

Permit

Environmental Protection Act 1994

Environmental authority EPPG00530413

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

Environmental authority number: EPPG00530413

Environmental authority takes effect on 1 November 2019

Environmental authority holder(s)

Name(s)	Registered address
KGLNG E & P II Pty Ltd	Level 11 28 The Esplanade PERTH WA 6000
Bronco Energy Pty Limited	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000 Australia
Total E & P Australia III	Level 13 BGC Centre 28 The Esplanade PERTH WA 6000
PAPL (Upstream II) Pty Limited	Level 12 60 Carrington Street SYDNEY NSW 2000

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 06: A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	ATP803

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 *Sustainable Planning Act 2009* 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.

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

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

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

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Date issued: 1 November 2019

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)

Environmental Authority Conditions

This environmental authority consists of the following Schedules and Appendix:

Part A

Pre-Existing Legislative Requirements and Conditions

Schedule A	General Conditions
Schedule B	Water
Schedule C	Dams
Schedule D	Land
Schedule E	Disturbance to Land
Schedule F	Environmental Nuisance
Schedule G	Air
Schedule H	Waste
Schedule I	Rehabilitation
Schedule J	Stimulation Activities
Schedule K	Community Issues
Schedule L	Notification
Schedule M	Definitions

Part B

Legislative Requirements and Conditions for the Santos GLNG Gas Field Development Project

Schedule A	General Conditions
Schedule B	Water
Schedule C	Operating Standards
Schedule D	Biodiversity Values
Schedule E	Waste
Schedule F	Noise
Schedule G	Air
Schedule H	Regulated Structures
Schedule I	Well Construction, Maintenance and Stimulation Activities
Schedule J	Rehabilitation
Schedule K	Notification
Schedule L	Definitions

Part A – Pre-Existing Legislative Requirements and Conditions

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

- (A1) In the carrying out of the petroleum activity(ies), the holder of this environmental authority must not exceed the number and maximum size for each of the specified petroleum activities listed in Schedule A, Table 1 – Authorised Petroleum Activities for each petroleum tenure.

Schedule A, Table 1 – Authorised Petroleum Activities

Resource Authority Number	Petroleum Activity	Number of Existing Petroleum activities	Number of Proposed Petroleum activities	Maximum size (where applicable)
ATP 803	Seismic			
	- 2D	N/A	600km	600km
	- 3D	N/A	100 km ²	100km ²
	Total Coal Seam Gas (CSG) wells	3	60	60ha total disturbance
	- CSG Exploration Wells (indicative)	3	30	
	- CSG Appraisal Wells (indicative)	0	30	
	- CSG Development Wells (indicative)	0	0	
	Field Compressor Stations	0	0	N/A

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Resource Authority Number	Petroleum Activity	Number of Existing Petroleum activities	Number of Proposed Petroleum activities	Maximum size (where applicable)
	Central Compressor Stations	0	0	N/A
	Regulated dams > 401 megalitres	0	0	N/A
	Regulated dams < 400 megalitres			
	• Brine	0	0	N/A
	• Aggregation	0	2	240ML /dam 6ha/dam
	• Exploration/Appraisal Evaporation Dams	0	0	N/A
	Low hazard dams	0	180	- 45ha maximum total disturbance - 0.25ha/dam maximum disturbance
	Water treatment Facilities	0	0	N/A
	Brine Encapsulation Facilities	0	0	N/A
	Sewage Treatment Plants	0	0	N/A

Prevent or Minimise Likelihood of Environmental Harm

- (A2) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of Measures, Plant and Equipment

- (A3) The holder of the environmental authority must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority;
 - (b) maintain such measures, plant and equipment in their proper and effective condition; and
 - (c) operate such measures, plant and equipment in a proper and effective manner.
- (A4) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration materially increases, or is likely to increase, the environmental harm caused by the petroleum activity(ies).

Operational Plan

- (A5) An Operational Plan must be developed and submitted to the administering authority by 9 December 2011 which provides detailed information about the petroleum activity(ies) to be carried out under this environmental authority.
- (A6) The petroleum activity(ies) identified in the Operational Plan must set out the maximum scope of the petroleum activity(ies) and incorporate the petroleum activities set out in the approved Work Program and / or Development Plan for the relevant resource authority as required under the *Petroleum Act 1923* or the *Petroleum and Gas (Production and Safety) Act 2004*.
- (A7) The Operational Plan must be consistent with the requirements of this environmental authority and include, but not be limited to:
- (a) a stated period for the Operational Plan which is at least one (1) **year** but does not exceed three (3) **years** duration and which specifies an end date;
 - (b) a description of the existing and all proposed petroleum activities under the period of the Operational Plan;
 - (c) a map or series of maps that:

- (i) record the location of all **infrastructure** and its unique reference name / number that exists at the commencement of the period of the Operational Plan, including but not necessarily being limited to:
 - (a) **regulated dams**;
 - (b) **exploration, appraisal and development wells**;
 - (c) water and gas gathering and flow lines;
 - (d) gas processing facilities (including generators and compressors);
 - (e) water treatment facilities;
 - (f) **brine** encapsulation facilities;
 - (g) sewage treatment facilities;
 - (h) field compressor stations;
 - (i) central compressor stations;
 - (j) power lines;
 - (k) tracks and roads;
- (ii) show the location of all **programmed and approved infrastructure** that will be developed during the period of the Operational Plan, including the items listed under condition (A7)(c)(i) and their unique reference name / number, if applicable;
- (iii) show major environmental features such as **waters, sensitive places** and environmentally sensitive areas; and
- (d) spatial datasets (GIS) which depict those requirements under condition (A7)(c)(i), (A7)(c)(ii) and (A7)(c)(iii) in shapefile format.

(A8) The Operation Plan must contain a record of **significant disturbance to land** as a result of existing and **programmed and approved infrastructure** during the period of the Operational Plan, which must include, but not necessarily be limited to the following:

- (a) as at the commencement of the Operational Plan period:
 - (i) minimum undisturbed area;
 - (ii) maximum existing disturbed area;
 - (iii) total areas(s) of disturbance to **Category A, B and C Environmentally Sensitive Areas** by area type (e.g. Of concern RE, Endangered RE, State Forest);
 - (iv) total area(s) rehabilitated;
 - (v) identification of rehabilitated areas by category (e.g. age, status);
 - (vi) maps showing rehabilitated areas by category;
 - (vii) the results of the Rehabilitation Monitoring Program undertaken on **rehabilitation** carried out under the previous Operational Plan(s) and an assessment in relation to the requirements and acceptance criteria set out in this environmental authority; and
- (b) **programmed and approved infrastructure** for the current Operational Plan period:
 - (i) maximum area(s) to be disturbed;

- (ii) a description of each area(s) to be disturbed including tenure, coordinates, general site characteristics and disturbance types (e.g. well lease, flow lines, access track);
 - (iii) existing land use(s) of each area(s) to be disturbed; and
 - (iv) forecasted total area to be rehabilitated for the period of the Operational Plan;
- (A9) The Operational Plan must include a calculation of financial assurance for the maximum proposed and existing disturbance during the period of the Operational Plan.
- (A10) The commencement of the first Operational Plan period is the 9 December 2011.
- (A11) The holder of this environmental authority must implement the Operational Plan.
- (A12) A subsequent Operational Plan must be submitted to the administering authority not less than 20 **business days** prior to the expiry of the current Operational Plan.

Financial Assurance

- (A13) The holder of this environmental authority must:
- (a) provide to the administering authority financial assurance in the amount and form required from time to time by the administering authority; and
 - (b) review and maintain the amount of financial assurance based on the maximum disturbance from the proposed and existing petroleum activity(ies).
- (A14) The calculation of financial assurance must be in accordance with the Department of Environment and Resource Management's Guideline "Financial assurance for petroleum activities", as amended from time to time.
- (A15) The financial assurance is to remain in force until the administering authority is satisfied that no claim is likely to be made on the assurance.

Existing Petroleum Activities

- (A16) Conditions (E1) to (E15) in the Disturbance to Land Schedule only apply to the petroleum activity(ies) which commenced after 5 October 2011 subject to the holder of this environmental authority having complied with all disturbance conditions of the relevant environmental authority that applied at the time the existing petroleum activity(ies) was constructed.

Contingency Plan for Emergency Environmental Incidents

- (A17) A Contingency Plan for Emergency Environmental Incidents which has been **certified** by a **suitably qualified person** must be developed by 2 November 2011.
- (A18) The Contingency Plan for Emergency Environmental Incidents must include, but not necessarily be limited to:
- (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (b) identification of the types of environmental incidents that may occur, including but not limited to flooding impacts, relevant to the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (c) response procedures to be implemented to prevent or minimise the risk of environmental harm arising from environmental emergency incidents;
 - (d) response procedures to minimise the extent and duration of environmental harm caused by environmental emergency incidents;
 - (e) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;
 - (f) communication procedures and lines of communication within and beyond the organisation, including but not limited to Local Government, to be employed in responding to environmental emergency incidents;
 - (g) the resources to be used in response to environmental emergency incidents;
 - (h) procedures to investigate the cause of any incidents including releases or near misses, and where necessary, the remedial actions to be implemented to reduce the likelihood of recurrence of similar events;
 - (i) procedures for responding to incidents resulting from **stimulation** activities, including specific rectification measures in the event of non-routine stimulation events;
 - (j) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;
 - (k) procedures to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of a **dam**;
 - (l) procedures to respond to a **regulated dam** reaching its **mandatory reporting level**;
 - (m) procedures to respond to a **regulated dam** reaching its **design storage allowance**.
 - (n) a receiving environment monitoring program, to be specifically implemented in the event of a release to **waters** or land to examine / assess environmental impacts. For monitoring of **waters**, this program must include upstream, downstream and impact site monitoring procedures. For soils monitoring, three replicate samples must be taken at depth intervals of 0-10 cm, 20-30 cm and 50-60 cm at both a reference site and the impact site as a minimum;
 - (o) the provision and availability of documented procedures to staff attending any emergency

- environmental incident to enable them to effectively respond;
- (p) training of staff that will be called upon to respond to emergency environmental incidents to enable them to effectively respond;
 - (q) timely and accurate reporting of the circumstance and nature of emergency environmental incidents to the administering authority and any affected landholder, occupier and / or their nominated representative in accordance with conditions of this environmental authority; and
 - (r) procedures for accessing monitoring locations during emergency environmental incidents.

(A19) The holder of this environmental authority must implement the Contingency Plan for Emergency Environmental Incidents.

Underground Gas Storage

(A20) Testing, evaluating, developing and using natural underground reservoirs for petroleum storage or to store **prescribed storage gases** is not authorised under this environmental authority.

Infrastructure

(A21) The following **infrastructure** must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

- (a) **regulated dams**;
- (b) **exploration, appraisal and development wells**;
- (c) water treatment facilities;
- (d) **brine** encapsulation facilities;
- (e) sewage treatment facilities;
- (f) authorised discharge points to air and **waters**;
- (g) any chemical storage facility associated with the environmentally relevant activity of chemical storage;
- (h) field compressor stations;
- (i) central compressor stations;
- (j) gas processing facilities; and
- (k) pipeline compressor stations.

Monitoring

(A22) The holder of this environmental authority must develop and implement a monitoring program for all monitoring required by the conditions of this environmental authority by 9 December 2011.

Environmental authority

- (A23) All monitoring under this environmental authority must be conducted by a **suitably qualified person**.
- (A24) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated, operated and maintained effectively in accordance with the manufacturer's specifications.
- (A25) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests, except as otherwise authorised by the administering authority.
- (A26) Any management or monitoring plans, systems, programs or procedures required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three (3) **years** in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.
- (A27) If monitoring conducted in accordance with this environmental authority indicates a condition or contaminant level has caused, or has potential to cause, environmental harm, the holder of this environmental authority must, as soon as is practicable, take the necessary actions to rectify the condition or contaminant level so as to avoid or minimise environmental harm.
- (A28) An annual monitoring report must be prepared each **year** and submitted to the administering authority in the form requested by the administering authority. This report must include but not necessarily be limited to:
- (a) a summary of the previous 12 **months** monitoring results obtained under all monitoring programs required under this environmental authority and a comparison of the previous 12 **months** monitoring results to both the limits set in this environmental authority and to relevant prior results;
 - (b) the date on which the samples was taken;
 - (c) the time at which the samples was taken;
 - (d) the monitoring point at which the sample was taken;
 - (e) the results of all monitoring and details of any exceedances with the conditions of this environmental authority and the dates and times these exceedances were reported to the administering authority;
 - (f) details regarding the status of disturbance, progressive **rehabilitation** associated with the petroleum activity(ies) and the schedule of disturbance submitted to the administering authority as part of the financial assurance calculations;
 - (g) an evaluation / explanation of the data derived from any monitoring programs;

- (h) data analyses and interpretation to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination and the environmentally relevant activity(ies); and
- (i) an outline of actions taken to minimise the risk of environmental harm from any condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A27).

(A29) The evaluation and explanation of data for the purposes of the annual monitoring report must be performed by a **suitably qualified person**.

Documentation and Records Management

(A30) A record of all **documents** required by this environmental authority must be:

- (a) kept for a minimum of five (5) years; and
- (b) be made available to an authorised person upon request.

(A31) The holder of this environmental authority must develop all **documents** required under this environmental authority in a way that is consistent with the requirements of this environmental authority.

SCHEDULE B – WATER

Contaminant Release

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

Sewage Treatment Works

- (B2) Sewage treatment works with a total daily peak design capacity greater than 21 **equivalent persons** are not permitted.
- (B2A) The **construction** and operation of sewage treatment works is authorised if the total daily peak design capacity is less than 21 **equivalent persons**
- (B2B) Notwithstanding condition (B2A), the disposal of sewage effluent disposal must not cause environmental harm.

