

Permit

Environmental Protection Act 1994

Environmental Authority EPML00817713 Newlands Coal Mine

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

Environmental authority number: EPML00817713

Environmental authority takes effect on 6 May 2026

The anniversary date of this environmental authority is 28 February each year. The payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name(s)	Registered address
NC COAL COMPANY PTY LIMITED	Level 44 Gateway Building 1 Macquarie Place SYDNEY NSW 2000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 13: Mining black coal	ML4748, ML4754, ML4755, ML4761, ML4771, ML4774, ML10176, ML10316, ML10317, ML10322, ML10348, ML10352, ML10361, ML10362, ML70460
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)	
Ancillary 60 - Waste disposal 2: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(d) more than 10,000t but not more than 20,000t	
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (b-i) 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	

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).

Mobile and temporary activities

If you operate a mobile and temporary ERA, other than regulated waste transport, you are required to maintain a work diary. You must:

- use the approved form for a work diary (ESR/2015/1696);
- keep the work diary records for 2 years after the last entry;
- inform the administering authority within 7 days of the work diary being lost or stolen;
- record the information required in the work diary for each location within 1 day of leaving the location.

Contaminated land

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

- the presence of, or happening of an event involving, a hazardous contaminant on the land that is causing, or is reasonably likely to cause, serious or material environmental harm (notice must be given within 24 hours); or
- if the land is contaminated land – a change in the condition of the land that is causing, or is reasonably likely to cause, serious or material environmental harm (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 land (notice must be given within 20 business days).

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(1) of the EP Act, an EA has effect:

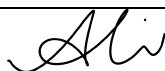
- (a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority—on the nominated day; or
- (b) if the authority states a day or an event for it to take effect—on the stated day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

However, in accordance with section 200(2) of the EP Act, the day that the EA takes effect may not be before:

- (a) if the authority is for a resource activity—the day the relevant tenure is granted to the applicant; or
- (b) if a development permit for a material change of use of premises under the *Planning Act 2016* is necessary for carrying out an activity that related to the authority—the day the development permit takes effect; or
- (c) if an SDA Approval under the *State Development and Public Works Organisation Act 1971* is necessary for carrying out an activity that relates to the authority—the day the approval takes 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.

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 EA.



Signature

6 May 2026

Date

Dr Alison Cummings

Department of the Environment, Tourism, Science and Innovation

Delegate of the administering authority

Environmental Protection Act 1994

Enquiries:

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Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this EA, 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 restore the environment (section 319C)
- 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 EP Act. 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 and Federal Government agencies prior to commencing any activity at the site. For example, this may include permits or approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access State controlled roads), the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (to clear vegetation), and the Department of Primary Industries (to clear marine plants or to obtain a quarry material allocation).

Obligations under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

Matters of national environmental significance (MNES) are regulated under the Commonwealth EPBC Act rather than under state legislation. You may need to submit a referral if your project potentially impacts any matters protected under the EPBC Act. For more information on self-assessments, and referral and assessment processes, please visit the Australian Government Department of Climate Change, Energy, the Environment and Water's website at www.dcceew.gov.au/environment/epbc/advice.

Obligations under the *Aboriginal Cultural Heritage Act 2003 and Torres Strait Islander Cultural Heritage Act 2003 (the Cultural Heritage Acts)*

The Cultural Heritage Acts require anyone who carries out a land-use activity to exercise a duty of care. This 'duty of care' means land users must take all reasonable and practicable measures to ensure their activity does not harm Aboriginal or Torres Strait Islander cultural heritage and applies to any activity where Aboriginal or Torres Strait Islander cultural heritage is located. For more information on your obligations under this legislation, please visit the Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism webpage at, www.dwatsipm.qld.gov.au.

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 – Waste Management

Schedule D – Noise

Schedule E – Groundwater

Schedule F – Water

Schedule G – Regulated Structures

Schedule H – Land and Rehabilitation

Schedule J – Sewage Treatment

Schedule K – Biodiversity

Appendix A – Watercourse Subsidence

Definitions

Figures

Schedule A: General	
Condition number	Condition
A1	Scope of activity This environmental authority authorises the mining of 15 million tonnes run of mine coal per annum (Mtpa).
A2	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.
A3	The environmental authority holder must: (a) Install all measures, plant, and equipment necessary to ensure compliance with the conditions of this environmental authority; (b) Maintain such measures, plant, and equipment in a proper and efficient condition; (c) Operate such measures, plant, and equipment in a proper and efficient manner; and (d) Ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.
A4	Monitoring and sampling All monitoring and sampling required by conditions of this environmental authority must be carried out, interpreted, and recorded by an appropriately qualified person.
A5	Plans, reports, and programs Any plans, reports or programs required by a condition of this environmental authority must be developed and reviewed by an appropriately qualified person.
A6	Record keeping Except where specified otherwise in another condition of this environmental authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.
A7	Upon request from the administering authority, copies of all records, plans and other documentation specifically required by the conditions of this environmental authority must be made available and provided to the administering authority within: (a) 10 business days; or (b) An alternative timeframe agreed between the administering authority and the environmental authority holder.

A8	Risk Management The environmental authority holder must develop and implement a risk management system for mining activities which aligns with the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management, within 3 months from date of issue of this environmental authority.
A9	Notification of emergencies, incidents and exceptions The environmental authority holder must notify the administering authority within 24 hours , after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this environmental authority.
A10	Within 10 business days following the notification under condition A9 , or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following: (a) Results and interpretation of any samples taken and analysed; (b) Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and (c) Proposed actions to prevent a recurrence of the emergency or incident.
A11	Complaints The environmental authority holder must record all environmental complaints received about the mining activities including: (a) Name, address and contact number for of the complainant; (b) Time and date of complaint; (c) Reasons for the complaint; (d) Investigations undertaken; (e) Conclusions formed; (f) Actions taken to resolve the complaint; (g) Any abatement measures implemented; and (h) Person responsible for resolving the complaint.

A12	When requested by the administering authority, the environmental authority holder must investigate any nuisance, or contaminant release, or environmental harm, or complaint under condition A11 that is neither frivolous nor vexatious in the opinion of the authorised person, by: (a) Undertaking the monitoring specified by the administering authority; (b) Undertaking the monitoring in the timeframe nominated or agreed to by the administering authority; (c) Completing an analysis and interpretation of the monitoring results; (d) Implementing abatement measures, where required; and (e) The results of the investigation must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.
A13	Third-party reporting The environmental authority holder must: (a) Obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority not exceeding 3 yearly intervals following July 2015; and (b) Provide each report to the administering authority within 90 days of its completion.
A14	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 environmental authority holder must: (a) Comply with the amended or changed standard, policy or guideline within 2 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 Table G1 – Transitional hydraulic performance requirements for existing structures, the time specified in condition G25; 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.

Schedule B – Air	
Condition number	Condition
B1	Dust and particulate matter must not exceed the following levels when measured at any sensitive or commercial place: (a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter – Gravimetric method; (b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, when monitored in accordance with the most recent version of either: (i) Australian Standard AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet – Gravimetric method; or (ii) Australian Standard AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 low volume sampler—Gravimetric method; (c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres (PM2.5) suspended in the atmosphere of 25 micrograms per cubic metre over a 24 hour averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.10 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM (sub)2.5(/sub) low volume sampler—Gravimetric method; and (d) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.3:2003 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method or using an alternative sampling methodology determined in consultation with the administering authority.
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 in accordance with conditions B1(a) and B1(c) at a location(s) and within a timeframe nominated by the administering authority, and the results must be submitted within 10 business days to the administering authority following completion of monitoring.

B3	If the monitoring, carried out in accordance with condition B2, indicates an exceedance of the relevant limits in condition B1, then the environmental authority holder must investigate whether the exceedance is due to emissions from the activity. If the mining activity is found to be the cause of the exceedance, then the environmental authority holder must immediately implement dust abatement measures so that emissions of dust from the activity do not result in further environmental nuisance.
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Schedule C –Waste management	
Condition number	Condition
C1	Waste Management Plan Waste, other than waste managed under condition C5, must be managed in accordance with the procedures contained within the Waste Management Plan, which must be developed and implemented for all stages of the authorised mining activities. The Waste Management Plan must: (a) Describe how the waste and resource management hierarchy set out by the <i>Waste Reduction and Recycling Act 2011</i> are recognised and applied; (b) Identify the waste streams for the project; (c) Nominate a program for the safe recycling or disposal of all wastes, including which reuse and recycling options are utilised; (d) Propose waste management control strategies that consider: (i) The type and source 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; and (vii) Disposal, reuse and recycling options; (e) Detail the hazardous characteristics of the waste generated (if any); (f) Cover a disposal procedure for hazardous waste; (g) Outline the process to be implemented to allow for continuous improvement of the Waste Management Plan; and (h) Cover a staff awareness and induction program with regard to the content of the Waste Management Program.
C2	Landfill General and regulated waste (other than tyres, which can be buried above the water table in pit and with location co-ordinates recorded) identified in the Waste Management Plan must only be disposed of into the waste disposal facility (landfill) on ML4748 or removed from site.
C3	Burning waste Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.

C4	The environmental authority holder may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause environmental harm at any sensitive place or commercial place.
C5	Tailings disposal Tailings must be managed in accordance with procedures contained within the Mineral Waste Management Plan which must be developed and implemented for all stages of the authorised mining activities. The Mineral Waste Management Plan must include provisions for: (a) Containment of tailings; (b) The management of seepage and leachates both during operation and the foreseeable future; (c) The control of fugitive emissions to air; (d) A program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings; (e) Maintaining records of the relative locations of any other waste stored within the tailings. (f) Rehabilitation strategy; and (g) Monitoring of rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of tailings, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.
C6	Acid sulphate soils Treat and manage acid sulphate soils in accordance with the latest edition of the Queensland Acid Sulfate Soil Technical Manual.

Schedule D – Noise	
Condition number	Condition
D1	Noise nuisance Noise from the mining activity must not cause an environmental nuisance, at any sensitive or commercial place.
D2	When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous or 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 14 days to the administering authority following completion of monitoring.
D3	All noise monitoring which is conducted as per condition D2 must be undertaken in accordance with the following noise monitoring requirements: (a) All noise monitoring must be conducted in accordance with the administering authority's most recent version of the <i>Noise Measurement Manual</i> (ESR/2016/2195), the relevant Australian Standard and the <i>Environmental Protection Regulation 2019</i> (Chapter 5, Part 4); (b) Source noise levels must be expressed as component noise levels for the purposes of comparison with noise limits; (c) All noise measurements must be taken using an appropriate sound level meter as classified under AS IEC 61672; and (d) Monitoring location(s) must be relevant to the matter(s) under investigation.
D4	If the environmental authority holder can provide evidence through monitoring that the limits defined in Table D1 – Noise Limits and Table D2 – Blasting noise limits, are not being exceeded then the environmental authority holder is not in breach of condition D1. Monitoring must include: (a) $L_{A, \max \text{ adj, T}}$; (b) Relevant background sound level; (c) The level and frequency of occurrence of impulsive or tonal noise; (d) Atmospheric conditions including wind speed and direction; and (e) Location, date and time of recording.

Schedule D – Noise

Condition number	Condition
D5	If monitoring indicates exceedance of the limits in Table D1 – Noise Limits and Table D2 – Blasting noise limits, 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.

