the landform is safe for humans and fauna; b) the landform is stable with no subsidence or erosion gullies for at least three (3) years; c) any contaminated land (e.g. contaminated soils) is remediated and rehabilitated; d) not allowing for acid mine drainage; e) there is no ongoing contamination to waters (including groundwater); f) rehabilitation is undertaken in a manner such that any actual or potential acid sulfate soils on the area of significant disturbance are treated to prevent or minimise environmental harm in accordance with the <i>Instructions for the treatment and management of acid sulfate soils</i> (2001); g) all significantly disturbed land is reinstated to the pre-disturbed land suitability class; and h) for land that is not being cultivated by the landholder: i) groundcover, that is not a declared pest species is established and self-sustaining; ii) vegetation of similar species richness and species diversity to pre-selected analogue sites is established and self-sustaining; iii) the maintenance requirements for rehabilitated land is no greater than that required for the land prior to its disturbance caused by carrying out the resource activities; and i) for land that is to be cultivated by the landholder, cover crop is revegetated, unless the landholder will be preparing the site for cropping within three (3) months of the resource activities being completed.
I29	Register of Regulated Dams A Register of Regulated Dams must be established and maintained by the holder for each regulated dam as per Conditions I30 to I34.
I30	The holder must provisionally enter the required information in the Register of Regulated Structures when a design plan for a regulated dam is submitted to the administering authority.
I31	The holder must make a final entry of the required information in the Register of Regulated Structures once compliance with Condition I10 to I12 has been achieved.
I32	The holder must ensure that the information contained in the Register of Regulated Dams is current and complete on any given day.
I33	All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.
I34	The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Dams, in the electronic format required by the administering authority.

I35	Transitional arrangements All existing structures that have not been assessed in accordance with either the <i>Manual or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Structures</i> (EM635) or the former <i>Manual for Assessing Hazard Categories and Hydraulic Performance of Dams</i> must be assessed and certified in accordance with the <i>Manual or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933) within six (6) months of amendment of the authority adopting this schedule.
I36	All existing structures must subsequently comply with the timetable for any further assessments in accordance with the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures</i> (ESR/2016/1933) specified in Table I1: Transitional hydraulic performance requirements for existing structures, depending on the consequence category for each existing structure assessed in the most recent previous certification for that structure.
I37	Table I1: Transitional hydraulic performance requirements for existing structures ceases to apply for a structure once any of the following events has occurred: a) It has been brought into compliance with the hydraulic performance criteria applicable to the structure under the Manual; b) It has been decommissioned; or c) It has been certified as no longer being assessed as a regulated structure.
I38	Certification of the transitional assessment required by Conditions I35 and I36 (as applicable) must be provided to the administering authority within six (6) months of amendment of the environmental authority adopting this schedule.

Table I1: Transitional hydraulic performance requirements for existing structures

Transition period required for existing structures to achieve the requirements of the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Dams</i>			
Compliance with criteria	High	Significant	Low
>90% and a history of good compliance performance in last 5 years	No transition required	No transition required	No transitional conditions apply. Review consequence assessment every 7 years.
>70%-≤90%	Within 7 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 10 years, unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	No transitional conditions apply. Review consequence assessment every 7 years.
>50-≤70%	Within 5 years unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Within 7 years unless otherwise agreed with the administering authority, based on no history of unauthorised releases.	Review consequence assessment every 7 years.
≤50%	Within 5 years or as per compliance requirements (e.g. TEP timing)	Within 5 years or as per compliance requirements (e.g. TEP timing)	Review consequence assessment every 5 years.

Agency interest: Community	
Condition number	Condition
J1	Complaint Response All complaints received must be recorded including investigations undertaken, conclusions formed and action taken.
J2	The holder of this environmental authority must record the following details for all complaints received: a) name, address and contact number for complainant (if not available record – not identified); b) time and date of complaint; c) investigations undertaken; d) conclusions formed; e) actions taken to resolve complaint; f) any abatement measures implemented; and g) person responsible for resolving the complaint.
J3	When requested by the administering authority, the environmental authority holder must undertake relevant specified monitoring within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint of environmental harm at any sensitive place or commercial place. The results of the investigation (including an analysis an interpretation of the monitoring results) and abatement measures implemented must be provided to the administering authority within fourteen (14) days of completion of the investigation.
J4	In consultation with the administering authority, the environmental authority holder must cooperate with and participate in any community environmental liaison committee established in respect of either the licensed place specifically or the industrial estate where the licensed place is located.

END OF CONDITIONS

Definitions

Key terms and/or phrases used in this document are defined in this section. Applicants should note that where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

“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.

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

- a) vegetation establishment, survival and succession;
- b) vegetation productivity, sustained growth and structure development;
- c) fauna colonisation and habitat development;
- d) 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;
- e) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;
- f) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;
- g) resilience of vegetation to disease, insect attack, drought and fire; and
- h) vegetation water use and effects on ground water levels and catchment yields.

“acid sulfate soil(s)” means a soil or soil horizon which contains sulfides or an acid soil horizon affected by oxidation of sulfides.

“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 Science or its successor.

“AEP” means the Annual Exceedance Probability, which is the probability that at least one event in excess of a particular magnitude will occur in any given year.

“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 (dBL).

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

“APPEA Code” means the current APPEA, Code of Environmental Practice.

“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.

“areas of pre-existing disturbance” means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include

areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term ‘areas of pre-disturbance’ does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.

“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.

“background noise level” means the sound pressure level, measured in the absence of the noise under investigation, as the $LA_{90, T}$ being the A-weighted sound pressure level exceeded for 90% of the measurement time period T of not less than 15 minutes, using Fast response.

“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.

“bunded” means within bunding consistent with Australian Standard 1940.

“Category A Environmentally Sensitive Areas” means any area listed in Schedule 12, Section 1 of the Environmental Protection Regulation 2008.

“Category B Environmentally Sensitive Areas” means any area listed in Schedule 12, Section 2 of the Environmental Protection Regulation 2008.

“Category C Environmentally Sensitive Areas” means any of the following areas:

- nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992*;
- koala habitat areas as defined under the Nature Conservation (Koala) Conservation Plan 2006;

- state forests or timber reserves as defined under the *Forestry Act 1959*;
- regional parks (previously known as resource reserves) under the *Nature Conservation Act 1992*;
- an area validated as 'essential habitat' or 'essential regrowth habitat' from ground-truthing surveys in accordance with the *Vegetation Management Act 1999* for a species of wildlife listed as endangered or vulnerable under the *Nature Conservation Act 1992*;
- 'of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers and descriptions.

"certification", "certifying" or "certified" by an appropriately qualified and experienced person in relation to a design plan or an annual report regarding dams/structures, 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.

"certification areas" mean areas the subject of progressive certifications for the relevant tenure. For this environmental authority, the only certification areas are the Progressive Rehabilitation Certification (PRC) areas specified in **Figure 2 – Progressive Rehabilitation Certified Area of G5S, Figure 3 – Progressive Rehabilitation Certified Area of Grasstree, Figure 5 – A5 Landform (2001 IDR section), A6 Landform (2009 IDR Section) and A6 North Seismic certification area, Figure 6 – G4 East certification area and Figure 7 – OC1 LW 22_25 certification area.**

"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 Australian Code for the Transport of Dangerous Goods by Road and Rail approved by the Australian Transport Council; or
- c) a lead hazardous substance within the meaning of the *Workplace Health and Safety Regulation 1997*;
- 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;
 - ii) a surface active agent, including, for example, soap or related detergent;
 - iii) a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide;
 - iv) a fertiliser for agricultural, horticultural or garden use;
 - v) a substance used for, or intended for use for mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater; or

- vi) manufacture of plastic or synthetic rubber.

“clearing” means:

- a) in relation to grass, scrub or bush – the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include –
- i) the flattening or compaction of vegetation by vehicles if the vegetation remains living;
 - ii) the slashing or mowing of vegetation to facilitate access tracks; or
 - iii) the clearing of noxious or introduced plant species; and
- b) in relation to trees – cutting down, ringbarking, pushing over, poisoning or destroying in any way.

“Coarse Reject” A form of process residue generated as a result of processing the ore at the concentrator. Represents the coarser size fraction of the coal reject produced.

“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.

“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.

“completion criteria” these are the standards that are to be met by successful rehabilitation. They will generally be in the form of numerical values that can be verified by measurement of the indicators selected for the rehabilitation objectives. They may include an element based on time, e.g. the criterion has been achieved for seven (7) consecutive years for 95 percent of the area.

“construction” includes building a new dam and modifying or lifting an existing dam.

“contaminate” means to render impure by contact or mixture.

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

“contaminant” – a contaminant can be:

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

“control measure” means any action or activity that can be used to prevent or eliminate a hazard or reduce it to an acceptable level.

“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. However, a dam does *not* mean a fabricated or manufactured tank or container designed to a recognised standard, *nor* does a dam mean a land-based structure where that structure is designed to an Australian Standard. In case there is any doubt, a levee (dyke or bund) is a dam, but (for example) a bund designed for spill containment to AS1940 is *not* a dam.

“declared pest plants” are listed in Schedule 2 of the *Land Protection (Pest and Stock Route Management) Regulation 2003*.

“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 design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include ‘as constructed’

drawings.

“design storage allowance” or **“DSA”** means the minimum storage required in a dam at the first of November each year in order to meet the hydraulic performance requirements.

“disturbance” of land includes:

- a) compacting, removing, covering, exposing or stockpiling of earth;
- b) removal or destruction of vegetation or topsoil or both to an extent where the land has been made susceptible to erosion;
- c) carrying out mining within a watercourse, waterway, wetland or lake;
- d) the submersion of areas by tailings or hazardous contaminant storage and dam/structure walls;
- e) temporary infrastructure, including any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc.) which is to be removed after the mining activity has ceased; or
- f) releasing of contaminants into the soil, or underlying geological strata.

However, the following areas are not included when calculating areas of ‘disturbance’:

- g) areas off lease (e.g. roads or tracks which provide access to the mining lease);
- h) areas previously disturbed which have achieved the rehabilitation outcomes;
- i) by agreement with the administering authority, areas previously disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
- j) areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc.) which is to be left by agreement with the landowner; and
- k) disturbance that pre-existed the grant of the tenure.

“dwelling” means any of the following structures or vehicles that is principally used as a residence –

- a) a house, unit, motel, nursing home or other building or part of a building; or
- b) a caravan, mobile home or other vehicle or structure on land; or
- c) a water craft in a marina.