Erosion and Sediment Control Plan

- (B3) An Erosion and Sediment Control Plan which has been **certified** by a **suitably qualified person** must be developed by 9 December 2011 or prior to the commencement of any significant disturbance to land (whichever is the sooner).
- (B4) The Erosion and Sediment Control Plan must include but not necessarily be limited to:
- (a) managing and / or diverting uncontaminated stormwater run-off around areas disturbed by the petroleum activity(ies) or where contaminants or wastes are stored or handled that may contribute to contamination of **waters**;
 - (b) ensuring that contaminated stormwater runoff and incident rainfall is collected, treated, reused, or released in accordance with the conditions of this environmental authority;
 - (c) roofing or minimising the size of areas where contaminants or wastes are stored or handled;
 - (d) revegetating disturbed areas as soon as practicable after the completion of works;
 - (e) using materials and or processes (e.g. dry absorbents) to clean up spills that will minimise contamination of **waters**;
 - (f) placing erosion and sediment control structures to minimise erosion of disturbed areas and prevent the contamination of **waters**;
 - (g) an inspection and maintenance program for the erosion and sediment control measures;

- (h) provision for adequate access to maintain all erosion and sediment control measures especially during the wet season from November to April;
 - (i) additional erosion and sediment control measures for **construction** of wells and pipelines on slopes >10%;
 - (j) a surface water monitoring program designed to detect impacts from sediment runoff into **waters**;
 - (k) identification of remedial actions required to ensure compliance with the conditions of this environmental authority; and
 - (l) details of community consultation strategies and processes to be used in further developing and implementing the Erosion and Sediment Control Plan.
- (B5) The holder of this environmental authority must implement the Erosion and Sediment Control Plan.
- (B6) A copy of the Erosion and Sediment Control Plan must be made available to any potentially affected landholder upon request by that landholder.

Maintenance and Cleaning

- (B7) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants cannot be released into any **waters**.

Watercourses, Wetlands and Springs

- (B8) In the carrying out of the petroleum activity(ies) the holder of this environmental authority must not excavate, clear vegetation or place **fill**, in or within:
- (a) 200 metres from any **wetland, lake or spring**; or
 - (b) 100 metres of the **high bank** of any other **watercourse**.
- (B9) Despite condition (B8), powerline, pipeline, track and road **construction** works may be undertaken within 200 metres of, and in a **wetland, lake or spring** or within 100 meters of, and in a **watercourse** where there is no reasonable and practicable alternative (e.g. **trenchless methods**) and only for a maximum period of 10 **business days**, provided that the works are conducted in accordance with the following order of preference:
- (a) conducting work in times of no flow;
 - (b) conducting work in times of flow but in a way that does not:
 - (i) adversely impact the flow of water within the **watercourse**; or
 - (ii) permanently impound water; or
 - (iii) permanently divert the course of flow of water.

- (B10) Powerline, pipeline, track and road **construction** works resulting in **significant disturbance** to the **bed and banks** of a **watercourse, wetland, lake or spring** must:
- (a) be no greater than the minimum area necessary for the purpose of the significant disturbance;
 - (b) be designed and undertaken by a **suitably qualified person** taking into account the matters listed in the “Planning Activities” and “Impact Management During Activities” sections of the Department of Environment and Resource Management’s “Guideline – Activities in a **watercourse, lake or spring** associated with mining operations” December 2010, as amended from time to time; and
 - (c) upon cessation of the works, commence **rehabilitation** immediately.
- (B11) Sediment control measures must be implemented to minimise any increase in water turbidity due to powerline, pipeline, track and road **construction** works in the **bed and banks** of a **watercourse, wetland, lake or spring**.
- (B12) Routine, regular and frequent visual monitoring must be undertaken while carrying out powerline, pipeline, track and road **construction** work and any maintenance of completed works in a **watercourse, wetland, lake or spring**.
- (B13) If, due to powerline, pipeline, track and road **construction** works, water turbidity increases in a **watercourse, wetland, lake or spring** outside contained areas, works must cease and the sediment control measures must be rectified to limit turbidity before the works recommence.
- (B14) All measures must be taken to minimise adverse impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland’s River Improvement Trusts.

Note: Locations and details of River Improvement Areas and River Improvement Trusts are provided in the Schedule to the River Improvement Trust Regulation 1998.

Floodplains

- (B15) Where the petroleum activity(ies) is carried out on **floodplains**, the holder of this environmental authority must ensure that the petroleum activity(ies) 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

- (e) pose an **unacceptable risk** to the safety of persons from flooding; or
- (f) pose an **unacceptable risk** of damage to property from flooding.

Water Monitoring

- (B16) The method of water sampling required by this environmental authority must comply with that set out in the most recent version of the Department of Environment and Resource Management's "Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009 Version 2 September 2010" as amended from time to time.

Note: Condition (B16) requires the "Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009 Version 2 September 2010" to be followed. Where it is not followed because of exceptional circumstances this should be explained and reported with the results.

Groundwater

- (B17) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to any **watercourse, lake, wetland or spring**.

Groundwater Impact Monitoring Program

- (B18) A Groundwater Monitoring Program must be developed and implemented which is able to detect any changes to groundwater quality as a result of storing contaminants in a containment facility(ies) (e.g. surface **dams**, monocells) by 9 December 2011.
- (B19) The Groundwater Monitoring Program must be developed and implemented by a **suitably qualified person** in the fields of hydrogeology, groundwater sampling design and groundwater monitoring program design.
- (B20) The Groundwater Monitoring Program, must include, but not necessarily be limited to:
- (a) locations of monitoring sites, monitoring methodology and trigger values for detecting impacts on groundwater quality;
 - (b) as a minimum, sampling of the parameters and at the frequency listed in Schedule B, Table 1 – Minimum Groundwater Monitoring Parameters and Monitoring Frequency;
 - (c) procedures to establish background groundwater quality;
 - (d) sampling of groundwater in accordance with the requirements for baseline bore, well and **stimulation** impact monitoring as per conditions (J14) to (J20);
 - (e) a sufficient number of monitoring sites to provide information on the following:

- (i) seepage to groundwater and surrounding soils from any **regulated dam** and its effect on groundwater and soils; and
 - (ii) background water quality (i.e. groundwater quality in representative **bores** that have not been affected by the petroleum activity(ies) authorised under this environmental authority);
 - (ii) the conduct of a geodetic survey of all monitoring **bores** to determine the relative water surface elevations of each bore and reported in metres relative to the **AHD**; and
 - (iii) the determination of groundwater flow direction, groundwater flow rate and hydraulic conductivity;
- (f) a rationale containing details on the program purpose, program conceptualisation and verification of assumptions.

- (B21) The holder of this environmental authority must implement the Groundwater Monitoring Program.
- (B22) All groundwater monitoring **bores** must be installed according to the standards outlined in the Department of Environment and Resource Management's "Minimum Construction Requirements for Water Bores in Australia" 2003 or the "Minimum Standards for the Construction and Reconditioning of Water Bores that Intersect the Sediments of Artesian Basins in Queensland" 2010, as amended from time to time.
- (B23) Groundwater monitoring **bores** must be constructed by, or under the supervision of a licensed Queensland water bore driller who has the correct endorsements on their licence for the type of activity being performed.
- (B24) Groundwater samples must be monitored annually for the water quality parameters specified in Schedule B, Table 1 – Groundwater Monitoring Parameters.

Schedule B, Table 1 – Groundwater Monitoring Parameters

Ground water parameter	Units	Untreated coal seam water	Permeate	Brine
Static water level	m	Monitor	Monitor	Monitor
pH	pH unit	Monitor	Monitor	Monitor
Electrical conductivity	µS/cm	Monitor	Monitor	Monitor
Major Anions (sulphate, chloride)	Mg/L	Monitor	-	-
Major cations (calcium, magnesium, sodium and potassium)	Mg/L	Monitor	-	-

(B25) All groundwater monitoring **bores** must be maintained in an operative condition and be accessible at all times to any **authorised person**.

SCHEDULE C – DAMS**Assessment of Hazard Category**

- (C1) The **hazard category** of any **dam** must be assessed by a **suitably qualified and experienced person** in accordance with the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, as amended from time to time.
- (C2) The hazard assessment required under condition (C1) must occur in any of the following situations:
- (a) prior to the design and **construction** of the **dam**;
 - (b) prior to any change in its purpose or its stored contents;
 - (c) for a **dam** assessed and **certified** as a high or significant hazard **dam**, at least biennially after its **construction**;
 - (d) for an **existing low hazard dam**, within 120 **business days** of 5 October 2011.
- (C3) A **hazard assessment** report and **certification** must be prepared for any **dam assessed** and the report may include a **hazard assessment** for more than one **dam**.
- (C4) The holder must, on receipt of a **hazard assessment** report and **certification**, provide to the **Administering Authority** one paper copy and one electronic copy of the **hazard assessment** report and **certification**.
- (C5) All **certifications** must be in the form set out in the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, as amended from time to time.

Construction of Low Hazard Dam to Contain Wetting Front

- (C6) Where a **dam** is assessed as **low hazard**, it must be
- (a) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the **dam** is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and **rehabilitation**.

- (C7) Where a **dam** is for the first time assessed as significant or high, the holder of this environmental authority must ensure that within 12 **months** of that assessment, the **dam** meets the conditions required for **regulated dams** under this environmental authority.
- (C8) In the event of early signs of loss of structural or hydrological integrity of a **low hazard dam**, the holder of this environmental authority must:
- (a) take immediate action to prevent or minimise any actual or potential environmental harm; and
 - (b) report in writing to the administering authority, any findings and actions taken within 20 **business days** of that event.

Monitoring of Low Hazard Dams

- (C9) The condition of all **low hazard dams** must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each **dam**.

Design and Construction of a Regulated Dam

- (C10) All **regulated dams** must be designed by, and constructed under the supervision of a **suitably qualified and experienced person** in accordance with the requirements of the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C11) Construction of a **regulated dam** is prohibited unless the **holder** has:
- (a) submitted a **hazard category assessment** report and **certification** to the administering authority;
 - (b) commissioned a **suitably qualified and experienced person** to prepare a design plan for the **dam**; and
 - (c) received the design plan for the **dam**, together with **certification** of that plan from the **suitably qualified and experienced person**, that:
 - (i) the design plan is in accordance with the requirements of the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time;
 - (ii) the **dam** is capable of delivering the performance stated in the design plan; and
 - (d) when **constructed** and operated in accordance with the design plan, the **dam** will be compliant in all respects with conditions (C10) to (C15) of this environmental authority.

(C12) **Regulated dams** must be designed and constructed to prevent:

- (a) floodwaters from entering the **regulated dam** from a **watercourse** or drainage line to the **annual exceedance probability** specified for determining **spillway** capacity in the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, as amended from time to time; and
- (b) wall failure due to erosion by floodwaters arising from the **watercourse** or drainage line to the **annual exceedance probability** specified for determining **spillway** capacity in the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, as amended from time to time; and
- (c) overtopping as a result of a flood event of the **annual exceedance probability** specified for determining **spillway** capacity in the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, as amended from time to time.

(C13) The **design plan** for a **regulated dam** must include, but not necessarily be limited to:

- (a) a design report which provides:
 - (i) **certification** of the **design plan**;
 - (ii) a description of all the **documents** which constitute the **design plan**;
 - (iii) a statement of:
 - 1. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory **documents** relied upon in preparing the **design plan**; and
 - 2. all relevant facts and data used in preparing the **design plan**, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the **design plan**;
 - 3. the **hazard category** of the **dam**; and
 - 4. the reasoning of the certifying **suitably qualified and experienced person** as to how the **design plan** provides the necessary required performance;
 - (iv) documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;
 - (v) detailed criteria for the design, operation, maintenance and decommissioning of the **dam** including any assumptions;
 - (vi) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;
 - (vii) reasoning for how the **design plan** provides the required performance;
 - (viii) details of any other matter which may substantially affect, or is critical to, the **design plan**; and
 - (ix) evidence that the certifier is a **suitably qualified and experienced person**.
- (b) drawings showing the lines and dimensions of built structures and land forms associated with the **regulated dam**;

- (c) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;
- (d) a description of any containment systems;
- (e) an operational plan that includes;
 - (i) normal operating procedures and rules;
 - (ii) emergency and contingency 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 **dam**;
- (f) a plan for the decommissioning and **rehabilitation** of the **dam** at the **end** of its operational life;
- (g) details of reports on investigations and studies done in support of the **design plan**; and
- (h) any other matter required by the **suitably qualified and experienced person**.

(C14) All **aggregation dams** must:

- (a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and **rehabilitation**; and
- (b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the **dam**.

Operation of a Regulated Dam

(C15) Operation of a **regulated dam** is prohibited unless the holder of this environmental authority has:

- (a) submitted to the administering authority one paper copy and one electronic copy of the design plan and **certification**, and a set of 'as constructed' drawings and specifications, together with **certification** that the **dam**:
 - (i) has been constructed in accordance with the design plan;
 - (ii) is capable of delivering the performance stated in the **design plan**; and
 - (iii) is compliant with the relevant conditions of this environmental authority;
- (b) the conditions of this environmental authority relating to the construction of the **dam** have been met; and
- (c) the holder of this environmental authority has entered the details required under this environmental authority, into a Register of Regulated Dams.

(C16) Each **regulated dam** must be maintained and operated in a manner that is consistent with the current design plan and the associated **certified** 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.

Mandatory Reporting Level

- (C17) The **mandatory reporting level** must be marked on a **regulated dam** in such a way that it is clearly visible.
- (C18) The holder must, on becoming aware that the **mandatory reporting level** has been reached, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Annual Inspection Report

- (C19) Each **regulated dam** must be inspected annually by a **suitably qualified and experienced person**.
- (C20) At each annual inspection, the condition and adequacy of all components of the **regulated dam** must be assessed:
- (a) against the most recent hazard assessment report and **design plan**;
 - (b) against recommendations contained in previous annual inspections reports;
 - (c) against recognised **dam** safety deficiency indicators;
 - (d) for changes in circumstances potentially leading to a change in **hazard category**;
 - (e) for conformance with the conditions of this environmental authority;
 - (f) for conformance with the drawings of the **certified design plan**;
 - (g) for the adequacy of the available storage in each **regulated dam**, based on an actual observation(s) taken in May of each **year**, of accumulated sediment, state of the containment barrier and the level of liquids in the **dam**.
- (C21) A **suitably qualified and experienced person** must prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the **dam**.
- (C22) The **suitably qualified and experienced person** who prepared the annual inspection report must **certify** that report in accordance with the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time.
- (C23) The holder of this environmental authority must:
- (a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the **regulated dam** will safely perform its intended function; and

- (b) within 20 **business days** of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each **regulated dam**.