Table D1 – Noise Limits

Noise level dB(A)	Monday to Sunday (including public holidays)		
	7am - 6pm	6pm - 10pm	10pm - 7am
	Noise measured at a 'sensitive or commercial place'		
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 + 5

*Note: Where "Background" means background sound pressure level measured in accordance with the latest edition of the administering authority's Noise Measurement Manual. **Table D1** does not purport to set operating hours for the mining activities.*

Table D2 – Blasting noise limits

Blasting noise limits	Sensitive or commercial blasting noise limits		
	Monday – Saturday 7am – 6pm	Sunday and Public Holidays 9am - 6pm	Other times
Airblast overpressure	115 dB (Linear) Peak for 4 out of 5 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time	115 dB (Linear) Peak for 4 out of 5 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time	No blasting impacts to occur
Ground vibration peak particle velocity	5mm/second peak particle velocity for 4 out of 5 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time	5mm/second peak particle velocity for 4 out of 5 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time	No blasting impacts to occur

Schedule D – Noise	
Condition number	Condition
D6	Vibration nuisance Vibration from the mining activity must not cause an environmental nuisance, at any sensitive place.
D7	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, at monitoring location(s) relevant to the matter(s) under investigation, and the results must be notified within 14 days to the administering authority following completion of monitoring.
D8	If the environmental authority holder can provide evidence through monitoring that the limits defined in Table D2 – Blasting noise limits, are not being exceeded then the environmental authority holder is not in breach of condition D6. Monitoring must include: (a) Peak particle velocity (mm/s); (b) Air blast overpressure level (dB linear peak); (c) Location of the blast/s within the mining area (including which bench level); (d) Atmospheric conditions including temperature, relative humidity and wind speed and direction; and (e) Location, date and time of recording.
D9	For the purposes of condition D6 the mining activities will not cause environmental nuisance where noise from the mining activities does not exceed the criteria specified in Table D2 – Blasting noise limits.
D10	If monitoring indicates exceedance of the limits in Table D2 – Blasting noise limits, 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.

Schedule E – Groundwater	
Condition number	Condition
E1	The environmental authority holder must not release contaminants to groundwater.
E2	All groundwater sampling and monitoring methods must be in accordance with the latest version of the administering authority's <i>Monitoring and Sampling Manual 2018</i> , unless otherwise approved by the administering authority.
E3	Annual groundwater monitoring data submission All groundwater quality monitoring data collected in accordance with the conditions of this environmental authority must be provided to the administering authority via WaTERS with each annual return.
E4	Groundwater quality Groundwater quality must be monitored: (a) At the locations specified in Table E1 – Groundwater monitoring locations and frequency and illustrated in Figure 1 – Newlands Coal Project Groundwater Bore Monitoring Locations; (b) At the frequencies specified in Table E1 – Groundwater monitoring locations and frequency; and (c) For the quality characteristics listed in Table E2 – Groundwater quality triggers.
E5	Results of monitoring of groundwater from compliance bores identified in Table E1 – Groundwater monitoring locations and frequency must not exceed any of the groundwater quality limits specified in Table E2 – Groundwater quality triggers on more than 3 consecutive monitoring occasions.
E6	If monitoring results from groundwater bores identified in Table E1 – Groundwater monitoring locations and frequency exceed any of the trigger values stated in Table E2 – Groundwater quality triggers on 3 consecutive monitoring occasions the environment authority holder must: (a) Notify the administering authority via WaTERS within 24 hours of becoming aware; and (b) Complete an investigation under condition E7.

E7	Exceedance Investigation - Groundwater quality Where groundwater from bores identified in Table E1 – Groundwater monitoring locations and frequency exceeds any of the trigger levels specified in Table E2 – Groundwater quality triggers on three (3) consecutive sampling occasions, the environmental authority holder must: (a) Complete an investigation to determine if the exceedance is the result of: i. Activities authorised under this environmental authority; or ii. Natural variation; or iii. Neighbouring land use resulting in groundwater impacts; and (b) Submit a report to the administering authority within 2) days of receiving the results.
E8	If the investigation under condition E7 determines that the exceedance was the result of activities authorised under this environmental authority, then a further investigation must be completed, and a report must be submitted to the administering authority within 28 days after submission of the exceedance investigation report under condition E7. The further investigation report must: (a) Determine the source, cause, and extent of contamination (environmental harm); and (b) Contain mitigation and management measures undertaken to address any groundwater contamination, and to prevent recurrence of groundwater contamination.
E9	By 30 June 2027, the environmental authority holder must provide to the administering authority a report that: (a) Provides a review of the increasing trends, for TPH (C10-C36) within Bore R3902W, and electrical conductivity within Bore SC9878; (b) Identify whether iron is a contaminant of concern for the site; (c) Proposes groundwater trigger values for all the bores having interim values in Table E2 – Groundwater quality triggers in accordance with the methods in DES 2021¹; and (d) Provides justification and raw data for the proposed trigger values
E10	Groundwater Standing Water Level (SWL) Groundwater SWL must be monitored: (a) At the locations specified in Table E1 – Groundwater monitoring locations and frequency and illustrated in Figure 1 – Newlands Coal Project Groundwater Bore Monitoring Locations; and (b) At the frequencies specified in Table E1 – Groundwater monitoring locations and frequency.
E11	Groundwater SWL when measured at the monitoring locations specified in Table E1 – Groundwater monitoring locations and frequency must not fall below the groundwater level triggers specified in Table E3 – Groundwater standing water level triggers.

E12	If the groundwater SWL measured at water level bores specified in Table E1 – Groundwater monitoring locations and frequency fall below the corresponding groundwater level triggers specified in Table E3 – Groundwater standing water level triggers, the environmental authority holder must: (a) Notify the administering authority via WaTERS within 24 hours of becoming aware; (b) Complete an investigation into the cause within 28 days; and (c) If the investigation carried out under part (b) determines that the mining activities are a potential cause or contributor to the exceedance: (i) Notify the administering authority via WaTERS within 24 hours of making the determination; and (ii) Within twenty-eight (28) days after notification of the exceedance submit a report detailing the actions taken to ensure compliance with condition E10 of this environmental authority.
E13	Annual Groundwater Monitoring Report (AGMR) An annual groundwater monitoring report must be completed and submitted with each annual return. It must include: (a) A review of all the groundwater quality and SWL data of all groundwater bores listed within Table E1 – Groundwater monitoring locations and frequency; (b) An assessment of groundwater quality and SWL trends for all data from all groundwater bores listed in Table E1 – Groundwater monitoring locations and frequency; (c) An assessment of any impacts on groundwater quality and level due to the mining activities; and (d) Review of ongoing adequacy of the monitoring network and propose replacement bores (if required) where bores have been removed as part of mining activities.
E14	Bore construction, maintenance and decommissioning The construction, maintenance and management of groundwater bores (including groundwater monitoring bores) must be undertaken in a manner that: (a) Prevents contaminants entering the groundwater; (b) Ensures representative groundwater samples from the target hydrogeological unit/s; and (c) Maintains the hydrogeological environment within the hydrogeological unit.

¹ DES (2021) Using monitoring data to assess groundwater quality and potential environmental impacts. Version 2. Department of Environment and Science (DES), Queensland Government, Brisbane.

Table E1 – Groundwater monitoring locations and frequency

Bore	Location		Hydro stratigraphical unit	Ground level Elevation(mAHD)	Screen depth (mBGL)	Monitoring frequency
	Latitude	Longitude				
MB02	-21.24564	147.87753	Regolith	300.8	20-28	Quarterly
MB03	-21.18161	147.87754	Regolith	283.487	30-42	
MB05	-21.28126	147.93865	Regolith	327.2	29-41	
R3891W	-21.23057	147.95855	Regolith	315.489	106-118	
Terrill's Bore ¹	-21.31098	147.88829	Regolith	302.532	54.1-68.9	
					77.7-89.5	
R3906W	-21.13989	147.90291	Regolith/Basalt	223.635	14-33	
SW8896W	-21.4079	147.96845	Regolith/Basalt	334.44 ²	31-36	
E2106W	-21.22874	148.01593	Triassic Rewan Group (TRG)	352.003	46 - 57	
R3900W	-21.23996	147.94738	Triassic Rewan Group (TRG)	306.143	30 - 50	
R3902W	-21.17209	147.90961	Triassic Rewan Group (TRG)	250.589	30 - 42	
MB06	-21.25183	148.0413	Triassic Rewan Group (TRG)	384.7	36 - 48	
MB07	-21.23786	148.04571	Triassic Rewan Group (TRG)	382.189	36 - 42	
MB08 ³	-21.19765	148.03821	Triassic Rewan Group (TRG)	292.4	38 - 44	
MB09	-21.1384	148.02677	Triassic Rewan Group (TRG)	247.667	33 - 39	
SC9906W	-21.35245	147.9628	Triassic Rewan Group (TRG)	322.1 ²	20 - 66	
R3890W	-21.14969	147.91221	Triassic Rewan Group (TRG)	239.894	56 - 67	
MB04	-21.15114	147.95902	Rangal Coal Measures (RCM)	251.28	36 - 40	
MB10	-21.10173	147.98712	Rangal Coal Measures (RCM)	239.9	35 - 41	
E2104W	-21.16072	148.01248	Rangal Coal Measures (RCM)	289.483	65 - 68	
E2105W	-21.17879	148.00831	Rangal Coal Measures (RCM)	329.83	45.9 - 57.9	
SC9904W	-21.38383	147.90898	FCCM & Interburden	296.32	46 - 54	
SC9908W	-21.33258	147.87462	Fort Cooper Coal Measures (FCCM)	302.43 ²	80 - 96	
SC9878	-21.38131	147.88939	Moranbah Coal Measures (MCM) Interburden	295.043	39.8 - 50.8	
SC9874	-21.36999	147.86211	Exmoor Formation	295.42 ²	128 - 154	
SC9905W	-21.38032	147.86806	Exmoor Formation	285.551	40-56	

¹Installed with two screens to target different depths within the same aquifer

²LIDAR 2023 surface RL

³Monitored only for groundwater quality parameters

Table E2 – Groundwater quality triggers

Investigation trigger levels for bores															
Monitoring Bores		MB02	MB03	MB05	R3891W	Terrill's Bore	E2106W	R3900W	R3902W	MB09	MB08	MB07	MB06	SC9906W	R3890W
Geology Screened		Regolith					TRG								
Quality Characteristics	Units														
pH (lab)	pH Units	6.5-8.5 ¹													
Electrical Conductivity (lab)	µS/cm	1320 ²	3740 ²	2390 ²	1220 ²	8430 ²	2020 ²	32450 ²	3490 ²	4850 ²	5850 ²	2115 ²	824 ²	3405 ²	2650 ²
Sulphate	mg/L	6 ²	43 ²	22 ²	39 ²	268 ²	35 ²	292 ²	236 ²	24 ²	3 ²	24 ²	54 ²	113 ²	58 ²
Ammonia	mg/L	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}
Nitrate	mg/L	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}
Aluminium	mg/L	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}
Antimony	mg/L	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³
Arsenic	mg/L	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³
Boron	mg/L	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}
Cadmium	mg/L	0.0002 ^{3,4}	0.0002 ^{3,4}	0.0002 ^{3,4}	0.0002 ^{3,4}	0.0002 ^{3,4}	0.0004 ^{2,4}	0.001 ^{2,4}	0.0002 ^{3,4}	0.0005 ^{5,4}	0.0005 ^{5,4}	0.0005 ^{5,4}	0.0005 ^{5,4}	0.0006 ^{3,4}	0.0002 ^{3,4}
Chromium (CrVI)	mg/L	0.002 ^{5,4}	0.002 ^{5,4}	0.002 ^{5,4}	0.002 ^{2,4}	0.002 ^{5,4}	0.005 ^{2,4}	0.01 ^{2,4}	0.002 ^{2,4}	0.005 ^{5,4}	0.005 ^{5,4}	0.005 ^{5,4}	0.005 ^{5,4}	0.002 ^{2,4}	0.002 ^{2,4}
Copper	mg/L	0.002 ^{5,4}	0.002 ^{5,4}	0.002 ^{5,4}	0.002 ^{2,4}	0.002 ^{5,4}	0.0037 ^{2,4}	0.01 ^{2,4}	0.004 ^{2,4}	0.007 ^{5,4}	0.007 ^{5,4}	0.007 ^{5,4}	0.007 ^{5,4}	0.0014 ^{3,4}	0.003 ^{2,4}
Iron	mg/L	For interpretative purposes													
Lead	mg/L	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.01 ^{2,4}	0.0034 ^{3,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.0034 ^{3,4}	0.0034 ^{3,4}
Manganese	mg/L	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	3.08 ^{2,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}
Mercury	mg/L	0.0001 ^{5,4}	0.0001 ^{5,4}	0.0001 ^{5,4}	0.0001 ^{2,4}	0.0001 ^{5,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{5,4}	0.0001 ^{5,4}	0.0001 ^{5,4}	0.0001 ^{5,4}	0.0001 ^{2,4}	0.0001 ^{2,4}
Molybdenum	mg/L	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³
Nickel	mg/L	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}

Table E2 – Groundwater quality triggers (Cont.)

