

Draft environmental management plan
Proposed environmental authority
conditions



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Scope

- A1 The following environmentally specified relevant activities are authorised under this environmental authority:
- ERA 9 (3b) – Hydrocarbon Gas Refining – consists of refining 200,000,000m³ or more of natural gas
 - ERA 10 – Gas Producing – consists of manufacturing, processing or reforming 200 t or more of hydrocarbon gas in a year
 - ERA 14 (1) – Electricity Generation – generating electricity by using gas at a rated capacity of 10MW electrical or more
 - ERA 15 – Fuel Burning – consists of using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour
 - ERA 60 (1d) – Waste Disposal – operating a facility for disposing of, in a year, more than 200000 t of any combination of regulated waste, general waste and limited regulated waste and <5 t of untreated clinical waste (if in a scheduled area)
 - ERA 63 (1b) – Sewage Treatment - Operating sewage treatment works, other than no release works, with a total daily peak design capacity of more than 100 EP to 1500 EP.
 - ERA 8 – Chemical Storage - storing more than 500m³ of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3
 - ERA 38 – Surface Coating – coating, painting or powder coating, using, in a year, more than 100 t of surface coating materials.
 - ERA 47 – Timber milling and woodchipping – milling more than 100000 t of timber in a year.
 - ERA 56 – Regulated Waste Storage – receiving and storing regulated waste. Aggregation and brine dams
 - ERA 57 – Regulated Waste Transport – transporting regulated waste, other than tyres, in 36 or more vehicles. The transport of CS water and brine between project areas
 - ERA 58 – Regulated Waste Treatment – operating a facility for receiving and treating regulated waste to render the waste non-hazardous or less hazardous
 - ERA 60 – Waste Disposal – operating a facility for disposing of, in a year, more than 200000 t of any combination of regulated waste, general waste and limited regulated waste and <5 t of untreated clinical waste (if in a scheduled area)
 - ERA 61 – Waste Incineration and Thermal Treatment – incinerating or thermally treating other regulated waste
 - ERA 63 (1)(a)(i) – Sewage Treatment – Operating sewage treatment works (21-100 EP), other than no release works
 - ERA 63 (1)(b)(i) – Sewage Treatment – Operating sewage treatment works (100-1500 EP), other than no release works
 - ERA 64 – treating 10 ML or more raw water in a day. This ERA is for 'no release to waters' RO plants (the majority of our RO plants).
- A2 This environmental authority authorises the carrying out of the authorised petroleum activities and specified relevant activities subject to the conditions of this environmental authority.
- A3 This environmental authority does not authorise a relevant act¹ to occur in carrying out an authorised environmentally relevant activity unless a condition expressly authorises the relevant act to occur.²

¹ See section 493A of the Act

Authorised Petroleum Activities

A4 In the carrying out of the petroleum activities, the number and maximum size for each of the specified petroleum activities listed in *Schedule A, Table 1 – Authorised Petroleum Activities* must not be exceeded for each petroleum tenure.

Schedule A, Table 1 – Authorised Petroleum Activities

Tenure	Petroleum Activity	Number of Existing Petroleum Activities	Number of proposed activities	Maximum Size (Where Applicable)

Prevent or Minimise Likelihood of Environmental Harm

A5 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.

² Section 493A(2) of the Act provides that a relevant act is unlawful unless it is authorised to be done under, among other things, an environmental authority

Maintenance of Measures, Plant and Equipment

- A6 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 operate such measures, plant and equipment in a proper and effective manner.
- A7 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 activities.

Financial Assurance

- A8 The holder of this authority must provide a financial assurance from time to time, in the amount and form required by the administering authority for the authorised petroleum activities.
- A9 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.
- A10 The calculation of financial assurance must be in accordance with the most recent version of the administering authority's Guideline "Financial Assurance under the *Environmental Protection Act 1994*".
- A11 Prior to any changes in petroleum activities which would result in an increase to the maximum disturbance since the last financial assurance calculation was submitted, the holder of the environmental authority must submit, and the administering authority must have approved, an application to amend the financial assurance.

Third Party Audit

- A12 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.
- A13 Notwithstanding condition (A9), and prior to undertaking the third party audit, the scope and content of the third party audit can be negotiated with the administering authority.
- A14 An audit report must be prepared and certified by the third party auditor presenting the findings of each audit carried out.
- A15 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.
- A16 A written response must be attached to the audit report detailing the actions taken or to be taken on stated dates:
- a) to ensure compliance with this environmental authority; and
 - b) to prevent a recurrence of any non-compliance issues identified.