Design Storage Allowance

- (C24) On 1 November of each **year**, storage must be available in each **regulated dam** to meet the **design storage allowance** estimated for the **dam** in accordance with the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, as amended from time to time.
- (C25) The **holder** must, immediately on becoming aware that the **regulated dam** will not have the available storage to meet the **design storage allowance** on 1 November of any year, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Performance review

- (C26) The holder of this environmental authority must assess the performance of each **regulated dam** over the preceding November to May period based on actual observations of the available storage in each regulated dam taken in May of each year.
- (C27) The holder of this environmental authority must take action to modify its water management system so as to ensure that the **regulated dam** will perform in accordance with the requirements of this authority, for the subsequent November to May period.

Repair requirements

- (C28) Where the holder of this environmental authority detects any passage of the wetting front through the floor or sides of the **regulated dam**, they must, as soon as practicable:
- (a) repair the **dam** to rectify the detected passage of the wetting front or entrained contaminants through the floor or sides of the **dam**; or
 - (b) decommission and rehabilitate the **dam**.

Decommissioning

- (C29) The holder of this environmental authority must not abandon any **dam** but must decommission each **dam** such that ongoing environmental harm is prevented.

Transfer arrangements

- (C30) The holder of this environmental authority must provide a copy of any reports, documentation and certifications prepared under this environmental authority, including but not limited to any Register of Regulated Dams, hazard assessment, design plan and other supporting documentation, to a new holder of an environmental authority and the administering authority on transfer of the environmental authority.

Register of Regulated Dams

- (C31) A register of regulated dams must be established and maintained by the holder of this environmental authority and include, but not necessarily be limited to, the following information for each **regulated dam**:
- (a) date of entry in the register;
 - (b) name of the **dam**, its purpose and intended / actual contents;
 - (c) location of the **dam** defined by coordinates (GDA94) within five metres at any point from the outside of the **dam** including its storage area;
 - (d) the **hazard category** of the **dam** as assessed using the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", as amended from time to time;
 - (e) dates, names, and reference numbers of all **document(s)** lodged as part of a **design plan** for the **dam**;
 - (f) name and qualifications of the certifier of the **design plan** and 'as constructed' drawings;
 - (g) for the **regulated dam**, other than in relation to any **levees**:
 - (i) dimensions (metres) and surface area (hectares) of the **dam** measured at the foot print of the **dam**;
 - (ii) **dam crest volume** (megalitres);
 - (iii) **spillway crest level** (metres **AHD**);
 - (iv) maximum operating level (metres **AHD**);
 - (v) storage rating table of stored volume versus level (metres **AHD**);
 - (vi) **design storage allowance** (megalitres);
 - (vii) **mandatory reporting level** (metres **AHD**);
 - (h) **design plan** title and reference relevant to the **dam**;
 - (i) date **construction** was **certified** as compliant with the **design plan**;

- (j) name and qualifications of certifier;
- (k) details of the composition and **construction** of any liner;
- (l) the system for the detection of any leakage through the floor and sides of the **dam**;
- (m) dates when the **dam** underwent an annual inspection for structural and operational adequacy;
- (n) dates when the **dam** was inspected for the detection of leakage through the liner;
- (o) dates when the **dam** was inspected for the purpose of annually ascertaining the available storage capacity;
- (p) dates when recommendations and actions in the annual inspection report were provided to the administering authority; and
- (q) **dam** water quality as obtained from monitoring required under conditions (C37) to (C39).

Note: The dam register in the approved departmental format is available for download at:
http://www.derm.qld.gov.au/environmental_management/coal-seam-gas/environment.html.

- (C32) The holder of this environmental authority must provisionally enter the required information in the register of **regulated dams** when a **design plan** for a **regulated dam** is submitted to the administering authority.
- (C33) The holder of this environmental authority must make a final entry of the required information in the register of **regulated dams** once compliance with condition (C17) has been achieved.
- (C34) The holder of this environmental authority must ensure that the information contained in the register of **regulated dams** is always current and complete.
- (C35) All entries in the register of **regulated dams** must be approved by the chief executive officer for the holder of this environmental authority, or their delegate, as being accurate and correct.
- (C36) The holder of this environmental authority must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Dams, in the electronic format required by the administering authority.

Regulated Dam Water Quality Monitoring

- (C37) The holder of this environmental authority must monitor the quality of water in all **regulated dams** on the relevant resource authority(ies) no earlier than August and no later than October inclusive, every year.

- (C38) The monitoring of **regulated dam** water must include sufficient **analytes** and physico-chemical parameters to characterise water quality in the **dam** and must include, but not necessarily be limited to:
- (a) pH;
 - (b) electrical conductivity [$\mu\text{S/m}$];
 - (c) turbidity [NTU];
 - (d) total dissolved solids [mg/L];
 - (e) temperature [$^{\circ}\text{C}$];
 - (f) dissolved oxygen [mg/L];
 - (g) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [mg/L];
 - (h) sodium adsorption ratio (SAR);
 - (i) anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L];
 - (j) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];
 - (k) silica [mg/L];
 - (l) dissolved and total metals (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, chromium III, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [mg/L];
 - (m) total phosphorus [mg/L];
 - (n) ammonia, nitrate, nitrite as nitrogen [mg/L];
 - (o) total petroleum hydrocarbons [$\mu\text{g/L}$];
 - (p) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [$\mu\text{g/L}$];
 - (q) polycyclic aromatic hydrocarbons (including but not necessarily being limited to naphthalene, phenanthrene, benzo[a]pyrene) [$\mu\text{g/L}$];
 - (r) chlorophyll a [$\mu\text{g/L}$]; and
 - (s) total cyanobacteria biovolume [cells/mg/L]; and
 - (t) gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L].
- (C39) Water quality samples of **regulated dams** must be taken at a depth of 0.3m to 1.0m and be taken as far as practicable from the edge of the **regulated dam**.

SCHEDULE D — LAND

General

- (D1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.

Soil Management Plan

- (D2) A Soil Management Plan which has been **certified** by a **suitably qualified person** must be developed by 9 December 2011 or prior to the commencement of petroleum activities involving significant disturbance to land (whichever is the sooner).
- (D3) The Soil Management Plan must include, but not necessarily be limited to:
- (a) procedures for identifying soil units within areas to be disturbed by the petroleum activity(ies) at a scale of 1:50 000, in accordance with the “Guidelines for Surveying Soil and Land Resources, 2nd Edition” (McKenzie et al. 2008), “Australian Soil and Land Survey Handbook, 3rd Edition” (National Committee on Soil and Terrain 2009), “The Australian Soil Classification” (Isbell 2002) and the “Guidelines for agricultural land evaluation in Queensland” (Queensland Department of Primary Industries Information Series QI90005 1990), as amended from time to time;
 - (b) procedures for establishing baseline soils information for areas to be disturbed including soil depth, pH, electrical conductivity (EC), chloride, cations (aluminium, calcium, magnesium, potassium and sodium), exchangeable sodium percentage (ESP), particle size and soil fertility (including carbon, nitrogen, phosphorous, potassium, sulphur and micronutrients);
 - (c) identification of the types of soils and soil units requiring specific management practices (e.g. saline or sodic soils) relevant to assessment for agricultural suitability, erodibility and **rehabilitation**;
 - (d) for areas of good quality agricultural land, detailed methods to be undertaken to minimise potential impacts to soil productivity;
 - (e) detailed horizon and soils compaction management procedures for each soil unit, including **top soil** and **top soil** stockpile management procedures and methods of keeping soil horizons separate on excavation, storage and backfilling so as to minimise the impacts of soil disturbance and promote successful **rehabilitation**;
 - (f) detailed mitigation measures and procedures for each soil unit to manage the risk of adverse soil disturbance in the carrying out of the petroleum activity(ies); and
 - (g) a soils impact monitoring program outlining parameters to be monitored, frequency of monitoring and acceptable ranges for each parameter for each soil unit.

- (D4) The holder of this environmental authority must implement the Soil Management Plan whenever **significant disturbance to land** occurs as a result of the petroleum activity(ies).
- (D5) A copy of the Soil Management Procedures must be made available to any potentially affected landholder upon request by that landholder.

Fauna Management Procedures

- (D6) Fauna management procedures must be developed prior to the commencement of the petroleum activity(ies) authorised under this environmental authority.
- (D7) The fauna management procedures must be **certified** by a **suitably qualified person**.
- (D8) The fauna management procedures must ensure that the petroleum activity(ies) is carried out in a manner that minimises the risk of injury, harm, or entrapment to wildlife and stock.
- (D9) **Well infrastructure** and **dams** must be securely fenced and / or screened after **construction** is completed to:
- (a) exclude and prevent the entrapment of livestock and wildlife; and
 - (b) provide escape arrangements for any trapped livestock and wildlife; and
 - (c) limit habitats for the introduction or spread of **pests**.
- (D10) The fauna management procedures must include training and awareness of staff and contractors.
- (D11) Planned fauna handling must be undertaken by a **suitably qualified person**.
- (D12) The holder of this environmental authority must implement the fauna management procedures.

Note: The procedures required by conditions (D6) to (D12) should consider the "Australian Pipeline Industry Association Code of Environmental Practice – Onshore Pipelines" March 2009, as amended from time to time.

Pest Management Program

- (D13) Pest management procedures must be developed prior to the commencement of the petroleum activity(ies) authorised under this environmental authority.

- (D14) The pest management procedures must be **certified** by a **suitably qualified person**.
- (D15) The pest management procedures must include, but not necessarily be limited to:
- (a) identification of **pest** species and infestation areas;
 - (b) a list of potential **pest** species known to occur in the project area;
 - (c) prevention and / or minimisation of the introduction and / or spread of pests;
 - (d) control and management of **pest** outbreaks as a result of the petroleum activity(ies); and
 - (e) details of community consultation in developing the pest management procedures.
- (D16) A copy of the pest management procedures must be made available to any potentially affected landholder upon request by that landholder.
- (D17) The holder of this environmental authority must implement the pest management procedures.

Note: The pest management procedures required by conditions (D13) – (D15) should consider the “Petroleum Industry (including coal seam methane gas) Minimising Pest Spread Guidelines” June 2008, as amended from time to time. This document is available for download from:

http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Minimising-Pest-Spread-Advisory-Guidelines.pdf

Chemical and Fuel Storage

- (D18) All explosives, hazardous chemicals, corrosive **substances**, toxic substances, gases, dangerous goods, flammable and combustible liquids (including petroleum products and associated piping and **infrastructure**) must be stored and handled in accordance with the relevant Australian Standard where such is available.
- (D19) Notwithstanding the requirements of any Australian Standard, any liquids stored on site that have the potential to cause environmental harm must be stored in, or serviced by, an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to **waters** or land.
- (D20) Where no relevant Australian Standard is available for the chemical and / or fuel storage activity, the following requirements apply:
- (a) storage tanks must be **bunded** so that the capacity and **construction** of the **bund** is sufficient to contain at least 110 % of a single storage tank or 100 % of the largest storage tank plus 10 % of the second largest storage tank in multiple storage areas; and

- (b) drum storages must be **bunded** so that the capacity and **construction** of the **bund** is sufficient to contain at least 25 % of the maximum design storage volume within the **bund**.

(D21) All containment systems must be designed to minimise rainfall collection within the system.

Pipelines

(D22) Pipelines and other transmission lines must be co-located where feasible to reduce total disturbance.

(D23) Pipelines must be preferentially located alongside existing linear **infrastructure** such as roads, tracks and powerlines.

(D24) Pipeline trenches must only be left open for the minimum time practicable.

(D25) The length of pipeline trench open at any one time must be minimised as far as practicable.

SCHEDULE E - DISTURBANCE TO LAND

General

- (E1) Prior to conducting petroleum activities that involve **significant disturbance to land**, an assessment must be undertaken of the condition, type and ecological value of soils and vegetation in such areas where the activity is proposed to take place.
- (E2) The assessment required by condition (E1) must be undertaken by a **suitably qualified person** and include the carrying out of field validation surveys, observations and mapping of any **Category A, B or C Environmentally Sensitive Areas, wetlands** and the presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*.
- (E3) The assessment required by condition (E1) must include, but not necessarily be limited to:
- (a) baseline soils quality data and maps for the soil units to be disturbed as provided for in the Soils Management Plan;
 - (b) identification of the vegetation communities present (including species composition and regional ecosystem type¹ for native vegetation communities) within each area(s) to be disturbed;
 - (c) data representing each vegetation community present within each area(s) to be rehabilitated including:
 - (i) flora species richness and diversity;
 - (ii) structural data including woody stem count densities for dominant species within each stratum; and
 - (iii) percent foliage cover (accounting for seasonal variation and excluding **pests**);
 - (d) data regarding habitat features, including but not necessarily limited to:
 - (i) organic litter cover (%); and
 - (ii) trees with hollows $\geq 10\text{cm}$ diameter (count and number per hectare);
 - (iii) hollow bearing logs (count and number per hectare); and
 - (iv) fallen woody material (total length of logs $\geq 10\text{ cm}$ diameter per hectare and number of logs $\geq 10\text{cm}$ diameter per hectare); and
 - (e) a map or series of maps of suitable scale displaying the distributing of vegetation communities.
- (E4) If the assessment required by conditions (E1) to (E3) indicates that that an Environmentally Sensitive Area or wetland is incorrectly identified through State mapping, or is present and not identified by State

¹ Regional ecosystem type should be established using the most current version of the Qld Government's "*Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*". Assessment of the vegetation communities should be sufficient to establish any inherent variation within a single regional ecosystem type.

mapping, the holder of this environmental authority must advise the administering authority in writing before any **significant disturbance to land** takes place.