“EC” means electrical conductivity

“effluent” treated waste water discharged from sewage treatment plants.

“end” means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related activities such as rehabilitation. In other words, it does not refer to the ‘completion’ of the particular activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of the authority. Under the APPEA Code ‘completion’ refers to the point at which the particular survey, program or operation has been rehabilitated and abandoned.

“end of pipe” means the location at which water is released to waters or land.

“environmental authority” means an environmental authority under Chapter 5 of the *Environmental Protection Act 1994*.

“environmental authority holder” means the holder of this environmental authority.

“environmental nuisance” is defined in section 15 of the *Environmental Protection Act 1994* and is unreasonable interference or likely interference with an environmental value caused by:

- a) aerosols, fumes, light, noise, odour, particles or smoke; or
- b) an unhealthy, offensive or unsightly condition because of contamination; or
- c) another way prescribed by regulation.

“environmentally relevant activity” means an environmentally relevant activity as defined under Section 18 of the *Environmental Protection Act 1994* and listed in the *Environmental Protection Regulation 1998*.

“environmentally sensitive area” means Category A, B or C environmentally sensitive areas (ESAs)

“environmental offset” has the meaning in section 7 of the *Environmental Offsets Act 2014*.

“essential habitat” means an area identified as essential habitat for a species of wildlife listed as endangered, vulnerable, rare, or near threatened under the *Nature Conservation Act 1992* on a map prepared by the Chief Executive Officer of the Administering Authority and certified by the Chief Executive Officer of the Department of Resources for the purpose of the *Vegetation Management Act 1999*.

“fill” means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.

“floodplain” has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that:

- is covered from time to time by floodwater overflowing from the watercourse;
- does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island of the watercourse.

“floodwater” means water overflowing, or that has overflowed, from waters, river, creek, stream, lake, pond, wetland or dam onto or over riparian land that is not submerged when the watercourse or lake flows between or is contained within its bed and banks.

“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.

“hazardous contaminant” means a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm because of –

- a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability; or
- b) its physical, chemical or infectious characteristics.

“hazardous waste” means a substance, whether liquid, solid or gaseous that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause environmental harm.

“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 *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* (EM635), prepared by the administering authority, as amended from time to time.

“high bank” - the defining bank is the terrace or bank or, if no bank is present, the point on the active floodplain which confines the average annual peak flows.

“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 *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* (EM635).

Holder means:

(a) where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or

(b) where this document is a development approval, any person who is the registered operator for that development approval.

“infrastructure” means water storage dams, roads and tracks, buildings and other structures built for the purpose of resource activities but does not include other facilities required for the long term management of mining impacts or the protection of potential resources. Such other facilities include dams, waste rock dumps, voids, or ore stockpiles and buildings as well as other structures whose ownership can be transferred and which have a residual beneficial use for the next owner of the operational land or the background land owner.

“Internally drained rehabilitation (IDR)” means the process of rehabilitating landforms to limit catchment size by flattening dragline spoil peaks and bulldozing depressions to retain water and erosion products.

“LA_{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.

“LA_{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

“LA, 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.

“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.

“land” in the “land schedule” of this document means land excluding waters and the atmosphere.

“land degradation” includes the following:

- a) soil erosion;
- b) rising water tables;
- c) the expression of salinity;
- d) mass movement by gravity of soil or rock;
- e) stream bank instability; and
- f) a process that results in declining water quality.

“LA MAX adj T” is the adjusted average maximum A-weighted sound pressure level measured over a time period T. The maxima must be measured on a sound level meter with a frequency weighting that corresponds to perceived loudness (*A* weighting) and the meter must be set to the *fast* response time weighting. The measured values are to be adjusted upwards by 2dB(A) to 5dB(A), if the noise source has tonal characteristics. The measuring period must be in excess of five minutes. The arithmetic average of the adjusted maxima, after eliminating any extraneous noise peaks, is the measure used to characterise the noise environment. (This measure will generally be similar to a percent exceedance of 10% or less. Refer to Australian Standard AS1055.)

“land use” term to describe the selected use of the land, which is planned to occur after the cessation of resource activities.

“leachate” means a liquid that contains soluble, suspended or miscible contaminants likely to have been derived from material which is stored, processed or disposed of on site and which the liquid has passed through or emerged from, or is likely to have passed through or emerged from.

“levee” means a dam, dyke or bund 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 unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.

“limited regulated waste” means any of the following regulated wastes, asbestos, clinical waste or quarantine waste that has been rendered non-infectious, fish processing waste, food processing waste, poultry processing waste, tyres or treatment tank sludge or residue produced in the carrying out of an activity in relation to sewage treatment and water supply activities.

“linear infrastructure” means powerlines, pipelines, flowlines, roads and access tracks.

“mandatory reporting level” or **“MRL”** means a warning and reporting level determined in accordance with the criteria in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (EM635) published by the administering authority.

“manual” means the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (EM635) published by the administering authority.

“maximum extent of impact” means the total, cumulative, residual extent and duration of impact to a prescribed environmental matter that will occur over a project's life after all reasonable avoidance and reasonable on-site mitigation measures have been, or will be, undertaken.

“mg/L” means milligrams per litre.

“mine affected water”:

a) means 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 such runoff, 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;
- vii) associated water, coal seam gas water or produced water from the mine's petroleum activities.

b) does not include surface water runoff which, to the extent that it has been in contact with areas disturbed by resource activities that have not yet been completely rehabilitated, has only been in contact with:

- i) land that has been rehabilitated to a stable landform and either capped or revegetated in accordance with the acceptance criteria set out in the environmental authority but only still awaiting maintenance and monitoring of the rehabilitation over a specified period of time to demonstrate rehabilitation success; or
- ii) land that has partially been rehabilitated and monitoring demonstrates the relevant part of the landform with which the water has been in contact does not cause environmental harm to waters or groundwater, for example:
 - 1) areas that are been capped and have monitoring data demonstrating hazardous material adequately contained with the site;
 - 2) evidence provided through monitoring that the relevant surface water would have met the water quality parameters for mine affected water release limits in this environmental authority, if those parameters had been applicable to the surface water runoff; or
 - 3) both.

“measures” includes any measures to prevent or minimise environmental impacts of the mining activity such as bunds, silt fences, diversion drains, capping, and containment systems.

“mining activity/ies” means the following activities:

- (a) authorised as per the definition in section 110 of the *Environmental Protection Act 1994*;
- (b) all environmentally relevant activities authorised under this environmental authority;
- (c) all mining disturbance including construction of infrastructure, overburden removal and active mining;
- (d) all care and maintenance; and
- (e) rehabilitation.

“NAPP” means net acid producing potential expressed as kg H₂SO₄ per tonne. NAPP is the balance between the capacity of a sample to generate acidity (MPA) minus its capacity to neutralise acidity (ANC).

“NATA” means National Association of Testing Authorities, Australia.

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

“nature” includes:

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

“non-polluting” means having no adverse impacts upon the receiving environment.

“notice of election” has the meaning in section 18(2) *Environmental Offsets Act 2014*.

“noxious” means harmful or injurious to health or physical well-being.

“‘of concern’ regional ecosystem” means an ‘of concern’ regional ecosystem identified in the database maintained by the administering authority called ‘Regional ecosystem description database’ containing regional ecosystem numbers and descriptions. The database is available for inspections on the administering authority’s website at www.des.qld.gov.au.

“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.

“overland flow water” means water, including floodwater, flowing over land, otherwise than in a watercourse or lake:

- a) after having fallen as rain or in any other way; or
- b) after rising to the surface naturally from underground.

“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}).

“permanent infrastructure” includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc) which is to be left by agreement with the landowner.

“prescribed environmental matters” has the meaning in section 10 of the *Environmental Offsets Act 2014*, limited to the matters of State environmental significant listed in schedule 2 of the Environmental Offsets Regulation 2014.

“primary protection zone” means an area within 200m from the boundary of any Category A, B or C ESA.

“protected area” means:

- a) a protected area under the *Nature Conservation Act 1992*;
- b) a marine park under the *Marine Parks Act 1992*; or
- c) a World Heritage Area.

“progressive certification” has the meaning in the *Environmental Protection Act 1994*.

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

“process water” means water used or produced during the mineral development activities.

“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.

“regional ecosystem” has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.

“Register of Regulated Dams” includes:

- a) date of entry in the register;
- b) name of the dam, its purpose and intended/actual contents;

- c) the consequence category of the dam as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (EM635);
- d) dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;
- e) name and qualifications of the suitably qualified and experienced person who certified the design plan and 'as constructed' drawings;
- f) for the regulated dam, other than in relation to any levees –
 - i) the dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;
 - ii) coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area
 - iii) dam crest volume (megalitres);
 - iv) spillway crest level (metres AHD).
 - v) maximum operating level (metres AHD);
 - vi) storage rating table of stored volume versus level (metres AHD);
 - vii) design storage allowance (megalitres) and associated level of the dam (metres AHD);
 - viii) mandatory reporting level (metres AHD);
- g) the design plan title and reference relevant to the dam;
- h) the date construction was certified as compliant with the design plan;
- i) the name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan;
- j) details of the composition and construction of any liner;
- k) the system for the detection of any leakage through the floor and sides of the dam;
- l) dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;
- m) dates when recommendations and actions arising from the annual inspection were provided to the administering authority;
- n) dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.

“regulated dam” means any dam in the significant or high consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (EM635) published by the administering authority.

“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 objectives” the end points that rehabilitation aims to achieve. They may be described in terms of future land use, biodiversity values, conservation values, health and safety outcomes, aesthetics or social outcomes or combinations of these.

“rehabilitation indicators” an indicator is something that can be measured and audited according to an established protocol and used to evaluate changes in a system.

“rehabilitation” or **“rehabilitated”** means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria and, where relevant, includes remediation of contaminated land.

“release” of a contaminant into the environment includes –

- a) to deposit, discharge, emit or disturb the contaminant; and
- b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- c) to fail to prevent the contaminant from being deposited, discharged, emitted or disturbed; and
- d) to allow the contaminant to escape; and
- e) to fail to prevent the contaminant from escaping.

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

“resource activity” is an activity that involves—

- (a) a geothermal activity; or
- (b) a GHG storage activity; or
- (c) a mining activity; or
- (d) a petroleum activity.

“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.

“riverine area” refers to the land confined to the flood flow channel of a watercourse.

“Run of mine (ROM) coal” means raw coal which has been extracted as part of the mining activities and has not been subject to any form of processing, crushing, screening or washing.