Monitoring Bores		MB02	MB03	MB05	R3891W	Terrill's Bore	E2106W	R3900W	R3902W	MB09	MB08	MB07	MB06	SC9906W	R3890W
Geology Screened		Regolith					TRG								
Quality Characteristics	Units														
Selenium	mg/L	0.005 ³	0.005 ^{3,4}	0.005 ³	0.01 ²	0.005 ³	0.01 ²	0.025 ²	0.01 ²	0.005 ³	0.005 ³	0.005 ³	0.005 ³	0.01 ²	0.01 ²
Silver	mg/L	0.0005 ²	0.0005 ²	0.0005 ²	0.01 ²	0.0005 ²	0.001 ²	0.01 ²	0.01 ²	0.0005 ²	0.0005 ²	0.0005 ²	0.0005 ²	0.005 ²	0.01 ²
Uranium	mg/L	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}
Vanadium	mg/L	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{2,4}	0.01 ^{5,4}	0.01 ^{2,4}	0.018 ^{2,4}	0.01 ^{2,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{2,4}	0.01 ^{2,4}
Zinc	mg/L	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{5,4}	0.010 ^{2,4}	0.01 ^{5,4}	0.027 ^{2,4}	0.051 ^{2,4}	0.03 ^{2,4}	0.02 ^{5,4}	0.02 ^{5,4}	0.02 ^{5,4}	0.02 ^{5,4}	0.01 ^{2,4}	0.014 ^{2,4}
TPH (C6-C9)	µg/L	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶
TPH (C10-C36)	µg/L	100 ⁶	100 ⁶	100 ⁶	100 ⁶	100 ⁶	100 ⁶	100 ⁶	100 ^{6,4}	100 ⁶	100 ⁶	100 ⁶	100 ⁶	100 ⁶	100 ⁶
Major ions	mg/L	Calcium, Chloride, Magnesium, Sodium, Potassium, Carbonate, and Bicarbonate- monitored for interpretative purposes													

Table E2 – Groundwater quality triggers (Cont.)

Investigation trigger level for bores												
Monitoring Bores		MB10	MB04	E2104W	E2105W	SC9904W	SC9908W	SC9878	SC9874	SC9905W	R3906W	SW8896W
Geology Screened		RCM				FCCM interburden	FCCM	MCM Interburden	Exmoor Formation	Regolith/Basalt		
Quality Characteristics	Units											
pH (lab)	pH Units	6.5-8.5 ¹										
Electrical Conductivity (lab)	µS/cm	2270 ²	6965 ²	2970 ²	2780 ²	16,400 ²	21000 ²	13250 ^{2,4}	16790 ²	10300 ²	5235 ²	3284 ²
Sulphate	mg/L	42 ²	16 ²	8.1 ²	26 ²	140 ²	239 ²	135 ²	592 ²	343 ²	307 ²	125 ²
Ammonia	mg/L	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	0.9 ^{3,4}	1.3 ^{2,4}	0.9 ^{3,4}
Nitrate	mg/L	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}	3.5 ^{2,4}	2.4 ^{3,4}	2.4 ^{3,4}	2.4 ^{3,4}
Aluminium	mg/L	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.055 ^{3,4}	0.058 ^{3,4}
Antimony	mg/L	0.009 ³	0.009 ³	0.009 ³	0.01 ²	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³	0.009 ³
Arsenic	mg/L	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³	0.013 ³
Boron	mg/L	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}	1.28 ^{2,4}	0.94 ^{3,4}	0.94 ^{3,4}	0.94 ^{3,4}
Cadmium	mg/L	0.0002 ^{3,4}	0.0002 ^{3,4}	0.0004 ^{2,4}	0.0002 ^{3,4}	0.0002 ^{3,4}	0.0007 ^{2,4}	0.0006 ^{2,4}	0.007 ^{2,4}	0.0005 ^{2,4}	0.0002 ^{3,4}	0.0002 ^{3,4}
Chromium (CrVI)	mg/L	0.005 ^{5,4}	0.005 ^{5,4}	0.005 ^{2,4}	0.006 ^{2,4}	0.006 ^{2,4}	0.008 ^{2,4}	0.007 ^{2,4}	0.005 ^{2,4}	0.004 ^{2,4}	0.003 ^{2,4}	0.005 ^{2,4}
Copper	mg/L	0.003 ^{5,4}	0.003 ^{5,4}	0.003 ^{2,4}	0.008 ^{2,4}	0.028 ^{2,4}	0.006 ^{2,4}	0.002 ^{2,4}	0.002 ^{2,4}	0.010 ^{2,4}	0.082 ^{2,4}	0.002 ^{2,4}
Iron	mg/L	Iron is monitored for interpretative purposes										
Lead	mg/L	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}	0.0034 ^{3,4}
Manganese	mg/L	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}	1.9 ^{3,4}
Mercury	mg/L	0.0001 ^{5,4}	0.0001 ^{5,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}	0.0001 ^{2,4}
Molybdenum	mg/L	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³	0.034 ³
Nickel	mg/L	0.11 ^{3,4}	0.11 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.011 ^{3,4}	0.11 ^{3,4}	0.11 ^{3,4}

Table E2 – Groundwater quality triggers (Cont.)

Investigation trigger level for bores												
Monitoring Bores		MB10	MB04	E2104W	E2105W	SC9904W	SC9908W	SC9878	SC9874	SC9905W	R3906W	SW8896W
Geology Screened		RCM				FCCM Interburden	FCCM	MCM Interburden	Exmoor Formation		Regolith/Basalt	
Quality Characteristics	Units											
Selenium	mg/L	0.005 ³	0.005 ³	0.01 ²	0.01 ²	0.01 ²	0.02 ²	0.01 ²	0.01 ²	0.01 ²	0.005 ³	0.005 ^{2,4}
Silver	mg/L	0.0005 ³	0.0005 ³	0.01 ³	0.01 ³	0.01 ²	0.005 ²	0.005 ²	0.002 ²	0.009 ²	0.0005 ²	0.0005 ²
Uranium	mg/L	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}	0.0005 ^{3,4}
Vanadium	mg/L	0.01 ^{5,4}	0.01 ^{5,4}	0.01 ^{2,4}	0.01 ^{2,4}	0.01 ^{2,4}	0.01 ^{2,4}	0.02 ^{2,4}	0.01 ^{2,4}	0.01 ^{2,4}	0.01 ^{2,4}	0.04 ^{2,4}
Zinc	mg/L	0.018 ^{5,4}	0.018 ^{5,4}	0.021 ^{2,4}	0.094 ^{2,4}	0.02 ^{2,4}	0.060 ^{2,4}	0.008 ^{3,4}	0.02 ^{2,4}	0.026 ^{2,4}	0.152 ^{2,4}	0.08 ^{5,4}
TPH (C6-C9)	µg/L	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶	20 ⁶
TPH (C10-C36)	µg/L	100 ⁶	100 ⁶	100 ⁶	100 ⁶	395 ²	208 ²	100 ⁶	100 ⁶	189 ²	100 ⁶	100 ⁶
Major ions	mg/L	Calcium, Chloride, Magnesium, Sodium, Potassium, Carbonate, and Bicarbonate are monitored for interpretative purposes										

Notes:

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

¹Site specific 80th and 20th percentile based on data from December 2008- November 2024.

²Bore specific 95th percentile based on data from December 2008- November 2024.

³ANZG values for 95% aquatic ecosystem protection.

⁴Interim triggers due to insufficient data, increasing trend or insufficient contemporary data. These must be updated as per condition E9.

⁵Aquifer specific 95th percentile.

⁶LOR of the typical analytical method.

Table E3 – Groundwater standing water level triggers

Bore	Hydro stratigraphical unit	Casing Height (TOC)(m)	Screen depth (mBGL)	Ground level Elevation (mAHD)	Groundwater level triggers (mAHD)
MB02	Regolith	0.68	20-28	300.8	290.16
MB03	Regolith	0.695	30-42	283.487	262.082
MB05	Regolith	0.95	29-41	327.2	304.15
R3891W	Regolith	0.42	106-118	315.489	288.409
Terrill's Bore	Regolith	0.79	54.1-68.9	302.532	266.422
			77.7-89.5		
R3906W	Regolith/Basalt	0.57	14-33	223.635	211.805
SW8896W	Regolith/Basalt	0.56	31-36	334.44 ²	315.1
E2106W	TRG	0.3	46 - 57	352.003	334.963
R3900W	TRG	0.29	30 - 50	306.143	284.033
R3902W	TRG	0.565	30 - 42	250.589	226.664
MB06	TRG	0.86	36 - 48	384.7	367.61
MB07	TRG	0.955	36 - 42	382.189	362.744
MB09	TRG	0.817	33 - 39	247.667	240.424
SC9906W	TRG	0.5 ¹	20 - 66	322.1 ²	288.2
R3890W	TRG	0.445	56 - 67	239.894	210.539
MB04	RCM	0.8	36 - 40	251.28	237.58
MB10	RCM	0.795	35 - 41	239.9	208.695
E2104W	RCM	0.355	65 – 68	289.483	273.308
E2105W	RCM	0.3	45.9 - 57.9	329.83	301.33
SC9904W	FCCM & Interburden	0.33	46 - 54	296.32	271.83
SC9908W	FCCM	0.5 ¹	80 – 96	302.43 ²	2m/year
SC9878	MCM Interburden	0.5	39.8 – 50.8	295.043	271.113
SC9874	Exmoor Formation	0.5 ¹	128 - 154	295.42 ²	2m/year
SC9905W	Exmoor Formation	0.28	40-56	285.551	268.631

¹Assumed TOC measurement provided to the department on 9 April 2025, due to limited access.