- (E5) If, within the 20 **business days** following the lodgement of the notification under condition (E4) the administering authority notifies the holder of this environmental authority, in writing, that further validation of the Environmentally Sensitive Area or wetland is required, then **significant disturbance to land** within the relevant area is prohibited until the administering authority provides written advice that **significant disturbance to land** may proceed.
- (E6) The holder of this environmental authority, when carrying out the petroleum activity(ies) must:
- (a) in order of preference, avoid, minimise or mitigate any impacts on areas of vegetation or other areas of ecological value;
 - (b) minimise disturbance to land that may otherwise result in land degradation;
 - (c) ensure that for land that is to be **significantly disturbed** by the petroleum activity(ies):
 - (i) the top layer of the soil profile is removed;
 - (ii) soils is stockpiled in a manner that will preserve its biological and chemical properties; and
 - (iii) soils are used for **rehabilitation** purposes;
 - (d) avoid **clearing** mature trees; and
 - (e) prior to carrying out field based **petroleum activities**, make all relevant staff, contractors or agents carrying out those petroleum activities, aware of the location of any **Category A, B or C Environmentally Sensitive Areas, wetlands** and presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992* and the requirements of this environmental authority.

Note: This environmental authority does not authorise the taking of protected plants, protected animals or the tampering with animal breeding places as defined under the Nature Conservation Act 1992 and relevant approvals will need to be obtained.

- (E7) Despite condition (E6), **significant disturbance to land** caused by the carrying out of the petroleum activity(ies) must not involve **clearing** vegetation or placing **fill**:
- (a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of **ecosystem functioning**, ecological connectivity (i.e. stepping stone or contiguous bioregional / local corridor networks) and / or results in an increase in **threatening processes**; or
 - (b) on slopes greater than 10 % for the petroleum activity(ies) other than for pipelines and wells; or
 - (c) in **discharge areas**.

Environmental authority

- (E8) Where petroleum activities are undertaken within **high value regrowth** or **remnant vegetation** that is other than a **Category A, B or C Environmentally Sensitive Area** and their associated protection zones, the holder of this environmental authority must be able to demonstrate that no reasonable or practicable alternative exists and for lineal **infrastructure**, that **significant disturbance to land** does not exceed the following areas:
- (a) 18 meters in width for dual carriage way roads;
 - (b) six (6) metres in width for access tracks not associated with a water or gas line; or
 - (b) for pipelines, including provision for a utility corridor and access track:
 - (i) 12 metres width for a single water or gas gathering line; or
 - (ii) 18 metres width for a trench with one water gathering line and one parallel gas gathering pipeline; or
 - (iii) 25 metres width for multiple trenches where there are three (3) parallel gas or water gathering lines; and
 - (iv) seven (7) metres width for any additional trench for a water or gas line.
- (E9) Documentation demonstrating compliance with the requirements of condition (E8) must be prepared by the holder of this environmental authority before any disturbance to land takes place.
- (E10) Cleared vegetation must be stockpiled in a manner that facilitates respreading or salvaging and does not impede vehicle, stock or wildlife movements.

Disturbance to Land – Environmentally Sensitive Areas

- (E11) Petroleum activities must be carried out in accordance with Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category A ESAs	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted. Subject to conditions (E12) and (E16).

Environmental authority

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted. Subject to conditions (E12) and (E16).
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Petroleum activities permitted.
Category C ESAs excluding 'Of Concern' Regional Ecosystems, State Forests and Timber Reserves	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Only limited petroleum activities permitted. Subject to conditions (E12) and (E16).
Category C ESAs that are State Forests, Timber Reserves and 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Only limited petroleum activities permitted. Subject to conditions (E12) to (E15) inclusive.	Petroleum activities permitted.

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.

Indicative Environmentally Sensitive Area mapping is available on the Department of Environment and Resource Management website at:

http://www.derm.qld.gov.au/ecoaccess/maps_of_environmentally_sensitive_areas.php.

(E12) **Low impact or limited petroleum activities** carried out within an ESA, **primary protection zone** or **secondary protection zone** must not be conducted in those areas where there is overlap with another

ESA or **primary protection zone** where **low impact** or **limited petroleum activities** are not authorised.

- (E13) Where **limited petroleum activities** are undertaken within the **primary protection zone** of, or within 'Endangered' or 'Of Concern' Regional Ecosystems, State Forests or Timber Reserves, the holder of this environmental authority must be able to demonstrate that no reasonable or practicable alternative exists and that **significant disturbance to land** only be located, and carried out in areas according to the following order of preference:
- (a) pre-existing cleared areas or **significantly disturbed land** within the **primary protection zone** of an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve;
 - (b) pre-existing cleared areas or **significantly disturbed land** within the **primary protection zone** of an 'Endangered' Regional Ecosystem;
 - (c) undisturbed areas within the **primary protection zone** of an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve;
 - (d) undisturbed areas within the **primary protection zone** of an 'Endangered' Regional Ecosystem;
 - (e) pre-existing areas of significant disturbance within an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve (e.g. areas where significant **clearing** or thinning has been undertaken within the Regional Ecosystem, and / or areas containing high densities of weed or **pest** species which has inhibited re-colonisation of native regrowth);
 - (f) pre-existing areas of significant disturbance within an 'Endangered' Regional Ecosystem (e.g. areas where significant **clearing** or thinning has been undertaken within the Regional Ecosystem and / or areas containing high densities of weed or **pest** species which has inhibited re-colonisation of native regrowth);
 - (g) areas where **clearing** of an 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve is unavoidable; and
 - (h) areas where **clearing** of an 'Endangered' Regional Ecosystem is unavoidable.
- (E14) Documentation demonstrating compliance with the requirements of condition (E13) must be prepared by the holder of this environmental authority before any disturbance to land takes place.
- (E15) For **limited petroleum activities** undertaken within the **primary protection zone** of, or within 'Endangered' or 'Of Concern' Regional Ecosystems, State Forests or Timber Reserves, vegetation **clearing** must not exceed any of the following areas:
- (a) for the life of the project and before any activity commences, if the disturbance relates to an 'Endangered' or 'Of Concern' Regional Ecosystem, 10 % of the **remnant unit** of 'Endangered' or 'Of Concern' Regional Ecosystem as ground truthed and mapped as per conditions (E1) to (E3) of this environmental authority; and

- (b) 6 metres in width for access tracks not associated with a water or gas line; or
 - (c) for lineal **infrastructure**, including provision for a utility corridor and access track:
 - (i) 12 metres width for a single water or gas gathering line; or
 - (ii) 18 metres width for a trench with one water gathering line and one parallel gas gathering pipeline; or
 - (iii) 25 metres width for multiple trenches where there are three (3) parallel gas or water gathering lines; and
 - (iv) seven (7) metres width for any additional trench for a water or gas line.
- (E16) The record of the assessment required by conditions (E1) to (E3) and the extent of **significant disturbance to land** in the following areas must be submitted to the administering authority with each annual return:
- (a) the **primary protection zone** of, or within an 'Endangered' or 'Of Concern' Regional Ecosystem, State Forest or Timber Reserve; and
 - (b) in the **secondary protection zone** of ESAs; and
 - (c) other **remnant vegetation** areas; and
 - (d) **wetlands**.
- (E17) **Limited petroleum activities** carried out in the **secondary protection zone** must be located in pre-existing areas of **clearing** or significant disturbance to the greatest practicable extent and must avoid the **clearing** of mature trees where possible.

Offsets

- (E18) The holder of this environmental authority must enter in to an environmental offset agreement with the administering authority where **significant disturbance to land** with **State significant biodiversity values** cannot be avoided or minimised.
- (E19) The environmental offset agreement must be entered in to within six (6) **months** after submitting the record of significant disturbance required by condition (E16), unless otherwise agreed to by the administering authority.
- (E20) The holder of this environmental authority must implement any environmental offset agreement entered in to in accordance with conditions (E18) and (E19) as soon as practicable after finalisation.

Note: Offset requirements will be determined in accordance with principles and guidelines of the "Queensland Government Environmental Offsets Policy" June 2008 and with the 'Queensland Biodiversity Offset Policy' when it becomes available.

SCHEDULE F – ENVIRONMENTAL NUISANCE**Odour, dust and other airborne nuisance**

- (F1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activity(ies) must not cause an environmental nuisance at any **sensitive place**.

Nuisance monitoring (other than noise)

- (F2) When the administering authority advises the holder of this environmental authority of a complaint alleging nuisance other than noise, the holder must investigate the complaint as soon as practicable.
- (F3) The holder of this environmental authority must advise the administering authority in writing of the action proposed or undertaken to resolve the complaint within three (3) **business days** of completing the complaint investigation.
- (F4) When requested by the administering authority, the holder of this environmental authority must undertake monitoring as specified by the administering authority, within a reasonable and practical timeframe nominated by the administering authority to investigate any complaint of environmental nuisance at any **sensitive place**.
- (F5) The results of the investigation (including an analysis and interpretation of the monitoring results) and the abatement measures implemented must be provided to the administering authority within five (5) **business days** of receiving the advice under condition (F4), unless a longer time is agreed to in writing by the administering authority.
- (F6) If monitoring in accordance with condition (F4) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then the holder of this environmental authority must:
- (a) address the complaint including the use of alternative dispute resolution services if required; and / or
 - (b) implement abatement or attenuation measures so that the authorised petroleum activity(ies) does not result in further environmental nuisance.

Noise

- (F7) A Noise Management Plan which has been **certified** by a **suitably qualified person** must be developed prior to the commencement of the petroleum activity(ies) authorised by this environmental authority.
- (F8) The Noise Management Plan must include, but not necessarily be limited to:
- (a) a commitment by the Chief Executive Officer for the holder of this environmental authority, or their delegate, to ensure adequate allocation of staff and resources to the establishment and operation of the Noise Management Plan;
 - (b) definition of roles, responsibilities and authorities within the staffing of the Noise Management Plan;
 - (c) delivery of training to staff and contractors and maintenance of competencies;
 - (d) risk / constraint analysis methods to be undertaken prior to any new operation (e.g. drill site) or installation of new equipment that has the potential to create noise nuisance;
 - (e) procedures and methods to undertake assessments to determine compliance with the noise limits in Schedule F, Table 1 – Noise limits at Sensitive Receptors in the event of a **valid complaint** being received and when there are no **alternative arrangements** in place, taking in to account any tonal or **impulsive noise** impacts;
 - (f) procedures for handling noise complaints;
 - (g) community liaison and consultation procedures including but not limited to consultation for when night time petroleum activities (i.e. between 10:00 pm and 6:00 am) are likely to exceed 25 dBA;
 - (h) procedures for managing records associated with all aspects of the Noise Management Plan including standardised forms for recording monitoring results and complaints;
 - (i) details of petroleum activities and measured and / or predicted noise levels of noise sources associated with those activities;
 - (j) reasonable and practicable control or abatement measures (including relocating the activity, altering the hours of operation, or having an alternate arrangement in place with any potentially affected person) that can be undertaken to ensure compliance with the noise limits in Schedule F, Table 1 – Noise limits at Sensitive Receptors;
 - (k) the level of noise at **sensitive receptors** that would be achieved from implementing the measures detailed under condition (F8)(j); and
 - (l) mediation processes to be used in the event that noise complaints are not able to be resolved.
- (F9) The holder of this environmental authority must implement the Noise Management Plan.
- (F10) Prior to undertaking petroleum activities that will result in **short-term, medium-term or long term noise events** that are likely to impact on a sensitive receptor, the holder of this environmental authority

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must model or calculate any potential noise emissions from the relevant petroleum activity(ies) to ensure that noise emissions will not exceed the noise levels specified in Schedule F, Table 1 – Noise limits at Sensitive Receptors.

- (F11) The emission of noise from the petroleum activity(ies) authorised under this environmental authority must not result in levels greater than those specified in Schedule F, Table 1 – Noise limits at Sensitive Receptors in the event of a **valid complaint** about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	L _{Aeq,adj,15 min}	45 dBA	43 dBA	40 dBA
6:00 pm – 10:00 pm	L _{Aeq,adj,15 min}	40 dBA	38 dBA	35 dBA
10:00 pm – 6:00 am	L _{Aeq,adj,15 min}	28 dBA	28 dBA	28 dBA
	Max L _{pA, 15 mins}	55 dBA	55 dBA	55 dBA
6:00 am – 7:00 am	L _{Aeq,adj,15 min}	40 dBA	38 dBA	35 dBA

1. The noise limits in Table 1 have been set based on the following deemed **background noise levels** (L_{ABG}):

7:00 am - 6:00 pm: 35 dBA
 6:00 pm – 10:00 pm: 30 dBA
 10:00 pm – 6:00 am: 25 dBA
 6:00 am – 7:00 am: 30 dBA

- (F12) If the noise subject to a 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 just audible	+ 2 dBA
Impulsive characteristic is clearly audibly	+ 5 dBA

- (F13) Where **alternative arrangements** are in place with an affected person(s) at a **sensitive receptor** as referred to by condition (F8)(j), the noise limits in Schedule F, Table 1 – Noise limits at Sensitive Receptors do not apply at that **sensitive receptor** for the duration for which the **alternative arrangements** are in place.

Low Frequency Noise

- (F14) Notwithstanding condition (F11), emission of any low frequency noise must not exceed the following limits 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 noise levels is no greater than 15 dB.

