Permit

Environmental Protection Act 1994

Environmental authority EPPG00898213

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

Environmental authority number: EPPG00898213

Environmental authority takes effect on 6 March 2023

Environmental authority holder(s)

Name(s)	Registered address
SANTOS CSG PTY LTD	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
TOTALENERGIES EP AUSTRALIA	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
TOTALENERGIES EP AUSTRALIA II	BGC Centre, Level 13 28 The Esplanade PERTH WA 6000
PAPL (Upstream) Pty Limited	c/- Addisons Commercial Lawyers Level 12, 60 Carrington Street SYDNEY NSW 2000
KGLNG E&P Pty Ltd	Level 11 28 The Esplanade PERTH WA 6000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 – 08 – A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	ATP2017 PL1019 PL1020 PL309 PL310 PL313 PL314 PL315

ABN 46 640 294 485

Environmentally relevant activity/activities	Location(s)
	PL316 PL317 PL318 PL319 PL322 PL323
Schedule 3 – 07 – A petroleum activity involving injection of a wastefluid into a natural underground reservoir or aquifer	ATP2017 PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Schedule 3 – 06 – A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	ATP2017 PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Schedule 3 – 03 – A petroleum activity that is likely to have a significant impact on a category A or B Environmentally Sensitive Area	ATP2017 PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322

Environmentally relevant activity/activities	Location(s)
	PL323
Ancillary 64 – Water treatment – 3 – Treating 10ML or more raw water in a day	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Ancillary 63 – Sewage Treatment – 1(b-i) – Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 but not more than 1500EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Ancillary 62 – Resource recovery and transfer facility operation – 1© – Operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Ancillary 55 – Other waste reprocessing or treatment – 2© – Operating a facility for receiving and either reprocessing or treating, in a year, the following quantity of category 2 regulated waste – more than 10,000t	PL1019 PL1020 PL309 PL310 PL313

Environmentally relevant activity/activities	Location(s)
	PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Ancillary 15 – Fuel burning – Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Ancillary 14 – Electricity generation – 1 – Generating electricity by using gas at a rated capacity of 10MW electrical or more	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
Ancillary 10 – Gas producing – Manufacturing, processing or reforming 200t or more of hydrocarbon gas in a year	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323

Environmentally relevant activity/activities	Location(s)
Ancillary 09 – Hydrocarbon gas refining – 1(b) – Hydrocarbon gas refining (the relevant activity) consists of refining natural gas or coal seam methane gas – 200,000,000 cubic metres or more of natural gas	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323
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)©	PL1019 PL1020 PL309 PL310 PL313 PL314 PL315 PL316 PL317 PL318 PL319 PL322 PL323

Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

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

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or

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

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

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

Take effect

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

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority – on the nominated day; or

b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or

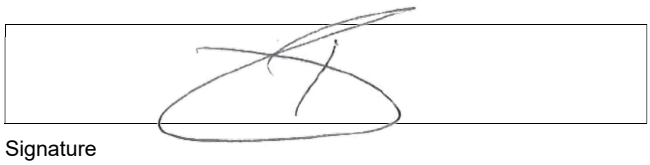
c) otherwise on the day the authority is issued.

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

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

The anniversary day of this environmental authority is the same day each year as the original take effect date unless you apply to change the anniversary day. The payment of the annual fee will be due each year on this day.

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



Signature

6 March 2023

Date

Tristan Roberts
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Delegate of the administering authority
Environmental Protection Act 1994

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Privacy statement
Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

Obligations under the *Environmental Protection Act 1994*

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

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

Other permits required

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

Schedule List

Conditions of environmental authority

Schedule A – General

A1 This environmental authority authorises the carrying out of the following resource activity(ies):

(a) the petroleum activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities* to the extent they are carried out in accordance with the activity's corresponding scale and intensity;
(b) incidental activities that are not otherwise specified relevant activities.

Schedule A, Table 1 – Scale and Intensity for the Activities

	GLNG Project		Gas Field Development Project	
Petroleum Activities	**Scale (number of activities)**	**Intensity (maximum size in total)**	**Scale (number of activities)**	**Intensity (maximum size in total)**
Coal seam gas, exploration, appraisal and development wells[1]	1,460	2,190ha	1,838[1]	2,757ha
Gas Injection wells	49	73.5ha	Not applicable	Not applicable
Water Injection wells	13	19.5	Not applicable	Not applicable
Stimulation activities	All wells	All wells	All wells	All wells
Gathering lines/transmission pipelines	As required	As required	As required	As required
Access Roads	As required	As required	As required	Width: 30m
Compressor stations	3 R-HCS-02 R-NCS-02-01 R-NCS-02-01	50ha 2X30ha	1 (below the threshold of 500kg of fuel per hour)	8ha
LNG plant	1	7ha	Not applicable	Not applicable
Regulated structure(s) (dams) ≥400 megalitres	2	90ha	Not applicable	Not applicable
Regulated structure(s) (dams)	28	305ha	Not applicable	Not applicable

<400 megalitres				
Regulated structure (dams)	Not applicable	Not applicable	4	64ha
Non-regulated dams	3161	790ha	Not applicable	Not applicable
Water treatment facilities that allow treated water to be released to waters other than seawater	13	≤48ML/day	1	10ha
Sewage treatment plant(s) that discharge treated effluent to an infiltration trench or through an irrigation scheme, or to land for dust suppression, construction or operational purposes	5	>100 equivalent persons (EP) ≤450EP	Not applicable	Not applicable
	9	>21EP ≤100EP	Not applicable	Not applicable
Sewage treatment plant(s)	Not applicable	Not applicable	5	(>100EP <1500EP)
			9	(>21EP <100EP)

[1]Development wells for the GFD only

A2 The resource activities in condition (A1) are authorised subject to the conditions of this environmental authority.

A3 A register identifying infrastructure constructed and disturbance incurred under the GFD Project Environmental Impact Statement must be maintained. This register must be provided to the administering authority upon request.

A4 This environmental authority authorises a relevant act[1] to occur only to the extent that:

a) the relevant act is an ordinary consequence of carrying out the resource activities authorised by this environmental authority in accordance with its conditions; or
b) the relevant act is specifically authorised by the conditions of this environmental authority and carrying out an activity which results in the relevant act does not contravene the conditions of this authority.

[1]See section 493A of the *Environmental Protection Act 1994*

Monitoring

A5 All monitoring must be undertaken by a suitably qualified person.

A6 If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.

A7 The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the complaint within five (5) business days of completing the complaint investigation, unless a longer time is agreed to by the administering authority.

A8 All laboratory analyses and tests required must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.

A9 Notwithstanding condition (A8), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.

A10 Monitoring and sampling must be carried out in accordance with the requirements of the following documents (as relevant to the sampling being undertaken), as amended from time to time:

(a) for waters and aquatic environments, the Queensland Government's Monitoring and Sampling Manual 2009 –Environmental Protection (Water) Policy 2009
(b) for groundwater, Groundwater Sampling and Analysis – A Field Guide and any applicable Australian Standard
(c) for noise, the latest administering authority's Noise Measurement Manual and any applicable Australian Standard
(d) for air, the Queensland Air Quality Sampling Manual and/or Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions, as appropriate for the relevant measurement
(e) for soil, the Guidelines for Surveying Soil and Land Resources, 2nd edition (McKenzie et al.2008), and/or the Australian Soil and Land Survey Handbook, 3rd edition (National Committee on Soil and Terrain, 2009)
(f) for dust, Australian Standard AS3580.

Contingency Procedures for Emergency Environmental Incidents

A11 Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) A clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.
(b) Consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.
(c) Response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.
(d) The practices and procedures to be employed to restore the environment or mitigate any environmental harm caused.
(e) Procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.
(f) Training of staff to enable them to effectively respond.

(g) Procedures to notify the administering authority, local government and any potentially impacted landholder.

Maintenance of Plant and Equipment

A12 All plant and equipment must be maintained and operated in their proper and effective condition.

A13 The following infrastructure must be signed with a unique reference name or number in such a way that it is clearly observable:
(a) regulated dams and low consequence dams
(b) exploration, appraisal and development wells
(c) water treatment facilities
(d) sewage treatment facilities
(e) specifically authorised discharge points to air and waters
(f) any chemical storage facility associated with the environmentally relevant activity of chemical storage
(g) field compressor stations
(h) central compressor stations
(i) gas processing facilities; and
(j) pipeline compressor stations.

A14 Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.

Documentation

A15 A certification must be prepared by a suitably qualified person within 30 business days of completing every plan, procedure, program and report required to be developed under this environmental authority, which demonstrates that:
(a) relevant material, including current published guidelines (where available) have been considered in the written document
(b) the content of the written document is accurate and true; and
(c) the document meets the requirements of the relevant conditions of the environmental authority.

A16 All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

A17 All documents required to be developed under this environmental authority must be kept for five (5) years.

A18 All documents required to be prepared, held or kept under this environmental authority must be provided to the administering authority upon written request within the requested timeframe.

A19 A record of all complaints must be kept including the date, complaint's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

Third Party Audit

A20 A third-party auditor, nominated by the holder of this environmental authority and accepted by the administering authority, must audit compliance with the conditions of this environmental authority at a minimum frequency of every three (3) years.

A21 Notwithstanding condition A20, and prior to undertaking the third-party audit, the scope and content of the third-party audit can be negotiated with the administering authority.

A22 An audit report must be prepared and certified by the third-party auditor presenting the findings of each audit carried out.

A23 Any recommendations arising from the audit report must be acted upon by:
(a) investigating any non-compliance issues identified; and
(b) as soon as reasonably practicable, implementing measures or taking necessary action to ensure compliance with the requirements of this environmental authority.

A24 A written response must be attached to the audit report detailing the actions taken on stated dates:
(a) by the holder to ensure compliance with this environmental authority; and
(b) to prevent a recurrence of any non-compliance issues identified.

A25 The audit report required by condition A22 and the written response to the audit report required by condition A24 must be submitted with the subsequent annual return.

Schedule AA - Underground Gas Storage conditions only applicable for GLNG project

AA1 The only gas authorised to be stored underground is coal seam gas and other gas of sales specification quality.

AA2 The authorised gas must only be injected at the location(s) and within the formation(s) and impact zones depicted in Appendix 1 and listed in *Schedule AA, Table 1 - Details of Authorised Storage Formation.*

Schedule AA, Table 1 Details of Authorised Storage Formation

Tenure	Field	Reservoir Name
PL314	Grafton Range	Grafton Range Upper Precipice
PL314	Pleasant Hills	Pleasant Hills Showgrounds
		Pleasant Hills Lower Precipice
		Pleasant Hills Upper Precipice
PL314	Pine Ridge	Pine Ridge Precipice Sandstone
PL315	Pickanjinnie	Pickanjinnie Showgrounds
		Pickanjinnie Precipice
PL315	Raslie	Raslie Precipice Sandstone
PL317	Richmond	Richmond Precipice Sandstone

AA3 Gas injection must not result in:
(a) fracturing the target formation; or
(b) surface migration of the injected gas; or
(c) loss of containment from within the impact zones; or
(d) ingress to buildings and structures; or
(e) fugitive emissions.

AA4 If environmental harm is caused or threatened to be caused, as a result of gas injection activities, gas injection must cease immediately.

AA5 The maximum injection pressure permitted must not exceed 90 per cent of the formation fracture pressure.

AA6 Tracers must not be injected underground.

Monitoring and Reporting Requirements for Operational Gas Injection

AA7 The holder of this environmental authority must:
(a) continuously monitor the injection pressure and flow rate of the gas;
(b) record the daily quantity of gas injected into the formation and the cumulative volume of gas injected into the formation;
(c) monitor the pressure of the target formation at a sufficient frequency to ensure injection pressure does not exceed 90 percent of the formation fracture pressure; and

(d) in the event of anomalous pressure or volume recording, that indicates potential non-conformance with AA3, AA4 or AA5 inform the administering authority within 24 hours of becoming aware.

AA8 A Gas Injection Monitoring report must be prepared annually and include but not necessarily be limited to:
(a) A summary of the results of monitoring as required by condition AA7;
(b) An assessment of the injection flow rates, cumulative volume of gas injected and the formation pressure;
(c) Interpretation on reservoir pressure versus gas injection volume to validate that gas is being confined to the authorised reservoirs in accordance with condition AA7(c);
(d) Records of annual well integrity operations that indicate gas injection well integrity; and
(e) Interpretation of monitoring results as required by condition AA7 to validate performance against the objectives of condition AA3, AA4 and AA5.

Operational Gas Injection Cessation Report

AA9 A gas injection cessation report which has been certified by a suitably qualified person must be submitted to the administering authority within two (2) months of completion of gas injection activities.

AA10 The gas injection cessation report must include, but not necessarily be limited to:
(a) volumes of gas injected at each well;
(b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the verification monitoring, preventative measures and the residual risk; and
(c) a monitoring report outlining the methods and results of verification monitoring undertaken to assess the performance of the operational injection activities and preventative measures for identified hazards.

Schedule B - Water

Contaminant Release

B1 Contaminants must not be directly or indirectly released to any waters except as permitted under this environmental authority.