²LIDAR 2023 surface RL

Schedule F – Water	
Condition number	Condition
F1	Contaminant release Contaminants that will, or have the potential to, cause environmental harm must not be released directly or indirectly to any waters as a result of the authorised mining activities, except as permitted under the conditions of this environmental authority.
F2	All water sampling and monitoring methods must be in accordance with the latest version of the administering authority's <i>Monitoring and Sampling Manual 2018</i>, unless otherwise approved by the administering authority.
F3	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 F1 – Mine affected water release points, sources and receiving waters and depicted in Figure 2 – Newlands Coal Project Release Point Locations attached to this environmental authority.
F4	The release of mine affected water to internal water management infrastructure installed and operated in accordance with a water management plan that complies with condition F26 is permitted.
F5	The release of mine affected water to waters from the release points must be monitored at the locations specified in Table F1 – Mine affected water release points, sources and receiving waters for each quality characteristic and at the frequency specified in Table F2 – Release contaminant trigger investigation levels, potential contaminants. <i>Note: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition F5 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 F1 – Mine affected water release points, sources and receiving waters

Release Point (RP)	Latitude (GDA2020)	Longitude (GDA2020)	Mine Affected Water Source and Location	Monitoring Point	Receiving waters description
DP1	-21.175897	147.89209	Ramp 14 Evap Pond	At end of pipe	Overflow Creek
DP2	-21.148424	147.90192	Ramp 8 Mine Void	At end of pipe/pump	Cerito Creek
DP3	-21.194645	148.004895	Ramps 9 & 10 Mine Void	Darren's Dam Spillway	Wilson Creek
DP6	-21.211026	147.914586	Ramp 4 Mine Void	At discharge pipe	Cerito Creek
DP8	-21.196436	147.908999	Ramp 6 Mine Void	At discharge pipe	Cerito Creek
DP9	-21.26263	147.907688	Highwall of Ramp 1 Mine Void	At end of pipe/pump	Cerito Creek
DP10	-21.233	147.894	Lake Austin	At pontoon pump	Overflow Creek
DP11	-21.191342	147.890286	CHPP Anti-Pollution Pond	At spillway	Overflow Creek
DP14A / 14B	-21.209719	147.918546	Levee 5	At spillway (14A) At end of pipe (14B)	Cerito Creek
DP18	-21.36325	147.940704	Banrock C Mine Void	At end of pipe/pump	Suttor Creek
DP19	-21.355508	147.919284	Dirty Water Dam	At end of pipe	Suttor Creek
DP20	-21.34213	147.929848	Banrock A Evaporation Dam	At outflow spillway	Suttor Creek
DP23	-21.371484	147.926869	Ramp 17 Mine Void	At end of pipe	Suttor Creek
DP24	-21.370244	147.894641	Wollombi East Drain Sediment Dam	At end of pipe	Suttor Creek
DP26	-21.404171	147.926347	Somerled Sediment Dam	At end of pipe	Boundary Creek
DP29	-21.189322	148.038273	Ramp 12 Discharge Dam	At end of pipe	Eastern Creek
DP30	-21.18781	148.012328	R9 North End Wall	At end of pipe	Wilson Creek
DP32	-21.3781	147.9397	Saddlers Pit	At end of pipe	Suttor Creek
DP33	-21.364352	147.923797	Ramp 15 Mine Void	At end of pipe	Suttor Creek
DP34*	-21.204385	148.034502	Ramp 10	At discharge location	Eastern Creek

*Denotes proposed water release points. To be updated.

Table F2 – Release contaminant trigger investigation levels, potential contaminants

Quality Characteristic	Trigger Levels (µg/L)	Comment on Trigger Level	Monitoring Frequency
Aluminium	138	80% upstream background levels	Commencement of release and thereafter weekly during release
Cadmium	0.2	For aquatic ecosystem protection, based on SMD guideline	
Chromium	1	For aquatic ecosystem protection, based on SMD guideline	
Copper	3	For aquatic ecosystem protection, based on LOR for ICPMS	
Iron	280	80% established background levels	
Lead	4	For aquatic ecosystem protection, based on SMD guideline	
Nickel	11	For aquatic ecosystem protection, based on SMD guideline	
Zinc	8	80% established background levels	
Boron	370	For aquatic ecosystem protection, based on SMD guideline	
Manganese	1900	For aquatic ecosystem protection, based on SMD guideline	
Molybdenum	34	For aquatic ecosystem protection, based on low reliability guideline	
Uranium	2	80% established background levels	
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 (C6-C9)	20	For aquatic ecosystem protection, based on LOR for Lab Analysis	
Petroleum hydrocarbons (C10-C36)	100	For aquatic ecosystem protection, based on LOR for Lab Analysis	
Sodium (mg/L)	210	80% established background levels	

Notes:

- (a) All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
- (b) The quality characteristics required to be monitored as per **Table F2 – Release contaminant trigger investigation levels, potential contaminants** 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 F2 – Release contaminant trigger investigation levels, potential contaminants** by amendment.
- (c) SMD – slightly moderately disturbed level of protection, guideline refers ANZECC & ARMCANZ (2000).
- (d) LOR – typical reporting for method stated. ICPMS/CV FIMS – analytical method required to achieve LOR.

Schedule F – Water	
Condition number	Condition
F6	If quality characteristics of the release exceed any of the trigger levels specified in Table F2 – Release contaminant trigger investigation levels, potential contaminants during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in Table F2 – Release contaminant trigger investigation levels, potential contaminants and: (a) Where the trigger values are not exceeded then no action is to be taken; or (b) Where the downstream results exceed the trigger values specified Table F2 – Release contaminant trigger investigation levels, potential contaminants for any quality characteristic, compare the results of the downstream site to the data from background monitoring sites and: (i) If the result is less than the background monitoring site data, then no action is to be taken; or (ii) 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 within 90 days of receiving the result, outlining: (A) Details of the investigations carried out; and (B) Actions taken to prevent environmental harm. <i>Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with condition F6(b)(ii), no further reporting is required for subsequent trigger events for that quality characteristic.</i>
F7	If an exceedance in accordance with condition F6(b)(ii) is identified, the environmental authority holder must notify the administering authority in writing within 24 hours of receiving the result.
F8	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 F3 – Mine affected water release during flow events.

Schedule F – Water	
Condition number	Condition
F9	Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with condition F3 must only take place during periods of natural flow in accordance with the receiving water flow criteria for discharge specified in Table F3 – Mine affected water release during flow events for the release point(s) specified in Table F1 – Mine affected water release points, sources and receiving waters .
F10	The release of mine affected water to waters in accordance with condition F3 must not exceed the Maximum Release Rate (for all combined release point flows) for each receiving water flow criterion for discharge specified in Table F3 – Mine affected water release during flow events when measured at the monitoring points specified in Table F1 – Mine affected water release points, sources and receiving waters .
F11	If the release limits defined in Table F3 – Mine affected water release during flow events is exceeded, then the environmental authority holder must immediately cease the release of mine affected water.
F12	The daily quantity of mine affected water release from each release point must be measured and recorded.
F13	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 F3 – Mine affected water release during flow events

Kangaroo Creek Discharge Criteria

SCENARIO	FLOW RATES		END OF PIPE (For All Kangaroo Creek Receiving Point Flow Scenarios)					RECEIVING WATER QUALITY LIMITS					
	RECEIVING WATER FLOW RATE AT WQS5	END OF PIPE MAX. RELEASE RATE (Combined)	END OF PIPE WATER QUALITY (WQ) RELEASE LIMITS: (DP1, DP2, DP3, DP6, DP8, DP9, DP10, DP11, DP14A, DP14B, DP30, DP35, DP37, DP38, DP40)				RELEASE TRIGGER LIMITS (End of Pipe)	Receiving Water Contaminant Trigger Levels					ASSIMILATION TRIGGER LIMIT - At Bowen River (FSS18)
	m ³ /s	m ³ /s	EC (µS/cm)	pH	Turbidity (NTU)	Sulphate (mg/l)		EC (µS/cm)	pH	Turbidity (NTU)	Sulphate (mg/l)	Sodium (mg/l)	
	Sample Frequency		DAILY ²	DAILY ²	DAILY ²	DAILY ²	Weekly During Release	Daily During Release			Weekly During Release		Weekly During Release
Low Flow	For a period of 28 days after natural flow event that exceeds 1.0 m ³ /s	0.5	2500	Min. - 6.5 Max. - 9.2	600	500	Not Applicable	2900	Min. - 6.5 Max. - 9.0	400	500	N/A	EC - FSS17 + 200µS/cm at FSS18
Medium Flow	0.5 - 2m ³ /s	0.75	3000	Min. - 6.5 Max. - 9.2	600	500	Table F2 ²	2400	Min. - 6.5 Max. - 9.0	400	500	180	Not Required
	0.5 - 2m ³ /s	0.45	4000		600	750		2400					
High Flow	2-6m ³ /s	0.9	4000	Min. - 6.5 Max. - 9.2	600	750	Table F2 ²	2000	Min. - 6.5 Max. - 9.0	400	500	180	Not Required
	2-6m ³ /s	0.6	5500		600	1000		2000					
Very High Flow	6-12m ³ /s	1.4	4500	Min. - 6.5 Max. - 9.2	600	750	Table F2 ²	1850	Min. - 6.5 Max. - 9.0	400	250	180	Not Required
	6-12m ³ /s	1	6500		600	1000		1850					
Flood Event	12-30m ³ /s	3	4500	Min. - 6.5 Max. - 9.2	600	750	Table F2 ²	1850	Min. - 6.5 Max. - 9.0	400	250	180	Not Required
	12-30m ³ /s	2	6500		600	1000		1850					
Extreme Flood	>30m ³ /s	7	4500	Min. - 6.5 Max. - 9.2	600	750	Table F2 ²	1850	Min. - 6.5 Max. - 9.0	400	250	180	Not Required
	>30m ³ /s	5	6500		600	1000		1850					

Table F3 Cont. – Mine affected water release during flow events

Eastern Creek Discharge Criteria

SCENARIO	FLOW RATES		END OF PIPE (For All Eastern Creek Receiving Point Flow Scenarios)					RECEIVING WATER QUALITY LIMITS -					
	RECEIVING WATER FLOW RATE AT WQS9	END OF PIPE MAX. RELEASE RATE (Combined)	END OF PIPE WATER QUALITY (WQ) RELEASE LIMITS: (DP29, DP34, DP36, DP39)				RELEASE TRIGGER LIMITS (End of Pipe)	Receiving Water Contaminant Trigger Levels					ASSIMILATION TRIGGER LIMIT - At Bowen River (FSS18)
	m ³ /s	m ³ /s	EC (µS/cm)	pH	Turbidity (NTU)	Sulphate (mg/l)		EC (µS/cm)	pH	Turbidity (NTU)	Sulphate (mg/l)	Sodium (mg/l)	
	Sample Frequency		DAILY ²	DAILY ²	DAILY ²	DAILY ²	Weekly During Release	Daily During Release			Weekly During Release		Weekly During Release
Low Flow	For a period of 28 days after natural flow event that exceeds 1.0 m ³ /s	0.5	2500	Min.- 6.5 Max.- 9.2	600	500	Not Applicable	2900	Min.- 6.5 Max.- 9.0	400	500	N/A	EC - FSS17 + 200µS/cm at FSS18
Medium Flow	0.5 - 2m ³ /s	0.5	3000	Min.- 6.5 Max.- 9.2	600	500	Table F2 ²	2400	Min.- 6.5 Max.- 9.0	400	500	180	Not Required
	0.5 - 2m ³ /s.	0.33	4000		600	750		2400					
High Flow	2-6m ³ /s	0.75	4000	Min.- 6.5 Max.- 9.2	600	750	Table F2 ²	2000	Min.- 6.5 Max.- 9.0	400	500	180	Not Required
	2-6m ³ /s	0.5	5500		600	1000		2000					
Very High Flow	6-12m ³ /s	1.4	4500	Min.- 6.5 Max.- 9.2	600	750	Table F2 ²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	6-12m ³ /s	1	6500		600	1000		1850					
Flood Event	12-30m ³ /s	3	4500	Min.- 6.5 Max.- 9.2	600	750	Table F2 ²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	12-30m ³ /s	2	6500		600	1000		1850					
Extreme Flood	>30m ³ /s	7	4500	Min.- 6.5 Max.- 9.2	600	750	Table F2 ²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	>30m ³ /s	5	6500		600	1000		1850					