Noise Monitoring

- (F15) The holder of this environmental authority must undertake noise monitoring as soon as practicable when requested by the administering authority.
- (F16) The holder of this environmental authority must report the results of noise monitoring to the administering authority within three (3) **business days** of completion of the monitoring event.
- (F17) Noise monitoring and recording must include, but not necessarily be limited to:
- (b) $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and T=15 mins);
 - (c) $L_{Aeq\ adj, 15\ mins}$;
 - (c) **background noise level** as $L_{A\ 90, 15\ mins}$;
 - (d) **Max $L_{pA, 15\ mins}$** ;
 - (e) the level and frequency of occurrence of **impulsive** or tonal noise and any adjustment and penalties to measured noise levels levels;
 - (f) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (g) effects due to any extraneous factors such as traffic noise;
 - (h) location, date and time of monitoring;
 - (i) if the complaint concerns low frequency noise, **Max $L_{pZ, 15\ mins}$** ; and

- (j) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range for both the noise source and the background noise in the absence of the noise source.
- (F18) The method of measurement and reporting of noise levels and background sound pressure levels must comply with the Department of Environment and Resource Management's "Noise Measurement Manual" 2000 or **Australian Standard 1055**, as amended from time to time.

Vibration and Blasting

- (F19) A Blast Management Plan must be developed in accordance with **Australian Standard 2187** by a **suitably qualified person** prior to each blasting activity.
- (F20) The Blast Management Plan must include measures to minimise the likelihood of any adverse effects being caused by airblast overpressure and / or ground borne vibrations at any **sensitive receptor** and demonstrate current best practice environmental management.
- (F21) All blasting must be carried out in a proper manner by a **suitably qualified person**.
- (F22) All blasting must be carried out in accordance with the Blast Management Plan.
- (F23) Noise from blasting operations must not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at or extrapolated to any **sensitive receptor**.
- (F24) Ground-borne vibration peak particle velocity caused by blasting operations must not exceed 10 mm/s at any time, when measured at or extrapolated to any **sensitive receptor**.

Blast and Vibration Monitoring

- (F25) Monitoring and recording of the air blast overpressure and ground borne vibration of every blast must be undertaken.
- (F26) Blast and vibration monitoring must include but not necessarily be limited to:
 - (a) maximum instantaneous charge;
 - (b) location of the blast within the site (including any bench level);
 - (c) airblast overpressure level (dB Linear Peak);
 - (d) peak particle velocity (mm / s);
 - (e) location, date and time of recording;

- (f) measurement instrumentation and procedure;
- (g) meteorological conditions for blast monitoring (including temperature, relative humidity, temperature gradient, cloud cover, wind speed and direction); and
- (h) distances from the blast site to potentially noise-affected buildings or structures.

SCHEDULE H – WASTE

General

- (H1) All general waste must only be removed from the site and sent to a recycling facility or disposal facility licensed to accept the waste under the *Environmental Protection Act 1994*.
- (H2) 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* and sent to a recycling facility or disposal facility licensed to accept the waste.
- (H3) Waste must not be burned on the site, unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.
- (H4) All waste fluids and muds resulting from drilling and exploration petroleum activities must be contained in a properly lined **dam** or containment structure for disposal, remediation or reuse where applicable.

Coal Seam Gas Water Management Plan

- (H5) The holder of this environmental authority must develop and implement a Coal Seam Gas Water Management Plan for the proper and effective management of **coal seam gas water** produced in the carrying out of the petroleum activity
- (H6) The Coal Seam Gas Water Management Plan must include, but not necessarily be limited to:
 - (a) the matters required by sections 310D (5) and 662 of the *Environmental Protection Act 1994*; and
 - (b) a water management strategy that:
 - (i) addresses **coal seam gas water** management across all integrated operations; and
 - (ii) minimises the development footprint of water management **infrastructure**; and
 - (iii) does not allow for **coal seam gas water** to be disposed of, as the primary means, in **coal seam gas evaporation dams**, unless otherwise approved by the administering authority.
 - (c) commitments, actions and milestones for the delivery and implementation of the Coal Seam Gas Water Management Plan.
- (H7) The holder of this environmental authority must not implement or amend a Coal Seam Gas Water Management Plan where such implementation or amendment would result in a contravention of any condition of this environmental authority.

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- (H8) The holder of this environmental authority must submit any amendments to the Coal Seam Gas Water Management Plan to the administering authority prior to its implementation.
- (H9) If, within 20 **business days** following the submission of the amended Coal Seam Gas Water Management Plan, the administering authority provides comments on the amended Coal Seam Gas Water Management Plan, the holder of this environmental authority must:
- (a) have due regard to that comment in the finalisation of the amended Coal Seam Gas Water Management Plan; and
 - (b) submit the finalised amended Coal Seam Gas Water Management Plan within 40 **business days** after the administering authority provided comments; and
 - (c) implement the amended Coal Seam Gas Water Management Plan.
- (H10) The holder of this environmental authority must ensure that **coal seam gas water** is contained, is not released to land or **waters** and is only used for purposes specifically authorised:
- (a) under this environmental authority; or
 - (b) under Section 186 of the *Petroleum and Gas (Production and Safety) Act 2004*; or
 - (c) under Section 86 of the *Petroleum Act 1923*; or
 - (d) under an approval of resource for **beneficial use** as provided for under the *Environmental Protection Act 1994*.
- (H11) The holder of this environmental authority must ensure that the **coal seam gas water** to be used for domestic or stock purposes meets the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time.
- (H12) **Coal seam gas water** released to the environment in accordance with condition (H10) must not have any properties that could cause, nor contain any contaminants in concentrations that are capable of causing environmental harm.

Note: Coal seam gas water that is beneficially used under an approval issued under the Environmental Protection (Waste Management) Regulation 2000 will be regulated under the conditions of that approval.

Coal Seam Gas Water Use for Dust Suppression

- (H13) **Coal seam gas water** produced from the authorised petroleum activity(ies) may only be used for dust suppression:
- (a) on roads; and

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(b) for **construction** and operational purposes for the petroleum activity(ies) authorised by this environmental authority.

(H14) **Coal seam gas water** produced from the authorised petroleum activity(ies) may only be used for dust suppression as provided for in condition (H13) provided that:

- (a) the water quality meets the limits specified in Schedule H, Table 1 – Dust suppression water contaminant release limits for each of the water quality characteristics; and
- (b) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority.

Schedule H, Table 1 – Dust suppression water contaminant release limits

Water Quality Characteristics	Unit	Limit	Limit Type
pH	ph Units	6.0 to 9.0	Range
Sodium adsorption ratio	ratio	8	80 th percentile
		12	Maximum
Total dissolved solids	mg/L	2000	Maximum
Total petroleum hydrocarbons	mg/L	10	Maximum

(H15) Use of **coal seam gas water** for dust suppression in accordance with conditions (H13) and (H14) must be carried out in a manner such that:

- (a) vegetation is not damaged; or
- (b) soil quality is not adversely impacted; or
- (c) there is no surface ponding or runoff of the coal seal gas water from the application area; or
- (d) deep drainage below the root zone of any vegetation is minimised; or
- (e) the quality of shallow aquifers is not adversely affected; or
- (f) there are no release of **coal seam gas water** to **waters**.

Brine and Salt Management

- (H16) 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*.

SCHEDULE I – REHABILITATION

Rehabilitation Plan

- (I1) A Rehabilitation Plan which has been **certified** by a **suitably qualified person** must be developed prior to the carrying out of the petroleum activity(ies).
- (I2) The Rehabilitation Plan must include strategies for the determination of final land use(s) and **rehabilitation** goals and details of how **rehabilitation** objectives will be achieved. The Rehabilitation Plan must include:
- (a) a rehabilitation hierarchy for:
 - (i) reinstating a native ecosystem as similar as possible to the original ecosystem as the preferred option; then
 - (ii) establishing an alternative outcome with a higher environmental value than the previous land use; then
 - (iii) reinstating the previous land use (e.g. grazing or cropping); and
 - (b) methods to achieve **rehabilitation** goals including, but not necessarily being limited to:
 - (i) establishing final land use(s) in consultation with affected landholder(s) and the administering authority;
 - (ii) identifying suitable **analogue**² **sites** to measure **rehabilitation** success that may either be the pre-disturbed area or another area that has equivalent values and characteristics as the intended final land use(s); and
 - (iii) for sites that are being reinstated to a land use other than a native ecosystem, the Rehabilitation Plan must identify any additional and relevant indicators to be measured at both the **analogue** and **rehabilitation** site(s) so as to assess progressive and final **rehabilitation** success for that land use;
 - (iv) for sites that are being reinstated to native ecosystems and the **analogue site** is the pre-disturbed site, the Rehabilitation Plan must include indicators that, as a minimum include those in condition (E3)(a) – (E3)(d) and will be able to measure success against the progressive and final **rehabilitation** criteria in this environmental authority;
 - (v) identification of any land use constraints which have resulted from the petroleum activity(ies);
 - (vi) residual pollution risks with strategies for managing and mitigating them;
 - (vii) landscape planning and landform design principles to achieve **stable** landforms including slope designs, erosion controls and drainage lines;

² The latest version of the Qld Government's "*Biocondition, a Condition Assessment Framework for Terrestrial Biodiversity in Queensland, Assessment Manual*" and accompanying document "*Methodology for the Establishment and Survey of Reference Sites for Biocondition*" may be used to establish suitable analogue sites for like native vegetation communities.

- (viii) integrating rehabilitated areas so they are compatible with the surrounding landscape, including linking rehabilitated areas of native vegetation with undisturbed native vegetation to provide larger areas and wildlife corridors where feasible;
- (ix) ensuring that **significantly disturbed areas** are rehabilitated progressively and that the progressive **rehabilitation** criteria are routinely measured;
- (x) site preparation such as re-profiling, re-instating surface drainage systems;
- (xi) **top soil** management such as **top soil** handling and stockpiling to preserve soil fertility and biota, respreading techniques, planned thickness, ripping, **top soil** treatments / amendments and mulching in consideration of **analogue** data;
- (xii) flora to be established, including required species diversity, abundance and composition and projective cover in consideration of **analogue** data;
- (xiii) plant propagation and / or supply methods including using seeds / spores of local provenance where feasible;
- (xiv) establishment methods to maximise **rehabilitation** success such as seed treatments, seed spreading, timing of seeding to suit best local climatic conditions, hydroseeding, transplanting;
- (xv) weed control;
- (xvi) sourcing habitat structures for native fauna and installation methods in consideration of matching **analogue** data;
- (xvii) on going maintenance program for rehabilitated areas; and
- (xviii) rehabilitation monitoring program as required by conditions (I13) and (I14) of this environmental authority; and
- (c) timeframes for commencing **rehabilitation** of **significantly disturbed areas** that are not required for the ongoing conduct of the petroleum activity(ies), not greater than three (3) **months** for the **rehabilitation** of buried pipelines and not greater than nine (9) **months** for any other **significantly disturbed area**.

- (I3) The holder of this environmental authority must implement the Rehabilitation Plan.

Progressive Rehabilitation for Significantly Disturbed Land

- (I4) Pipelines trenches must be backfilled immediately after pipe laying and rehabilitated as soon as practicable but not longer than three (3) **months** after completion.
- (I5) During backfilling of pipeline trenches, soils must be replaced so that the soil horizons are consistent with the soil horizons of the immediately surrounding area.
- (I6) Backfilled and rehabilitated pipeline trenches must:
 - (a) be a **stable** landform;

- (b) exhibit no subsidence or erosion gullies for the life of the operational pipeline; and
 - (c) be re-profiled to a level consistent with surrounding soils; and
 - (d) be re-profiled to original contours and established drainage lines; and
 - (e) be visually consistent with the surround land features; and.
 - (f) be vegetated with groundcover as a minimum to ensure that erosion is minimised.
- (17) Progressive **rehabilitation** of **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) (other than constructing pipelines) which is not required for the ongoing conduct of the petroleum activity(ies) must commence as soon as practicable, but not longer than nine (9) **months** following the completion of any **construction** or operational works associated with the petroleum activity(ies).
- (18) Progressive **rehabilitation** of **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) must be undertaken in accordance with the Schedule of Disturbance as submitted to the administering authority as part of the financial assurance calculations.
- (19) Progressive **rehabilitation** of **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) must:
- (a) remediate any contaminated land (e.g. contaminated soils, decommissioned **dams** containing salt);
 - (b) reshape all **significantly disturbed land** to a **stable** landform;
 - (c) reprofile all **significantly disturbed land** to original contours;
 - (d) on all **significantly disturbed land**:
 - (i) re-establish surface drainage lines;
 - (ii) reinstate the top layer of the soil profile;
 - (iii) establish groundcover to ensure that erosion is minimised;
 - (iv) establish vegetation of floristic species composition found in **analogue sites**;
 - (e) undertake **rehabilitation** in a manner such that any actual and potential **acid sulfate soils** in or on the site are either not disturbed, or submerged, or are treated to prevent and / or minimise environmental harm.

Final Acceptance Criteria for Significantly Disturbed Land

- (110) All **significantly disturbed land** caused by the carrying out of the petroleum activity(ies) must be rehabilitated to meet the following final acceptance criteria:
- (a) For all land use(s):

- (i) all **significantly disturbed land** is reinstated to the pre-disturbed soil suitability class;
- (ii) the landform is safe for humans and fauna;
- (iii) the landform is **stable** with no subsidence or erosion gullies for at least three (3) **years**;
- (iv) all **significantly disturbed land** is reinstated so that the distribution of vegetation communities represents the **analogue site**;
- (v) the water quality of any residual **void** or water bodies constructed by the petroleum activity(ies) meets criteria for subsequent uses and does not have potential to cause environmental harm;
- (vi) there is no ongoing contamination to **waters**;
- (vii) there is no ongoing contamination to groundwater from **dams** or monocells (demonstrated via groundwater monitoring and leak detection monitoring systems); and
- (viii) the maintenance requirements for rehabilitated land is no greater than that required for the land prior to its disturbance caused by carrying out the petroleum activity(ies).