Contingency Plan for Emergency Environmental Incidents

- A17 Responses to environmental emergency incidents must be undertaken in accordance with the *Santos GLNG Upstream Contingency Plan for Emergency Environmental Incidents*.
- A18 The *Santos GLNG Upstream 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, relevant to the petroleum activities authorised to be carried out under this environmental authority;
 - c) response procedures to minimise the extent and duration of environmental harm caused by environmental emergency incidents;
 - d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;
 - e) 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;
 - f) the resources to be used in response to environmental emergency incidents;
 - g) 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;
 - h) procedures for responding to incidents resulting from stimulation activities, including specific rectification measures in the event of non-routine stimulation events;
 - i) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;
 - j) procedures to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of a dam;
 - k) procedures to respond to a regulated dam reaching its mandatory reporting level;
 - l) procedures to respond to a regulated dam reaching its design storage allowance;
 - m) 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 an analogue and the impact site as a minimum;
 - n) the provision and availability of documented procedures to staff attending any emergency environmental incident to enable them to effectively respond;
 - o) training of staff that will be called upon to respond to emergency environmental incidents to enable them to effectively respond;
 - p) 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
 - q) procedures for accessing monitoring locations during emergency environmental incidents.

d

Infrastructure

A19 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:

- r) regulated dams and low hazard dams;
- s) exploration, appraisal and development wells;
- t) water treatment plants;
- u) sewage treatment facilities;
- v) authorised discharge points to air and waters;
- w) any chemical storage facility associated with the environmentally relevant activity of chemical storage; and
- x) compressor stations.

Monitoring

A20 All monitoring required under this environmental authority must be undertaken by a suitably qualified person.

A21 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, unless NATA accredited tests are not available.

A22 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.

A23 An annual 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) the results of the Seepage Monitoring Program that is required by the conditions of this environmental authority;
- b) a summary of:
 - (i) any investigations required for the Seepage Monitoring Program prescribed under this environmental authority;
 - (ii) the regulated dam register in the approved format that is required by the conditions of this environmental authority;
 - (iii) the results of annual regulated dam water quality monitoring that is required by the conditions of this environmental authority;
 - (iv) the results of vibration and blast monitoring required by the conditions of this environmental authority;
 - (v) any well closure reports that are required by the conditions of this environmental authority, where applicable;
 - (vi) the results of any baseline or stimulation impact monitoring program that is required by this environmental authority, where applicable;
 - (vii) non NATA accredited laboratory testing methods, where applicable;
- c) the management criteria report required by section 316A of the *Environmental Protection Act 1994*;

- d) if prepared for the subject annual return period, any third party audit report and written response to said report that is required by this environmental authority;
- e) a comparison of the previous 12 months monitoring results to both the limits set in this environmental authority and to relevant prior results including 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
- f) details of any exceedances with the conditions of this environmental authority and the dates and times these exceedances were reported to the administering authority;
- g) an outline of actions taken to minimise the risk of environmental harm from any circumstance, condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A20).

Surface Water Sampling Methodology

A24 The methods of water sampling required by this environmental authority must comply with that set out in the latest edition of the *Queensland Monitoring and Sampling Manual* as amended from time to time.

Groundwater Sampling Methodology

A25 The methods of groundwater sampling required by this environmental authority must comply with the latest edition of *the Queensland Monitoring and Sampling Manual, AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on sampling groundwater*, and the *Australian Government's Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat #6890.1)* as relevant and as amended from time to time.

Noise Sampling Methodology

A26 Noise must be measured in accordance with the prescribed standards in the *Environmental Protection Regulation 2008*.

Documentation and Records Management

A27 A record of all documents required by this environmental authority must be kept for a minimum of five (5) years.

A28 All plans and monitoring programs required by this environmental authority must be certified by a suitably qualified person.

A29 All plans and monitoring programs under this environmental authority must be implemented.

SCHEDULE B – WATER

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

Erosion and Sediment Control Plan

- B2 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:
- allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities;
 - minimise soil erosion resulting from wind, rain, and flowing water
 - minimise the duration that disturbed soils are exposed to the erosive forces of wind, rain, and flowing water;
 - minimise work-related soil erosion and sediment runoff; and
 - minimise negative impacts to land or properties adjacent to the activities (including roads).