B2 The extraction of groundwater as part of the petroleum activities from underground aquifers must not directly or indirectly cause environmental harm to any watercourse or wetland.

Works in Watercourses, Wetlands and Lakes

B3 Only construction or maintenance of linear infrastructure is permitted in or within a general ecologically significant wetland or in a watercourse.

B4 The construction and/or maintenance of linear infrastructure that will result in significant disturbance in or on the bed and banks of a watercourse or within a general ecologically significant wetland must be conducted in accordance with the following order of preference:
(a) conducting works in times when there is no water present;
(b) conducting works in times of no flow;
(c) conducting works in times of flow but in a way that does not impede low flow.

B5 The construction and maintenance of linear infrastructure authorised under condition B3 must comply with the water quality limits specified in *Schedule B, Table 1 Release Limits for Construction or Maintenance of Linear Infrastructure.*

Schedule B, Table 1 Release Limits for Construction or Maintenance of Linear Infrastructure

Water Quality Parameters	Units	Water Quality Limits
Turbidity	Nephelometric Turbidity Units (NTU)	For a general ecologically significant wetland, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50 m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within 50 m downstream of the construction or maintenance activity.
		For a general ecologically significant wetland, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU

		applies, measured within 50 m downstream of the construction or maintenance activity.
Hydrocarbons	-	For a general ecologically significant wetland, or watercourse, no visible sheen or slick

B6 Monitoring must be undertaken at a reasonable frequency to ensure compliance with condition B5.

B7 A register must be kept of all linear infrastructure construction and maintenance activities in a wetland of other environmental value and watercourses, which must include:
(a) location of the activity (e.g., GPS coordinates (GDA94) and watercourse name)
(b) estimated flow rate or surface water at the time of the activity
(c) duration of work
(d) results of impact monitoring carried out under condition B6.

B8 Petroleum activities must occur outside a wetland of high ecological significance.

B9 Petroleum activities must not negatively impact a wetland of high ecological significance.

B10 Linear infrastructure activities, other than linear infrastructure construction and/or maintenance activities, must not change the existing surface water hydrological regime of any general ecologically significant wetland.

B11 The construction and/or maintenance of linear infrastructure in any general ecologically significant wetland must not:
(a) prohibit the flow of surface water in or out of the wetland;
(b) impact surface water quality in the wetland unless specifically authorised by this environmental authority;
(c) drain the wetland;
(d) fill the wetland;
(e) impact bank stability; or
(f) result in the clearing of riparian vegetation outside of the required footprint.

B12 Where the petroleum activity(ies) is carried out on floodplains petroleum activity(ies) must be carried out in a way that does not:
(a) concentrate flood flows in a way that will or may cause or threaten an adverse environmental impact; or
(b) divert flood flows from natural drainage paths and alter flow distribution; or
(c) increase the local duration of floods; or
(d) increase the risk of detaining flood flows; or

Erosion and Sediment Control

B13 For activities involving significant disturbance to land, control measures that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:
(a) preferentially divert stormwater around significantly disturbed land, or allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities;
(b) minimise soil erosion resulting from wind, rain, and flowing water;

(c) minimise the duration that disturbed soils are exposed to the erosive forces of wind, rain, and flowing water;
(d) minimise work-related soil erosion and sediment runoff; and
(e) minimise negative impacts to land or properties adjacent to the activities (including roads).

Well Testing

B14 Subject to conditions B15 and B16 the injection of CSG water or better quality groundwater is authorised in wells that are not exploration, appraisal or development wells, for the purposes of hydraulic testing, where such hydraulic tests are undertaken for no more than two (2) consecutive days.

B15 The maximum volume of CSG water or better quality groundwater injected for the purposes of hydraulic testing identified in condition B14 must not exceed 1 ML per hydraulic test.

B16 Written notification detailing the type and location (GPS coordinates) of any hydraulic testing undertaken in accordance with condition B14 must be provided to the administering authority at least 10 business days prior to the commencement of the hydraulic test.

Seepage Monitoring Program

B17 A seepage monitoring program must be developed by a suitably qualified person which is commensurate with the site-specific risks of contaminant seepage from containment facilities, and which requires and plans for detection of any seepage of contaminants to groundwater as a result of storing contaminants by no longer than 3 months following the effective date of this environmental authority.

B18 The seepage monitoring program required by condition B17 must include but not necessarily be limited to:
(a) identification of the containment facilities for which seepage will be monitored
(b) identification of trigger parameters that are associated with the potential or actual contaminants held in the containment facilities as provided for in condition B19.
(c) identification of trigger concentration levels that are suitable for early detection of contaminant releases at the containment facilities
(d) installation of background seepage monitoring bores where groundwater quality will not have been affected by the petroleum activities authorised under this environmental authority to use as reference sites for determining impacts
(e) installation of seepage monitoring bores that:
    i. are within formations potentially affected by the containment facilities authorised under this environmental authority (i.e. within the potential area of impact)
    ii. provide for the early detection of negative impacts prior to reaching groundwater dependent ecosystems bores, or water supply bores
    iii. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e. faults, areas of unconformities known to connect two or more formations)
(f) monitoring of groundwater at each background and seepage monitoring bore at least annually for the trigger parameters identified in condition B19
(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions B19 and B18 (c) trigger the early detection of seepage, or upon becoming aware of any monitoring results that indicate potential groundwater contamination
(h) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis; and

(i) provides for annual updates to the program for new containment facilities constructed in each annual return period.

B19 Seepage monitoring bores identified in B18 (d) and B18 (e) must be monitored annually for the trigger parameter(s) specified in *Schedule B, Table 1 Seepage Monitoring Trigger Parameters*.

Schedule B, Table 2 Seepage Monitoring Trigger Parameters

Parameter	Units	Untreated Coal Seam Water	Permeate	Brine
Static Water Level	m	monitor	monitor	monitor
pH	pH unit	monitor	monitor	monitor
EC	µS/cm	monitor	monitor	monitor
Major Anions (sulphate, chloride)	mg/L	monitor	-	-
Major Cations (calcium, magnesium, sodium and potassium)	mg/L	monitor	-	-

B20 A bore drill log must be completed for each seepage monitoring bore in condition B18 which must include:
(a) bore identification reference and geographical coordinate location
(b) specific construction information including but not limited to depth of bore, depth and length of casing, depth and length of screening and bore sealing details
(c) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible trigger parameters
(d) lithological data, preferably a stratigraphic interpretation to identify the important features including the identification of any aquifers; and
(e) target formation of the bore.

Schedule BA – Fluid Injection conditions only applicable to GLNG project

BA1 The only fluids authorised to be injected into an aquifer(s) are those fluid types into the aquifer formations and locations listed in *Schedule BA, Table 1 Details of Authorised Fluid Injection.*

Schedule BA, Table 1 Details of Authorised Fluid Injection

Well Location (easting and northing (MGA Z55))	Well Number/ Reference	Target Formation	Fluid Type	Water Quality[1](2) Impact Zone	Hydraulic Impact Zone[2]
7013142, 7071103	TBDIG01	Gubberamunda	Treated CSG water	1,500 metres	15,000 metres
701574, 7071369	TBDIG02	Gubberamunda	Treated CSG water		
702492, 7070264	TBDIG03	Gubberamunda	Treated CSG water		
703342, 7068925	TBDIG04	Gubberamunda	Treated CSG water		
703080, 7069642	TBDIG09	Gubberamunda	Treated CSG water		
703221, 7067882	RTRIG11	Gubberamunda	Treated CSG water		
700030, 7070411	PASIG05	Gubberamunda	Treated CSG water		
698073, 7069729	PASIG07	Gubberamunda	Treated CSG water		
698177, 7068384	CWRIG08	Gubberamunda	Treated CSG water		
699141, 7070866	PASIIG12	Gubberamunda	Treated CSG water		
697989, 7067415	CWRIG13	Gubberamunda	Treated CSG water		
697528, 7066628	CWRIG14	Gubberamunda	Treated CSG water		
703242, 7083206	Emu Park 1	Timbury Hills	Treated CSG water	200 metres	18,000 metres

1 The water quality impact zone area shall be described as a polygon with boundary references specified in grid references to GDA94 and will only be applicable where the injection water quality is poorer than the target aquifer.

2 For details on the defining the water quality impact zone and the hydraulic impact zone, refer to chapter 7.3 of the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) Managed Aquifer Recharge.

BA2 The treated CSG water injection trial authorised by condition BA1 is limited to 180 days for the injection activities at the Emu Park 1 well. The administering authority must be notified prior to the commencement of the treated CSG water injection trial.

BA3 Treated CSG water injection into the Gubberamunda target formation authorised by condition BA1 is limited to a period of twenty (20) years from 09 April 2014.

Well Integrity

BA4 Unless otherwise stated in a condition of this environmental authority, injection wells must be carried out in accordance with well construction requirements in the most recent version of the Department of Environment and Resource management's standards for the construction of injection wells, as amended from time to time.

BA5 Fluid injection well(s) authorised by this environmental authority must have appropriate records and documents which support and indicate mechanical integrity and which hold a certificate of mechanical integrity prepared and certified by a suitably qualified person, available for inspection such that:
(a) there is no significant leakage in the casing, tubing, or packer; and

(b) there is no significant fluid movement into a water resource aquifer through vertical channels adjacent to the well bore hole.

BA6 For fluid injection:

(a) at depth less than 100 m, the injection operation must not exceed the dry overburden pressure of the base of the overlying aquitard; or

(b) at depth greater than 100 m, the injection operation must not exceed 90 percent of the formation fracture pressure.

Fluid Injection Quality

BA7 Fluid used for the well injection activities in the Gubberamunda Target Formation, as authorised by condition BA1 must comply with the contaminant limits prescribed in *Schedule BA, Table 2 Specific Contaminant Limits for Injection Fluid* (Gubberamunda Target Formation).

Schedule BA, Table 2 Specific Contaminant Limits for Injection Fluid

Water Quality Characteristics (units)	Release Limits	Limit Type	Monitoring Frequency
Electrical Conductivity (uS/cm)	1000	Maximum	Fortnightly for the first 12 month of operation, then monthly afterwards
pH (pH unit)	6.5 8.5	Range	
N-Nitrosodomethylamine (ug/L)	0.1	Maximum	
Dissolved Oxygen (mg/L)	1	Maximum	
Ammonia as N (mg/L)	0.5	Maximum	
Total nitrate as N (mg/L)	50	Maximum	
Faecal coliforms (cfu/100 ml)	1	Maximum	
Total chlorine (mg/L)	5	Maximum	
Benzene (mg/L)	0.001	Maximum	
Toluene (mg/L)	0.8	Maximum	
Ethyl benzene (mg/L)	0.3	Maximum	
Xylene (mg/L)	0.6	Maximum	
Aluminium (mg/L) (total)	0.1	Maximum	
Arsenic (mg/L) (total)	0.01	Maximum	
Beryllium (mg/L) (total)	0.06	Maximum	
Boron (mg/L) (total)	0.4	Maximum	
Cadmium (mg/L) (total)	0.002	Maximum	
Chromium (mg/L) (total)	0.05	Maximum	
Copper (mg/L) (total)	1	Maximum	
Iron (mg/L) (total)	0.3	Maximum	Fortnightly for the first 12 month of operation, then monthly afterwards
Lead (mg/L) (total)	0.01	Maximum	
Manganese (mg/L) (total)	0.1	Maximum	
Mercury (mg/L) (total)	0.001	Maximum	
Selenium (mg/L) (total)	0.01	Maximum	
Zinc (mg/L) (total)	3	Maximum	

BA8 Fluid used for the well injection activities in the Emu Park 1 well, as authorised by condition BA1, must comply with the contaminant limits prescribed *in Schedule BA, Table 3 Specific Contaminant Limits for Injection Fluid (Emu Park 1 Well)*.

Schedule BA, Table 3 Specific Contaminant Limits for Injection Fluid (Emu Park 1 Well)

Water Quality Characteristics	Release Limits	Limit Type	Monitoring Frequency
Electrical	300 to 900	Range	Daily
pH (pH Unit)	6.5 8.5	Range	Daily
Dissolved oxygen (mg/L)	0.5	Maximum	Daily

Fluid Injection Quantity

BA9 The total volume of fluid injected to the Emu Park 1 well must not exceed 180 ML over the duration of the injection trial.

BA10 The total volume of fluid injected into the Gubberamunda Target Formation, as authorised by condition BA1 must not exceed 24 ML/day.

Monitoring

BA11 Monitoring for changes in groundwater pressure resulting from the CSG water injection trial at the Emu Park 1 well must be conducted. The monitoring must involve the following:

(a) the use of a minimum of three wells, accessing the following formations and locations:
  (i) Timbury Hills formation within the hydraulic impact zone of the well; and
  (ii) Precipice Sandstone formation within 1 km radius of the well; and
  (iii) Gubberamunda formation within 1 km radius of the well.

Injection Management Plan

BA12 An Injection Management Plan must be submitted to the administering authority prior to the carrying out of the fluid injection activities.