(b) Additional requirements for sites that are being reinstated to native ecosystems:

- (i) each vegetation community must be re-established so that each of the following **rehabilitation** parameters are maintained for at least three (3) **years**:
- (ii) the rehabilitated site shows distinct and progressive re-establishment of the various strata which characterise the vegetation community in the **analogue site**;
- (iii) all dominant species within each strata are re-established at densities equivalent to that of the **analogue site**;
- (iv) notwithstanding (I10)(b)(i) and (I10)(b)(ii), a minimum of 70% **species richness** and **species diversity** is observed when compared to the relevant **analogue site**;
- (v) a minimum of 50% **foliage cover** is observed when compared to the relevant **analogue site**;
- (vi) each vegetation community must be rehabilitated and maintained until it can be demonstrated that it is resilient and self-sustaining; and
- (vii) percent organic litter cover, count and density of hollow bearing logs and nest boxes (as replacement for trees with hollows $\geq 10\text{cm}$ diameter) and fallen woody material (total length of logs $\geq 10\text{ cm}$ diameter per hectare and number of logs $\geq 10\text{cm}$ per hectare) have been installed at numbers and densities no lower than the **analogue site**.

(I11) Notwithstanding condition (I10), all buried pipelines must be decommissioned in accordance with the requirements of **Australian Standard 2885**, as amended from time to time.

(I12) Despite condition (I10), any dam may be decommissioned for a **beneficial use** provided that it:

- (a) no longer contains contaminants that will migrate in to the environment; and

- (b) the administering authority and the landholder agree in writing that the **dam** will be used by the landholder following the cessation of the petroleum activity(ies).

Rehabilitation Monitoring Program

- (I13) A Rehabilitation Monitoring Program which has been **certified** by a **suitably qualified person** must be developed by 9 December 2011.
- (I14) The Rehabilitation Monitoring Program must include, but not necessarily be limited to:
- (a) methods to measure subsidence and erosion rates at rehabilitated buried transmission pipeline corridors and buried flow lines;
 - (b) monitoring of indicators identified in the Rehabilitation Plan at **analogue sites** to measure progressive and final **rehabilitation** success relevant to the final land use(s); and
 - (c) frequency and seasonality of monitoring **analogue sites** and rehabilitated areas to assess **rehabilitation** success; and
 - (d) identification of the experimental design for analysing **analogue** and rehabilitated site data including statistical methods of analyses.
- (I15) The holder of this environmental authority must implement the Rehabilitation Monitoring Program.

Monitoring of Progressive Rehabilitation

- (I16) Regular maintenance and at least yearly monitoring of rehabilitated areas must take place to measure compliance with condition (I6) and (I9).

Monitoring of Final Rehabilitation Success

- (I17) Final acceptance criteria are deemed to be met when monitoring of rehabilitated areas demonstrate compliance with the requirements of condition (I10) for three (3) consecutive **years**.

Rehabilitation Reporting for Relinquishment of Part of an Authority to Prospect Area

- (I18) Prior to relinquishing part of an authority to prospect area, the holder of this environmental authority must prepare a rehabilitation report which specifically relates to the area to be relinquished and which:
- (a) reports on the condition of the area to be relinquished against the requirements of conditions (I10) and (I11) of this environmental authority; and

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- (b) includes the results of all rehabilitation monitoring undertaken in the area to be relinquished in accordance with the Rehabilitation Monitoring Program and conditions (I16) and (I17) of this environmental authority.
- (I19) The report required under condition (I18) must be submitted to the administering authority twenty (20) **business days** prior to the relinquishment notice being lodged with the administering authority of the *Petroleum and Gas (Production and Safety) Act 2004*.

SCHEDULE J – STIMULATION ACTIVITIES**Well Drilling, Completion and Stimulation**

- (J1) **Oil based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J2) **Synthetic based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J3) **Stimulation** activities are not permitted.

SCHEDULE K – COMMUNITY ISSUES

- (K1) The holder of this environmental authority must maintain a record of all **valid complaints** and incidents causing environmental harm, and actions taken in response to the **valid complaint** or incident.
- (K2) The holder of this environmental authority must record the following details for all **valid complaints** received:
- (a) name, address and contact number for valid complainant;
 - (b) time and date of **valid complaint**;
 - (c) reasons for the complaint as stated by the valid complainant;
 - (d) investigations undertaken in response to the **valid complaint**;
 - (e) conclusions formed;
 - (f) actions taken to resolve the **valid complaint**;
 - (g) any abatement measures implemented to mitigate the cause of the **valid complaint**; and
 - (h) name and contact details of the person responsible for resolving the **valid complaint**.

SCHEDULE L - NOTIFICATION PROCEDURES

- (L1) The holder of this environmental authority must telephone the Department of Environment and Resource Management's Pollution Hotline (telephone: 1300 130 372) and any affected landholder, occupier or their nominated representative as soon as reasonably practicable, but within 24 hours after becoming aware of:
- (a) a release of contaminants as provided for in condition (L3); or
 - (b) any event where environmental harm (excluding environmental nuisance) has been caused or may be caused; or
 - (c) any detection of **restricted stimulation fluids** from **stimulation** fluid monitoring; or
 - (d) any result from baseline **bore**, well or **stimulation** water impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource.
- (L2) Notwithstanding condition (L1), the holder of this environmental authority must telephone the Department of Environment and Resource Management's Pollution Hotline (telephone: 1300 130 372) as soon as reasonably practicable, but within 24 hours after becoming aware of:
- (a) any non-compliance with any condition of this environmental authority other than in relation to a release of contaminants; or
 - (b) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (c) when the level of the contents of any **regulated dam** reaches the **mandatory reporting level**; or
 - (d) when a **regulated dam** will not have available storage to meet the **design storage allowance** on the 1 November of any year; or
 - (e) 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**).
- (L3) Subject to condition (L1), the holder of this environmental authority must report spills of contaminants (including but not limited to hydrocarbons, **coal seam gas water**, **stimulation** fluids or any mixtures) of the following volumes or kind:
- (a) releases of any volume of contaminants to water;
 - (b) releases of volumes of contaminants to land greater than:
 - (i) 200L of hydrocarbons; or
 - (ii) 200 L of **stimulation** additives; or
 - (iii) 500 L of **stimulation fluids**; or
 - (iv) 1000 L of **brine**; or
 - (v) 5 000 L of **coal seam gas water**;

- (c) releases of any volumes of contaminants where potential serious or material environmental harm has occurred or may occur.
- (L4) The notification of emergencies or incidents as required by conditions (L1), (L2) and (L3) 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 actually or potentially 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.
- (L5) Within 10 **business days** following the initial notification, 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 information required by condition (L4);
 - (b) the root cause of the emergency or incident;
 - (c) the confirmed quantities and types of any contaminants involved in the incident;
 - (d) 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);

- (e) 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;
 - (f) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
 - (g) results and current status of landholder consultation, including commitment to resolve any outstanding issues / concerns; and
 - (h) actions and / or procedural changes to prevent a recurrence of the emergency or incident.
- (L6) As soon as reasonably practicable, but not more than 24 hours, after becoming aware of one of the circumstances described in conditions (J6) or (J7) that relate to **stimulation** activities, the holder of this environmental authority must give written notice of the event, its nature and the circumstances in which it happened to;
- (a) the administering authority; and
 - (b) each owner and occupier of land that is, has been, or is reasonably likely to be, affected by the event.
- (L7) As soon as reasonably practicable after the notification in condition (L6), the holder of this environmental authority must give the administering authority written notice of:
- (a) the rectification measures implemented under condition (J10);
 - (b) the results of any monitoring carried out on those rectification measures; and
 - (c) the success of the rectification measures implemented.
- (L8) Within 10 **business days** following the initial notification of an emergency or incident or receipt of monitoring results indicating any significant changes in groundwater quality caused by the petroleum activity(ies) other than that relating to the circumstances described in condition (J7), then the analysis results indicating these changes, including any proposed actions to mitigate the changes in groundwater quality information must be submitted to the administering authority.
- (L9) If groundwater contamination caused by the petroleum activity(ies) is encountered, the following must be reported to satisfy requirements under condition (L8):
- (a) the level of environmental harm caused as a result of such contamination to soils and groundwater;
 - (b) the conduct of a geodetic survey of all monitoring **bores** to determine the relative water surface elevations of each bore and reported in metres relative to the **AHD**; and
 - (c) the determination of groundwater flow direction, groundwater flow rate and hydraulic conductivity.

SCHEDULE M - DEFINITIONS

*Note: Terms which are defined in this environmental authority are **bolded** throughout. Where a term is not defined in this environmental authority, the definition in the Environmental Protection Act 1994, its regulations and Environmental Protection Policies, then the Acts Interpretation Act 1954, then the Macquarie Dictionary then the Petroleum and Gas (Production and Safety) Act 2004 or its regulations must be used in that order.*

“acid sulfate soils” means soil or sediment containing highly acidic soil horizons or layers affected by the oxidation of iron sulfides (*actual acid sulfate soils*) and / or soil or sediment containing iron sulfides or other sulfidic material that has not been exposed to air and oxidised (*potential acid sulfate soils*). The term acid sulfate soil generally includes both actual and potential acid sulfate soils. Actual and potential acid sulfate soils are often found in the same soil profile, with actual acid sulfate soils generally overlying potential acid sulfate soil horizons.

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

“active” for the purposes of landholders’ 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.

“aggregation dam” means a regulated dam that receives and contains coal seam gas water or coal seam gas concentrate. The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.

“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 between the holder of this environmental authority and an affected or potentially affected person at a sensitive receptor for a defined noise nuisance impact and may include an agreed period of time for which the arrangement is in place. An agreement for alternative arrangement may include, but not necessarily be limited to a range of noise abatement measures to be installed at a sensitive receptor and / or provision of alternative accommodation for the duration of the defined noise 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 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 such as that ground truthing assessment required under the Land Schedule of this environmental authority.

“analytes” means a chemical parameter determined by either physical measurement in the field or by laboratory analysis.

“annual exceedance probability or AEP” is the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year.

“appraisal well” 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.

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

- any kind and all things associated with the construction and operation of a dam; and
- any land used for those operations.

“Australian Standard 1055” means Australian Standard 1055.1:1997 “Description and Measurement of Environmental Noise – General procedures”.

“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 2885” means Australian Standard 2885.0:2008 “Pipelines – Gas and Liquid Petroleum General Requirements”, Australian Standard 2885.1:2007 “Pipelines – Gas and Liquid Petroleum Design and Construction” and Australian Standard 2885.3:2001 “Pipelines – Gas and Liquid Petroleum Operation and Maintenance”, or any updated versions that becomes available from time to time.

“Australian Standard 4323” means Australian Standard 4323.1:1995 “Stationary source emissions method 1: Selection of sampling positions”.

“Australian / New Zealand Standard 5667.11” means Australian / New Zealand Standard 5667.11: 1998 “Water Quality – Sampling – Guidance on sampling at Groundwaters”.

“Australian / New Zealand Standard 5667.12” means Australian / New Zealand Standard 5667.12:1999 “Guidance on Sampling of Bottom Sediments” for permanent, semi-permanent water holes and water storages”.

“authorised person” means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive or chief executive officer of a local government.

“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 percent 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.

“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:
 - of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Environmental Protection Act 1994*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - the transfer and use have been approved or authorised under any relevant legislation. Or
- with respect to coal seam gas water, refer to the Department of Environment and Resource Management's "Operational Policy - Management of water produced in association with petroleum activities" and "Notice of decision to approve a resource for beneficial use – CSG water" as amended from time to time which can be accessed on the Department of Environment and Resource Management's website at www.derm.qld.gov.au.

“black earth” means a type of soil, also known as vertosols and is a soil order of the Australian Soil Classification. These are clay soils with shrink / swell properties that display strong cracks when dry and / or lenticular structural aggregates at depth. They have high soil fertility and a large water holding capacity.

“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.

“bund or banded” 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 banded 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 means a day that is not—

- a Saturday or Sunday; or
- a public holiday, special holiday or bank holiday in the place in which any relevant act is to be or may be done.

“BTEX” means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.

“Category A Environmentally Sensitive Area” means any area listed in Section 25 of the *Environmental Protection Regulation 2008*.

“Category B Environmentally Sensitive Area” means any area listed in Section 26 of the *Environmental Protection Regulation 2008*.

“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*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*;
- An area identified as “Essential Habitat” or “Essential Regrowth Habitat” under the *Vegetation Management Act 1999* for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*; or
- Of Concern Regional Ecosystems identified in the database maintained by the Department of Environment and Resource Management called ‘RE description database’ containing Regional Ecosystem numbers and descriptions.

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

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

“certify” or “certification” or “certified” in relation to any matter other than a design plan, ‘as constructed’ drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that:

- all relevant material has been considered in the written document; and
- that the content of the written document is accurate and true; and
- that the written document meets the requirements of the relevant conditions of the environmental authority.

“clearing” for vegetation means removing, cutting down, ringbarking, pushing over, poisoning or destroying in any way including by burning, flooding or draining; but does not include destroying standing vegetation by stock, or **lopping** a tree.

“coal seam gas water” means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. CSG water is a waste, as defined under s13 of the EP Act.

“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.

“coal seam gas water dams” include any type of dam (storage or evaporation) used to contain groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production.

“coal seam gas evaporation dam” is defined as a impoundment, enclosure or structure that is designed to be used to hold coal seam gas water for evaporation.

“construction” 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 purposes of preparing a design plan.

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

“design plan” is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include ‘as constructed’ drawings.

“design storage allowance or DSA” means an available volume, estimated in accordance with the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, prepared by the Department of Environment and Resource Management, as amended from time to time, that must be provided in a dam to an annual exceedance probability 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 Department of Environment and Resource Management.

“document” has the meaning in the *Acts Interpretation Act 1954* and means:

- any paper or other material on which there is writing; and
- any paper or other material on which there are marks; and

- 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).

“ecosystem functioning” means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of an area of vegetation.

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

“equivalent person or EP” means an equivalent person under volume 1, section 2 of the “Guidelines for Planning and Design of Sewerage Schemes”, October 1991, published by the Water Resources Commission, Department of Primary Industries, Fisheries and Forestry.

“evaporation dam” means a land based structure designed to contain or impound coal seam gas water, the purpose of which is to contain or impound the water.

“existing aggregation dam” means *[insert names and locations of aggregation dams that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“existing brine dam” means *[insert names and locations of brine dams that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“existing dam” means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on *[insert the approval date of this environmental authority]*..