Works in watercourses, wetlands, lakes and springs

- B3 Petroleum activity(ies) that require earthworks, vegetation clearing, placing fill and/or that will result in significant disturbance other than that associated with the construction and/or maintenance of **linear infrastructure**, is not permitted in or within:
- 200 metres of any lake or spring; or
 - 100 metres of the high bank of any other watercourse.
- B4 All reasonable alternative locations must be considered prior to the construction of any linear infrastructure that will result in significant disturbance in or on the **bed and banks** of a watercourse or within the areas specified in condition (B3)(b).
- B5 Despite condition (B3), the infrastructure and associated activities necessary for construction and/or maintenance purposes specified in *Schedule B, Table 1 – Authorised Works in a Watercourse or within 200m of Springs* is permitted in the location specified *Schedule B, Table 1 – Authorised Works in a Watercourse or within 200m of Springs*.

Schedule B, Table 1 – Authorised Works in a Watercourse or within 200m of Springs

Tenure	Description of Infrastructure/Works	Latitude	Longitude

- B6 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 the areas specified in (B3)(a) and (B3)(b) must be conducted in accordance with the following order of preference:
- conducting works in times when there is no water present;
 - conducting works in times of no flow;
 - conducting works in times of flow but in a way that does not impede low flow.
- B7 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 the areas specified in (B3)(b), or in any **general ecologically significant wetland** must not release from the site any contaminants to any waters that exceed the water quality limits specified in *Schedule B, Table 2 – Release Limits to Waters*.

Schedule B, Table 2 – Release Limits to Waters

Water Quality Parameters	Units	Water Quality Limits
Turbidity	NTU	For a wetland of other environmental value, 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 wetland of other environmental value, 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

- B8 Background water turbidity must be measured within 20 metres upstream of the construction and/or maintenance activities.
- B9 Monitoring is undertaken at a reasonable frequency to ensure compliance with condition (B7).
- B10 Written notification detailing the location (GPS coordinates) of any significant disturbance to be undertaken in or on the **bed and banks** of a watercourse, or within the areas specified in condition (B3)(b), must be provided to the administering authority at least 24 hours prior to the commencement of the significant disturbance.
- B11 Petroleum activities must occur outside a **wetland of high ecological significance**.
- B12 Petroleum activities, other than linear infrastructure must occur outside a **general ecologically significant wetland**.
- B13 Petroleum activities must not negatively impact a wetland of high ecological significance.
- B14 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.
- B15 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

- B16 Where the petroleum activity(ies) is carried out on **floodplains** petroleum activity(ies) must be carried out in a way that does not:
- a) concentrate flood flows in a way that will or may cause or threaten an adverse environmental impact; or
 - b) divert flood flows from natural drainage paths and alter flow distribution; or
 - c) increase the local duration of floods; or
 - d) increase the risk of detaining flood flows; or
 - e) pose an **unacceptable risk** to the safety of persons from flooding; or
 - f) pose an **unacceptable risk** of damage to property from flooding.

Well Testing

- B17 Subject to Conditions (B18) and (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 BB – GROUNDWATER

BB1 The extraction of groundwater as part of the petroleum activities from underground aquifers must not directly or indirectly cause environmental harm to any watercourse, lake, wetland or spring.

Seepage Monitoring Program

BB2 A Seepage Monitoring Program must be developed to detect any seepage to groundwater as a result of storing contaminants in a regulated structure(s) (e.g. surface dams, monocells).

BB3 The Seepage Monitoring Program, must include, but not necessarily be limited to:

- a) procedures to detect any seepage to groundwater and surrounding soils from regulated structure(s) and its possible effect on groundwater and soils;
- b) identification of seepage monitoring bores and their locations including:
 - (i) baseline / hydraulically up-gradient seepage monitoring bores (i.e. bores where groundwater quality will not have been affected by petroleum activities;
 - (ii) seepage monitoring bores that are within aquifers potentially affected by the regulated structure(s) authorised under this environmental authority;
 - (iii) a geodetic survey of all seepage monitoring bores; a geodetic survey showing groundwater potentiometric surface
- c) the Seepage Monitoring Program has been designed consistent with relevant Guidelines and Standards such that the Program design has:
 - (i) a sufficient number seepage monitoring points and / or wells to obtain representative groundwater samples from the uppermost aquifer up-gradient and down-gradient of the potential influence;
 - (ii) if a salt monocell is authorised under this environmental authority, a sufficient number of seepage monitoring bores located not more than 150 m from the monocell or the boundary of the monocell facility, whichever is the closer;
 - (iii) sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the presence or absence of contaminants;
 - (iv) procedures to determine the quality of groundwater down gradient of any potential sources of contaminants including groundwater passing the relevant seepage monitoring bore(s);
 - (v) procedures to allow an assessment of whether there has been any statistically significant adverse change in groundwater quality at locations hydraulically down gradient of the containment activity(ies).
- d) procedures to determine groundwater flow direction, groundwater flow rate and hydraulic conductivity beneath the relevant regulated structure(s);
- e) sampling of all baseline or hydraulically up-gradient monitoring bores for the minimum groundwater parameters levels listed below quarterly over the 12 month period immediately prior to the commencement of any new containment activities:
- f) identification of the trigger parameter(s) associated with the potential contaminants of concern identified in (e);
- g) a sampling program of all seepage monitoring bores:
 - (i) to measure and record standing groundwater levels in metres accurate to 0.01 metres to be plotted as function of time (hydrograph) to identify seasonal patterns;
 - (ii) quarterly monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) whilst activities are being carried out;
 - (iii) annual monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) for a minimum of three (3) years after the containment activity(ies) ceases;