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

Scheme fund means the scheme fund established under the *Mineral and Energy Resources (Financial Provisioning) Act 2018*, section 24.

“secondary protection zone” in relation to a Category A or Category B ESA means an area within 100 metres from the boundary of the primary protection zone.

“sensitive place” means:

- a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises;
- b) a motel, hotel or hostel;
- c) an educational institution;
- d) a medical centre or hospital;
- 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 residual impact” has the meaning in section 8 *Environmental Offsets Act 2014*.

“significantly disturbed” or **“significant disturbance”** or **“significant disturbance to land or areas”** has the meaning in Schedule 12, section 4 of the *Environmental Protection Regulation 2008*. Land is significantly disturbed if—

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

“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.

“spring” means the land to which the water rises naturally from below the ground and the land over which the water then flows.

“stable” has the meaning in Schedule 5 of the *Environmental Protection Regulation 2008* and, for a site, means the rehabilitation and restoration of the site is enduring or permanent so that the site is unlikely to collapse, erode or subside.

“storm water” means all surface water runoff from rainfall.

“suitably qualified and experienced person” in relation to dams means one 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:

- a) knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- b) a total of five years of suitable experience and demonstrated expertise in at least four of the following categories, with the ‘geomechanics of dams’ category being compulsory:
 - i) geomechanics of dams with particular emphasis on stability, geology and geochemistry.
 - ii) investigation, design or construction of dams.
 - iii) operation and maintenance of dams.
 - iv) hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology.
 - v) hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes.
 - vi) hydrogeology with particular reference to seepage, groundwater.
 - vii) solute transport processes and monitoring thereof.
 - viii) dam safety.

“synthetic based drilling mud” means a mud where the base fluid is a synthetic oil, consisting of chemical compounds which are artificially made or synthesised by chemically modifying petroleum components or other raw materials rather than the whole crude oil

“system design plan” means a plan that manages an integrated containment system that shares the required DSA and/or ESS volume across the integrated containment system.

“top soil” means the top layer of soil, alluvium or weathered rock that forms a suitable plant growth medium. Top soil should be non-crusting and low in salinity.

“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*.

“waste and resource management hierarchy” has the meaning given by the *Waste Reduction and Recycling Act 2011*.

“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.

“watercourse” means a watercourse as defined under Chapter 2 of the *Water Act 2000*.

“waterlogging” is the saturation of soil by soil water.

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

“water quality” means the chemical, physical and biological condition of water.

“waters” includes –

- a) river, creek, stream in which water flows permanently or intermittently either:
 - i) in a natural channel, whether artificially improved or not;
 - ii) in an artificial channel that has changed the course of the river, creek or stream;
- b) lake, lagoon, pond, swamp, wetland, dam;
- c) unconfined surface water;
- d) storm water channel, storm water drain, roadside gutter;
- e) bed and banks and any other element of a river, creek, stream, lake, lagoon, pond, swamp, wetland, storm water channel, storm water drain, roadside gutter or dam confining or containing water;
- f) groundwater;
- g) non-tidal or tidal waters (including the sea); or
- h) any part thereof.

“wet season” means the time of year, covering one or more months, when most of the average annual rainfall in a region occurs. For the purposes of DSA determination this time of year is deemed to extend from 1 November in one year to 31 May in the following year inclusive.

“wetland” means an area shown as a wetland on a ‘Map of referable wetlands’, a document approved by the chief executive (environment). A map of referable wetlands can be viewed at www.des.qld.gov.au.

“µg/L” means micrograms per litre.

END OF DEFINITIONS

Figure 1: Water Release Points and Monitoring Locations

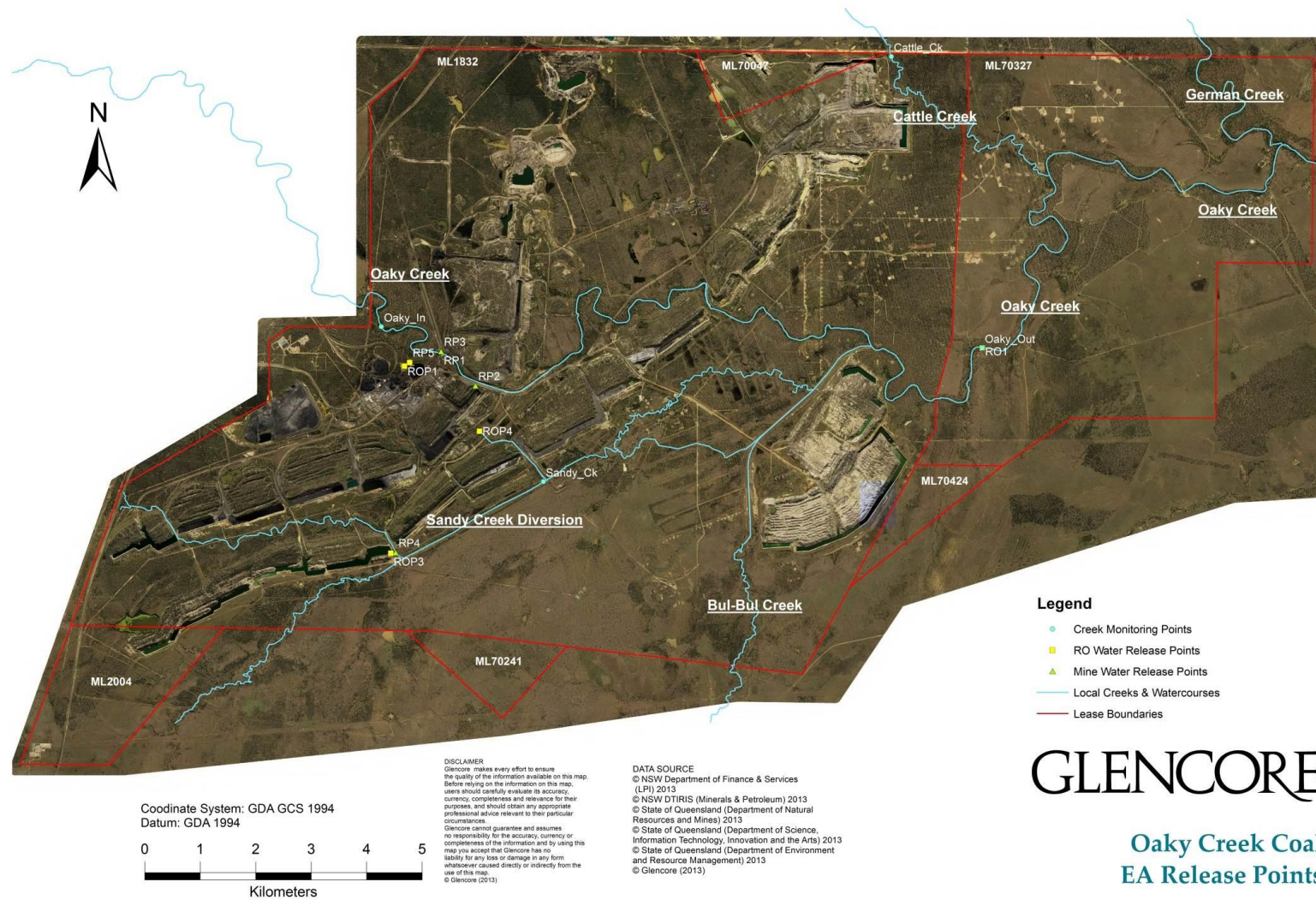


Figure 2: G5 progressive certification area as approved 16 December 2020



Figure 3: Grasstree progressive certification area as approved 16 December 2020

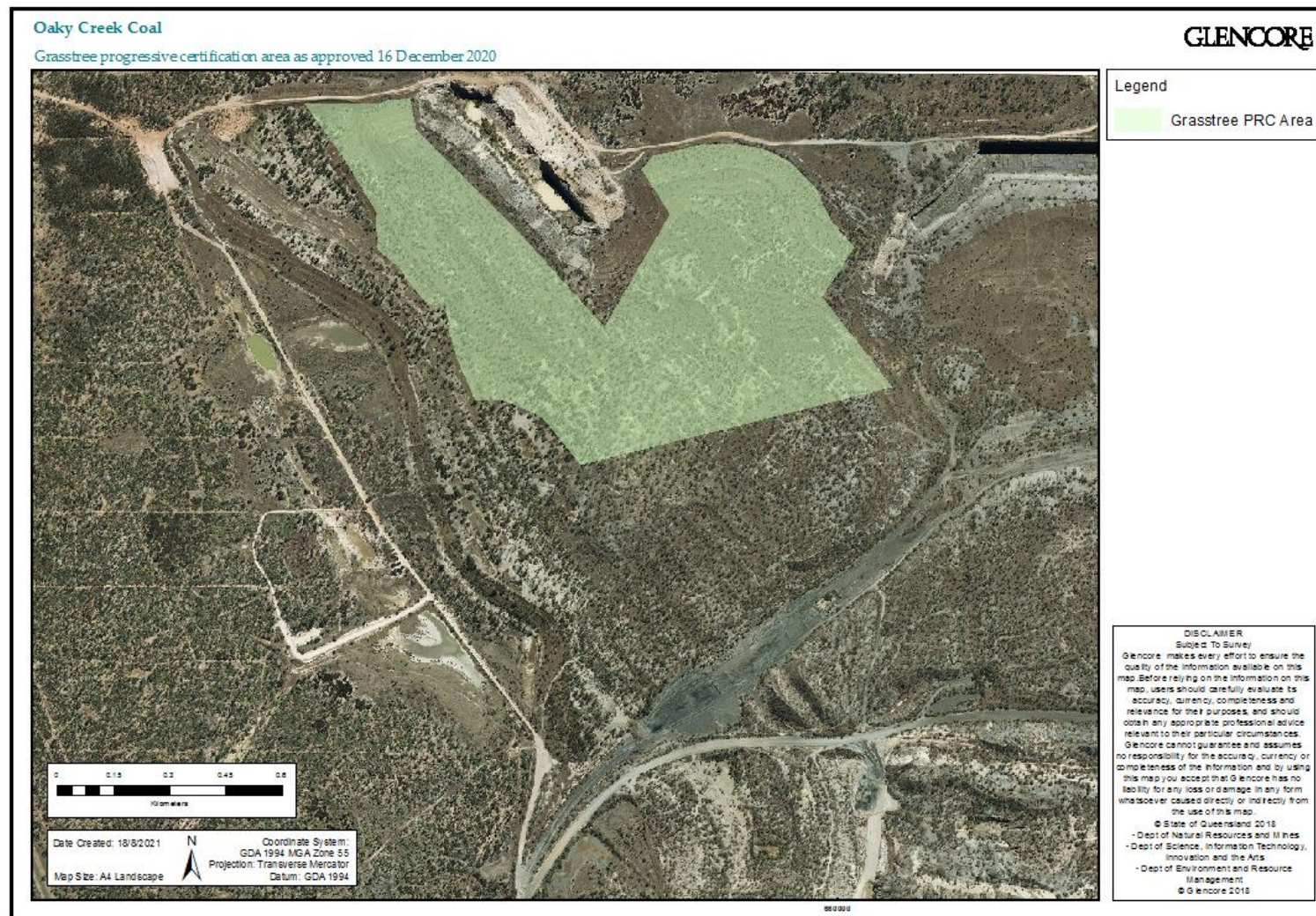


Figure 4: Areas of mine rehabilitated using Internally Drained Rehabilitation (IDR) methodology up to 14 August 2014