“existing coal seam gas evaporation dam” means *[insert names and locations of existing dams containing coal seam gas water for the primary purpose of evaporation that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“existing low hazard dam” means *[insert names and locations of existing low hazard dams that are constructed and / or whose construction had substantially commenced on the approval date of this environmental authority]*.

“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.

For clarity, an exploration well does not include an appraisal or development well.

“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.

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

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

- is covered from time to time by floodwater overflowing from the watercourse; 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.

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

“foreseeable future” means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the **end** of a 150 year foreseeable future with an acceptably low probability of failure before that time.

“hazard category” means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, prepared by the Department of Environment and Resource Management, as amended from time to time.

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

“high value regrowth” vegetation means

- any of the following:
 - an endangered regional ecosystem;
 - an of concern regional ecosystem;

- a least concern regional ecosystem; and
- have not been cleared since 31 December 1989; and
- is shown on a regrowth vegetation map.

“hub” means more than one unit of fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined, located within five (5) km of any other fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, prepared by the Department of Environment and Resource Management, as amended from time to time..

“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.

“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 90% 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.

“landfill monocell” means a specialised, isolated landfill facility where a single specific waste type is exclusively disposed (i.e. salt).

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

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

“limited petroleum activities” mean only the following petroleum activities:

- **well sites** not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance. Well sites may include the following infrastructure:
 - well pads;
 - water pumps and generators associated with well operations;
 - sumps for storing drilling muds;
 - flare pits;
 - ponds used to contain and / or store **stimulation** fluid;
 - temporary campsites for the purpose of establishing the limited petroleum activity;
- geophysical surveys (including seismic petroleum activities);
- ecological geological surveys (including seismic petroleum activities);
- gathering / flow pipelines from a well head to the initial compression facility;
- supporting access tracks; and
- communication and power lines that are necessary for the undertaking of petroleum activities and that are located within well sites, well pads and pipeline right of ways without increasing the disturbance area of petroleum activities.

For clarity, limited petroleum activities exclude and exclusions are not necessarily limited to:

- the construction of infrastructure for processing or storing petroleum or by-products;
- low hazard dams (that do not meet the limitations prescribed above);
- regulated dams;
- borrow pits;
- compressor stations;
- campsites / workforce accommodation;
- pipelines which are used to transport gas after the initial compression facility (e.g. trunk pipelines, transmission pipelines or pipelines that require a pipeline license) except for those pipelines authorized under the conditions of Schedule D of the Environmental Authority;
- waste disposal; or
- other supporting infrastructure for the project (e.g. sewage treatment plants).

“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.

“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 hazard dam” means any dam that is:

- not classified as high or significant as assessed using the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time; and
- that contains contaminants in concentrations which exceed the values or range shown in Table 3 of the "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams", prepared by the Department of Environment and Resource Management, as amended from time to time at any time.

"low impact petroleum activities" means limited petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land. Examples of such activities include but are not necessarily limited to soil surveys, topographic surveys, cadastral surveys and ecological surveys and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.

"Max L_{pZ} , 15 min" means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.

"Max L_{pA} , 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 Hazard Categories and Hydraulic Performance of Dams" prepared by the Department of Environment and Resource Management, 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.

"meter" means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe."

"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.

"pest" means species:

- declared under the *Land Protection (Pest and Stock route Management) Act 2002*;
- declared under Local Government model local laws; and
- which may become invasive in the future.

“populated area” includes towns and cities which have a populated of 200 or more people and with a minimum density of 40 people / km².

“prescribed storage gases” has the meaning provided in section 12 of the *Petroleum and Gas (Production and Safety) Act 2004*.

“primary protection zone” means an area within a 200 metre buffer from the boundary of any Category A, B or C Environmentally Sensitive Area.

“programmed and approved” means when the location of infrastructure has been approved by the authorised person(s) with the organisation(s).

“regulated dam” means any dam in the significant or high hazard category as assessed using the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”, prepared by the Department of Environment and Resource Management, as amended from time to time.

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

“regrowth vegetation map” means a map certified by the chief executive as the regrowth vegetation map for the State and showing for the State:

- areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - have not been cleared since 31 December 1989; and
- particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- areas the chief executive decides under section 20AI to show on the map as high value regrowth vegetation.

“remnant unit” means a continuous polygon of remnant vegetation (as defined by the QLD Herbarium) representative of a single RE type or a single heterogeneous unit.

“remnant vegetation” means vegetation, part of which forms the predominant canopy of the vegetation—

- covering more than 50 % of the undisturbed predominant canopy; and
- averaging more than 70 % 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.

“**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 81B of the *Environmental Protection Regulation 2008*:

- 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.

“**secondary protection zone**” in relation to a Category A Environmentally Sensitive Area means an area within an 800 metre buffer from the boundary of a **primary protection zone**.

“**secondary protection zone**” in relation to a Category B or C Environmentally Sensitive Area means a area within a 300 metre buffer from the boundary of a **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; or
- a library, childcare centre, kindergarten, school, university or other educational institution;
- a medical centre, surgery or hospital; or
- a protected area; or
- 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; or
- 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.

“**sensitive receptor**” means an area or place where noise (including low frequency, vibration and blasting) is measured to investigate whether nuisance impacts are occurring and includes:

- a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- a library, childcare centre, kindergarten, school, university or other educational institution;
- a medical centre, surgery or hospital; or
- a protected area; or
- 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; or
- 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.

“**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 land or significant disturbance to land or significant disturbance” means disturbance to land as defined in section 28 of the *Environmental Protection Regulation 2008*.

“species richness” means the number of different species in a given area.

“species diversity” means the diversity within an ecological community that incorporates both species richness and the evenness of species' abundances.

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

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

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

“State significant biodiversity values” means those regional ecosystems, essential habitat, wetlands, watercourses, legally secured offset areas and connectivity areas provided in Appendix 1 of the *“Queensland Biodiversity Offset Policy”* (Department of Environment and Resource Management, 2011).

“stimulation” means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing / hydrofracturing, fracture acidizing and the use of proppant treatments.

“stimulation fluid” means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir.

“stimulation impact zone” means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.

“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 matter using the relevant protocols, standards, methods or literature.

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

- exactly what has been assessed and the precise nature of that assessment;
- the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- 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

- the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

“suitably qualified and experienced person” in relation to dams means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the Professional Engineers Act 1988, or registered as a National Professional Engineer (NPER) with the Institution of Engineers Australia, or holds equivalent professional qualifications to the satisfaction of the administering authority for the *Environmental Protection Act 1994*, and the administering authority for the *Environmental Protection Act 1994* is satisfied that person has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

- knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- a total of five (5) years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry, and
- a total of five (5) years of suitable experience and demonstrated expertise each, in three (3) of the following categories:
 - investigation and design of dams.
 - construction, operation and maintenance of dams.
 - hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology.
 - hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes.
 - hydrogeology with particular reference to seepage, groundwater.
 - solute transport processes and monitoring thereof.
 - dam safety.

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

“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 the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority

“threatening processes” means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).

“tolerable limits” means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).

“top soil” 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.

“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.

“trenchless methods” means construction methods for the installation of pipelines and cables below the ground with minimal excavation. Trenchless methods can include, but not necessarily be limited to:

- moling
- pipe ramming method
- horizontal directional drilling
- utility tunneling, pipe jacking, auger boring
- microtunnelling and pipe jacking
- on-line replacement

“unacceptable risk” means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 “Risk Management” or any updated version that becomes available from time to time.

“valid complaint” means a complaint the administering authority considers is not frivolous, nor vexatious, nor based on mistaken belief.

“void” means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).

“waters” includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, 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.

“watercourse” has the meaning provided in section 5 of the *Water Act 2000* and includes the bed and banks and any other element of a river, creek or stream confining or containing water.

“well infrastructure” means infrastructure required for the construction, completion and operation 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” means a wetland as defined under the Queensland Wetlands Program and are areas of 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. To be classified as a wetland, the area must have one or more of the following attributes:

- 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

- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

For the purposes of Chapter 5A activities, wetlands do not include springs and watercourse and those wetlands that are defined in the document entitled "*Wetland Mapping and Classification Methodology*" (Department of Environment and Resource Management, 2005) as:

- H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel;
- H2M3p Ponded pastures;
- H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (e.g. cropping);
- H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage;
- H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;
- H3C1 Artificial stand-alone water storages not within a natural water body or channel; or
- H3C2 Artificial Channel drain / canal –bore drains, swales, **bores** and irrigation channel overflows / ponding.

"**year**" means a period of 12 months.

"**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.

END OF PART A ENVIRONMENTAL AUTHORITY

Part B – Legislative Requirements and Conditions for the Santos GLNG Gas Field Development Project

Any condition with * is a Coordinator General Stated Condition for the Santos GLNG Gas Field Development Project.

Schedule A – General

Scoping table conditions

A1 The activities in Condition A1-1 are not authorised on ATP803. Conditions A1 to K3 do not apply under this Environmental Authority.

Note: Due to the expiry of the Coordinator General's Report on 4 December 2019, for the EIS for the Santos GLNG Gas Field Development Project, the conditions listed in Part B of this Environmental Authority have been included. These activities and conditions are not authorised on an ATP.

A1-1 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) The specified relevant activities are the ERAs which are authorised by this Environmental Authority which include:
 - i. Item 3, Schedule 2A of the *Environmental Protection Regulation 2008* – a petroleum activity that is likely to have a significant impact on a category A or B environmentally relevant activity.
 - ii. Item 6, Schedule 2A of the *Environmental Protection Regulation 2008* – a petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam.
 - iii. Item 8, Schedule 2A of the *Environmental Protection Regulation 2008* – a petroleum activity or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES.

- iv. **ERA 8(3) – Chemical storage** consists of storing more than 500m³ of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3.
 - v. **ERA 55(2c) – Other waste reprocessing and treatment** consists of operating a facility for receiving and reprocessing or treating, in a year, of more than 10,000t of category 2 regulated waste.
 - vi. **ERA 62(1c) – Resource recovery and transfer facility** consisting of operating a facility for receiving and sorting, dismantling, baling or temporarily storing category 2 regulated waste.
 - vii. **ERA 63(1a-i) – Sewage treatment** consisting of operating sewage treatment works, other than no-release works, with a total daily peak design capacity of 21 – 100 EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme.
 - viii. **ERA 63(1b-i) – Sewage treatment** consisting of operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 but no more than 1,500 EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme.
 - ix. **ERA 64(3) – Water treatment** consisting of treating 10ML or more of raw water in a day.
- (c) incidental activities that are not otherwise specified relevant activities.

Table 1 – Scale and Intensity of the Activities

Project Components	Scale (Maximum number of activities)	Intensity (Maximum size of disturbed area during construction)
Wells	163	Up to 245 ha
Gathering lines and Pipelines	As required	As required
Stimulation Activities	All wells are subject to stimulation activities	

Environmental authority

Project Components	Scale (Maximum number of activities)	Intensity (Maximum size of disturbed area during construction)
Compressor Facilities (below the threshold of 500kg of fuel per hour)	1	Up to 8 ha
Water Treatment Facilities	1	Up to 10 ha
Access Roads	As required	Access road width up to 30m
Regulated Structures (Dams)	4	Up to 64 ha
Sewage Treatment Plant(s)	As required	As required

A2* The resource activities in condition (A1-1) are authorised subject to the conditions of this environmental authority.

A3* This environmental authority authorises a relevant act¹ 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.

¹See section 493A of the Environmental Protection Act 1994

Monitoring

A4* All monitoring required must be undertaken by a suitably qualified person.

- A5*** If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.
- A6*** All laboratory analyses and tests required must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.
- A7*** Notwithstanding condition (A6), 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.
- A8*** 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 (2009:27 GeoCat #6890.1)
 - (c) for noise, the *Environmental Protection Regulation 2008*
 - (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

- A9*** 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

A10* All plant and equipment must be maintained and operated in their proper and effective condition.

A11* 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.

A12* Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.

Complaints

A13* Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

Documentation

A14* 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.

A15* All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

A16* All documents required to be developed under this environmental authority must be kept for five (5) years.

A17* 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.

A18* 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

- A19*** 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.
- A20*** Notwithstanding condition (A19), and prior to undertaking the third party audit, the scope and content of the third party audit can be negotiated with the administering authority.
- A21*** An audit report must be prepared and certified by the third party auditor presenting the findings of each audit carried out.
- A22*** 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.
- A23*** A written response must be attached to the audit report detailing the actions taken or to be 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.
- A24*** The audit report required by condition (A21) and the written response to the audit report required by condition (A23) must be submitted with the subsequent annual return.

Schedule B – Water

General

- 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 and wetlands

- 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 ecological 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 Water release limits for Construction or Maintenance of Linear infrastructure*.

Schedule B, Table 1 - Water Release limits for Construction or Maintenance of Linear Infrastructure

Water Quality Parameters	Units	Water Quality Limits
Turbidity	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 50m 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 50m 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 50m downstream of the construction or maintenance activity.
Hydrocarbons	-	No visible sheen

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.

Floodplains

B12* Where the petroleum activity is carried out on floodplains the petroleum activity 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.

Seepage monitoring program

- B13*** 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.
- B14*** The seepage monitoring program required by condition (B13) 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 (B15).
 - (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 quarterly for the trigger parameters identified in condition (B15)

- (g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (B15) and (B14)(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.

B15* Seepage monitoring bores identified in (B14)(b) must be monitored quarterly for the trigger parameter(s) specified in Schedule B, Table 2 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	-	-

Seepage monitoring bore drill log

- B16*** A bore drill log must be completed for each seepage monitoring bore in condition (B14) 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.

Well testing

- B17*** Subject to condition (B18) and condition (B19), 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.
- B18*** The maximum volume of CSG water or better quality groundwater injected for the purposes of hydraulic testing identified in condition (B17) must not exceed 1ML per hydraulic test.
- B19*** Written notification detailing the type and location (GPS coordinates) of any hydraulic testing undertaken in accordance with condition (B17) must be provided to the administering authority at least 10 business days prior to the commencement of the hydraulic test.