BA13 The Injection Management Plan must include but not necessarily be limited to:

(a) estimated volumes and rates of fluid to be produced and injected;
(b) a description of the physical, chemical and biological components and their concentrations of the fluid to be produced;
(c) details of how and where the fluid will be produced, aggregated, stored and kept separate from other fluid until it is, treated and injected into the source aquifer;
(d) details of where the fluid is proposed to be treated including a description of the treatment process;
(e) a demonstration that the injection fluid has inconsequential reactivity with the target formation and native groundwater it will come into contact with;
(f) the characteristics of the receiving environment;
(g) identification of the water quality impact zone and the hydraulic impact zone;
(h) identification of all existing bores, lakes, wetlands, environmental assets and watercourses connected to groundwater, faults and other geologic features that occur within the water quality impact zone and the hydraulic impact zone;
(i) identification of the environmental values and water quality objectives of the potential water quality impact zone of the target formation in accordance with the Environmental Protection Act 1994, Environmental Protection Regulation 2019, Environmental Protection (Water and Wetland Biodiversity) Policy 2019 and the Queensland Water Quality Guidelines 2018;
(j) an assessment of the potential impacts on the environmental values of the receiving environment including migration of injection fluid or native groundwater out of the target formation through wells,

bores, wetlands, connected watercourses, faults or other geologic features likely to impact on other aquifers;

(k) a risk assessment consistent with the risk framework specified in the Australian Guidelines for Water Recycling: Managed Aquifer Recharge identifying potential hazards, their inherent risk, preventative measures for the management of potential hazards and after consideration of the operational monitoring to manage potential hazards identified in the risk assessment including details on sampling and analysis methods including frequency and locations, and quality assurance and control;

(l) verification methods to assess performance of the injection activities,

(m) control measures that will be implemented for fluid storage, treatment and injection to prevent or control the release of a contaminant or waste to the environment;

(n) the indicators or other criteria against which the performance of fluid injection will be assessed;

(o) procedures that will be adopted to regularly review the monitoring program and to report to management and the administering authority should unforeseen or non-compliant monitoring results be recorded;

(p) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;

(q) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and

(r) a program to monitor impacts on the environmental values of the receiving environment identified by condition BA13(j).

Reporting Requirements for Fluid Injection

BA14 For fluid injection activities other than trials at the Emu Park 1 well as authorised under condition BA1, a fluid injection report must be developed.

BA15 The fluid injection report must summarise the results of the Injection Monitoring Program and provide interpretation and analysis of those results including but not necessarily being limited to:

(a) the results of the monitoring program as required by condition BA7;

(b) monthly summaries of injection conditions;

(c) commentary on changes to injection fluid characteristics or sources;

(d) annulus performance;

(e) packer isolation tests;

(f) mechanical integrity tests;

(g) pressure of the target formation;

(h) stability of overlying aquitard;

(i) an updated risk assessment providing details on potential hazards including their inherent risk, preventative measures and monitoring, and the residual risk;

(j) quantity of fluid injected; and

(k) quality parameters of fluid injected.

Well Closure

BA16 A Well Closure Plan must be submitted to the administering authority within six (6) months prior to the cessation of fluid injection at a well.

BA17 The Well Closure Plan must include, but not necessarily be limited to the following:

(a) details of when and under what circumstances the injection well will be decommissioned;

(b) sealing details including the method, type of material to be used and the location and the depth (metres) from ground surface of the bottom of the seal will be located; and

(c) any proposed test or measure to be made.

BA18 Actions outlined in the well closure plan must be completed within three (3) months of the cessation of fluid injection at the injection well.

BA19 Upon completion of injection activities at a fluid injection well, a well closure report demonstrating compliance with the well closure plan as required by condition BA16 for that well must be prepared by a suitably qualified person.

Injection Cessation Report

BA20 A fluid injection cessation report must be submitted to the administering authority within four (4) months of completion of fluid injection activities.

BA21 The fluid injection cessation report must include, but not necessarily be limited to:

(a) volumes of fluid injected at each well;

(b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the verification monitoring, preventative measures and the residual risk; and

(c) a monitoring report outlining the methods and results of verification monitoring as required by condition BA13(r) to assess the performance of the injection activities and preventative measures for identified hazards.

Schedule C – Land

General

C1 Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.

Top Soil Management

C2 Top soil must be managed in a manner that preserves its biological and chemical properties.

Land Management

C3 Land that has been significantly disturbed by the pipeline activities must be managed to ensure that gully erosion or subsidence do not occur on that land.

Chemical Storage

C4 Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipeline Operation and Maintenance

C5 Contaminants authorised to be released to land under conditions C6, C8, C14 and C20 must be carried out in a manner that ensures:
(a) vegetation is not damaged;
(b) soil quality is not adversely impacted;
(c) there is no surface ponding or runoff beyond the designated release area;
(d) there is no aerosols or odours;
(e) deep drainage below the root zone of any vegetation is minimised;
(f) the quality of shallow aquifers is not adversely affected.

Pipeline Wastewater

C6 Contaminants that are hydrostatic test water from pipelines and contaminants from low point drains may be released to land in accordance with condition C5.

C7 Produced water may be re-used in:
(a) drilling and well hole activities; or
(b) stimulation activities.

C8 Produced water may be released to land for the following purposes:
(a) dust suppression;
(b) construction and operational purposes for the petroleum activity authorised by this environmental authority; and
(c) irrigation.

C9 Produced water irrigated to land must:
(a) not exceed the release limits specified in *Schedule C, Table 1a Irrigation water quality monitoring*; and

(b) be monitored at the frequency and for the quality characteristics at the monitoring point specified in *Schedule C, Table 1a - Irrigation water quality monitoring*; or
(c) the process under C10 has been completed.

C10 Produced water for irrigation which does not meet criteria in condition C10 (a) and (b) may be used for irrigation provided a report has been completed which:
(a) determines soil structure, stability and productive capacity will be maintained or improved;
(b) determines there are no toxic effects to crops;
(c) determines yields and produce quality are maintained or improved;
(d) states water quality criteria, which has been determined in accordance with the assessment procedures outlined *in Schedule C, Table 1b Assessment procedures for water quality criteria*; and
(e) includes a water monitoring program to ensure that condition C10 (a), (b) and (c) are being achieved.

Schedule C, Table 1a - Irrigation water quality monitoring

Quality Characteristic	Release Limit	Limit Type	Frequency	Monitoring Point
Electrical conductivity (EC)	<950 µs/cm^3	95th percentile over a one-year period	Fortnightly	At a location following final treatment and prior to release.
Sodium adsorption ratio (SAR) for heavy soils	≤6			
SAR for light soils	≤12			
pH	6.0 - 8.5			
Aluminium	20 mg/L	Maximum	Bi-annually	
Arsenic	2.0 mg/L			
Boron	Refer to table 9.2.18 of ANZECC	Refer to table 9.2.18 of ANZECC		
Cadmium	0.05 mg/L	Maximum		
Chromium	1 mg/L			
Cobalt	0.1 mg/L			
Copper	5 mg/L			
Fluoride	2 mg/L			
Iron	10 mg/L			
Lithium	2.5 mg/L			
Lead	5 mg/L			
Manganese	10 mg/L			

Mercury	0.002 mg/L			
Molybdenum	0.05 mg/L			
Nickel	2 mg/L			
Zinc	5 mg/L			

Schedule C, Table 1b Assessment procedures for water quality criteria

Water Quality Criteria	Assessment Procedure
electrical conductivity sodium adsorption ratio pH	Salinity Management Handbook, with reference to Chapter 11; and/or Australian and New Zealand Guidelines for Fresh and Marine Water Quality, with reference to Volume 1 Chapter 4 and Volume 3 Chapter 9. The assessment should consider: • soil properties within the root zone to be irrigated (e.g. clay content, cation exchange capacity, exchangeable sodium percentage) • water quality of the proposed resource (e.g. salinity, sodicity) • climate conditions (e.g. rainfall) • leaching fractions • average root zone salinity (calculated) • crop salt tolerance (e.g. impact threshold and yield decline) • management practices and objectives (e.g. irrigation application rate, amelioration techniques) • broader landscape issues (e.g. land use, depth to groundwater) • any additional modelling and tests undertaken to support the varied water quality parameters.
heavy metals	Australian and New Zealand Guidelines for Fresh and Marine Water Quality, with reference to Volume 1 Chapters 3 and 4 and Volume 3 Chapter 9. The assessment should aim to derive site specific trigger values (e.g. cumulative contaminant loading limit) based on the methodology provided in the above mentioned procedure.

C11 Produced water may be used for domestic, or stock purposes provided the water quality complies with the criteria specified in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000).

C12 Produced water may be transferred to a third-party to be used for the following purposes, subject to condition C13:
(a) dust suppression;
(b) construction and operational purposes; or
(c) domestic or stock purposes provided the water quality complies with criteria specified in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000).

C13 If the responsibility of coal seam gas water is given or transferred to a third party in accordance with condition C12, the holder of the environmental authority must ensure that:
(a) the responsibility of the coal seam gas water is given or transferred in accordance with a written agreement (the third party agreement); and
(b) the third party is made aware of the General Environmental Duty under section 319 of the *Environmental Protection Act 1994*.

Sewage Treatment Works

C14 Greywater or treated sewage effluent from a treatment system with a daily peak design capacity of up to 450 EP may be:
(a) released to land by sub-surface or spray irrigation provided it is to a fenced and signed contaminant release area that is:
i. a minimum distance of 50 metres from any watercourse, wetland or protected area; and
ii. a minimum distance of 100 metres from any potable water supply or stock drinking water supply; and
iii. kept vegetated with groundcover that is not a prohibited or restricted pest species; or
(b) used for dust suppression and construction purposes subject to condition C20.

C15 When circumstances prevent the irrigation of treated sewage effluent to land, the contaminants must be directed to on-site storage or lawfully disposed of off-site.

Sewage Treatment Works Between 21 EP to 450 EP

C16 Treated sewage effluent released to land must be monitored at the frequency and for the quality characteristics specified in *Schedule C, Table 1 – Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 21EP* for each quality characteristic.

Schedule C, Table 1 Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 21EP

Quality Characteristic	Release Limit	Limit Type	Frequency	Monitoring Point
5-day Biochemical oxygen demand (BOD)	20 mg/L	Maximum	Quarterly	Release pipe from sewage treatment works
E. coli	1000 cfu per 100 mL	80th percentile based on at least 5 samples with not less than 30 minutes between samples		
	10,000 cfu per 100 mL	Maximum		
pH	6.0 - 8.5	Range	Monthly	
Dissolved Oxygen	2 mg/L	Minimum		

Electrical Conductivity		Monitor only		

Sewage Treatment Works Between 100 EP and 450 EP

C17 Prior to construction of a sewage treatment works with a daily peak design capacity of greater than 100EP, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated.

C18 All nominated locations and minimum areas of land in condition C17 for sewage treatment works with a daily peak design capacity of greater than 100EP, must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent and use model inputs representative of the activity and release location including but not limited to effluent quality, soil and vegetation types, and climatic conditions.

C19 Treated sewage effluent must only be released to the nominated locations and minimum areas of land determined by the MEDLI program or recognised equivalent identified in condition C18.

Treated Sewage Effluent Use for Dust Suppression, Construction and Operational Purposes

C20 Treated sewage effluent may only be used for dust suppression, construction and operational purposes provided that:

(a) the treated sewage effluent has not been stored in a dam or tank prior to use;

(b) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority; and

(c) the treated sewage effluent quality:

i. is monitored at the location and frequency specified in *Schedule C, Table 2 - Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes;* and

ii. meets the release limits for each quality characteristic specified in *Schedule C, Table 2 - Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes.*

Schedule C, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes

Quality Characteristic	Sampling and *In situ* Measurement Point Location	Limit type	Release Limit	Frequency
pH	Treated sewage effluent storage	Range	6.0 to 8.5	Weekly until 12 months of monitoring demonstrates no exceedances of the release limits. Monthly monitoring can occur thereafter, excluding E.coli.
5-day Biochemical Oxygen Demand (BOD)		Median	20 mg/L	
Electrical Conductivity		Maximum	1600 uS/cm	
Turbidity		95%ile (max)	2 (5) NTU	
Total Suspended Solids		Median	5 mg/L	
E. coli		Median	<10 cfu per 100 mL	Weekly

Schedule D – Biodiversity

Confirming Biodiversity Values

D1 Prior to undertaking activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground environmentally sensitive areas and wetlands at that location must be undertaken by a suitably qualified person.

D2 A suitably qualified person must develop and certify a methodology so that condition D1 can be complied with, and which is appropriate to confirm on-the-ground environmentally sensitive areas and wetlands

D3 Where areas mapped as environmentally sensitive areas and wetlands differ from those confirmed under conditions D1 and D2, petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground values.

D4 All documentation survey information photographs, field data or any material associated with the field validation requirements in D1 must be maintained for the life of the environmental authority to demonstrate to the administering authority that surveys were conducted in a manner consistent with requirements contained in D2.