Table F3 Cont. – Mine affected water release during flow events

Suttor Creek Discharge Criteria

SCENARIO	FLOW RATES		END OF PIPE (For All Suttor Creek Receiving Point Flow Scenarios)					RECEIVING WATER QUALITY LIMITS -					
	RECEIVING WATER FLOW RATE AT WQS4	END OF PIPE MAX. RELEASE RATE (Combined)	END OF PIPE WATER QUALITY RELEASE LIMITS: (DP18, DP19, DP20, DP23, DP24, DP26, DP32, DP33)				RELEASE TRIGGER LIMITS (End of Pipe)	Receiving Water Contaminant Trigger Levels					ASSIMILATION TRIGGER LIMIT - At Suttor River (FSS16)
	m³/s	m³/s	EC (µS/cm)	pH	Turbidity (NTU)	Sulphate (mg/l)		EC (µS/cm)	pH	Turbidity (NTU)	Sulphate (mg/l)	Sodium (mg/l)	
	Sample Frequency		DAILY²	DAILY²	DAILY²	DAILY²	Weekly During Release	Daily During Release		Weekly During Release		Weekly During Release	
Low Flow	For a period of 28 days after natural flow event that exceeds 1.0 m³/s.	0.5	2500	Min.- 6.5 Max.- 9.2	600	500	Not Applicable	2400	Min. - 6.5 Max. - 9.0	400	500	N/A	EC - WQS3 + 200uS/cm at FSS16
Medium Flow	1.0 - 3m³/s	0.73	3000	Min.- 6.5 Max.- 9.2	600	500	Table F2²	2000	Min.- 6.5 Max.- 9.0	400	500	180	Not Required
	1.0 - 3m³/s	0.5	4000		600	750		2000					
High Flow	3-10m³/s	0.9	4000	Min.- 6.5 Max.- 9.2	600	750	Table F2²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	3-10m³/s	0.66	5500		600	1000		1850					
Very High Flow	10-20m³/s	2.4	4500	Min.- 6.5 Max.- 9.2	600	750	Table F2²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	10-20m³/s	1.76	6500		600	1000		1850					
Flood Event	20-50m³/s	4.8	4500	Min.- 6.5 Max.- 9.2	600	750	Table F2²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	20-50m³/s	3.2	6500		600	1000		1850					
Extreme Flood	>50m³/s	10.17	4500	Min.- 6.5 Max.- 9.2	600	750	Table F2²	1850	Min.- 6.5 Max.- 9.0	400	250	180	Not Required
	>50m³/s	7.04	6500		600	1000		1850					

¹ Flow triggers should be compared to natural flow only. Where stream flow measurements are obtained downstream of the discharges for WQS5, WQS9 and WQS4, the discharge rates should be subtracted from the stream flow measurements before comparing to the stream flow trigger.

² Upon commencement of release of mine water, the first sample must be collected within 4 hours of initial discharge to the receiving environment.

Schedule F – Water	
Condition number	Condition
F14	Notification of release event The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after commencing to release mine affected water to the receiving environment. Notification must include the submission of written advice to the administering authority of the following information: (a) Release commencement date/time; (b) Details regarding the compliance of the release with the conditions of Schedule F – Water of this environmental authority (that is, contaminant limits, natural flow, discharge volume); (c) Release point/s; (d) Release rate; (e) Release salinity; and (f) Receiving water/s including the natural flow rate.
F15	The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after cessation of a release event of the cessation of a release notified under condition F14 and within 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 Schedule F – Water of this environmental authority (i.e. contaminant 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 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 F14 and F15, provided the relevant details of the release are included within the notification provided in accordance with conditions F14 and F15.</i>
F16	Notification of release event exceedance If the release limits defined in Table F3 – Mine affected water release during flow events are exceeded, the environmental authority holder must notify the administering authority in writing within 24 hours of receiving the results.

F17	The environmental authority holder must, within twenty-eight (28) days of a release that is not compliant with the conditions of this environmental authority, provide a report to the administering authority detailing: (a) The reason for the release; (b) The location of the release; (c) The total volume of the release and which (if any) part of this volume was non-compliant; (d) The total duration of the release and which (if any) part of this period was non-compliant; (e) All water quality monitoring results (including all laboratory analyses); (f) Identification of any environmental harm as a result of the non-compliance; (g) All calculations; and (h) Any other matters pertinent to the water release event.
F18	Monitoring of water storage quality Water storages stated in Table F4 – Water storage monitoring which are associated with the release points must be monitored for the water quality characteristics specified in Table F5 – Onsite water storage contaminant limits at the monitoring locations and at the monitoring frequency specified in Table F4 – Water storage monitoring.
F19	In the event that water storages defined in Table F4 – Water storage monitoring exceed the contaminant limits defined in Table F5 – Onsite water storage contaminant limits, the environmental authority holder must implement measures, where practicable, to prevent access to waters by all livestock.
F20	Receiving environment monitoring and contaminant trigger levels The quality of the receiving waters must be monitored at the locations specified in Table F6 – Receiving water upstream background sites, downstream monitoring points and downstream assimilation monitoring points shown on Figure 3 – Newlands Coal Project Water quality monitoring point locations for each quality characteristic and at the monitoring frequency stated in Table F3 – Mine affected water release during flow events.
F21	During periods of natural flow, when mine water discharge is not occurring, the sampling frequency for water quality characteristics contained in Table F3 – Mine affected water release during flow events is monthly.

Table F4 – Water storage monitoring

Site Code	Water Storage Description	Latitude (GDA2020)	Longitude (GDA2020)	Monitoring Location	Frequency of Monitoring
PP2	Darrens Dam	-21.19484	148.00497	At spillway	Quarterly
PP3	Ramp 9 North Pit	-21.19858	148.01618	At bottom of Ramp	
PP6	Ramp 8 Pit	-21.14833	147.90668	At bottom of Nth Ramp	
PP9	CHPP Anti-Pollution Pond	-21.19137	147.89010	At Spillway	
PP10	100ML Raw Water Dam	-21.18093	147.88378	At walkway	
PP11	CHPP Process Water Pond	-21.20250	147.89077	At pump infrastructure	
PP12	Levee 5	-21.21733	147.92066	At embankment	
PP15	Levee 3	-21.22798	147.92691	At embankment	
PP17	Lake Austin	-21.23299	147.89362	At pump infrastructure	
PP20	Levee 7	-21.20425	147.91221	At embankment	
PP24	Ramp 4 Pit	-21.21650	147.91397	At Ramp 4a pump infrastructure	
PP26	Ramp 6 Pit	-21.19368	147.90733	At base of ramp	
PP27	Ramp 1 Pit	-21.25764	147.89865	At base of South Ramp	
PP30	Ramp 10 Pit	-21.21128	148.02789	At base of Ramp	
PP49	Banrock A Pit	-21.34098	147.92488	At base of Ramp	
PP51	Banrock C Pit	-21.35401	147.93161	At base of Ramp	
PP53	Lenny's Lagoon	-21.36410	147.92546	At Micks Drain	
PP56	McLaren Ramp 15 Pit	-21.36534	147.92017	At base of Ramp	
PP58	McLaren Ramp 17 Pit	-21.37492	147.92348	At base of Ramp	
PP59	McLaren Ramp 18 Pit	-21.38428	147.92824	At base of Ramp	
PP62	Wollombi Ramp 21 Pit	-21.37387	147.88271	At base of Ramp (Wollombi No.1)	
PP66	Somerled Ramp 20 Pit	-21.34098	147.92488	At base of Ramp	
PP76	Saddlers Pit	-21.37800	147.93958	At base of Ramp	
PP83	Bangarra Dirty Water Dam	-21.14206	148.01179	At discharge location	
PP85	Ramp 12 Discharge Dam	-21.18934	148.03881	At discharge location	

Table F5 – Onsite water storage contaminant limits

Quality Characteristic ³	Test Value	Contaminant Limit
pH (pH unit)	Range	Greater than 4, less than 9 ²
EC (µS/cm)	Maximum	5970 ¹
Sulphate (mg/L)	Maximum	1000 ¹
Aluminium (mg/L)	Maximum	5 ¹
Copper (mg/L)	Maximum	1 ¹
Lead (mg/L)	Maximum	0.1 ¹
Nickel (mg/L)	Maximum	1 ¹
Uranium (mg/L)	Maximum	20
Zinc (mg/L)	Maximum	20 ¹

Note:

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

² Page 4.2-15 of ANZECC & ARMCANZ (2000) "Soil and animal health will not generally be affected by water with pH in the range of 4–9".

³ With the exception of pH and EC, total measurements (unfiltered) must be taken and analysed for each quality characteristic.

Table F6 – Receiving water upstream background sites, downstream monitoring points and downstream assimilation monitoring points

Monitoring points	Receiving waters location description	Longitude (GDA2020)	Latitude (GDA2020)
Upstream background monitoring points			
Monitoring point FSS20	Eastern Creek Upstream (near Salt Mill bore)	148.04830	-21.20040
Monitoring point WQS7	Cerito Creek Upstream at Highwall Dam	147.92542	-21.23624
Monitoring point WQS3	Suttor Creek Upstream at Lease Boundary	147.96411	-21.37536
Monitoring Point FSS7	Suttor Creek at the Bridge	148.06420	-21.33650
Monitoring Point FSS17	Bowen River Upstream	147.84941	-20.75434
Downstream monitoring points			
Monitoring point WQS5	Kangaroo Creek Downstream	147.93380	-21.08590
Monitoring point WQS4	Suttor Creek Downstream	147.86275	-21.38162
Monitoring point WQS9	Eastern Creek Downstream	147.98969	-21.08413
Downstream assimilation points			
Monitoring point FSS16	Suttor River Downstream	147.65330	-21.49790
Monitoring point FSS18	Bowen River Downstream	147.77600	-20.77500
Monitoring point ¹ FSS19	Rosella Creek Downstream	147.84128	-20.81903

1) Monitoring point FSS19 to be used as an alternate downstream assimilation point when access is not possible to Bowen River Downstream FSS18.

Schedule F – Water	
Condition number	Condition
F22	If quality characteristics of the receiving water at the downstream monitoring points (WQS9, WQS5 and WQS4) or assimilation monitoring points (FSS16 and FSS18) exceed any of the trigger levels specified in Table F3 – Mine affected water release during flow events 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, provide the administering authority written notification within 24 hours of becoming aware of the exceedance and then complete an investigation into the potential for environmental harm and provide a written report to the administering authority within 20 business days of receiving the results, outlining: (i) Details of the investigation carried out, and (ii) Actions taken to prevent environmental harm. <i>Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with condition F22(b), no further reporting is required for subsequent trigger events for that quality characteristic.</i>
F23	Water reuse Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party (with the consent of the third party).
F24	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 via WaTERS 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.

F25	Temporary Interference with waterways Destroying native vegetation, excavating, or placing fill in a watercourse, lake or spring necessary for and associated with mining operations must be undertaken in accordance with Department of Natural Resources, Mines and Energy's (or its successor's) Guideline – <i>Riverine protection permit exemption requirements</i> (WSS/2013/726).
F26	Water management plan A Water Management Plan must be developed and implemented for all stages of the mining activities on the site.
F27	Stormwater and water sediment controls An Erosion and Sediment Control Plan must be developed and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.
F28	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 F27 ; and (b) Water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with condition F26 , for the purpose of ensuring water does not become mine affected water.

Schedule G – Regulated structures	
Condition number	Condition
G1	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 not an existing structure; (b) If it is an existing structure, prior to the adoption of this schedule; or (c) Prior to any change in its purpose or the nature of its stored contents.
G2	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.
G3	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).
G4	Design and construction of a regulated structure Conditions G5 to G9 inclusive do not apply to existing structures.
G5	All regulated structures must be designed by, and constructed 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). <i>Note: Construction of a dam includes modification of an existing dam. Certification of design and construction may be undertaken by different persons.</i>
G6	Construction of a regulated structure is prohibited unless the environmental authority holder has submitted a consequence category assessment report and certification to the administering authority that has been certified by 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.
G7	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 Regulated Dams/Levees register.