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.

Erosion and sediment control

C3* 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).

Land management

C4* 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

C5* Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipeline operation and maintenance

- C6*** Contaminants authorised to be released to land under conditions (C7), (C9), and (C15) 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

- C7*** Contaminants that are hydrostatic test water from pipelines and contaminants from low point drains, may be released to land in accordance with condition (C6).
- C8*** Produced water may be re-used in:
- (a) drilling and well hole activities; or
 - (b) stimulation activities.
- C9*** 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.
- C10*** 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 (C11) has been completed.

C11* 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 (C11) (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 $\mu\text{S}/\text{cm}^3$	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			

Environmental authority

Quality Characteristic	Release Limit	Limit Type	Frequency	Monitoring Point
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			

Quality Characteristic	Release Limit	Limit Type	Frequency	Monitoring Point
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.

Water Quality Criteria	Assessment Procedure
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.

- C12*** 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).
- C13*** Produced water may be transferred to a third party to be used for the following purposes, subject to condition (C14):
- (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).
- C14*** If the responsibility of produced water is given or transferred to a third party in accordance with condition (C13), the holder of the environmental authority must ensure:
- (a) the responsibility of the produced water is given or transferred in accordance with a written agreement (third party agreement);
 - (b) the third party is made aware of the General Environmental Duty under section 319 of the *Environmental Protection Act 1994*.

Sewage treatment works

C15* 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, construction or operational purposes subject to condition (C22).

C16* 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 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).

C20* Treated sewage effluent released to land must comply, at the monitoring point(s), with each of the release limits specified in Schedule C, Table 2 Treated sewage effluent standards for release to land

from sewage treatment works with a daily peak design capacity of greater than 100EP for each quality characteristic.

- C21*** Treated sewage effluent released to land must be monitored at the frequency and for the quality characteristics specified in Schedule C, Table 2 Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 100EP for each quality characteristic.

Schedule C, Table 2 Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 100EP

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		

Quality Characteristic	Release Limit	Limit Type	Frequency	Monitoring Point
Electrical Conductivity		Monitor only		

Treated sewage effluent use for the purposes of dust suppression, construction and operational purposes

C22* 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 3 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 3 Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes.

Schedule C, Table 3 – 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.
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	Weekly
E. coli		Median	<10 cfu per 100 mL	

Schedule D – Biodiversity Values

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.

Environmental authority

Disturbance to land environmentally sensitive areas

D6* Petroleum activities must be carried out in accordance with Schedule D, Table 1 Petroleum Activities in Environmentally Sensitive Areas, 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 zone 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 permitted subject to condition (D10)
Category B ESAs excluding 'Endangered' 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	

Environmental authority

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
		permitted subject to condition (D10)	
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 permitted subject to condition (D10)	
Category B ESAs that are 'Endangered' 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	

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
		permitted subject to condition (D10)	
Category C ESAs that are Essential Habitat, Essential Regrowth Habitat and/or 'Of Concern' 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 permitted subject to condition (D10)	
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) Limited impact camps permitted subject to condition (D10) Limited impact petroleum activities permitted subject to condition (D10)	

ESA Category	Within the ESA	Primary protection zone of the ESA	Secondary protection zone of the ESA
Category C ESAs that are State Forests and/or Timber Reserves	Limited petroleum activities permitted subject to condition (D11) Petroleum activities that are extraction activities and screening activities permitted. Limited impact camps permitted. Limited impact petroleum activities permitted subject to conditions (D8) and (D11)		

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

- 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 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:
- (a) no reasonable or practicable alternative exists for carrying out the limited petroleum activities within the environmentally sensitive area;
 - (b) the limited petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance;
 - (c) 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 (B2); and
 - (iv) power line stays have been preferentially located within the pipeline right of way where possible.
 - (d) the maximum clearance widths specified in Schedule D, Table 2 Authorised Disturbance for Linear Infrastructure are not exceeded.

Schedule D, Table 2 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 Department of Environment and Science. 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.

Maximum Disturbance

D13* Disturbance to ecological receptors listed in Schedule D, Table 3 Maximum disturbance limits to ecological receptors, must not exceed the relevant maximum disturbance limits.

Schedule D, Table 3 Maximum disturbance limits to ecological receptors

Ecological Receptor	Maximum disturbance area for ATP 803 (ha)
Endangered vegetation (REs and high value regrowth) (biodiversity status)	13.5
Of-concern vegetation (REs and high value regrowth) (biodiversity status)	87.6
Essential habitat	0
Wetlands (general ecological significance)	16.7
Resource reserves	0
State forest and timber reserves	0

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 *** 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 (E3), (E5), (E6), (C7), (C9) and (C15) to be disposed of or used on site.
- E3*** 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.
- E4*** 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*.

Residual Drilling Materials

- E5*** If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.
- E6*** 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.
- E7*** Records must be kept to demonstrate compliance with condition (E5) and condition (E6).

Schedule F – Noise

F1* Notwithstanding condition (A16), 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 (LABG):

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

F2* 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 LAeq,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

F3* Notwithstanding condition (F1), emission of any low frequency noise must not exceed either (F3(a)) and (F3(b)), or (F3(c)) and (F3(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.

F4* A Blast Management Plan must be developed for each blasting activity in accordance with Australian Standard 2187.

F5* 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.

F6* 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

Venting and flaring

G1* 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 (G1(a)) and (G1(b)) and (G1(c)), or with (G1(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/2016/1933¹) 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.
- 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 constructed² 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).
- 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.

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.

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

- 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.

Notification of affected persons

- 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

- c) 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 H16 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, as soon as practicable but within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.
- H15** 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.
- H16** The holder must record any changes to the MRL in the Register of Regulated Structures.

Design storage allowance

- H17** 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.
- H18** 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).
- H19** The holder must, as soon as practicable but within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.
- H20** 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

- H21** Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.
- H22** 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.

- H23** 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).
- H24** 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 days¹¹ of receipt of the request.

Transfer arrangements

- H25** 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

- H26** Regulated structures must not be abandoned but be either:
- a) decommissioned and rehabilitated to achieve compliance with condition H27; 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
 - ii) landholder is responsible for the dam, on and from an agreed date.

- H27** 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

- H28** A Register of Regulated Structures must be established and maintained by the holder for each regulated structure.
- H29** 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.
- H30** 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.
- H31** The holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day.
- H32** 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.
- H33** The holder must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format required by the administering authority.

Schedule I – Well construction, maintenance and stimulation activities

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.

Stimulation 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 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 [$\mu\text{S/m}$]
- (c) turbidity [NTU]
- (d) total dissolved solids [mg/L]
- (e) temperature [$^{\circ}\text{C}$]
- (f) dissolved oxygen [mg/L]
- (g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L]
- (h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [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) [$\mu\text{g/L}$]
- (m) total petroleum hydrocarbons [$\mu\text{g/L}$]
- (n) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para- and meta-xylene, and total xylene) [$\mu\text{g/L}$]
- (o) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [$\mu\text{g/L}$]
- (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].

Stimulation Impact Monitoring Program

- I14*** A 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 (J10); 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.

Rehabilitation reporting for relinquishment of part of an authority to prospect area under the *Petroleum and Gas (Production and Safety) Act 2004*

- J3*** Prior to relinquishing all or part of an authority to prospect area, a rehabilitation report must be prepared which specifically relates to the area to be relinquished and demonstrates conditions (J9) and (J10) have been met.
- J4*** The report required under condition (J3) must be submitted to the administering authority at least 40 business days prior to the relinquishment notice being lodged with the administering authority for the *Petroleum and Gas (Production and Safety) Act 2004*.

Remaining Dams

- J5*** 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

- J6*** Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.
- J7*** 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.
- J8*** 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

- J9*** 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 (J9)(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

- J10*** 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 (J1) and (J2)) 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) 1,000 L of brine; or
 - (v) 5,000 L of coal seam gas water; or
 - (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 (C9)(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

“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 Heritage Protection; 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.

“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.

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

- (a) against recommendations contained in previous annual inspections reports;

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

“appraisal well” 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.

“approved quality criteria” for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:

Part A In all cases:

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

*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.

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

Parameter	Maximum concentration
Arsenic	20 mg/kg
Selenium	5 mg/kg
Boron	100 mg/kg
Cadmium	3 mg/kg

Chromium	400 mg/kg
Copper	100 mg/kg
Lead	600 mg/kg

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:

TPH	Maximum concentration
C6 – C10	170 mg/kg
C10 – C16	150 mg/kg
C16 – C34	1300 mg/kg
C34 – C40	5600 mg/kg
Total Polycyclic Aromatic Hydrocarbons (PAHs)	20 mg/kg
Phenols (halogenated)	1 mg/kg
Phenols (non-halogenated)	60 mg/kg
Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes including otho, para and meta xylenes) and styrene)	7 mg/kg
Benzene	1 mg/kg

“areas of pre-existing disturbance” means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term ‘areas of pre-disturbance’ does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.

“assessed or assessment” 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;
- (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 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 holder of the environmental authority 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.

“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.

“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—

- a Saturday or Sunday; or
- public holiday, special holiday or bank holiday in the place in which any relevant act is to be or may be done; or
- a business day that occurs during the period starting on 20 December in a year and ending on 5 January in the following year.

“BTEX” means benzene, toluene, ethylbenzene, ortho-xylene, paraxylene, meta-xylene and total xylene.

“Category A Environmentally Sensitive Area” means any area listed in Schedule 19, part 1, section 1 of the Environmental Protection Regulation 2008.

“Category B Environmentally Sensitive Area” means any area listed in Schedule 19, part 1, section 2 of the Environmental Protection Regulation 2008.

“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
- (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.

“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.

“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.

“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).

“control measure” has the meaning in section 47 of the Environmental Protection Regulation 2008 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 2008 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 contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works.

“dam crest volume” means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the

instantaneous maximum volume within the walls, without regard to flows entering or leaving (for example, via spillway).

“development well” means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.

“design plan” is a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.

“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.

“document” has the meaning in the Acts Interpretation Act 1954 and means:

- any paper or other material on which there is writing; and
- any paper or other material on which there are marks; and
- 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.

“enclosed flare” means a device where the residual gas is burned in a cylindrical or rectilinear 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 2008 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.

“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.

For clarity, an exploration well does not include an appraisal or development well.

“extreme storm storage” means a storm storage allowance 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.

“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.

“floodplains” 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 of 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 facility” means a permanent fuel burning or combustion equipment which in isolation, or combined in operation, or which are interconnected, is, or are capable of burning more than 500 kg of fuel in an hour.

“GDA” means Geocentric Datum of Australia.

“general ecologically significant wetland” otherwise known as “wetlands of other environmental value”, is a wetland that meets the definition of a wetland and that is shown as a general ecologically significant wetland or “wetland of other environmental value” on the map of referable wetlands.

“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.

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.

“holder” means any person who is the holder of, or is acting under, that environmental authority.

“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 (for 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.

“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.

“LA 90, adj, 15mins” means the A-weighted sound pressure level, adjusted for tonal character that is equal to or exceeded for 90% of any 15 minutes sample period equal, using Fast response.

“LAeq, adj, 15mins” 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.

“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.

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

“limited impact camp” 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
- 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 1.25 ha; or
- are multi-well sites greater than 3 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.

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

“long term noise event” means 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.

“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 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)

“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.

“map of refrerrable wetlands” has the meaning in Schedule 12 of the Environmental Protection executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D.

“Max_{LpA, 15 min}” means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.

“Max_{LpZ, 15 min}” means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.

“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.

“methodology” means the science of method, especially dealing with the logical principles underlying the organisation 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 ($k_w=10^{-8}$ m/s) or subsoil with a clay content of greater than 20%; 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.

“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.

“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 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 metres 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) a 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.

“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 dam including its storage area
 - iii. Dam crest volume (megalitres);
 - iv. Spillway crest level (metres AHD).
 - v. Maximum operating level (metres AHD);
 - vi. Storage rating table of stored volume versus level (metres AHD);
 - vii. Design storage allowance (megalitres) and associated level of the dam (metres AHD);
 - viii. Mandatory reporting level (metres AHD);
- (g) The design plan title and reference relevant to the dam;
- (h) The date construction was certified as compliant with the design plan;
- (i) The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan;
- (j) Details of the composition and construction of any liner;
- (k) The system for the detection of any leakage through the floor and sides of the dam;
- (l) Dates when the regulated dam underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;
- (m) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority;
- (n) Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.

“regulated 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 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 topography, 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).

“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.

“restoration” means the replacement of structural habitat complexity, ecosystems 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 rehabilitation after pipeline decommissioning.

“restricted stimulation fluids” has the meaning in section 206 of the Environmental Protection Act 1994 and means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amount prescribed under a regulation:

- (a) petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene
- (b) chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.

“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 Environmentally Sensitive Area 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;
- 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 2008.

“sensitive receptor” is defined in Schedule 2 of the Environmental Protection (Noise) Policy 2008, 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 be rehabilitated to a particular condition to the condition it was in immediately before the disturbance.

“species richness” means the number of different species in a given area.

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

“stimulation” means a technique used to increase the permeability of a natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing / hydro-fracking, fracture acidizing and the use of proppant treatments.

“stimulation fluid” means the fluid injected underground to increase permeability. For clarity, the term stimulation fluid only applies to fluid injected down well post-perforation.

“stimulation impact zone” means a 100m 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 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 person” means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters 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 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 8 of the Environmental Protection Regulation 2008; and
- (c) 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 drill 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 the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.

“top soil” 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 300mm 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 10cm 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 all complaints unless considered by the administering authority to be frivolous, vexatious or 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.
- 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, spring, 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.

“water year” means the 12-month period from 1 July to 30 June.

“well integrity” means the ability of a well to contain the substances flowing through it.

“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 referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; 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:
 - 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
 - the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
 - 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.

“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 wetland of high ecological significance or high conservation value wetland on the map of referable wetlands.

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

END OF PART B OF ENVIRONMENTAL AUTHORITY