D5 The location of the petroleum activity must be selected in accordance with the following site planning principles:

(a) maximise the use of areas of pre-existing disturbance
(b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative impacts, on areas of native vegetation or other areas of ecological value
(c) minimise disturbance to land that may result in land degradation
(d) in order of preference, avoid then minimise isolation, fragmentation, edge effects or dissection of tracts of native vegetation; and
(e) in order of preference, avoid then minimise clearing of native mature trees.

D6 Petroleum activities must be carried out in accordance with *Schedule D, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, *Schedule D, Table 2 – Authorised Petroleum Activities and Disturbance* and any other relevant conditions of this environmental authority.

Schedule D, Table 1 Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary Protection Zone of the ESA	Secondary Protection of the ESA
Category A ESAs	No petroleum activities permitted	Only low impact petroleum activities permitted.	Limited petroleum activities permitted subject to condition D10 Limited impact camps permitted subject to condition D10 Limited impact petroleum activities subject to condition D10

ESA Category	Within the ESA	Primary Protection Zone of the ESA	Secondary Protection of the ESA
Category B ESAs excluding Regional Ecosystems	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition D10 Limited impact camps permitted subject to condition D10 Limited impact petroleum activities subject to condition D10	N/A
Category C ESAs that are Nature Refuges, Koala Habitat and/or Declared Catchment Areas	Only low impact petroleum activities permitted	Limited petroleum activities permitted subject to condition D10 Limited impact camps permitted subject to conditions D7 and D10 Limited impact petroleum activities subject to condition D10	N/A
Category B ESAs that are Regional Ecosystems	Only limited petroleum activities permitted subject to condition D11	Limited petroleum activities permitted subject to condition D10 Limited impact camps permitted subject to condition D10 Limited impact petroleum activities subject to condition D10	N/A
Category C ESAs that are Essential Habitat Regional Ecosystems	Only limited petroleum activities permitted subject to condition D11	Limited petroleum activities permitted subject to condition D10 Limited impact camps permitted subject to conditions D7 and D10 Limited impact petroleum activities subject to condition D10	N/A
Category C ESAs that are Regional Parks (Resource Use Area)	Only limited petroleum activities permitted subject to condition D11	Limited petroleum activities permitted subject to condition D10	N/A

ESA Category	Within the ESA	Primary Protection Zone of the ESA	Secondary Protection of the ESA
		Limited impact camps permitted subject to condition D10 Limited impact petroleum activities subject to condition D10	
Category C ESAs that are State Forests and/or Timber Reserves	Only limited petroleum activities permitted subject to condition D11 Limited impact camps permitted Limited impact petroleum activities subject to condition D8 and D11	N/A	N/A

Note: Approvals may be required under the Forestry Act 1959 where the petroleum activity(ies) is proposed to be carried out in ESAs that are State Forests or Timber Reserves.

Schedule D, Table 2 Authorised Petroleum Activities and Disturbances

Authorised Activity	Development Name	Location of Development (GDA94)		Size of Disturbance	ESA Affected
		Latitude	Longitude		
Pipeline Replacement	Roma Town Gas Supply	-26.57467239 to -26.57484102	148.81652127 to 148.81678162	Approximate Length: 27m Maximum Width: 15m Area of disturbance: 0.04 ha	Category C ESA (Of Concern Regional Ecosystem (RE))
		-26.57484102 to -26.57676487	148.81678162 to 148.81931362	Length: 480m Maximum Width: 15m Area of disturbance: 0.72 ha	Category C (Of Concern RE) Primary Protection Zone
		-26.57852201 to -26.57915321	148.8367684 to 148.84072202	Length: 430m Maximum Width: 15m Area of disturbance: 0.645 ha	Category B (Endangered RE) Secondary Protection Zone

Authorised Activity	Development Name	Location of Development (GDA94)		Size of Disturbance	ESA Affected
		Latitude	**Longitude**		
		-26.579152321 to -26.57711036	148.84072202 to 148.840766891	Length: 230m Maximum Width: 15m Area of disturbance: 0.345 ha	Category B (Endangered RE) Primary Protection Zone
Total Area of Disturbance for Pipeline Replacement					**1.75 ha**
CSG Re-injection Pipeline and Pleasant Hills Dam to Roma Hub 02 Dam Water transfer line	Roma Underground Storage and Pleasant Hills Dam to Roma Hub long distance water line	-26.427814 to -26.430236	149.013226 to 149.01254	Length: 276m Width: 20m Area of disturbance: 0.5591 ha	Category C (Of Concern RE) Primary Protection Zone
		-26.430236 to -26.433375	149.01254 to 149.011659	Length:360m Width: 20m Area of disturbance: 0.7110 ha	Category C ESA (Of Concern Regional Ecosystem (RE))
		-26.433375 to -26.435553	149.011659 to 149.011044	Length: 249m Width: 20m Area of disturbance: 0.4935 ha	Category C (Of Concern RE) Primary Protection Zone
		-26.435553 to -26.438237	149.011044 to 149.010292	Length:287m Width: 20m Area of disturbance: 0.4784 ha	Category C ESA (Of Concern Regional Ecosystem (RE))
		-26.438237 to -26.440709	149.010292 to 149.009599	Length: 305m Width: 20m Area of disturbance: 0.7024 ha	Category C (Of Concern RE) Primary Protection Zone
Total Area of Disturbance for CSG Re-injection Pipeline					**2.996 ha**
Water Transfer Line	Coxon Creek to Mount Hope Section 2	-26.372292 to -26.375052	149.093267 to 149.097478	Length: 739m Width: 12m Area of disturbance: 0.8868 ha	Category C ESA (Of Concern ecosystem): Primary Protection Zone
	Coxon Creek to Mount Hope Section 3	-26.374407 to -26.375052	149.097320 to 149.097478	Length: 70m Width: 12m Area of	Category C ESA (Of Concern ecosystem)

Authorised Activity	Development Name	Location of Development (GDA94)		Size of Disturbance	ESA Affected
		Latitude	Longitude		
				disturbance: 0.084 ha	
	Coxon Creek to Mount Hope Section 4	-26.387917 to -26.378832	149.098679 to 149.098908	Length: 1115m Width: 12m Area of disturbance: 1.338 ha	Category B (Endangered RE) Primary Protection Zone
Total Area of Disturbance for Water Transfer Line					**2.3088 ha**
Water Transfer Pipeline and Gas Transmission Pipeline	Blyth Creek Crossing	-26.466890 -26.466915 -26.467413 -26.467290 -26.466719 -26.466393 -26.466953 -26.466979 -26.466981 -26.467267 -26.467399 -26.467403 -26.466949 -26.466960 -26.466947 -26.466843 -26.466628 -26.466929 -26.467149	149.045108 149.045231 149.045427 149.045297 149.043949 149.043937 149.046125 149.046129 149.046387 149.046396 149.046410 149.046138 149.046031 149.047503 149.047862 149.048592 149.049527 149.049510 149.048555	Length: 140m Width: 30 - 52m Area of disturbance: 0.4901 ha	Category C ESA (Of Concern ecosystem)
				Length: 430m Width: 30m - 52m Area of disturbance: 1.6265 ha	Category C ESA (Of Concern ecosystem): Primary Protection Zone
Total Area of Disturbance for Water and Gas pipelines					**2.116 ha**
Water Transfer Pipelines (Crossing 2)	Blyth Creek	-26.467772 (point 2) to -26.468085 (point 5) to -26.468977 (point 9) to -26.468957 (point 21)	149.037975 (point 2) to 149.037266 (point 5) to 149.037166 (point 9) to 149.037457 (point 21)	Length: 125m Width: 24m – 80m Area of disturbance: 0.3275 ha	Category C ESA (Of Concern ecosystem)

D7 Limited impact camps must not be located within a primary protection zone of Category C ESA (Essential Habitat) or Category C ESA (Nature Refuges).

D8 Limited impact petroleum activities must not be located within areas that contain commercial species.

D9 Despite condition D6 decommissioning petroleum activities are authorised within all ESAs other than Category A ESAs, and within all ESA protection zones when conducted in accordance with the land disturbance planning principles provided in condition D5.

D10 Limited petroleum activities, limited impact camps or limited impact petroleum activities located within a primary protection zone or secondary protection zone of an environmentally sensitive area in accordance with *Schedule D, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, and activities listed in *Schedule D, Table 2 – Authorised Petroleum Activities and Disturbance* must not negatively affect the adjacent environmentally sensitive area.

D11 Prior to carrying out limited petroleum activities or limited impact petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule D, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, it must be demonstrated, in the following order of preference that:

1. no reasonable or practicable alternative exists for carrying out the limited petroleum activities within the environmentally sensitive area;
2. the limited petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance;
3. clearance widths for linear infrastructure is minimised to the maximum extent possible, taking into account the following matters:
    i. safe vehicle movement;
    ii. drainage devices installed are of a type that is appropriate for the track type and location;
    iii. erosion and sediment control measures installed are in accordance condition B13 and B3; and
    iv. power line stays have been preferentially located within the pipeline right of way where possible.
4. the maximum clearance widths specified in *Schedule D, Table 3 - Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule D, Table 3 Authorised Disturbance for Linear Infrastructure

Type of Linear Infrastructure	Clearance Width (m)
(A) Access track(s) not associated with a pipeline(s), communication lines(s) or power line(s):	
(a) single carriage access tracks	18
(b) dual carriage access tracks	21
(c) single or dual carriage access track and associated turnaround bay	35
(B) Access track(s) associated with a pipeline(s), communication line(s) or power line(s):	
(a) single carriage access tracks with a single pipeline, communication line or power line	24
(b) dual carriage access track with a single pipeline, communication line or power line.	27
(c) single or dual carriage access track and associated turnaround bay with a single pipeline, communication line or power line.	41
(d) additional clearing for any additional parallel pipeline, communication line or power line associated with (B)(a), (b) or (c)	7[1]
(C) Additional clearing for take-off drains, power line stays or turnaround bays or other work areas:	
(a) Additional clearing for power line stays associated with (B)	10

(b) additional clearing for take-off drains associated with (A) or (B)	10

[1] *Maximum total disturbance for (B) is 62m.*

Offset Delivery

D12 An Offset Plan must be prepared in accordance with section 5 of the Offset Strategy at Appendix AB of the final environmental impact statement (EIS) decided by the Coordinator - General on 3 September 2015. After a decision under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and three (3) months prior to any construction activities, the proponent must submit the Offset Plan to the administering authority. The Offset Plan must consider offsets for any significant residual impacts to the following ecological receptors:

i. regional ecosystems listed as endangered (biodiversity status)
ii. regional ecosystems listed as of concern (biodiversity status)
iii. essential habitat
iv. wetlands of general ecological significance.

The Offset Plan must:

(a) detail how the specific offset requirements conditioned by the Commonwealth Minister for the Environment in any approval for the project under the EPBC Act will be delivered
(b) detail proposed offsets to address any significant residual impacts for the ecological receptors at condition (D12) (i)-(iv)
(c) include, but not necessarily be limited to:
   i. a detailed description of the land to which the plan relates, the values affected and the extent and likely timing of impact on each value
   ii. evidence that values impacted can be offset
   iii. the method for delivering the offset, including consideration of land-based offsets, direct benefit management plans, offset transfers and/or offset payments and other tenure activities
(d) ensure a legally binding mechanism to protect and manage offset areas
(e) include a staging plan to demonstrate how offsets will be delivered and managed over the life of the project
(f) consider existing, proposed and future offsets prepared and/or planned under the existing environmental authorities pertaining to the project area.

D13 Disturbance to ecological receptors listed in *Schedule D, Table 4 – Maximum disturbance limits to ecological receptors*, must not exceed the relevant maximum disturbance limits.

Schedule D, Table 4 Maximum disturbance limits to ecological receptors

Ecological Receptor	Maximum disturbance area for Roma Project Area (ha)
Endangered vegetation (REs and high value regrowth) (biodiversity status)	153.2
Of-concern vegetation (REs and high value regrowth) (biodiversity status)	820.8
Essential habitat	2.8
Wetlands (general ecological significance)	49.4
Resource reserves	0

Ecological Receptor	Maximum disturbance area for Roma Project Area (ha)
State forest and timber reserves	54.8

Maximum Disturbance

D14 Conditions D12 and D13 apply only to disturbances associated with the GFD project.

Schedule E – Waste

General Waste Management

E1 Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.

E2 All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994.*

E3 Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised by conditions BA1, E4, E8, E9, C6, C8 and C14 to be disposed of or used on site.

E4 Unless otherwise authorised by the conditions of this EA to be released to land, Waste fluids, other than flare precipitant stored in flare pits, or residual drilling material, or drilling fluids stored in sumps, must be contained in either:
(a) an above ground container; or
(b) a structure which contains the wetting front.

E5 Vegetation waste may be burned if it relates to a state forest, timber reserve or forest entitlement area administered by the *Forestry Act 1959* and a permit has been obtained under the *Fire and Rescue Service Act 1990*.