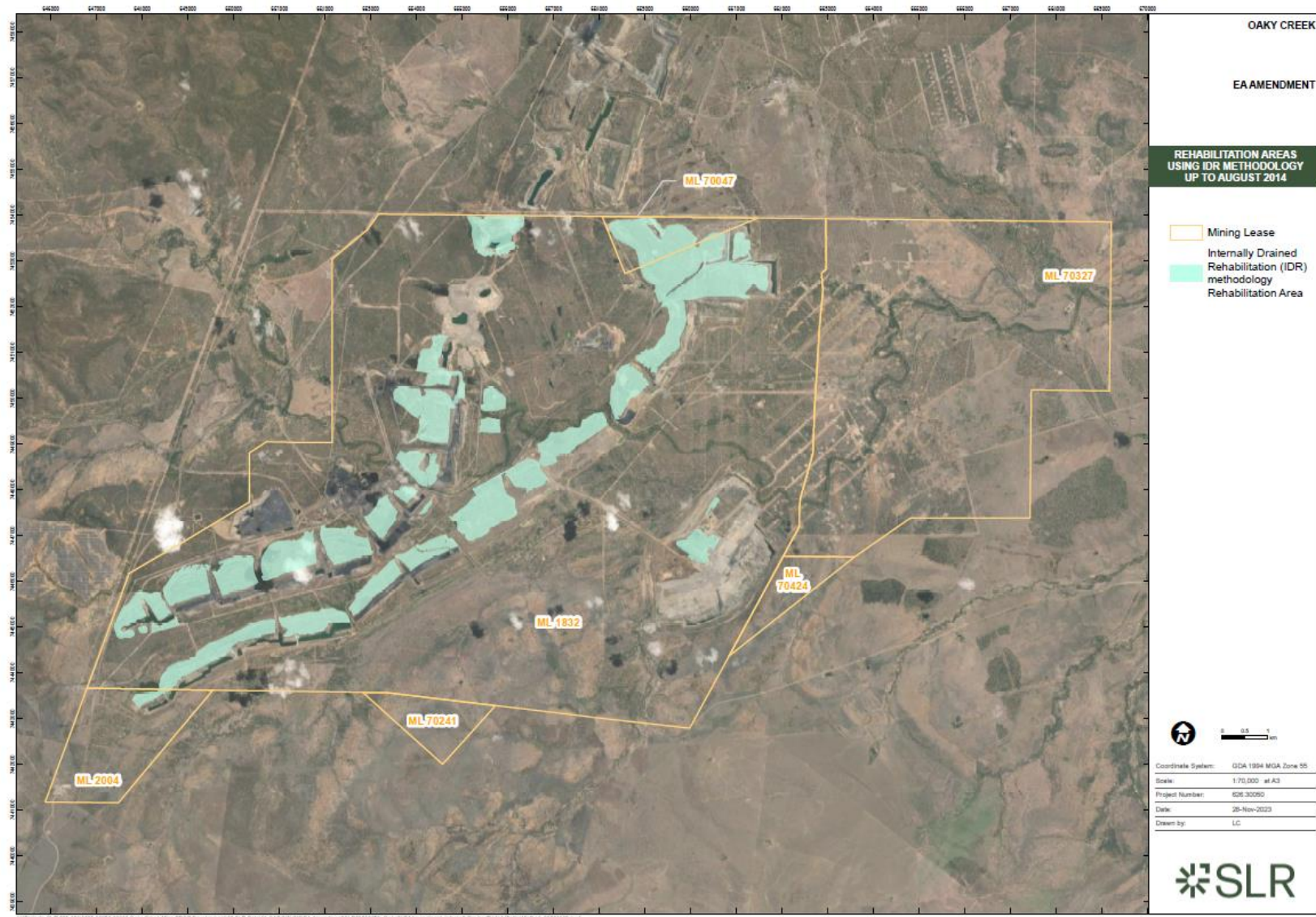


Figure 5: A5 Landform (2001 IDR Section), A6 Landform (2009 IDR Section) and A6 North Seismic certification area as approved 16 June 2022