G8	Regulated structures must: (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; and (c) 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.
G9	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.
G10	Operation of a regulated structure Operation of a regulated structure, except for an existing structure, is prohibited unless the environmental authority holder has submitted to the administering authority: (a) One paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition G6; (b) A set of 'as constructed' drawings and specifications; (c) Certification of those 'as constructed drawings and specifications' in accordance with condition G7; (d) 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; (e) The requirements of this authority relating to the construction of the regulated structure have been met; (f) The environmental authority holder has entered the details required under this authority into a Register of Regulated Dams; and (g) There is a current operational plan for the regulated structures.
G11	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 environmental authority holder must submit to the administering authority within 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.
G12	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.

Table G1 – 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 Structures</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

Note:

Good compliance performance relates to the hydraulic performance of the applicable structure, including its ability to comply with release parameters if applicable. It does not relate to administrative non-compliance such as notification errors or to unrelated conditions such as air quality.

G13	Mandatory reporting level Conditions G13 to G16 inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.
G14	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.
G15	The environmental authority holder must, as soon as practical and within 48 hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.
G16	The environmental authority 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.
G17	The environmental authority holder must record any changes to the MRL in the Register of Regulated Structures.
G18	Design storage allowance The environmental authority 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.
G19	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).
G20	The environmental authority holder must, as soon as possible and within 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.
G21	The environmental authority 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.
G22	Annual inspection report Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

G23	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.
G24	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).
G25	The environmental authority holder must: (a) Within 20 business days of receipt of the annual inspection report, provide to the administering authority: (i) The recommendations section of the annual inspection report; and (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 environmental authority holder, provide this to the administering authority within 10 business days of receipt of the request. <i>Note: Regulated structures which have been certified as low consequence category for 'failure to contain – overtopping', an annual inspection report is not needed unless significant changes or modifications have occurred to the regulated structure's operation/construction.</i>
G26	Transfer arrangements The environmental authority 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 environmental authority holder on transfer of this authority.
G27	Register of Regulated Dams A Register of Regulated Dams must be established and maintained by the environmental authority holder for each regulated dam.
G28	The environmental authority holder must provisionally enter the required information in the Register of Regulated Dams when a design plan for a regulated dam is submitted to the administering authority.
G29	The environmental authority holder must make a final entry of the required information in the Register of Regulated Dams once compliance with condition G10 and G11 has been achieved.
G30	The environmental authority holder must ensure that the information contained in the Register of Regulated Dams is current and complete on any given day.

G31	All entries in the Register of Regulated Dams must be approved by the chief executive officer for the environmental authority holder of this authority, or their delegate, as being accurate and correct.
G32	The environmental authority 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.
G33	Transitional arrangements All existing structures that have not been assessed in accordance with either the Manual or the former Manual for Assessing Hazard Categories and Hydraulic Performance of Dams must be assessed and certified in accordance with the Manual within 6 months of amendment of the authority adopting this schedule.
G34	All existing structures must subsequently comply with the timetable for any further assessments in accordance with the Manual specified in Table G1 – 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.
G35	Table G1 – 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.
G36	Certification of the transitional assessment required by G33 and G34 (as applicable) must be provided to the administering authority within 6 months of amendment of the authority adopting this schedule.

Schedule H – Land and rehabilitation	
Condition number	Condition
H1	The environmental authority holder must minimise the potential for contamination of land by hazardous contaminants.
H2	Subsidence A Subsidence Management Plan must be developed, and implemented prior to the commencement of activities that result in subsidence.

H3	The Subsidence Management Plan must: (a) 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; (b) Be developed in accordance with Appendix A – Watercourse subsidence for watercourse subsidence; (c) Describe the proposed impacts of subsidence on any land, watercourse and floodplain including but not limited to: i. Physical condition of surface drainage: (A) Erosion; (B) Areas susceptible to higher levels of erosion such as watercourse confluences; (C) Incision processes; (D) Stream widening; (E) Tension cracking; (F) Lowering of bed and banks; (G) Creation of instream waterholes; and (H) Changes to local drainage patterns ii. Overland flow: (A) Capture of overland flow by subsided long-wall panels; (B) Increased overbank flows due to lowering of high bank of watercourses; and (C) 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: (A) Surface water; and (B) Groundwater; iv. Land condition: current land condition to be impacted by subsidence; and v. Infrastructure: detail of existing infrastructure (pipelines, railway, powerlines and haul roads) should be identified where there is a potential impact from effects of land subsidence; (d) Propose options for mitigating any impacts associated with subsidence and how these mitigation methods will be implemented; (e) Describe cumulative impacts on watercourses or catchments; (f) Describe impacts on groundwater; and (g) Describe contingency procedures for emergencies; and (h) Include a program for monitoring and review of the effectiveness of the Subsidence Management Plan.
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H4	The Subsidence Management Plan must be reviewed: (a) Each calendar year; or (b) 3 yearly once underground mining has ceased.
H5	The appropriately qualified person that undertakes the review required by condition H4 must prepare a report that: (a) Assesses the Subsidence Management Plan against the requirements under condition H3; (b) Includes recommended actions to ensure actual and potential environmental impacts are effectively managed; (c) Identifies any amendments made to the Subsidence Management Plan following the review; and (d) Be made available to the administering authority upon request.
H6	The environmental authority holder must attach to the review report required by condition H5, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates: (a) To ensure compliance with this environmental authority; and (b) To prevent a recurrence of any non-compliance issues identified.
H7	Inspection of subsidence The environmental authority holder must arrange for each subsided longwall panel to be inspected by a suitably qualified and experienced person, in accordance with conditions H8 to H10 inclusive.
H8	The inspection required by condition H7 must be conducted between 1 April and 1 November: (a) Each calendar year; or (b) 3 yearly once underground mining has ceased.
H9	At each inspection, 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.
H10	For each inspection, copies of a report certified by the suitably qualified and experienced person, including any recommendations to ensure the integrity of each subsided longwall panel must be provided to the administering authority upon request.
H11	Overland flow The subsided longwall panels must not result in the capture of significant overland flow and must allow water to drain from the panel. The maximum surface area for ponded areas must not exceed 200m² and 1m in depth.

Schedule J – Sewage Treatment	
Condition number	Condition
J1	The only contaminant permitted to be released to land is treated sewage effluent in compliance with the release limits stated in Table J1 – Contaminant release limits to land .
J2	Treated sewage effluent may only be released to land in accordance with the conditions of this approval at the following locations: (a) Within the nominated area(s) identified in the Standard, Potable, Raw and Effluent Management Plan, as illustrated in Figure 4 – Treated Sewage Effluent Release Locations; and (b) Other land for the purpose of dust suppression and/or firefighting.
J3	The application of treated effluent to land must be carried out in a manner such that: (a) Vegetation is not damaged; (b) There is no surface ponding of effluent; and (c) There is no run-off of effluent.
J4	If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is present, and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.
J5	All sewage effluent released to land must be monitored at the frequency and for the parameters specified in Table J1 – Contaminant release limits to land .
J6	The daily volume of effluent release to land must be measured and records kept of the volumes of effluent released.
J7	When circumstances prevent the irrigation or beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent.
J8	A minimum area of 0.2 hectares (ha) of land, excluding any necessary buffer zones, must be utilised for the irrigation and/or beneficial reuse of treated sewage effluent.
J9	Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty whilst using the treated sewage effluent.
J10	Bio-solids produced by the activity for re-use must be: (a) Sampled, analysed, graded and classified according to the procedures specified in the administering authority's systems and standards; and (b) Re-used under a relevant approval issued by the administering authority.

Table J1 – Contaminant release limits to land

Contaminant	Unit	Release limit	Limit type	Frequency
5 day Biochemical oxygen demand (BOD)	mg/L	20	Maximum	Monthly
Total suspended solids	mg/L	30	Maximum	Monthly
Total Nitrogen	mg/L	30	Maximum	Monthly
Total Phosphorus	mg/L	15	Maximum	Monthly
E-coli	Organisms/100ml	1000	Maximum	Monthly
pH	pH units	6.0 – 9.0	Range	Monthly

Schedule K – Biodiversity	
Condition number	Condition
K1	Biodiversity offsets The environmental authority holder must provide a Biodiversity offset for impacts on applicable state significant biodiversity values consistent with the requirements for an offset as identified in the Biodiversity Offset Strategy (as per condition K2): (a) Prior to impacting on state significant biodiversity values; or (b) Where a land based offset is to be provided, within 12 months of the later of either of the following: (i) The date of issue of this environmental authority; or (ii) The relevant stage identified in the Biodiversity Offset Strategy submitted under condition K2; or (c) Where an offset payment is to be provided, within 4 months of the later of either of the following: (i) The date of issue of this environmental authority; or (ii) The relevant stage identified in the Biodiversity Offset Strategy submitted under condition K2.
K2	A Biodiversity Offset Strategy must be developed in accordance with the Queensland Biodiversity Offset Policy and submitted to the administering authority within either 30 days, or a lesser period agreed to by the administering authority, prior to impacting on applicable state significant biodiversity values.
K3	Prior to clearing, the clearing boundary must be defined to ensure that 'of concern' and 'endangered' regional ecosystems and buffer areas are not disturbed beyond the areas permitted to be cleared by the administering authority.

END OF PERMIT CONDITIONS

Appendix 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 the Department of Natural Resources and Mines 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:

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

Governing legislation

Subsidence on mining leases is managed under two separate Government Departments; the Department of Environment and Heritage Protection (EHP) and the Department of Natural Resources and Mines (NRM).

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.

A Plan of Operations describes the actions and programs required to achieve compliance with the conditions of an EA. 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, 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 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 economic 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:

- (a) Lowering of bed and banks
- (b) Creation of in-stream waterholes
- (c) Changes to local drainage patterns
- (d) Incision processes
- (e) Stream widening
- (f) Erosion
- (g) Increased overbank flows due to lowering of the high banks
- (h) Tension cracking through both shallow and deeper underlying strata (including aquifers)
- (i) Root shear and loss of riparian vegetation
- (j) 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:

(a) *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.

(b) *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.

(c) *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.

(d) *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.

(e) *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 riverbed 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.

(f) *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.

(g) *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.

(h) *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:

- (a) Monitoring
- (b) Assessment
- (c) Reporting

(d) Mitigation

Monitoring

- (a) 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:
 - (i) Sites must be located at all pillar zones intersecting a watercourse or tributary.
 - (ii) Sites must include representative locations at the interface of natural ground level and observed changes in surface elevation from subsidence within a watercourse.
- (b) 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.
- (c) 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.
- (d) Vegetation and ecological condition assessments should form part of the baseline dataset.
- (e) 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.
- (f) 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.
- (g) Surveys must include cross-sectional area and bed slope throughout all monitored reaches of impacted watercourses.
- (h) 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.
- (i) Surveys pre-subsidence should quantify the following features within watercourses:
 - (i) pool/riffle sequences
 - (ii) bed controls
 - (iii) entry points of other watercourses and localised tributaries
 - (iv) existing bed and bank scour points
 - (v) infrastructure located within the watercourse.
- (j) Surveys post-subsidence should quantify any changes to the pre-mining conditions including:
 - (i) erosion or deposition processes that have occurred as a result of subsidence,
 - (ii) migration of head cut erosion within watercourses and tributaries,
 - (iii) localised changes to stream bed slope,
 - (iv) localised widening of channels,
 - (v) destabilisation of stream bed and banks including fracturing and incision,
 - (vi) localised changes to bank heights
 - (vii) size of subsidence void created within the watercourse.
- (k) The subsidence monitoring program for groundwater must include the following information:
 - (i) Sites must include representative locations at the interface of natural ground surface and observed changes in surface elevation from subsidence.
 - (ii) Monitoring bores should be established in each aquifer at each monitoring site.