E6 Following the completion of the petroleum activity(ies), any residual brine and / or solid salt present in any dam must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994.*

Investigation into Alternative CSG Water Management Options

E7 The Salt and Brine Management Plan must be developed by December 2019 that has investigated the following:
(a) the viability of waste reuse or recycling through chemically processing or treating brine or salt residues to create useable or saleable products;
(b) the viability of the injection of brine into a natural underground structure that is geologically isolated and does not contain groundwater and does or could supply water for potable or agricultural purposes;
(c) the outcomes of the investigations and proposed actions forward, and identified methods for the beneficial use and of brine and salt; and
(d) procedures for identifying and implementing opportunities to improve the CSG water management practices.

Residual Drilling Materials

E8 If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.

E9 Residual drilling material can only be disposed of on- site:
(a) by mix-bury-cover method if the residual drilling material meets the approved quality criteria; or
(b) if it is certified by a suitably qualified third-party as being of acceptable quality for disposal to land by the proposed method and that environmental harm will not result from the proposed disposal.

E10 Records must be kept to demonstrate compliance with conditions E8 and E9.

Brine and Salt Management

E11 If evaporation dams are proposed to be used for evaporation of coal seam gas water concentrate after 1 January 2019, an evaluation of CSG water management must be undertaken, including:
(a) best practice environmental management for managing the CSG water; and
(b) feasibility of alternative ways for managing the CSG water.

Schedule F – Noise

F1 Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

F2 Notwithstanding condition F1, emission of noise from the petroleum activity at levels less than those specified in *Schedule F, Table 1 Noise nuisance limits* are not considered to be environmental nuisance.

Schedule F, Table 1 Noise nuisance limits

Time period	Metric	Short term noise event	Medium term noise event	Long term noise event
7:00am 6:00pm	LAeq,adj,15 min	45 dBA	43 dBA	40 dBA
6:00pm 10:00pm	LAeq,adj,15 min	40 dBA	38 dBA	35 dBA
10:00pm 6:00am	LAeq,adj,15 min	28 dBA	28 dBA	28 dBA
	Max LpA,15 min	55 dBA	55 dBA	55 dBA
6:00am 7:00am	LAeq,adj,15 min	40 dBA	38 dBA	35 dBA

Note: The noise limits in Table 1 have been set based on the following deemed background noise levels (L_{ABG}):
7:00am - 6:00 pm: 35 dBA
6:00pm - 10:00 pm: 30 dBA
10:00pm - 6:00 am: 25 dBA
6:00am - 7:00 am: 30 dBA

F3 If the noise subject to a valid complaint is tonal or impulsive, the adjustments detailed in *Schedule F, Table 2 Adjustments to be added to noise levels at sensitive receptors* are to be added to the measured noise level(s) to derive $L_{Aeq,\ adj,\ 15\ min}$.

Schedule F, Table 2 Adjustments to be added to noise levels at sensitive receptors

Noise characteristic	Adjustment to noise
Tonal characteristic is just audible	+ 2 dBA
Tonal characteristic is clearly audible	+ 5 dBA
Impulsive characteristic is detectable	+ 2 to + 5 dBA

F4 Notwithstanding condition F2, emission of any low frequency noise must not exceed either F4(a) and F4(b), or F4(c) and F4(d) in the event of a valid complaint about low frequency noise being made to the administering authority:

(a) 60 dB(C) measured outside the sensitive receptor; and
(b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB; or
(c) 50 dB(Z) measured inside the sensitive receptor; and
(d) the difference between the internal A-weighted and Z-weighted (Max $_{LpZ,\ 15\ min}$) noise levels is no greater than 15 dB.

F5 A Blast Management Plan must be developed for each blasting activity in accordance with Australian Standard 2187.

F6 Blasting operations must be designed to not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any sensitive place.

F7 Blasting operations must be designed to not exceed a ground-borne vibration peak particle velocity of 10mm/s at any time, when measured at or extrapolated to any sensitive place.

Schedule G – Air

Fuel Burning or Combustion Equipment

G1 If compressor stations meet the definition of a fuel burning or combustion facility, the design of the facility must be capable of achieving air quality objectives for each environmental value stated in the Environmental Protection (Air) Policy 2019.

Fuel Burning or Combustion Equipment

G2 A fuel burning or combustion facility must:

(a) not be operated unless it is listed in *Schedule G, Table 1 – Authorised Releases of Contaminants to Air* from Point Sources;

(b) not exceed the release limits specified in *Schedule G, Table 1 – Authorised Releases of Contaminants to Air* from Point Sources;

(c) be monitored for the release limits at the release point locations and at the monitoring frequency specified in *Schedule G, Table 1 – Authorised Releases of Contaminants to Air* from Point Sources.

Schedule G, Table 1 Contaminant Release Points and Release Limits to Air

Release Point Numbers	Determination requirement	Minimum Release Height (metres)	Minimum Velocity (m/sec)	Containment Release	Maximum Release Limit[1]	Frequency
Roma HCS-02 Compressors 7667-KX-30 7667-KX-31 7667-KX-32 7667-KX-33 7667-KX-34	Mass emission rate and concentration of oxides of nitrogen (NOx) in the flue gas at 15% O2, dry, 0° (237 °K), 101.3 kPa oxygen reference level.	15	10	Oxides of Nitrogen	150 mg/Nm^3 2g/s	All stacks must be monitored during commissioning (See Note 1) of the facility and once per year thereafter.
Roma HCS-02 Gas Turbine Generators 7667-GX-01 7667-GX-02 7667-GX-03 7667-GX-04	Mass emission rate and concentration of oxides of nitrogen (NOx) in the flue gas at 15% O_2, dry, 0° (237 °K), 101.3 kPa oxygen reference level.	15	10	Oxides of Nitrogen	150 mg/Nm^3 2g/s	All stacks must be monitored during commissioning (See Note 1) of the facility and once per year thereafter.

Note 1: The above NOx release limits are applicable during all timings except start-up, shutdown and calibration of emission monitoring devices. The start-up duration is allowed up to 30 minutes.

Venting and Flaring

G3 Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas must be flared in a manner that complies with all of G3(a) and G3(b) and G3(c), or with G3(d):

(a) an automatic ignition system is used, and

(b) a flame is visible at all times while the waste gas is being flared, and

(c) there are no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours, or

(d) it uses an enclosed flare.

Schedule H – Regulated Structures

Assessment of Consequence Category

H1 The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933[1]) at the following times:
a) prior to the design and construction of the structure; or
b) prior to any change in its purpose or the nature of its stored contents.

[1] This is the publication number, which can be used as a search term to find the latest version of the publication at www.des.qld.gov.au

H2 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.

H3 Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).

Design and Construction of a Regulated Structure

H4 All regulated structures must be designed by, and constructed[2] under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).
[2] Certification of design and construction may be undertaken by different persons.

H5 Construction of a regulated structure is prohibited unless:
(a) the holder has submitted a consequence category assessment report and certification to the administering authority; and
(b) certification for the design, design plan and the associated operating procedures has been certified by a suitably qualified and experienced person in compliance with the relevant condition of this authority.

H6 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 Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) and must be recorded in the Register of Regulated Structures.

H7 Regulated structures must:
(a) be designed and constructed in compliance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933);
(b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:
    i. floodwaters from entering the regulated dam from any watercourse or drainage line; and
    ii. wall failure due to erosion by floodwaters arising from any watercourse or drainage line.
(c) 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.

H8 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
(b) construction of the regulated structure is in accordance with the design plan.

H9 All affected persons must be provided with a copy of the emergency action plan in place for each regulated structure:
(a) prior to the operation of the new regulated structure; and
(b) if the emergency action plan is amended, within 5 business days of it being amended.

Operation of a Regulated Structure

H10 Operation of a regulated structure is prohibited unless the holder has submitted to the administering authority in respect of regulated structure, all of the following:
(a) one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition H5;
(b) a set of 'as constructed' drawings and specifications;
(c) certification of the 'as constructed drawings and specifications' in accordance with condition H8;
(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 holder has entered the details required under this authority, into a Register of Regulated Structures; and
(g) there is a current operational plan for the regulated structure.

H11 Each regulated structure must be maintained and operated, for the duration of its operational life until decommissioned and rehabilitated, in compliance with the current operational plan and, if applicable, the current design plan and associated certified 'as constructed' drawings.

Mandatory Reporting Level

H12 Conditions H13 to H15 inclusive only apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.

H13 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.

H14 The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

Mandatory Reporting Level

H15 The holder must record any changes to the MRL in the Register of Regulated Structures.

Design Storage Allowances

H16 The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

H17 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).

H18 The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

Annual Inspection Report

H19 Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

H20 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 a recommendations section, with any recommended actions to ensure the integrity of the regulated structure or a positive statement that no recommendations are required.

H21 The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933).

H22 The holder must within 20 business days of receipt of the annual inspection report, provide to the administering authority:

a) The recommendations section of the annual inspection report; and
b) If applicable, any actions being taken in response to those recommendations; and
c) If, following receipt of the recommendations and (if applicable) recommended actions, the administering authority requests a copy of the annual inspection report from the holder, provide this to the administering authority within 10 business days of receipt of the request.

Transfer Arrangements

H23 The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.

Decommissioning and Rehabilitation

H24 Regulated structures must not be abandoned but be either:

a) decommissioned and rehabilitated to achieve compliance with condition H25; or
b) be left in-situ for a use by the landholder provided that:
    i. it no longer contains contaminants that will migrate into the environment; and
    ii. it contains water of a quality that is demonstrated to be suitable for its intended use(s); and

c) the holder of the environmental authority and the landholder agree in writing that the;
   i. dam will be used by the landholder following the cessation of the environmentally relevant activity(ies); and
d) landholder is responsible for the dam, on and from an agreed date.

H25 Before surrendering this environmental authority the site must be rehabilitated to achieve a safe, stable, non-polluting landform and be suitable for the relevant final land use.

Register of Regulated Structures

H26 A Register of Regulated Structures must be established and maintained by the holder for each regulated structure.

H27 The holder must provisionally enter the required information in the Register of Regulated Structures when a design plan for a regulated dam is submitted to the administering authority.

H28 The holder must make a final entry of the required information in the Register of Regulated Structures once compliance with condition H10 has been achieved.

H29 The holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.

H30 All entries in the Register of Regulated Structures must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.

Monitoring

H31 Each regulated structure not on the register referred to in condition A3 must be monitored for the water quality characteristics and at the monitoring location and frequency specified in *Schedule H, Table 1 – Regulated Structure Contaminant Monitoring* as follows:

Schedule H, Table 1 Regulated Structure Contaminant Monitoring

Quality Characteristic (units)	Monitoring Location	Frequency of Monitoring
pH (pH unit)	At a depth of 0.3m to 1.0m and be taken as far as practicable from the edge of the regulated structure	No earlier than August and no later than October inclusive, every year.
Electrical Conductivity (uS/cm)		
Turbidity (NTU)		
Temperature		
Dissolved Oxygen (mg/L)		
Sodium adsorption ratio (SAR)		
Aluminium (mg/L)		
Arsenic (mg/L)		
Barium (mg/L)		
Boron (mg/L)		

Cadmium (mg/L)		
Chromium (CrVI) (mg/L)		
Copper (mg/L)		
Iron (mg/L)		
Fluoride (mg/L)		
Lead (mg/L)		
Manganese (mg/L)		
Mercury (mg/L)		
Nickel (mg/L)		
Selenium (mg/L)		
Silver (mg/L)		
Strontium (mg/L)		
Tin (mg/L)		
Zinc (mg/L)		
Total phosphorus (mg/L)		
Total Nitrogen (mg/L)		
Total petroleum hydrocarbons (ug/L)		
BTEX (ug/L)		
Polycyclic aromatic hydrocarbons (ug/L)		
Gross alpha + gross beta or radionuclides by gamma spectroscopy (Bq/L)		

Schedule I – Well Construction, Maintenance and Stimulation Activity

Drilling Activities

I1 Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).

I2 Drilling activities must not result in the connection of the target gas producing formation and another aquifer.

I3 Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target gas producing formation and another aquifer as a result of drilling activities.

Simulation Activities

I4 Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.

I5 Stimulation activities must not negatively affect water quality, other than that within the stimulation impact zone of the target gas producing formation.

I6 Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.

I7 The internal and external mechanical integrity of the well system prior to and during well stimulation must be ensured such that there is:

(a) no significant leakage in the casing, tubing, or packer; and
(b) there is no significant fluid movement into another aquifer through vertical channels adjacent to the well bore hole.

I8 Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

Stimulation Risk Assessment

I9 Prior to undertaking well stimulation activities, a risk assessment must be developed to ensure that stimulation activities are managed to prevent environmental harm.