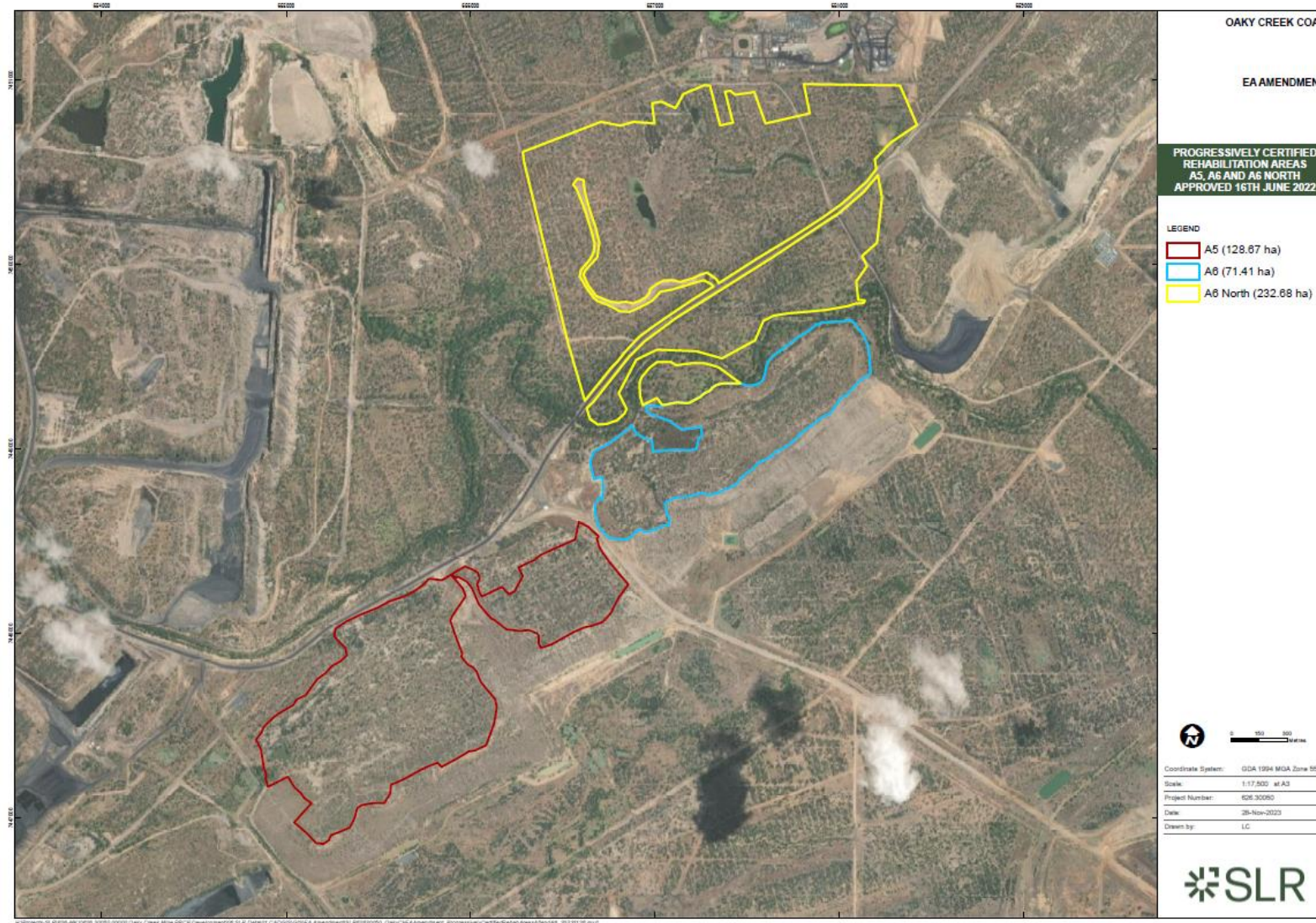


Figure 6: G4 East certification area certification area as approved 29 June 2023



Figure 7: OC1 LW 22_25 certification area as approved 29 June 2023

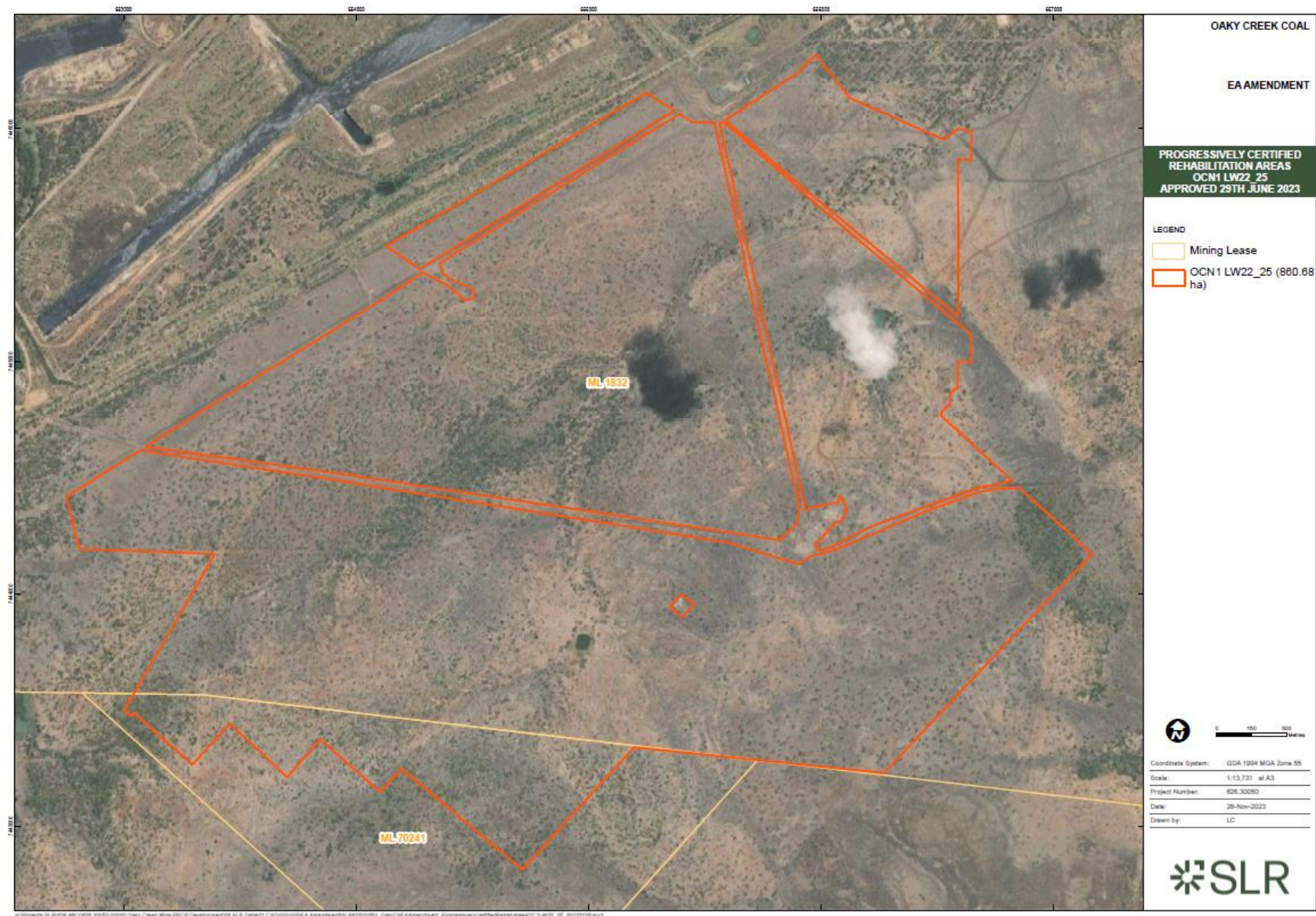
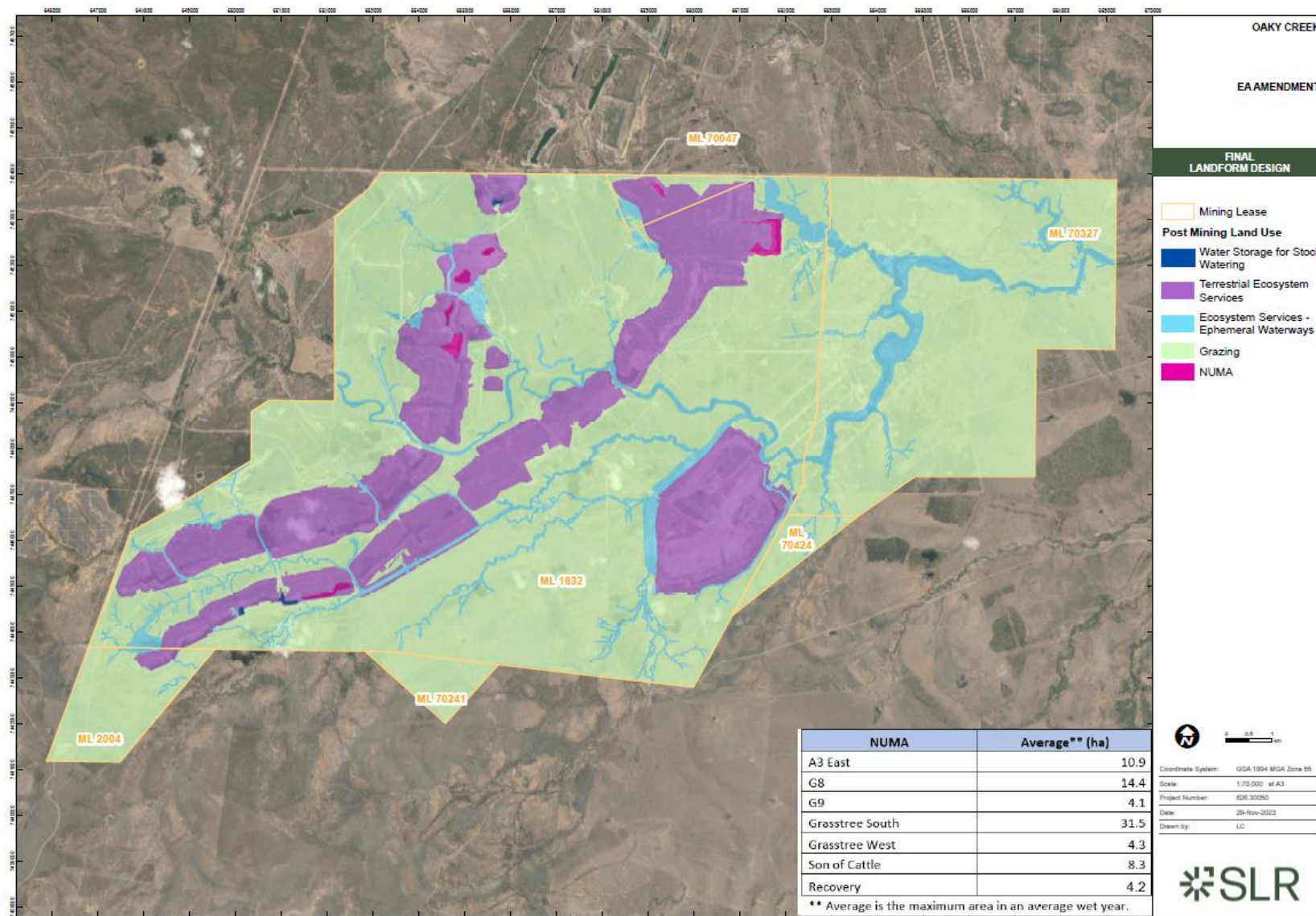


Figure 8: Final Landform Design



Appendix 1, Attachment A: Watercourse Subsidence

When to use

This appendix is to be used by the Environmental Authority (EA) holders in the preparation of a Subsidence Management Plan (SMP) where a watercourse, as defined under the *Water Act 2000*, is to be impacted as a result of underground longwall mining. For a feature to be defined as a watercourse under Chapter 1, Part 2 of the *Water Act 2000*, the feature must possess particular characteristics. Watercourse determinations are regularly undertaken across Central Queensland by authorised departmental officers as it is the determining factor in the requirement for approvals under the *Water Act 2000*.

In addition, this appendix is to be used by the Department when providing advice and assessing Subsidence Management Plans submitted by EA holders or proposed EA holders.

Purpose

The purpose of this appendix is to detail the information to be provided in a SMP and the legislative basis of the requirement for approval. The SMP forms the major reference document regarding subsidence impacts on watercourses as a result of underground longwall mining and is required to accompany proposals for watercourse subsidence.

The objective of the SMP is to ensure that the impacts of subsidence are properly managed. Where surface subsidence intersects a watercourse, it is important for the situation to be managed effectively to ensure no long-term maintenance is required within the watercourse, and to ensure that naturally occurring processes are not impaired.

A SMP should include the following information:

- Location of proposed longwall panels and modelled subsidence effects on the watercourse;
- Pre-subsidence management of watercourses proposed to be subsided;
- Monitoring methods pre and post-subsidence to detect and document any impacts on watercourses;
- Post-subsidence management of impacted watercourses through remediation and rehabilitation;
- Agreed outcome for proposed future landscape between the Department and the proponent.

Governing legislation

Historically, subsidence on mining leases has been managed under two separate Government Departments; the Environmental Protection Agency (EPA) and Natural Resources and Water (NRW). Under the former EPA, subsidence within mining leases was conditional to the proponent's EA, however the impact on watercourses was not specifically addressed.

Now Departments are as one, regulation can be coordinated such as watercourse subsidence is authorised under specific conditions included in an EA issued under the *Environmental Protection Act 1994*. Works undertaken within the bed and banks of a watercourse aimed at mitigating or remediating any physical impacts pre or post-subsidence are also authorised under the conditions of the EA. This guideline has been developed to assist the Department and proponents in undertaking a single collaborative process in the assessment and authorisation of proposals regarding subsidence of watercourses.

Environmental impact associated with mining activities is regulated under the *Environmental Protection Act 1994*. While this legislation does not identify longwall mining as a specific mining activity, it provides a definition of a 'mining activity' and 'environmental harm'. The process of longwall mining and resultant subsidence is governed by the legislation and authorised under a proponent's EA.

The holder or holders of a mining tenement issued under the *Mineral Resources Act 1989* must hold an EA for the mining activities to be carried out on the tenement. When applying for an EA, a number of environmental management documents must be in place describing the proposed project and the management of any environmental impacts.

An Environmental Management Plan (EM Plan) is a strategic document which provides information to support the application for an EA and proposes environmental protection commitments. It describes the project and surrounding environment, identifies relevant environmental values likely to be affected by the mining activities, outlines the potential adverse and beneficial impacts on environmental values and provides details on how the

proposal will protect and enhance these values. Once an EA has been granted, a Plan of Operations is required.

A Plan of Operations describes the actions and programs required to achieve compliance with the conditions of an EA. It also describes the actions and programs required to achieve or implement the commitments contained in the relevant EM Plan. All activities carried out on a mining lease must be carried out in accordance with the submitted Plan of Operations. A Plan of Operations describes an action program for complying with the conditions of the associated EA and EM Plan, contains a plan showing where all activities are to be carried out on the land, and includes a rehabilitation program for land disturbed or proposed to be disturbed.

Whilst management of subsidence will be included in both the EM Plan and the Plan of Operations, the Subsidence Management Plan is a stand-alone document authorised under the conditions of the EA.

Background

Throughout the Bowen Basin, economically viable coal deposits frequently extend beneath watercourses. Consequently, underground mining operations targeting the associated coal seams often also extend beneath watercourses. Underground mining is not a new concept in the extraction of coal throughout the Bowen Basin. This form of mining is preferred when economical constraints reduce the feasibility of mining using open cut methods. Whilst coal deposits located beneath watercourses contribute to total extractable coal, more importantly, extraction of this coal facilitates underground mining activities to continue along a coal seam uninterrupted across both sides of a watercourse. This provides for a more cost effective extraction of coal that might otherwise be uneconomic to mine.