(iii) Monitoring must include both water level measurements and water quality sampling in accordance with the following:

- (A) Water level measurement to be taken quarterly
- (B) Water quality field conductivity measurement to be taken 6 monthly
- (C) 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:

(a) *Stream Order 1, 2 and 3*

Monitoring must be undertaken at the following intervals:

- (i) Immediately prior to subsidence,
- (ii) Within two (2) months of the initial subsidence,
- (iii) 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.
- (iv) Following a peak flow event of greater than a **1 in 2 year** ARI and
- (v) Annually

(b) *Stream Order 4 and higher*

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

- (i) Immediately prior to subsidence,
- (ii) Within two (2) months of the initial subsidence,
- (iii) 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.
- (iv) Following a peak flow event of greater than a **1 in 5 year** ARI, and
- (v) 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.

- (a) The results of all monitoring activities should be reviewed by a suitably qualified person and detailed in the associated monitoring report.
- (b) 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) 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:
 - (i) Watercourse condition and geomorphic processes;
 - (ii) The condition of vegetation in riparian zones;
 - (iii) Examination of pillar zones in watercourses with particular attention to potential for tension cracking;
 - (iv) The creation of in-stream waterholes;
 - (v) Any impacts on groundwater.
- (b) 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.
- (c) 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:
 - (i) The current state of the groundwater and surface water resources;
 - (ii) Any impacts on these features;
 - (iii) Any remedial works required to be undertaken including a timetable for implementation.
 - (iv) 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 functionality 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

Definitions

Key terms and/or phrases used in this document are defined in this section. 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.

‘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.

‘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).

‘annual exceedance probability or AEP’ the probability that at least one event in excess of a particular magnitude will occur in any given year.

‘annual inspection report’ means an assessment prepared by a suitably qualified and experienced person containing details of the assessment against the most recent consequence assessment report and design plan (or system design plan);

- (a) Against recommendations contained in previous annual inspections reports;
- (b) Against recognised dam safety deficiency indicators;
- (c) For changes in circumstances potentially leading to a change in consequence category;
- (d) For conformance with the conditions of this authority;
- (e) For conformance with the ‘as constructed’ drawings;
- (f) For the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);
- (g) For evidence of conformance with the current operational plan.

‘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 relating to the subject matter using the relevant protocols, standards, methods or literature.

‘assessed or assessment’ 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 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 of the assessment:

- (a) Exactly what has been assessed and the precise nature of that determination;
- (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.

‘Act’ means the *Environmental Protection Act 1994*

‘authority’ means an environmental authority.

‘background’, with reference to the water schedule means the average of samples taken prior to the commencement of mining from the same waterway that the current sample has been taken.

‘blasting’ means the use of explosive materials to fracture:

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

‘brine’ means saline water with a total dissolved solid concentration greater than 40,000 mg/L.

‘brine dam’ means a regulated dam that is designed to receive, contain or evaporate brine.

‘certification’ means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by the *Manual for Assessing Consequence Categories and Hydraulic Performance of Dams (EM635)*, including design plans, ‘as constructed’ drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs.

‘certifying, certify or certified’ have a corresponding meaning as ‘certification’.

‘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; or
- (d) A drug or poison in the Standard for the Uniform Scheduling of Drugs and Poisons prepared by the Australian Health Ministers’ Advisory Council and published by the Commonwealth; or
- (e) Any substance used as, or intended for use as:
 - (i) A pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product; or
 - (ii) A surface active agent, including, for example, soap or related detergent; or
 - (iii) A paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide; or
 - (iv) A fertiliser for agricultural, horticultural or garden use; or
 - (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.

‘commercial place’ means a workplace 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.

‘consequence’ in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.

‘consequence category’ means a category, either low, significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*.

‘construction’ or **‘constructed’** in relation to a dam includes building a new dam and modifying or lifting an existing dam, but does not include investigations and testing necessary for the purpose of preparing a design plan.

‘dam’ means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works.

‘dam crest volume’ means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls, without regard to flows entering or leaving (e.g. via spillway).

‘design storage allowance or DSA’ means an available volume, estimated in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)* published by the administering authority, must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that manual.

‘designer’ for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.

‘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’:

- (a) Areas off lease (e.g. Roads or tracks which provide access to the mining lease);
- (b) Areas previously disturbed which have achieved the rehabilitation outcomes;
- (c) 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);
- (d) 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;
- (e) Disturbance that pre-existed the grant of the tenure.

‘EC’ means electrical conductivity.

‘effluent’ treated wastewater released from sewage treatment plants.

‘emergency action plan’ means documentation forming part of the operational plan held by the holder or a nominated responsible officer, that identifies emergency conditions that sets out procedures and actions that will be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure, and to ensure timely warning to downstream communities and the implementation of protection measures. The plan must require dam owners to annually update contact details.

‘existing structure’ means a structure that was in existence prior to the adoption of this schedule of conditions under the authority.

‘extreme storm surge’ means a storm storage allowance determined in accordance with the criteria in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)* published by the administering authority.

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

‘holder’ for a mining tenement, means a holder of the tenement under the *Mineral Resources Act 1989*, and the holder of the associated environmental authority under the *Environmental Protection Act 1994*.

‘hydraulic performance’ means the capacity of a regulated dam to contain or safely pass flowable substances based on the design criteria specified for the relevant consequence category in the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*. **‘infrastructure’** means water storage dams, levees, roads and tracks, buildings and other structures built for the purpose of the mining activity.

‘ISCP’ means the Intrinsic Spontaneous Combustion Propensity classification which enables a general appraisal of the possible likelihood of a spontaneous combustion event, with the following classifications:

- (a) A Low ISCP Classification (I) has an R_{70} Value ($^{\circ}\text{C/hr}$) of <0.5 ;
- (b) A Low-Medium ISCP Classification (II) has an R_{70} Value ($^{\circ}\text{C/hr}$) of between 0.5 and 1;
- (c) A Medium ISCP Classification (III) has an R_{70} Value ($^{\circ}\text{C/hr}$) of between 1 and 2;
- (d) A High ISCP Classification (IV) has an R_{70} Value ($^{\circ}\text{C/hr}$) of between 2 and 4;
- (e) A Very High ISCP Classification (V) has an R_{70} Value ($^{\circ}\text{C/hr}$) of between 4 and 8;
- (f) An Extremely High ISCP Classification (VI) has an R_{70} Value ($^{\circ}\text{C/hr}$) of between 8 and 16; and
- (g) An Exceptionally High ISCP Classification (VI) has an R_{70} Value ($^{\circ}\text{C/hr}$) of ≥ 16 .

‘ R_{70} Value ($^{\circ}\text{C/hr}$)’ means the adiabatic R_{70} Self Heating Rate - determined as a ratio of the time taken for the coal temperature to increase from 40°C to 70°C , which gives a relative measure of the oxidation rate of the coal. This value is used as an index to determine the propensity of the coal to spontaneously combust.

‘land’ in the ‘land schedule’ of this document means land excluding waters and the atmosphere, that is, the term has a different meaning from the term as defined in the *Environmental Protection Act 1994*. For the purposes of the *Acts Interpretation Act 1954*, it is expressly noted that the term ‘land’ in this environmental authority relates to physical land and not to interests in land.

‘land use’ –means the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

‘leachate’ means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of at the operational land which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

‘levee’ means an embankment that only provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.

‘licensed place’ means the mining activities carried out at the mining tenements detailed in this environmental authority.

‘low consequence dam’ means any dam that is not a high or significant consequence category as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*.

‘m’ means metres.

‘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 that *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933)* published by the administering authority.

‘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.

‘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;
- (i) Groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated;
- (ii) Groundwater from the mine’s dewatering activities;
- (iii) A mix of mine affected water (under any of paragraphs i)-v) and other water.

(b) does not include surface water runoff which, to the extent that it has been in contact with areas disturbed by mining 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:
 - (A) Areas that are been capped and have monitoring data demonstrating hazardous material adequately contained with the site;
 - (B) 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
- (iii) Both.

‘modification or modifying’ see definition of ‘construction’.

‘NATA’ means National Association of Testing Authorities, Australia.

‘natural flow’ means the flow of water through waters caused by nature.

‘non polluting’ means having no adverse impacts upon the receiving environment.

‘operational plan’ includes:

- (a) Normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance);
- (b) Contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the regulated structure.

‘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 (mm/s).

‘protected area’ means –

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

‘receiving environment’ in relation to an activity that causes or may cause environmental harm, means the part of the environment to which the harm is, or may be, caused. The receiving environment includes (but is not limited to):

- (a) A watercourse;
- (b) Groundwater; and
- (c) An area of land that is not specified in this environmental authority.

The term does not include land that is specified in this environmental authority.

‘receiving waters’ means the waters into which this environmental authority authorises releases of mine affected water.

‘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 structure’ includes any land-based containment structures, levees, bunds and voids, but not a tank or container designed and constructed to an Australian Standard that deals with strength and structural integrity.

‘rehabilitation’ the process of reshaping and revegetating land to restore it to a stable landform

‘release event’ means a surface water discharge from mine affected water storages or contaminated areas on the licensed place.

‘RL’ means reduced level, relative to mean sea level as distinct from depths to water.

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

‘saline drainage’ The movement of waters, contaminated with salts, as a result of the mining activity.

‘sensitive place’ means:

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

Note: The definition of ‘sensitive place’ and ‘commercial place’ is based on Schedule 1 of EPP Noise. That is, a sensitive place is inside or outside on a dwelling, library & educational institution, childcare or kindergarten, school or playground, hospital, surgery or other medical institution, commercial & retail activity, protected area or an area identified under a conservation plan under Nature Conservation Act 1992 as a critical habitat or an area of major interest, marine park under Marine Parks Act 2004, park or garden that is outside of the mining lease and open to the public for the use other than for sport or organised entertainment. A commercial place is inside or outside a commercial or retail activity.

A mining camp (i.e., accommodation and ancillary facilities for mine employees or contractors, or both, associated with the mine the subject of the environmental authority) is not a sensitive place for that mine or mining project, whether or not the mining camp is located within a mining tenement that is part of the mining project the subject of the environmental authority. For example, the mining camp might be located on neighbouring land owned or leased by the same company as one of the holders of the environmental authority for the mining project, or a related company. Accommodation for mine employees or contractors is a sensitive place if the land is held by a mining company or related company,

and if occupation is restricted to the employees, contractors and their families for the particular mine or mines which are held by the same company or a related company.

For example, a township (occupied by the mine employees, contractors and their families for multiple mines that are held by different companies) would be a sensitive place, even if part or all of the township is constructed on land owned by one or more of the companies.

‘structure’ means dam or levee.

‘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.

‘state significant biodiversity values’ are those values listed in Appendix 1 of the Queensland Biodiversity Offsets Policy.

‘suitably qualified and experienced person’ in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, and has demonstrated competency and relevant experience:

- (a) For regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design.
- (b) For regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments.

Note: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.

‘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.

‘the Act’ means the *Environmental Protection Act 1994*.

‘µS/cm’ means micro siemens per centimetre.

‘void’ means any constructed, open excavation in the ground.

‘watercourse’ has the same meaning given in the *Water Act 2000*.

‘water quality’ means the chemical, physical and biological condition of water.

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

‘WaTERS’ means the Water Tracking and Electronic Reporting System.

‘water year’ means the 12-month period from 1 July to 30 June.

‘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.