I10 The stimulation risk assessment required must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well and address issues at a relevant geospatial scale such that changes to features and attributes are adequately described and must include, but not necessarily be limited to:

a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice;
b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority;
c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s);
d) naturally occurring geological faults;
e) seismic history of the region (e.g. earth tremors, earthquakes);
f) proximity of overlying and underlying aquifers;

g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation.
h) identification and proximity of landholders' active groundwater bores in the area where stimulation activities are to be carried out;
i) the environmental values of groundwater in the area;
j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to stimulation monitoring in order to accurately assess the risks to environmental values of groundwater;
k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
m) a description of the well mechanical integrity testing program;
n) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc);
o) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation;
p) groundwater transmissivity, flow rate, hydraulic conductivity and direction(s) of flow;
q) a description of the chemicals used in stimulation activities (including estimated total mass, estimated composition, chemical abstract service numbers and properties), their mixtures and the resultant compounds that are formed after stimulation;
r) a mass balance estimating the concentrations and absolute masses of chemicals that will be reacted, returned to the surface or left in the target gas producing formation subsequent to stimulation;
s) an environmental hazard assessment of the chemicals used including their mixtures and the resultant chemicals that are formed after stimulation including:
    i. toxicological and ecotoxicological information of chemicals used;
    ii. information on the persistence and bioaccumulation potential of the chemicals used;
    iii. identification of the stimulation fluid chemicals of potential concern derived from the risk assessment;
t) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities;
u) if used, identification and an environmental hazard assessment of using radioactive tracer beads in stimulation activities
v) an environmental hazard assessment of leaving stimulation chemicals in the target gas producing formation for extended periods subsequent to stimulation;
w) human health exposure pathways to operators and the regional population;
x) risk characterisation of environmental impacts based on the environmental hazard assessment;
y) potential impacts to landholder bores as a result of stimulation activities;
z) the determination of the likelihood of causing interconnectivity and/or negative water quality as a result of stimulation activities undertaken in close proximity or each other; and
aa) potential environmental or health impacts which may result from stimulation activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

I11 Prior to undertaking any stimulation activity, a baseline bore assessment must be undertaken of the water quality of:

(a) all landholders' active groundwater bores (subject to access being permitted by the landholder) that are spatially within a two (2) kilometre horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and
(b) all landholders' active groundwater bores (subject to access being permitted by the landholder) in any aquifer that is within 200 metres above or below the target gas producing formation and is spatially located with a two (2) kilometre radius from the location of the stimulation initiation point; and
(c) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the risk assessment required by conditions I9 and I10.

I12 Prior to undertaking stimulation activities at a well, there must have sufficient water quality data to accurately represent the water quality in the well to be stimulated. The data must include, as a minimum, the results of analyses for the parameters in condition I13.

I13 Baseline bore and well assessments must include relevant analytes and physicochemical parameters to be monitored in order to establish baseline water quality and must include, but not necessarily be limited to:
(a) pH
(b) electrical conductivity [µS/m]
(c) turbidity [NTU]
(d) total dissolved solids [mg/L]
(e) temperature [°C]
(f) dissolved oxygen [mg/L]
(g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L]
(h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO3) [mg/L]
(i) sodium adsorption ratio (SAR)
(j) anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L]
(k) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L]
(l) dissolved and total metals and metalloids (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, total chromium, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [µg/L]
(m) total petroleum hydrocarbons [µg/L]
(n) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para- and meta-xylene, and total xylene) [µg/L]
(o) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [µg/L]
(p) sodium hypochlorite [mg/L]
(q) sodium hydroxide [mg/L]
(r) formaldehyde [mg/L]
(s) ethanol [mg/L]; and
(t) gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L].

I14 Despite condition I13, baseline bore and well assessment undertaken prior to 07 December 2022 must include the minimum water quality analytes and physico-chemical parameters identified in the Baseline Assessment Guideline (EHP) and any restricted stimulation fluids as defined in the *Environmental Protection Act 1994*, as amended from time to time, in order to establish baseline water quality.

Simulation Impact Monitoring Program

I14 Stimulation Impact Monitoring Program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (I9) and (I10) that relate to stimulation activities and must include, as a minimum, monitoring of:

(a) the stimulation fluids to be used in stimulation activities at sufficient frequency and which sufficiently represents the quantity and quality of the fluids used; and
(b) flow back waters from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and
(c) flow back waters from stimulation activities at sufficient frequency and accuracy to demonstrate that 150 per cent of the volume used in stimulation activities has been extracted from the stimulated well; and
(d) all bores in accordance with condition (I11) at the following minimum frequency:
    i. monthly for the first six (6) months subsequent to the stimulation activities being undertaken; then
    ii. annually for the first five (5) years subsequent to the stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (I13) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.

I15 The Stimulation Impact Monitoring Program must provide for monitoring of:

(a) analytes and physico-chemical parameters relevant to baseline bore and well assessments to enable data referencing and comparison including, but not necessarily being limited to the analytes and physico- chemical parameters in condition I13; and
(b) any other analyte or physico-chemical parameters that will enable detection of adverse water quality impacts and the inter-connection with a non-target aquifer as a result of stimulation activities including chemical compounds that are actually or potentially formed by chemical reactions with each other or coal seam materials during stimulation activities.

I16 The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholders upon request by that landholder.

Schedule J – Rehabilitation

Rehabilitation Planning

J1 A Rehabilitation Plan must be developed by a suitably qualified person and must include the:
- (a) rehabilitation goals; and
- (b) procedures to be undertaken for rehabilitation that will:
  - i. achieve the requirements of conditions (J2) to (J6) inclusive; and
  - ii. provide for appropriate monitoring and maintenance.

Transitional Rehabilitation

J2 Significantly disturbed areas that are no longer required for the on-going petroleum activities, must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria:
- (a) contaminated land resulting from petroleum activities is remediated and rehabilitated;
- (b) the areas are:
  - i. non-polluting;
  - ii. a stable landform;
  - iii. re-profiled to contours consistent with the surrounding landform
- (c) surface drainage lines are re-established;
- (d) top soil is reinstated; and
- (e) either:
  - i. groundcover, that is not a prohibited or restricted pest species, is growing; or
  - ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Remaining Dams

J3 Where there is a dam, (including a low consequence dam) that is being or intended to be used by the landholder or overlapping tenure holder, the dam must be decommissioned to no longer accept inflow from the petroleum activity(ies) and the contained water must be of a quality suitable for the intended on- going uses(s) by the landholder or overlapping tenure holder.

Pipeline Activities

J4 Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.

J5 Reinstatement and revegetation of the pipeline right of way must commence within 6 months after cessation of petroleum activities for the purpose of pipeline construction.

J6 Backfilled, reinstated and revegetated pipeline trenches and right of ways must be:
- (a) a stable landform
- (b) re-profiled to a level consistent with surrounding soils
- (c) re-profiled to original contours and established drainage lines; and
- (d) vegetated with groundcover which is not a prohibited or restricted pest species, and which is established and growing.

Final Rehabilitation Acceptance Criteria

J7 All significantly disturbed areas caused by petroleum activities which are not being or intended to be utilised by the landholder or overlapping tenure holder, must be rehabilitated to meet the following final acceptance criteria measured either against the highest ecological value adjacent land use or the pre-disturbed land use:

(a) greater than or equal to 70 per cent of native ground cover species richness
(b) greater than or equal to the total per cent ground cover
(c) less than or equal to the per cent species richness of prohibited or restricted pest species
(d) where the adjacent land use contains, or the pre-clearing land use contained, one or more regional ecosystem(s), then:
    i. at least one Regional Ecosystem(s) from the same broad vegetation group, as demonstrated by the predominant species in the ecologically dominant layer, must be present; and,
    ii. the Regional Ecosystem present in J7(d)(i) must possess an equivalent or higher conservation value (biodiversity status) than the Regional ecosystem(s) in either the adjacent land or pre-disturbed land.

Final Rehabilitation Acceptance Criteria in Environmentally Sensitive Areas

J8 Where significant disturbance to land has occurred in an environmentally sensitive area, the following final rehabilitation criteria as measured against the pre- disturbance biodiversity values assessment (required by conditions D1 and D3) must be met:

(a) greater than or equal to 70% of native ground cover species richness
(b) greater than or equal to the total per cent ground cover
(c) less than or equal to the per cent species richness of Prohibited or restricted pest species
(d) greater than or equal to 50% of organic litter cover
(e) greater than or equal to 50% of total density of coarse woody material; and
(f) all predominant species in the ecologically dominant layer, that define the pre-disturbance regional ecosystem(s) are present.

Schedule K – Notification

K1 The administering authority must be notified through the Pollution Hotline as soon as reasonably practicable, but within 48 hours after becoming aware of:

a) any unauthorised significant disturbance to land; or
b) any unauthorised release of contaminants greater than:
    i. 200 L of hydrocarbons; or
    ii. 200 L of stimulation additives; or
    iii. 500 L of stimulation fluids; or (iv).
    iv. 1,000 L of brine; or
    v. 5,000 L of coal seam gas water; or (vi).
    vi. 10,000 L of sewage effluent;
    vii. 100,000 L of irrigation-quality coal seam gas water, released inside a designated irrigation area authorised by condition C8(c).
c) a potential or actual loss of structural or hydraulic integrity of a dam; or
d) when the level of the contents of any regulated dam reaches the mandatory reporting level; or
e) when a regulated dam will not have available storage to meet the design storage allowance on the 1 November of any year; or
f) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during stimulation increases by more than 3.5 MPa from the pressure immediately preceding stimulation); or
g) any detection of restricted stimulation fluids from stimulation fluid monitoring; or
h) any analyses result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource; or
i) any analyses result from groundwater monitoring that exceeds trigger action investigation levels, if provided in this environmental authority.

K2 The notification of emergencies or incidents as required by condition K1 must include but not be limited to the following information:

a) the environmental authority number and name of the holder;
b) the tenure type and number where the emergency or incident occurred;
c) the name and telephone number of the designated contact person;
d) the location of the emergency or incident (GDA94);
e) the date and time that the emergency or incident occurred;
f) the date and time the holder of this environmental authority became aware of the emergency or incident;
g) details of the nature of the event and the circumstances in which it occurred;
h) the estimated quantity and type of any contaminants involved in the incident;
i) the actual or potential suspected cause of the emergency or incident;
j) a description of the land use at the site of the emergency or incident (e.g. grazing, pasture, forest etc.) and/or the name of any relevant waters and other environmentally sensitive features;
k) a description of the possible impacts from the emergency or incident;
l) a description of whether stock and/or wildlife were exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
m) any sampling conducted or proposed, relevant to the emergency or incident;
n) landholder details and details of landholder consultation;
o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
p) whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.

K3 Within 10 business days following the initial notification under conditions K1 and K2 unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):

a) the root cause of the emergency or incident;
b) the confirmed quantities and types of any contaminants involved in the incident;
c) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
d) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
e) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
f) results and current status of landholder consultation, including commitment to resolve any outstanding issues/concerns; and
g) actions and/or procedural changes to prevent a recurrence of the emergency or incident.

Schedule L – Definitions

Words and phrases used throughout this environmental authority are defined below except where identified in the *Environmental Protection Act 1994* or its Regulations and Environmental Protection Policies. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

Word or Phrase	Definition
Adjacent Land Use(s)	means the ecosystem function adjacent to an area of significant disturbance, or where there is no ecosystem function, the use of the land. An adjacent land use does not include an adjacent area that shows evidence of edge effect.
Administering Authority	means: a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the *Environmental Protection Act 1994* the local government; or b) for all other matters the Chief Executive of the Department of Environment and Science; or c) another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.
Affected Person	is someone whose drinking water can potentially be impacted as a result of discharges from a dam or their life or property can be put at risk due to dwellings or workplaces being in the path of a dam break flood.
AHD	means Australian Height Datum and is the datum used for the determination of elevations in Australia. The determination uses a national network of benchmarks and tide gauges and sets mean sea level at zero elevation.
Alternative Arrangement	means a written agreement about the way in which a particular environmental nuisance impact will be dealt with at a sensitive place and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.
Analogue Site	means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation, vegetation community attributes and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters.
Analytes	means a chemical parameter determined by either physical measurement in the field or by laboratory analysis.
Annual Exceedance Probability or AEP	the probability that at least one event in excess of a particular magnitude will occur in any given year.

<table>
<tr><th>Word or Phrase</th><th>Definition</th></tr>
<tr><td>Annual Inspection Report</td><td>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.</td></tr>
<tr><td>Appraisal well</td><td>means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.</td></tr>
<tr><td>Approved quality criteria</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:

<u>Part A</u> In all cases:

<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>pH</td><td>6-10.5 (range)</td></tr>
<tr><td>Electrical Conductivity</td><td>20 dS/m (20,000 µS/cm)</td></tr>
<tr><td>Chloride*</td><td>8000 mg/L</td></tr>
</table>

*Chloride analysis is only required if an additive containing chloride was used in the drilling process.

The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing.