Technological improvements in underground mining methods have provided the ability to extract coal in areas previously inaccessible for mining. Modern day underground coal mining operations commonly utilise longwall mining techniques which allow extraction of more of the coal seam. Longwall mining allows access to the coal seam via a shaft, a decline or a highwall portal and system of underground workings, without the need to remove overburden. This technique is used to extract the coal seam via a series of “panels”, which can be hundreds of metres wide and kilometres in length. As the coal shearer removes the coal in the seam along the length of a panel, the overlying strata is collapsed behind, filling the void (goaf) left by the extracted coal. The collapse and settlement of the overlying strata can extend to the land surface above, resulting in localised lowering of the surface profile, and depressions in the landscape (commonly referred to as subsidence troughs).

Where a watercourse is located above a longwall panel, extraction of the coal seam causes subsidence of the panel can have a number of impacts on the watercourse. Some of these impacts include:

- Lowering of bed and banks
- Creation of in-stream waterholes
- Changes to local drainage patterns
- Incision processes
- Stream widening
- Erosion
- Increased overbank flows due to lowering of the high banks
- Tension cracking through both shallow and deeper underlying strata (including aquifers)
- Root shear and loss of riparian vegetation
- Changes to water quality (surface water and groundwater).

The degree of subsidence is generally a function of thickness of coal extracted, depth of overburden, strata type and panel width. The point of maximum subsidence generally occurs along the centreline of an extracted panel, whilst the pillar zones located between panels remain at natural surface level. Experience gained through widespread adoption of longwall mining processes in the Bowen Basin has seen advancement in the modelling and ability to predict the likely impacts of a subsidence event. This technology has also facilitated improved design and implementation of mitigation measures (engineered structures and associated earthworks) and highlighted potential short and long term maintenance issues which may require specific management intervention.

Subsidence Management Plan

The objective of the SMP is to ensure that the impacts of subsidence are properly managed. Where surface subsidence intersects a watercourse, effective management is required to ensure no long-term maintenance is required within the watercourse, and to ensure that naturally occurring processes are not unduly impaired. Consideration must be given for potential impacts on erosion, groundwater and surface water as a result of a proposed subsidence event.

A Subsidence Management Plan must address the following issues:

1. *Description of Pre Subsidence Situation & Survey*

- i) A general description of the area pre subsidence including photographic record should be provided.
- ii) Survey of cross-section and longitudinal profiles should be undertaken on all watercourses with potential to be impacted through subsidence. Permanent transects should be detailed within the proposed Subsidence Management Plan. Surveys should include the confluence with any other watercourses in the impacted area as well as any infrastructure spanning the watercourse. Surface drainage patterns should be investigated to determine current paths of water movement through the landscape. This path of water movement should be maintained where possible post-subsidence.

2. *Predicted Subsidence*

The degree of anticipated subsidence should be provided, including the length of watercourse to be impacted and the average depth of subsidence across individual panels. The predicted subsidence should be modelled to indicate the change in surface elevations expected. The volumes of water expected to be captured within the bed of the watercourse due to creation of waterholes should be provided. Consequences of any lowering of the high banks of the watercourse should be discussed, including impacts associated with greater floodplain interaction and potential for creation of new channels.

3. *Infrastructure*

Prior to mining, the anticipated impacts from subsidence should be determined on all infrastructure located within or above the watercourse to be subsided along with measures to be implemented to mitigate any impacts. Priority should be given to infrastructure which provides services to external parties (other mines, towns, industry). Measures for dealing with any interruption to such services should be outlined. Relocation of infrastructure may be necessary should the proposed subsidence pose sufficient risk.

4. *Preventative Works*

Where preventative measures are required to ensure the stability of the bed and banks of the watercourse (establishment of pile fields, exclusion of cattle, bentonite treatment) these should be discussed in the Subsidence Management Plan, including supporting evidence outlining the legitimacy of such works. These works may be required where self-repair by natural processes will not provide adequate remediation of impacted areas. Where there is potential for root shear to result in significant loss of riparian vegetation, mitigation measures may be required.

5. *Engineered Structures*

Engineered works may be required to maintain the stability and function of a watercourse impacted by subsidence. These works are often constructed prior to subsidence occurring within the watercourse. Such works can include timber pile fields, rock revetment, reshaping of existing stream banks, and river bed treatment to prevent increased ingress of surface water into underground aquifers. Where subsidence mitigation measures require engineered structures be installed, the design, monitoring and maintenance of these structures should be detailed in the Subsidence Management Plan. The plan should detail the purpose of each structure and any consequences should the structure fail to be installed. Appropriate design plans including the location of each structure will be required. As a minimum, fourth and fifth order watercourse will require the installation of engineered structures. Works undertaken within the bed and banks of a watercourse aimed at mitigating or remediating any physical impacts pre or post-subsidence are authorised under the conditions of the Environmental Authority. Where a separate report has been produced for engineered structures, this should be included as an appendix to the Subsidence Management Plan.

6. *Erosion*

The Subsidence Management Plan should detail the current watercourse condition to be impacted by subsidence. Identification of erosion zones which are likely to be exacerbated through tension cracking should be stabilised using appropriate methods. Such areas may include reaches with elevated rates of bed and bank erosion, access tracks and areas with poor quality, sparsely populated riparian vegetation. Sufficient riparian vegetation should be established prior to subsidence to assist with initial stabilisation of the bed and banks. Removal of grazing animals to allow establishment or recovery of riparian vegetation may be required for an extended period prior to subsidence.

7. *Groundwater*

Where groundwater aquifers exist beneath the mine plan area, investigations should be undertaken regarding the potential for impacts on these aquifers as a result of subsidence. The Subsidence Management Plan should discuss these aquifers, any anticipated impacts on each aquifer and proposed measures for mitigating these impacts. Any anticipated movement of surface water into underlying aquifers should be discussed, as this can result in loss of surface water from the system and impacts on water quality in these aquifers. Geotechnical assessment across the bed and banks of the watercourse should be undertaken to provide an indication of potential permeability issues related to sub-surface cracking and interaction with local groundwater tables. Monitoring bores should be established in each aquifer prior to subsidence and monitored for a period of time sufficient for obtaining background water levels and trends. Monitoring of these bores should continue post-subsidence to aid the detection of impacted aquifers.

8. *Surface Water*

i) *Baseline Monitoring*

The Subsidence Management Plan should detail baseline condition monitoring of all watercourses likely to be impacted through subsidence. The preferred monitoring assessment technique for stream condition in the Bowen Basin is the Index of Diversion Condition. This methodology was established as a result of the Australian Coal Association Research Program (ACARP) Project C9068. Monitoring of watercourses should extend a minimum of 1km upstream and downstream of the proposed area to be impacted and should include a geomorphic assessment of the entire reach. Where a baseline monitoring assessment has been undertaken as part of an Environmental Impact Statement (EIS) process, this may be considered sufficient provided there has been no subsequent modification or interference to the watercourse. The condition of riparian vegetation should also be detailed.

ii) *Cumulative Impacts on Watercourses*

With an increasing number of mines being established in close proximity to watercourses, a proponent utilising longwall mining methods may be requested to investigate the cumulative impact of these activities on the watercourse.

Monitoring and Reporting Requirements

The following criteria have been developed to provide detailed direction regarding monitoring and reporting requirements associated with subsidence of watercourses.

These criteria are outlined in a four step approach:

- Monitoring
- Assessment
- Reporting
- Mitigation

Monitoring

- Representative sites need to be identified that allow the impacts of subsidence to be assessed in a particular watercourse with particular attention to the following:
 - Sites must be located at all pillar zones intersecting a watercourse or tributary.

- Sites must include representative locations at the interface of natural ground level and observed changes in surface elevation from subsidence within a watercourse.
- Control sites beyond proposed mining extents should be established to verify pre-mining conditions. In watercourses, the sites should extend a minimum of 1km both upstream and downstream of the subsidence reach.
- Assessment of watercourse condition: Specific monitoring assessment techniques for watercourse condition should include but not be limited to the Index of Diversion Condition, as outlined in the ACARP Project C9068.
- Vegetation and ecological condition assessments should form part of the baseline dataset.
- Rainfall monitoring should be undertaken within areas proposed to be impacted by subsidence. In addition, flow event monitoring should occur in watercourses proposed to be impacted by subsidence. The type of monitoring devices and locations to be installed should be detailed in the Subsidence Management Plan.
- Where preventative works are undertaken pre-subsidence, subsequent monitoring assessments should include the integrity and effectiveness of these works in reducing the impact of subsidence within the watercourse.
- Surveys must include cross-sectional area and bed slope throughout all monitored reaches of impacted watercourses.
- Annual aerial photography and Digital Terrain Mapping is required to verify predicted subsidence surface profiles, and to identify potential short and long term erosion issues resulting from subsidence of watercourses.
- Surveys pre-subsidence should quantify the following features within watercourses:
 - pool/riffle sequences
 - bed controls
 - entry points of other watercourses and localised tributaries
 - existing bed and bank scour points
 - infrastructure located within the watercourse.
- Surveys post-subsidence should quantify any changes to the pre-mining conditions including:
 - erosion or deposition processes that have occurred as a result of subsidence,
 - migration of head cut erosion within watercourses and tributaries,
 - localised changes to stream bed slope,
 - localised widening of channels,
 - destabilisation of stream bed and banks including fracturing and incision,
 - localised changes to bank heights
 - size of subsidence void created within the watercourse.
- The subsidence monitoring program for groundwater must include the following information:
 - Sites must include representative locations at the interface of natural ground surface and observed changes in surface elevation from subsidence.
 - Monitoring bores should be established in each aquifer at each monitoring site.
 - Monitoring must include both water level measurements and water quality sampling in accordance with the following:
 - water level measurement to be taken quarterly
 - water quality field conductivity measurement to be taken 6 monthly
 - full chemical analysis of water samples to be taken annually.

Frequency of Monitoring

A proposed timeframe should be provided by the proponent in relation to the monitoring outlined in the Subsidence Management Plan. The Department, upon review of the proposed Subsidence Management Plan will determine a suitable monitoring timeframe based on the information provided. Monitoring requirements will depend on a number of factors, including the stream order of the watercourse proposed to be impacted. As a guide:

Stream Order 1, 2 and 3

Monitoring must be undertaken at the following intervals:

- immediately prior to subsidence,
- within two (2) months of the initial subsidence,
- following a rainfall event of **1 in 2 year** ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence.
- following a peak flow event of greater than a **1 in 2 year** ARI and
- annually.