Figure 1 – Newlands Coal Project Groundwater Bore Monitoring Locations

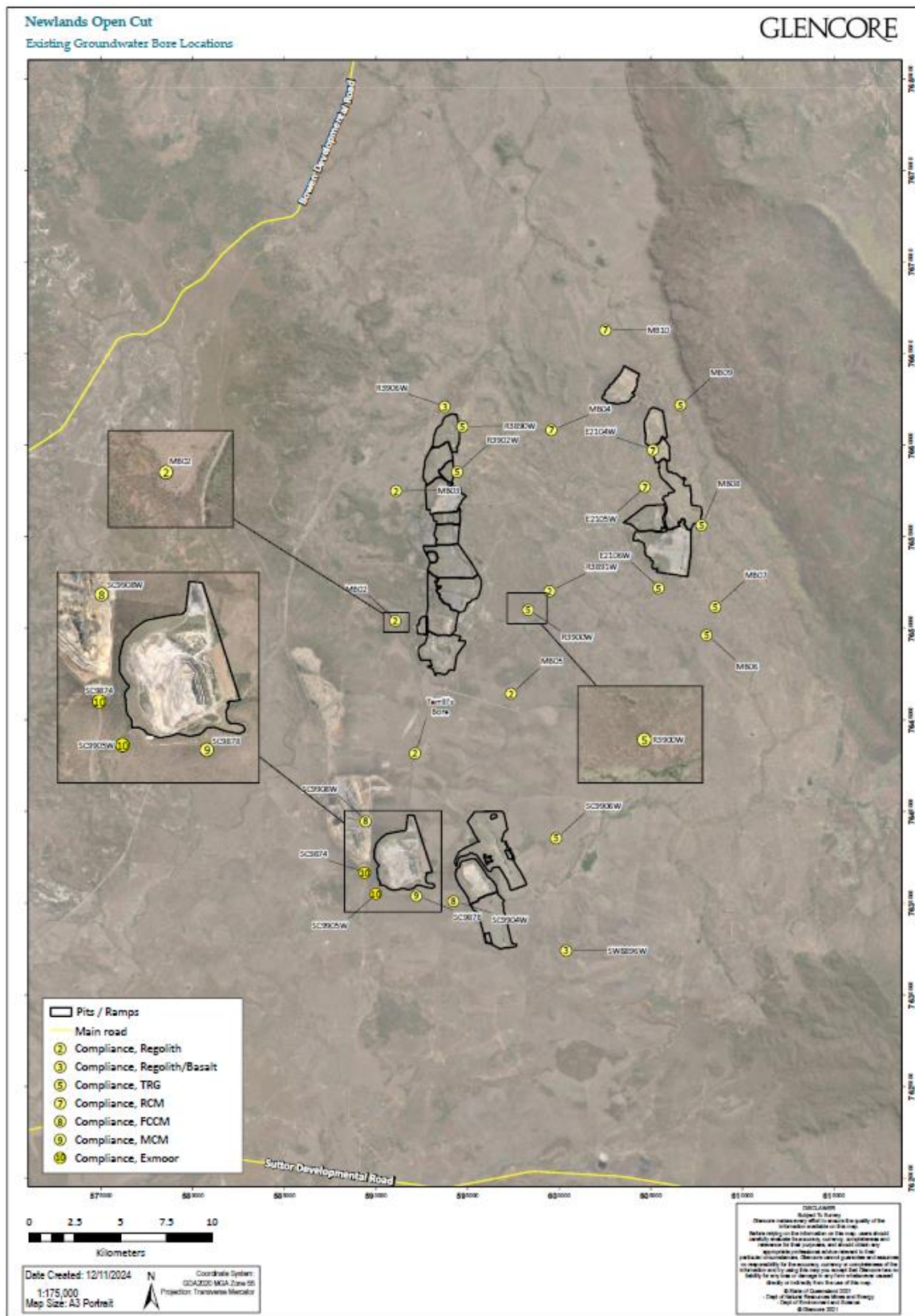


Figure 2 – Newlands Coal Project Release Point Locations

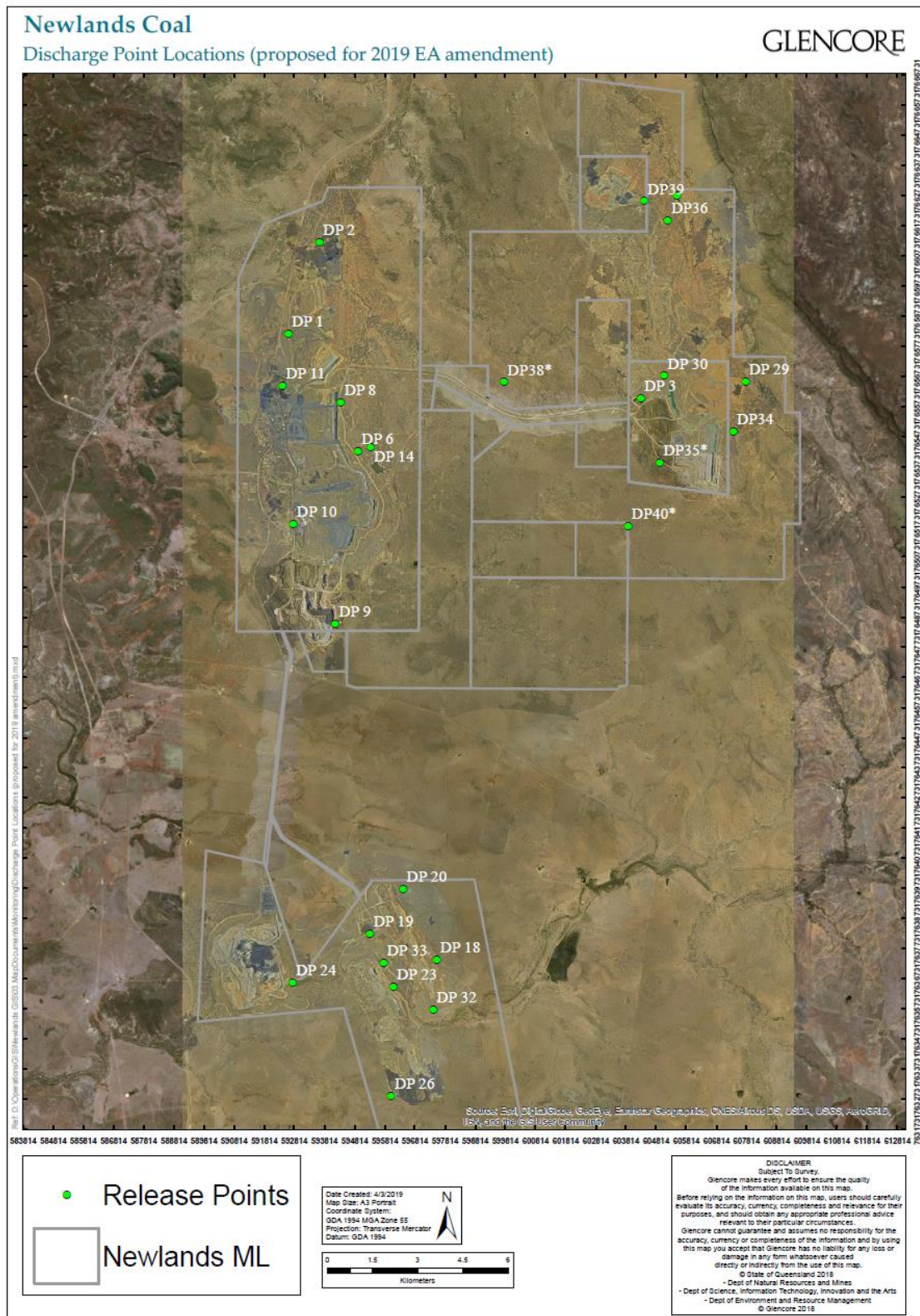


Figure 3 – Newlands Coal Project Water Quality Monitoring Point Locations

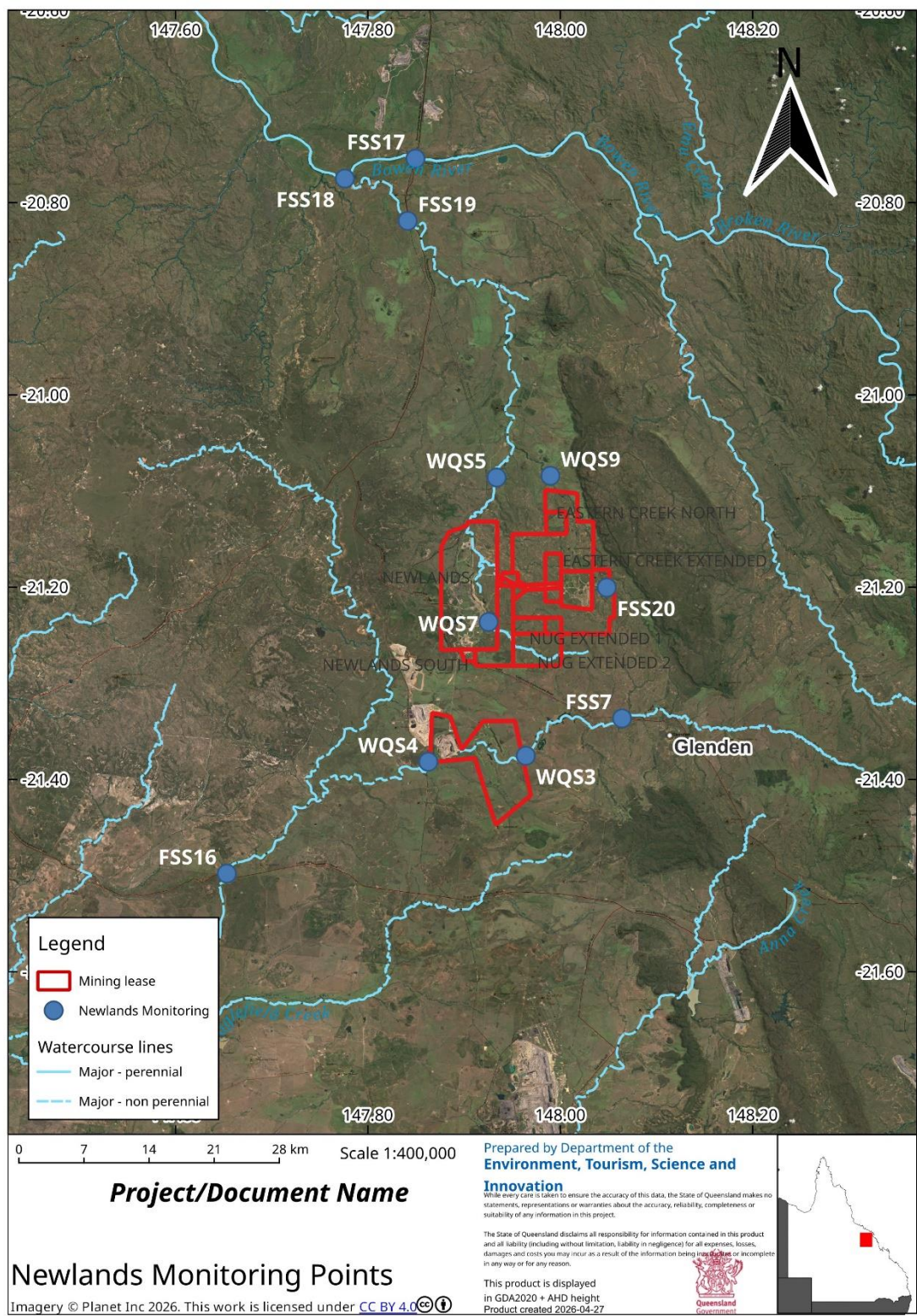


Figure 4 – Treated Sewage Effluent Release Locations



END OF ENVIRONMENTAL AUTHORITY