<u>Part B</u> If any of the following metals are a component of the drilling fluids, then for that metal:

<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>Arsenic</td><td>20 mg/kg</td></tr>
<tr><td>Selenium</td><td>5 mg/kg</td></tr>
<tr><td>Boron</td><td>100 mg/kg</td></tr>
<tr><td>Cadmium</td><td>3 mg/kg</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Word or Phrase</th><th>Definition</th></tr>
<tr><td></td><td>
<table>
<tr><td>Chromium</td><td>400 mg/kg</td></tr>
<tr><td>Copper</td><td>100 mg/kg</td></tr>
<tr><td>Lead</td><td>600 mg/kg</td></tr>
</table>
The limits in Part B and Part C refer to the post soil/by-product mix. Part C If a hydrocarbon sheen is visible, the following hydrocarbon fractions:
<table>
<tr><th>TPH</th><th>Maximum concentration</th></tr>
<tr><td>C6 – C10</td><td>170 mg/kg</td></tr>
<tr><td>C10 – C16</td><td>150 mg/kg</td></tr>
<tr><td>C16 – C34</td><td>1300 mg/kg</td></tr>
<tr><td>C34 – C40</td><td>5600 mg/kg</td></tr>
<tr><td>Total Polycyclic Aromatic Hydrocarbons (PAHs)</td><td>20 mg/kg</td></tr>
<tr><td>Phenols (halogenated)</td><td>1 mg/kg</td></tr>
<tr><td>Phenols (non-halogenated)</td><td>60 mg/kg</td></tr>
<tr><td>Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes including otho, para and meta xylenes) and styrene)</td><td>7 mg/kg</td></tr>
<tr><td>Benzene</td><td>1 mg/kg</td></tr>
</table>
</td></tr>
<tr><td>Areas of Pre-existing Disturbance</td><td>means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term ‘areas of pre-disturbance’ does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.</td></tr>
<tr><td>Assessed or Assessment</td><td>by a suitably qualified and experienced person in relation to a consequence assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit 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;</td></tr>
</table>

Word or Phrase	Definition
	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 Water	means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.
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.
Australian Standard 2187	means Australian Standard 2187.0:1998 Explosives—Storage, transport and use, Part 0, Australian Standard 2187.1:1998 Explosives—Storage, transport and use Part 1 and Australian Standard 2187.2:2006 Explosives—Storage and use, Part 2 or any updated versions that becomes available from time to time.
Australian Standard 3580	means any of the following publications: • AS3580.10.1 Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method. • 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 • AS3580.9.9 Methods for sampling and analysis of ambient air Determination of suspended particulate matter PM10 low volume sampler Gravimetric sampler.
Australian Standard 4323	means Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions.
Authority	means an environmental authority.
Background noise level	means the sound pressure level, measured in the absence of the noise under investigation, as the L A90, T being the A-weighted sound pressure level exceeded for 90 per cent of the measurement time period T of not less than 15 minutes, using Fast response.
Bed and Banks	for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.
Being or intended to be utilised by the landholder or overlapping tenure holder	for significantly disturbed land, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land

Word or Phrase	Definition
	such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the environmental authority holder identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.
Beneficial use	means with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is: o of benefit to that owner in that it adds real value to their business or to the general community, o in accordance with relevant provisions of the *Waste Reduction and Recycling Act 2011*, o sustainable by virtue of written undertakings given by that owner to maintain that dam, and o the transfer and use have been approved or authorised under any relevant legislation. Or, with respect to coal seam gas water, refer to the o Department of Environment and Heritage Protection's *Guideline – Approval of Coal Seam Gas Water for Beneficial Use.*
Bore	means a water observation bore or a water supply bore that is either sub-artesian or artesian.
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.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.
Bund or bunded	in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or bunded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.
Business day	has the meaning in the Acts Interpretation Act 1954 and *Environmental Protection Act 1994* and means a day that is not— o a Saturday or Sunday; or o a public holiday, special holiday or bank holiday in the place in which any relevant act is to be or may be done; or

Word or Phrase	Definition
	○ a business day that occurs during the period starting on 20 December in a year and ending on 5 January in the following year.
Category A Environmentally Sensitive Area	means any area listed in Schedule 19, part 1, section 1 of the Environmental Protection Regulation 2019.
Category B Environmentally Sensitive Area	means any area listed in Schedule 19, part 1, section 2 of the Environmental Protection Regulation 2019.
Category C Environmentally Sensitive Area	means any of the following areas: ○ Nature Refuges as defined under the *Nature Conservation Act 1992*; ○ Koala Habitat Areas as defined under the Nature Conservation (Koala) Conservation Plan 2006; ○ State Forests or Timber Reserves as defined under the *Forestry Act 1959*; ○ Regional parks (resource use area) under the *Nature Conservation Act 1992;* ○ An area validated as "Essential Habitat" from ground-truthing surveys in accordance with the *Vegetation Management Act 1999* for a species of wildlife listed as endangered or vulnerable under the *Nature Conservation Act 1992;* ○ Of Concern Regional Ecosystems that are remnant vegetation identified in the database called 'RE description database' containing Regional Ecosystem numbers and descriptions.
Certifying or Certify or Certified or Certification	in relation to a dam, means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this Manual, 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 (ID: 1.4 (2A))
Certifying or Certify or Certified or Certification	in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams means, a Statutory Declaration by a suitably qualified person or suitably qualified third-party accompanying the written document stating: • The person's qualifications and experience relevant to the function; • that the person has not knowingly included false, misleading or incomplete information in the document; • that the person has not knowingly failed to reveal any relevant information or document to the administering authority; • that the document addresses the relevant matters for the function and is factually correct; and • that the opinions expressed in the document are honestly and reasonably held.
Clearing	for vegetation: a) means remove, cut down, ringbark, push over, poison or destroy in any way including by burning, flooding or draining; but

Word or Phrase	Definition
	b) does not include destroying standing vegetation by stock or lopping a tree.
Closed-Loop Systems	means using waste on site in a way that does not release waste or contaminants in the waste to the environment.
Coal Seam Gas Water	means underground water brought to the surface of the earth, or moved underground in connection with exploring for, or producing coal seam gas.
Coal seam gas water concentrate	means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.
Commercial species	means species as listed in parts 1, 2 and 3 of Schedule 6 of the Vegetation Management Regulation 2012, which are above the diameters / sizes specified in this Schedule for each listed species.
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 (ESR/2016/1933).
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.
Control Measure	has the meaning in section 31 of the Environmental Protection Regulation 2019 and means a device, equipment, structure, or management strategy used to prevent or control the release of a contaminant or waste to the environment.
Daily Peak Design Capacity	for sewage treatment works, has the meaning in Schedule 2, section 63(4) of the Environmental Protection Regulation 2019 as the higher equivalent person (EP) for the works calculated using each of the formulae found in the definition for EP.
Dam	means a land-based structure or a void that is designed to 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. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.
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 (for example, via spillway).
Design Plan	is a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.

Word or Phrase	Definition
Design Storage Allowance or DSA	means an available volume, estimated in accordance with the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) 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.
Development Well	means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.
Discharge area	means: • that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and • identified by an assessment process consistent with the document Salinity Management Handbook • Queensland Department of Natural Resources, 1997, as amended from time to time; or • identified by an approved salinity hazard map held by the administering authority.
Document	has the meaning in the *Acts Interpretation Act 1954* and means: • any paper or other material on which there is writing; • any paper or other material on which there are marks; • figures, symbols or perforations having a meaning for a person qualified to interpret them; and • any disc, tape or other article or any material from which sounds, images, writings or messages are capable of being produced or reproduced (with or without the aid of another article or device).
Ecologically Dominant Layer	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means the layer making the greatest contribution to the overall biomass of the site and the vegetation community (NLWRA 2001). This is also referred to as the ecologically dominant stratum or the predominant canopy in woody ecosystems.
Ecosystem Function	means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.
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 ensure timely warning to affected persons and the implementation of protection measures. The plan must require dam owners to annually review and update contact information where required.

Word or Phrase	Definition
Enclosed Flare	means a device where the residual gas is burned in a cylindrical or rectangular enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.
Environmental Harm	has the meaning in section 14 of the *Environmental Protection Act 1994* and means any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance. Environmental harm may be caused by an activity a) whether the harm is a direct or indirect result of the activity; or b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.
Environmental Nuisance	has the meaning in section 15 of the *Environmental Protection Act 1994* and means unreasonable interference or likely interference with an environmental value caused by a) aerosols, fumes, light, noise, odour, particles or smoke; or b) an unhealthy, offensive or unsightly condition because of contamination; or c) another way prescribed by regulation.
Equivalent Person or **EP**	has the meaning under section 3 of the Planning Guidelines For Water Supply and Sewerage, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the Environmental Protection Regulation 2019 where: • EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or • EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.
Evaporation dam	means an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.
Exploring for petroleum	means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the *Petroleum and Gas (Production and Safety) Act 2004* for example including: • conducting a geochemical, geological or geophysical survey; • drilling a well; • carrying out testing in relation to a well; • taking a sample for chemical or other analysis.
Existing Structure	means a structure that prior to the activation of the GFD conditions meets any or both of the following, a structure: a) with a design that is in accordance with the April 2019 version 9.00 Manual for Assessing Consequence Categories and Hydraulic Performance of Structures and that is considerably in progress; b) that is under considerable construction or that is constructed.
Exploration Well	means a petroleum well that is drilled to: • explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or • obtain stratigraphic information for the purpose of exploring for petroleum.

Word or Phrase	Definition
	For clarity, an exploration well does not include an appraisal or development well.
Fill	means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse or wetland including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.
Flare Pit	has the meaning in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/1933), and means containment area where any hydrocarbon that is discovered in an over-pressured reservoir during a drilling operation is diverted to, and combusted, The flare pit is only used during the drilling and work over process on a petroleum well.
Flare Precipitant	means waste fluids which result from the operation of a flare.
Floodplain	has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that: • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and • has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.
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.
Fuel burning or combustion equipment	means a permanent fuel burning or combustion equipment which is in isolation, or combined in operation, or which are interconnected, is, or is capable of burning more than 500 kg of fuel in an hour.
GDA	means Geocentric Datum of Australia.
Geophysical survey	means a systematic collection of geophysical data.
Great Artesian Basin (GAB) spring	means an area protected under the *Environment Protection and Biodiversity Conservation Act 1999* because it is considered to be a Matter of National Environmental Significance and identified as a: • community of native species dependent on natural discharge of groundwater from the Great Artesian Basin; or • Great Artesian Basin spring; or • Great Artesian Basin discharge spring wetland. A GAB spring includes a spring vent, spring complex or watercourse spring and includes the land to which water rises naturally from below the ground and the land over which the water then flows.

Word or Phrase	Definition
	Note: The Australian Government's Protected Matters Search Tool should be used to get an indication of whether the area of interest may contain an MNES spring. Note: The GAB springs dataset can be requested from the Queensland Government Herbarium.
Greywater	means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.
Groundwater Dependent Ecosystems (GDE)	means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services. For the purposes of the environmental authority, groundwater dependent ecosystems do not include those mapped as "unknown".
Growing	means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.
High value regrowth	vegetation means vegetation located— a) on freehold land, indigenous land, or land subject of a lease issued under the *Land Act 1994* for agriculture or grazing purposes or an occupation licence under that Act; and b) in an area that has not been cleared (other than for relevant clearing activities) for at least 15 years, if the area is— i. an endangered regional ecosystem; or ii. an of concern regional ecosystem; or iii. a least concern regional ecosystem.
Holder	means any person who is the holder of, or is acting under, that environmental authority.
Hydraulic fracturing	means a technique used to create cracks in underground coal seams to increase the flow and recovery of gas or oil out of a well. It involves pumping a fluid, comprised largely of water and sand, under pressure, into a coal seam. This action fractures the coal seam which provides a pathway that increases the ability for gas to flow through the coal.
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 (ESR/2016/1933).
Hydraulic testing	means the testing of a geological formation to evaluate the hydrogeological characteristics of the formation.
Impulsive noise	means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.

Word or Phrase	Definition
Incidental activity	for this environmental authority means an activity that is not a specified relevant activity and is necessary to carry out the activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities.*
Infrastructure	means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps. Infrastructure does not include other facilities required for the long-term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation dams), pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.
$L_{Aeq, adj, 15 mins}$	means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.
$L_{A 90, adj, 15 mins}$	means the A-weighted sound pressure level, adjusted for tonal character, that is equal to or exceeded for 90per cent of any 15 minutes sample period equal, using Fast response.
Lake	means: • a lagoon, swamp or other natural collection of water, whether permanent or intermittent; and • the bed and banks and any other element confining or containing the water.
Land degradation	has the meaning in the *Vegetation Management Act 1999* and means the following: • soil erosion • rising water tables • the expression of salinity • mass movement by gravity of soil or rock • stream bank instability • a process that results in declining water quality.
Landholders' Active Groundwater Bores	means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *Water Act 2000*.
Limited impact camps	mean accommodation camps that: • are temporary (no more than 6 months); • are located within pre-existing areas of clearing or significant disturbance; • are up to 2 ha or located within well sites; and

Word or Phrase	Definition
	• may involve sewage treatment works that are no release works or release works that involve an irrigation release within pre-existing areas of clearing or significant disturbance.
Limited Impact Petroleum Activities	means petroleum activities that are located within areas that are not a regional ecosystem and: • are single well sites (includes observation, pilot, injection and production wells) greater than 1 ha; or • are multi-well sites greater than 1 ha; and • may involve construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone; and • may involve upgrading or maintenance of existing roads or tracks; and • may include power and communication lines; and • may include gas gathering lines from a well site to the initial compression facility; and • may include water gathering lines from a well site to the initial water storage or dam.
Limited Petroleum Activities	mean any low impact petroleum activity, and: • single well sites (includes observation, pilot, injection and production wells) up to 1 ha and associated infrastructure (water pumps and generators, sumps, flare pits or dams) located on the well site or up to 1.25 ha if the well pad includes the use of a tank (minimum 1ML) for above ground fluid storage, • multi-well sites up to an additional (in addition to single well site above) 0.25 ha per additional well and associated infrastructure (water pumps and generators, sumps, flare pits, dams or tanks) located on the well site to a maximum of 3 ha, • construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone upgrading or maintenance of existing roads or tracks, • power and communication lines, • gas gathering lines from a well site to the initial compression facility, • water gathering lines from a well site to the initial water storage or dam, • camps within well site that may involve sewage treatment works that are a no release works. • activities necessary to achieve compliance with the conditions of the EA in relation to another limited petroleum activity (e.g. sediment and erosion control measures, rehabilitation), • geophysical, geotechnical, geological, topographic and cadastral surveys (including seismic, sample /test / geotechnical pits, core holes).
Linear infrastructure	means powerlines, communication, pipelines, roads and access tracks.
Long term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (5) days, even when there are respite periods when the noise is inaudible within those five (5) days.