Stream Order 4 and higher

Monitoring (including surveys) must be undertaken at the following intervals:

- immediately prior to subsidence,
- within two (2) months of the initial subsidence,
- following a rainfall event of **1 in 5 year** ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence.
- following a peak flow event of greater than a **1 in 5 year** ARI, and
- annually.

Cumulative Impacts

Where subsidence is proposed in a Subsidence Management Plan, and the watercourse has already been subsided upstream or downstream, the monitoring assessment must determine not only the localised impacts on the watercourse resulting from the proposed subsidence, but also any cumulative impacts on the watercourse as a result of all other subsidence events.

Assessment

The design and assessment of engineered structures should be performed by a Registered Professional Engineer of Queensland (RPEQ). All other assessments should be performed by suitably qualified and experienced persons in the fields that they are assessing.

- The results of all monitoring activities should be reviewed by a suitably qualified person and detailed in the associated monitoring report.
- Recommendations should be made after assessment of the results regarding any specific treatment, remediation works, or engineered structures required post-subsidence to achieve stability in the watercourse.

Reporting

An annual report will be requested by the administering authority post-subsidence. The report should detail mining activities and all monitoring and rehabilitation activities as outlined within the Subsidence Management Plan. The reporting date will be determined in consultation with the administering authority.

- A monitoring report should contain the results of all monitoring activities, the assessment of these results, and recommendations for any remedial works required. The report should comment on the following:
 - Watercourse condition and geomorphic processes;
 - The condition of vegetation in riparian zones;

- Examination of pillar zones in watercourses with particular attention to potential for tension cracking;
- The creation of in-stream waterholes;
- Any impacts on groundwater.
- Where preventative works were undertaken pre-subsidence, subsequent monitoring assessments should include assessment of the integrity and effectiveness of these works in mitigating the impacts of subsidence.
- An annual report in the form of two (2) hard copies and one electronic copy shall be furnished to the administering authority. The report should in addition to addressing specific monitoring requirements provide comment on:
 - The current state of the groundwater and surface water resources;
 - Any impacts on these features;
 - Any remedial works required to be undertaken including a timetable for implementation.
 - Commitment from the proponent to addressing the recommendations in the report.

Mitigation

Where recommendations are made regarding specific treatment, remediation works, or engineered structures required post-subsidence to achieve stability in the watercourse, the proponent must ensure this work is undertaken.

Rehabilitation

The holder of the EA, if directed by the administering authority, will carry out additional remedial works deemed necessary to minimise the impacts of subsidence on the physical integrity of the watercourse.

Relinquishment

Relinquishment of monitoring and rehabilitation responsibilities conditional under a proponent's EA can only occur after the subsidence and approved mitigation and rehabilitation measures have been subjected to a suitable range of rainfall and flow events, and are deemed by the administering authority to be in a stable and functional condition. Any request for relinquishment will be negotiated with the administering authority and will require a submission containing monitoring data demonstrating stability and functionally in the watercourse over a suitable range of rainfall and flow events.

Acknowledgement

In 2007, BMA and Anglo Coal instigated discussions with the Department into a proposed assessment on the cumulative impacts of longwall mining beneath the Isaac River in Central Queensland. A final report was produced by Alluvium Consulting in July 2009 documenting the outcomes of the study. The Department greatly acknowledges the findings from this report and the assistance provided in the development of this guideline.

R Lucas, J Crerar, R Hardie, J Merritt and B Kirsch, 2009. *Isaac River Cumulative Impact Assessment of Mining Developments*. Report by Alluvium Consulting. ACARP for Diversion assessment guideline ex C9068

Appendix 2: Rehabilitation Requirements

Post mining land use (PMLU)	Mine Domain	Rehabilitation Goals	Objectives	Completion criteria
Terrestrial ecosystem services (open woodland)	Opencut voids: G3, G4, G5, G6, A3 West, A3 Mid, A4, G7, Aquila High, A5, A6, A7 South, Grasstree North, A7, Aquila Low, A3 Mid 3 (batters only), Cattle (batters only) Rehabilitated spoil dumps that are not applicable under condition F37 nor progressive certification areas (condition F35 & F36) In-pit tailings and reject emplacements	Long-term safety	Construct landforms that do not pose unacceptable hazards to humans, stock and wildlife.	- Overall slopes $\leq 21\%$ - Final void batter slopes are $<12\%$ on average across the filled voids and $<20\%$ on average across the reprofiled voids - Tailings/Reject material capped with minimum of 2m of fill material - Reshaped landform is free draining (Noting that the natural landform may have small pockets of short term water) - No highwalls are present in the landform - Potential safety hazards are similar to the surrounding landform
		Non-polluting	Maintain regional surface and ground water quality.	- Groundwater monitoring will comply with the trigger levels in Table D2 - Groundwater investigation - trigger levels of the EA. - Downstream surface water monitoring must comply with Condition C22 of the EA.
		Stable	- Demonstrate geotechnical stability. - Not exhibiting excessive erosion.	No evidence of erosion classified as 'moderate' or 'severe' as defined by Appendix 3 - Erosion classification framework.
		Able to sustain PMLU	Rehabilitated landform (including land cover and water) is suitable for providing Open Woodland	A vegetation assessment is completed by an AQP using a methodology as outlined in the Queensland Mine Rehabilitation commissioner technical paper 'Evaluating methods for assessing native ecosystem mine rehabilitation success' (March 2023).

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			Achieve self-sustaining system that doesn't require additional maintenance except that of surrounding areas (e.g., weed and fire control via grazing/pastoral management, etc.).	• >70% total cover across rehabilitation area, includes multilevel canopy, groundcover, and leaf litter. • At least four native tree or shrub species across the rehabilitation area. • Evidence of recruitment of native tree species over a representative climatic period.
Water storage for stock watering	A3 Mid 3 and Cattle pit lakes	Long-term safety	• Construct landforms that do not pose unacceptable hazards to humans, stock and wildlife.	• Slopes $\leq 21\%$. • No highwalls are present in the landform
		Non-polluting	• Maintain regional surface and ground water quality.	• Groundwater monitoring will comply with the trigger levels in Table D2 - Groundwater investigation - trigger levels of the EA. • Downstream surface water monitoring must comply with Condition C22 of the EA.
		Stable	• Demonstrate geotechnical stability. • Not exhibiting excessive erosion.	• No evidence of erosion classified as 'moderate' or 'severe' as defined by Appendix 3 - Erosion classification framework.
		Able to sustain PMLU	• Provides suitable	• Pit lakes to remain for landholder use are safe for stock access where required and have vegetated

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			drinking water for stock.	banks, otherwise pumped and transferred for stock use. Retained pit lake water quality characteristics to be below the relevant trigger values for livestock drinking water (beef cattle) defined in Environmental Protection (Water) Policy 2009 Mackenzie River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Mackenzie River Sub-basin, September 2011, or the most recent version.
Ecosystem services – ephemeral waterways	Ephemeral Creeks, Waterways and Diversions: Oaky Creek, Sandy Creek and Bul Bul Creek	Long term safety	- Retained water diversions are safe for humans and animals post-mining. - Any remaining infrastructure is safe or to be managed by future landholder. - Structural integrity maintained.	- Certification from a RPEQ that permanent diversions are stable. - Does not pose high risk to stock or humans as determined by an AQP.
		Non-polluting	Maintain regional surface and ground water quality.	- Downstream surface water monitoring must comply with Condition C22 of the EA. - Groundwater monitoring Table D2 - Groundwater investigation - trigger levels will comply with the trigger levels in Table C12 of the EA
		Stable	Not exhibiting excessive erosion	No evidence of erosion classified as 'moderate' or 'severe' as defined by Appendix 3 – Erosion classification framework.
		Able to sustain final land use	Permanent diversions are sustainable.	>70% total cover across bank, includes multilevel canopy, groundcover, and leaf litter.

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			Vegetation cover is established to minimize soil loss rates.	- At least four native tree or shrub species across the riparian area. - Evidence of recruitment of native tree species over a representative climatic period.
Grazing	Out of pit tailings	Long term safety	- Construct landforms that do not pose unacceptable hazards to humans, stock and wildlife. - Demonstrate geotechnical stability.	- RPEQ certification of capping construction and demonstration of long-term geotechnical stability. - Overall slopes $\leq 21\%$.
		Non-polluting	Maintain regional surface and ground water quality.	- Groundwater monitoring will comply with the trigger levels in Table D2 – Groundwater investigation – trigger levels of the EA. - Downstream surface water monitoring must comply with Condition C22 of the EA.
		Stable	Not exhibiting excessive erosion.	No evidence of erosion classified as 'moderate' or 'severe' as defined by Appendix 3 – Erosion classification framework.
		Able to sustain a final land use	Able to sustain periods of managed intermittent light grazing.	- At least 3 palatable, perennial and productive (3P) native species - Land Suitability Class has been determined in accordance with the <i>Guidelines for Agricultural Land Evaluation in Queensland (DSITI & DNRM 2015)</i> - Weed* presence is a maximum of 10% of total vegetative groundcover confirmed by an AQP in annual monitoring. Weed management recommendations to be provided in annual reports.
Grazing	Infrastructure, laydown yards, ROM, Haul roads	Long term safety	Any remaining infrastructure is safe or to be	(a) With the exception of any infrastructure to remain as part of the PMLU or where infrastructure is agreed to be retained by the landholder as

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			managed by future landholder.	evidenced by a signed landholder agreement, the following are complete: (i) All services disconnected and removed; (ii) All concrete bitumen and gravel roads removed; (iii) All operational pipelines drained and removed; (iv) All fencing that is not part of PMLU requirements removed; (v) All buildings demolished and/or removed off-site; (vi) All machinery and equipment removed; (vii) All surface water drainage infrastructure removed; and (viii) All rubbish removed.
		Non-polluting	Contaminated material is treated or removed.	Suitably qualified person (SQP) certifies through the completion of a contaminated land investigation that land is not contaminated.
		Stable	Not exhibiting excessive erosion.	- Overall slopes $\leq 21\%$. - No evidence of erosion as classified as 'moderate' or 'severe' as defined in Appendix 3 – Erosion classification framework.
		Able to sustain a final land use	Able to sustain periods of managed intermittent light grazing.	- At least 3 palatable, perennial and productive (3P) native species - Land Suitability Class has been determined in accordance with the <i>Guidelines for Agricultural Land Evaluation in Queensland (DSITI & DNRM 2015)</i> - Weed⁺, presence is a maximum of 10% of total vegetative groundcover confirmed by an AQP in annual monitoring. Weed management recommendations to be provided in annual reports.

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Grazing	Roads, tracks, exploration, subsidence, surface disturbance associated with underground mining, Water Storages.	Long term safety	Any remaining infrastructure is safe or to be managed by future landholder.	- Overall slopes $\leq 21\%$. - Dams to remain for landholder use are safe for stock access and have vegetated banks
		Non-polluting	Maintain regional surface and ground water quality.	- Groundwater monitoring will comply with the trigger levels in Table D2 – Groundwater investigation – trigger levels of the EA. - Downstream surface water monitoring must comply with Condition C22 of the EA. - AQP certifies that all contaminated sediment has been removed from all relevant dams that are not backfilled. - Retained water storage water quality for quality characteristics to be below the relevant trigger values for livestock drinking water (beef cattle) defined in Environmental Protection (Water) Policy 2009 Mackenzie River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Mackenzie River Sub-basin, September 2011, or the most recent version.
		Stable	Not exhibiting excessive erosion.	- All retained water storages achieve geotechnical safety and stability as assessed and approved by an AQP; - No evidence of erosion on the retained dam banks classified as 'moderate' or 'severe' as defined by Appendix 3 - Erosion classification framework.
		Able to sustain a final land use	Able to sustain periods of managed intermittent light grazing.	- infrastructure is agreed to be retained by the landholder as evidenced by a signed landholder agreement. - At least 3 palatable, perennial and productive (3P) native species - Land Suitability Class has been determined in accordance with the <i>Guidelines for Agricultural</i>

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				<i>Land Evaluation in Queensland (DSITI & DNRM 2015).</i> • Weed⁺ presence is a maximum of 10% of total vegetative groundcover confirmed by an AQP in annual monitoring. Weed management recommendations to be provided in annual reports. • for subsided areas, where required: ○ Shallow rip to infill surface cracks; ○ Excavate drainage channels to allow free drainage
Terrestrial ecosystem services (open woodland) with light grazing	Progressive certification area: Grasstree* and G5S [#] (approved 16 December 2020)	Long term safety	• Construct landforms that do not pose unacceptable hazards to humans, stock and wildlife.	• G5S: ≤20% of areas exceeding maximum slope of 34% Grasstree: ≤2.75% of areas exceeding a maximum slope of approximately 33%
		Non-polluting	• Maintain regional surface and ground water quality.	• Demonstrated that surface water and groundwater released are not inconsistent with background water quality
		Stable	• Demonstrate geotechnical and erosional stability. • Not exhibiting excessive erosion.	• G5S: demonstrated geotechnical stability as assessed by an AQP for areas exceeding 35% slope. • G5S and Grasstree: Progressive certification area is not actively eroding.
		Able to sustain a final land use	• Rehabilitated landform (including land cover and water) is suitable for providing Open	• No evidence of widespread vegetation dieback (i.e., dieback limited to isolated areas and temporary in nature). • Species richness and vegetation cover are similar to the species richness and vegetation cover at analogue sites.

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			Woodland to native fauna Achieve self-sustaining system that doesn't require additional maintenance except that of surrounding areas (e.g., weed and fire control via grazing/pastoral management, etc.).	
Terrestrial ecosystem services (open woodland) with light grazing	Progressive certification area: A5 Landform (2001 IDR Section) and A6 Landform (2009 IDR Section) (Approved 16 June 2022)^	Long term safety	Construct landforms that do not pose unacceptable hazards to humans, stock and wildlife.	- A5 Landform (2001 IDR): $\leq 1.5\%$ of areas exceeding maximum slope of 33% - A6 Landform (2009 IDR): $\leq 1.6\%$ of areas exceeding maximum slope of 33%
		Non-polluting	Maintain regional surface and ground water quality.	Safe pH/EC/sodium/turbidity/metal levels in water samples based on local applicable analogue systems and compliant with EA conditions
		Stable	- Demonstrate geotechnical and erosional stability. - Not exhibiting excessive erosion.	- Rill depth (≤ 0.3 m) or evidence of long-term stability. - Average slopes $< 33\%$
		Able to sustain a final land use	Rehabilitated landform (including land	$\geq 5\%$ average canopy cover across the certification areas.

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			cover and water) is suitable for providing Open Woodland to native fauna • Achieve self-sustaining system that doesn't require additional maintenance except that of surrounding areas (e.g., weed and fire control via grazing/pastoral management, etc.).	• At least four (4) native tree or shrub species across the certification areas. • Evidence of recruitment of native species over a representative climatic period, nominally five (5) years.
Grazing	Progressive certification area: A6 North Seismic Area (Approved 16 June 2022)^	Long term safety	• Any remaining infrastructure is safe or to be managed by future landholder.	• Does not pose a high risk to stock or humans as determined by a suitably qualified person and slopes $\leq 33\%$.
		Non-polluting	• Maintain regional surface and ground water quality.	• Safe pH, EC, sodium, turbidity, metal levels in water samples based on local applicable analogue systems and compliant with EA conditions.
		Stable	• Not exhibiting excessive erosion.	• Rill depth (≤ 0.3 m) or evidence of long-term stability.
		Able to sustain a final land use	• Able to sustain periods of managed	• > 70% of grass species and forb species of applicable analogue sites. • Grass cover > 70 % of applicable analogue site

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			intermittent light grazing.	- Herbage yield ≥ 70 % yield of applicable analogue site. - Land suitability class 4 or better. - Recovery of yield following disturbance based on applicable analogue sites (50 % of analogue site recovery).
Terrestrial ecosystem services (open woodland) with light grazing	Progressive certification area: G4 East (IDR) (Approved 29 June 2023) ^s	Long term safety	Construct landforms that do not pose unacceptable hazards to humans, stock and wildlife.	- Slopes are < 33 %. - IDR pre 2003 – for slopes > 33%, geotechnical assessment by a suitably qualified engineer to determine treatments required (if applicable) to ensure an adequate long-term factor of safety
		Non-polluting	Maintain regional surface and ground water quality.	Safe pH/EC/sodium/turbidity/metal levels in water samples based on local applicable analogue systems and compliant with EA conditions.
		Stable	- Demonstrate geotechnical and erosional stability. - Not exhibiting excessive erosion.	Rill depth (≤ 0.3 m) or evidence of long-term stability
		Able to sustain a final land use	- Rehabilitated landform (including land cover and water) is suitable for providing Open Woodland to native fauna - Achieve self-sustaining system that doesn't require	5% average canopy cover species across the rehabilitation area. - At least four native tree or shrub species across the rehabilitation area. - Evidence of recruitment of native species over a representative climatic period, nominally five years - Framework spp. remain following extreme weather events.

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			additional maintenance except that of surrounding areas (e.g., weed and fire control via grazing/pastoral management, etc.).	
Grazing	Progressive certification area: OC1 (Approved 29 June 2023) [#]	Long term safety	Any remaining infrastructure is safe or to be managed by future landholder.	Does not pose a high risk to stock or humans as determined by a suitably qualified person and Slopes ≤ 33 %
		Non-polluting	Maintain regional surface and ground water quality.	Safe pH, EC, sodium, turbidity, metal levels in water samples based on local applicable analogue systems and compliant with EA conditions.
		Stable	Not exhibiting excessive erosion.	Rill depth (≤ 0.3 m) or evidence of long-term stability.
		Able to sustain a final land use	Able to sustain periods of managed intermittent light grazing.	> 70% of grass species and forb species of applicable analogue sites. - Grass cover > 70 % of applicable analogue site - Herbage yield ≥ 70 % yield of applicable analogue site. - Land suitability class 4 or better. - Recovery of yield following disturbance based on applicable analogue sites (50 % of analogue site recovery).
Non-use management area (NUMA)	A3 East, G8, G9, Grasstree South, Grasstree West, Recovery and Son of Cattle.	Long term safety	Construct landforms that do not pose unacceptable hazards to	- No high walls are present in the landform. - Final void batter slopes are <21% on average across the residual void. - Warning signage and stock exclusion around void.

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			humans, stock and wildlife.	
		Non-polluting	Maintain regional surface and ground water quality.	- Very low spill risk. - Coal seams covered by backfill material in areas where seams not permanently inundated - Ongoing groundwater monitoring confirms the groundwater model's predictions that the A3 East, G8, and Son of Cattle voids will remain as groundwater sinks and that there is no risk of contaminant release to surface or groundwaters post-mining. - Ongoing groundwater monitoring confirms the groundwater model's predictions that there is low risk of contaminant release to surface or groundwaters post-mining from G9, Grasstree South, Grasstree West and Recovery voids. - Will not cause environmental harm outside of the tenure boundaries.
		Stable	- Demonstrate geotechnical stability. - Not exhibiting excessive erosion.	- Absence of active rill/gully erosion. - Geotechnical assessment to be undertaken by an AQP.

NOTE:

[#]as depicted in **Figure 2 – G5 progressive certification area**

^{*}as depicted in **Figure 3 – Grasstree progressive certification area**

[^]as depicted in **Figure 5: A5 Landform (2001 IDR Section), A6 Landform (2009 IDR Section) and A6 North Seismic certification area as approved 16 June 2022**

^s as depicted in **Figure 6: G4 East certification area**

[#]as depicted in **Figure 7:OC1 LW 22_25 certification area**

@https://environment.des.qld.gov.au/_data/assets/pdf_file/0031/89068/fitzroy_mackenzie_river_wqo_290911.pdf

⁺ Weeds are defined by the Biosecurity Act 2014.

Appendix 3 – Erosion classification framework*

Erosion classification**	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope	Loss of surface horizons, root exposure; moderate substantial soil deposits downslope
Rill / gully erosion**	≤0.4m deep Occasional rills/gullies	>0.4m to ≤ 1m deep Common rills/gullies	>1m deep Numerous rills/gullies forming corrugated ground surface
Tunnel erosion	Absent	Absence of significant tunnelling across landform	Presence of significant tunnelling across landform
Mass movement	Absent	Absent	Present

**the erosion classification framework is based on the 'Australian Soil and Land Survey Field Handbook' Third Edition. by the National Committee on Soil and Terrain (2009*

*** rip lines approximating contour are taken into account and are excluded from erosion features.*

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