Word or Phrase	Definition
Lopping	a tree, means cutting or pruning its branches, but does not include — • removing its trunk; and • cutting or pruning its branches so severely that it is likely to die.
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 (ESR/2016/1933).
Low flow	means flow up to the one month average recurrence interval.
Low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, earthworks or excavation work that cause either, a significant disruption to the soil profile or permanent damage to vegetation that cannot be easily rehabilitated immediately after the activity is completed. Examples of such activities include but are not necessarily limited to: • chipholes • coreholes • geophysical surveys • seismic surveys • soil surveys • topographic surveys • cadastral surveys • ecological surveys • installation of environmental monitoring equipment (including surface water).
Map of Queensland wetland environmental values	means the statutory map under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019. It identifies wetlands of high ecological significance (HES) and general ecological significance (GES) across the state.
Max LpZ, 15 min	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
Max LpA, 15 min	means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.
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 (ESR/2016/1933) published by the administering authority.
Manual	in reference to dams means the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority, as amended from time to time.
Medium term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re- occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.

Word or Phrase	Definition
Methodology	means the science of method, especially dealing with the logical principles underlying the organization of the various special sciences, and the conduct of scientific inquiry.
Mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least • one metre of a continuous layer of impermeable subsoil material (kw = 10–8 m/s) or subsoil with a clay content of greater than 20per cent; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and topsoil is replaced.
Month	has the meaning in the Acts Interpretation Act 1954 and means a calendar month and is a period starting at the beginning of any day of one (1) of the 12 named months and ending: • immediately before the beginning of the corresponding day of the next named month; or • if there is no such corresponding day—at the end of the next named month.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
Oil based drilling mud	means mud where the base fluid is a petroleum product such as diesel fuel.
Operational Plan	includes: a) normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA); 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.
Overburden pressure	means the pressure or stress imposed on a layer of soil or rock by the weight of overlying material. The overburden pressure at a depth z is given by p(z) = p0 + g ∫ 0≈ p(z) dz where p(z) is the density of the overlying rock at depth z and g is the acceleration due to gravity. p0 is the datum pressure, like the pressure at the surface.
Pipeline Waste Water	means hydrostatic testing water, flush water or water from low point drains.
Pre-disturbed land use	means the function or use of the land as documented prior to significant disturbance occurring at that location.
Predominant species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August

Word or Phrase	Definition
	2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
Primary protection zone	means an area within a 200 metre buffer from the boundary of any Category A, B or C Environmentally Sensitive Area.
Produced Water	has the meaning in Section 15A of the Petroleum and Gas (Production and Safety) Act 2004 and means CSG water or associated water for a petroleum tenure.
Prohibited or Restricted Pest Species	means any pest that is: a) a plant or animal, other than a native species of plant or animal, that is i. invasive biosecurity matter under the Biosecurity Act 2014 (Qld); or *Notes — 1 See the Biosecurity Act 2014, schedule 1, part 3 or 4 or schedule 2, part 2; and 2 See the note to the Biosecurity Act 2014, schedules 1 and 2.* ii. controlled biosecurity matter or regulated biosecurity matter under the Biosecurity Act 2014 (Qld) iii. tramp ants listed in schedule 1 and schedule 2 of the Biosecurity Act 2014 (Qld) b) pest declared under a local law by the local government for the Land to be a pest because the pest is causing, or has the potential to cause, an adverse environmental, economic or social impact in all or part of the local government area.
Regional ecosystem(s)	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a vegetation community in a bioregion that is consistently associated with a particular combination geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystems Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.
Register of Regulated Structures	includes: a) Date of entry in the register; b) Name of the structure, 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 (ESR/2016/1933); 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

Word or Phrase	Definition
	iii. dam including its storage area iv. Dam crest volume (megalitres); v. Spillway crest level (metres AHD). vi. Maximum operating level (metres AHD); vii. Storage rating table of stored volume versus level (metres AHD); viii. Design storage allowance (megalitres) and associated level of the dam (metres AHD); ix. 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 structure	means any structure in the significant or high consequence category as assessed using the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933) published by the administering authority. A regulated structure does not include: • a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container; • a sump or earthen pit used to store residual drilling material and drilling fluid only for the duration of drilling and well completion activities; • a flare pit.
Rehabilitation or rehabilitated	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria and, where relevant, includes remediation of contaminated land. For the purposes of pipeline rehabilitation, rehabilitation includes reinstatement, revegetation and restoration.
Reinstate or reinstatement	for pipelines, means the process of bulk earth works and structural replacement of pre-existing conditions of a site (i.e. soil surface typography, watercourses, culverts, fences and gates and other landscape(d) features) and is detailed in the APGA Code of Environmental Practice: Onshore Pipelines Revision 4 (2017).
Remnant vegetation	means vegetation, part of which forms the predominant canopy of the vegetation— • covering more than 50 per cent of the undisturbed predominant canopy; and

Word or Phrase	Definition
	• averaging more than 70 per cent of the vegetation's undisturbed height; and • composed of species characteristic of the vegetation's undisturbed predominant canopy cover.
Reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as "less than" the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L – 0.02 ug/L.
Residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.
Resource activity(ies)	has the meaning in section 107(d) of the Environmental Protection Act 1994.
Restoration	means the replacement of structural habitat complexity, ecosystem processes, services and function from a disturbed or degraded site to that of a pre-determined or analogue site. For the purposes of pipelines, restoration applies to final rehabilitations after pipeline decommissioning.
Restricted stimulation fluids	means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 70 of the Environmental Protection Regulation 2019: • petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene; or • chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment. The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.
Revegetation or revegetating or revegetate	means to actively re-establish vegetation through seeding or planting techniques in accordance with site specific management plans.
Secondary Protection Zone	in relation to a Category A or Category B ESA means an area within 100 metres from the boundary of the primary protection zone.
Sensitive Place	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel); • a library, childcare centre, kindergarten, school, university or other educational institution; • a medical centre, surgery or hospital; • a protected area;

Word or Phrase	Definition
	• a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment; • a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads; and • for noise, a place defined as a sensitive receptor for the purposes of the Environmental Protection (Noise) Policy 2019.
Sensitive receptor	is defined in Schedule 2 of the Environmental Protection (Noise) Policy 2019, and means an area or place where noise is measured.
Short term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than eight hours and does not re-occur for a period of at least seven (7) days. Re- occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.
Significantly disturbed or significant disturbance or significant disturbance to land or areas	has the meaning in Schedule 12, section 4 of the Environmental Protection Regulation 2008. Land is significantly disturbed if – a) it is contaminated land; or b) it has been disturbed and human intervention is needed to rehabilitate it: i. to a condition required under the relevant environmental authority; or ii. if the environmental authority does not require the land to a particular conditions – to the condition it was in immediately before the disturbance
Site	means the relevant petroleum activity(ies) to which the environmental authority relates.
Specified relevant activities	for this environmental activity means an activity that: a) but for being carried out as a resource activity, would otherwise be an activity prescribed under section 19 of the Environmental Protection Act 1994 as an environmentally relevant activity; or b) stimulation activities; or c) extracting material other than by dredging.
Spillway	means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.
Stable	has the meaning in Schedule 8 of the Environmental Protection Regulation 2019 and for a site, means the rehabilitation and restoration of the site is enduring or permanent so that the site is unlikely to collapse, erode or subside.
Stimulation	means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing/hydrofracking, fracture acidizing and the use of proppant treatments.

Word or Phrase	Definition
Stimulation fluid	means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir. For clarity, the term stimulation fluid only applies to fluids injected down well post- perforation.
Stimulation impact zone	means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.
Structure	for the purposes of Schedule H means a dam or levee.
Suitably 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 to performance relative to the subject matters using the relevant protocols, standards, methods or literature.
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: • for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design • 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.
Suitably qualified third-party	means a person who: a) has qualifications and experience relevant to performing the function including but not limited to: i. a bachelor's degree in science or engineering; and ii. 3 years' experience in undertaking soil contamination assessments; and b) is a member of at least one organisation prescribed in Schedule 14 of the Environmental Protection Regulation 2019; and not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
Sump	means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.
Synthetic based drilling mud	means a mud where the base fluid is a synthetic oil, consisting of chemical compounds which are artificially made or synthesised by chemically modifying petroleum components or other raw materials rather than the whole crude oil.
System Design Plan	means a plan that manages an integrated containment system that shares the required DSA and/or ESS volume across the integrated containment system.
Third party auditor	means a suitably qualified person who is either a certified third-party auditor or an internal auditor employed by the holder of the environmental authority and

Word or Phrase	Definition
	the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.
Topsoil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300 mm in depth from the natural surface.
Total density of coarse woody material	means the total length of logs on the ground greater than or equal to 10 cm diameter per hectare and number of logs on the ground greater than or equal to 10cm diameter per hectare.
Transmissivity	means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
Valid complaint	means a complaint the administering authority considers is not frivolous, nor vexatious, nor based on mistaken belief.
Void	means any constructed, open excavation in the ground.
Waste and Resource Management Hierarchy	has the meaning provided in section 9 of the Waste Reduction and Recycling Act 2011 and is the following precepts, listed in the preferred order in which waste and resource management options should be considered: a) AVOID unnecessary resource consumption; b) REDUCE waste generation and disposal c) RE-USE waste resources without further manufacturing d) RECYCLE waste resources to make the same or different products e) RECOVER waste resources, including the recovery of energy f) TREAT waste before disposal, including reducing the hazardous nature of waste g) DISPOSE of waste only if there is no viable alternative.
Waste and Resource Management Principles	has the meaning provided in section 4(2)(b) of the Waste Reduction and Recycling Act 2011 and means the: a) polluter pays principle b) user pays principle c) proximity principle d) product stewardship principle.
Waste Fluids	has the meaning in section 13 of the Environmental Protection Act 1994 in conjunction with the common meaning of “fluid” which is “a substance which is capable of flowing and offers no permanent resistance to changes of shape”. Accordingly, to be a waste fluid, the waste must be a substance which is capable of flowing and offers no permanent resistance to changes of shape.
Watercourse	has the meaning in Schedule 4 of the Environmental Protection Act 1994 and means: 1) a river, creek or stream in which water flows permanently or intermittently a) in a natural channel, whether artificially improved or not; or b) in an artificial channel that has changed the course of the watercourse.

Word or Phrase	Definition
	2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
Waters	includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
Well Integrity	means the ability of a well to contain the substances flowing through it.
Well infrastructure	means infrastructure required for the construction and completion of a well including but not limited to cellar pits, dams and drill sumps.
Well site	means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.
Wetland	for the purpose of this environmental authority, wetland means: • areas shown on the Map of Queensland wetland environmental values, which is a state-wide statutory map under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019; and • areas defined under the Queensland Wetlands Program as permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and possess one or more of the following attributes: o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or o the substratum is not soil and is saturated with water, or covered by water at some time. The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
Wetlands of General Ecological Significance	**"Wetlands of General Ecological Significance"** or general ecologically significant wetland" is a wetland that meets the definition of a wetland and that is shown as a wetland of 'general ecological significance' on the Map of Queensland wetland environmental values.
Wetland of High Ecological Significance	otherwise known as "high conservation value wetland" is a wetland that meets the definition of a wetland and that is shown as a High Ecological Significance wetland on the Map of Queensland wetland environmental values.
Year	means a period of 12 months.

Word or Phrase	Definition
80th percentile	in relation to release limits means that not more than one (1) of the measured values is to exceed the stated release limit for any five (5) consecutive samples where: • the consecutive samples are taken over a five (5) month period; and • the consecutive samples are taken at approximately equal periods.
95th percentile	in relation to release limits means calculating the 95th percentile of all samples recorded over each 24 hour period for the duration of the release the result of which cannot exceed limits.

END OF ENVIRONMENTAL AUTHORITY