- h) a Seepage Trigger Action Response Procedure which must include but not be limited to the following:
 - (i) trigger levels for the relevant trigger parameter(s) identified in (f);
 - (ii) trigger and action response measures at which investigations will be undertaken;
 - (iii) action levels for the relevant possible contaminants of concern at which the holder of this environmental authority will undertake additional investigation into the potential for environmental harm, including the validation and verification of the source, cause and extent of contamination;
- i) identification monitoring equipment to be used; and
- j) a rationale containing details on the Programs purpose, conceptualisation and verification of the procedures, determinations, analysis and assumptions undertaken.

BB4 Seepage monitoring bores identified in (BB3) must be monitored quarterly for the trigger parameter(s) specified in *Schedule BB – Table 1 (Seepage Monitoring Trigger Parameters)*.

Schedule BB, Table 1 – 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	-	-

Monitoring Bores

BB5 The following information concerning each newly constructed seepage monitoring bore must be submitted to the administering authority with each annual return:

- a) bore ID and location presented on a plan;
- b) design of the monitoring bores installed;
- c) specific construction information including but not limited to geographical coordinate (including the geophysical coordinate system utilised) depth of bore, depth and length of casing, depth and length of screening, presence of any measuring probe;
- d) identification of any aquifers intercepted by the monitoring bores;
- e) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible contaminants of concern; and
- f) a lithological log and preferably a stratigraphic interpretation to identify the important features.

SCHEDULE C – REGULATED STRUCTURES

Assessment of Consequence Category

- C1 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* as amended from time to time.
- C2 The **consequence assessment** required under condition (C1) must occur in any of the following situations:
- prior to the design and construction of the structure;
 - prior to any change in its purpose or its stored contents;
 - for a structure assessed and certified as a high or significant consequence structure, at least biennially after its construction.
- C3 A consequence assessment report and **certification** must be prepared by a **suitably qualified and experienced person** for any **structure** assessed

Note: The consequence assessment report may include a consequence assessment for more than one structure.

- C4 Where an existing structure is for the first time assessed as significant or high, the structure must meet the conditions required for regulated structures under this environmental authority within 12 months of that assessment.

Construction of Low Consequence Dam to Contain Wetting Front

- C5 Where a dam is assessed as low consequence, it must be:
- 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
 - 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.
- C6 In the event of early signs of loss of structural or hydraulic integrity of a low consequence dam:
- immediate action to prevent or minimise any actual or potential environmental harm must be taken;
 - any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Consequence Dams

- C7 The condition of all low consequence 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 consequence assessment based on the particular circumstances of each dam.

Design and Construction of a Regulated Structure

- C8 **Construction** of any dam determined to be a **regulated structure** is prohibited until:
- a) a **consequence category** assessment report and certification has been submitted to the administering authority;
 - b) a **design plan** for the regulated structure has been prepared by a **suitably qualified and experienced person**; and
 - c) certification from a suitable qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant conditions of this environmental authority has been received.
- C9 The design plan must contain the information prescribed in the *Guideline – Structures which are dams or levees constructed as part of environmentally relevant activities*, as amended from time to time.
- C10 All regulated structures must be designed by, and constructed under the supervision of a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, as amended from time to time.
- C11 All regulated structures must be constructed in accordance with a design plan that has been certified by a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, as amended from time to time.
- C12 Certification by a suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:
- a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure; and
 - b) construction of the regulated structure is in accordance with the design plan.
- C13 All **regulated structures** must be designed and constructed to prevent:
- a) floodwaters from entering the regulated structures from a watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, 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 in the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, 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 consequence Categories and Hydraulic Performance of Structures*, as amended from time to time.

Operation of a Regulated Structure

- C14 Operation of a regulated structure is prohibited unless:
- a) one paper copy and one electronic copy of the design plan and certification, and a set of 'as constructed' drawings and specifications has been submitted to the administering authority, together with certification that the structure:
 - (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 structure have been met; and
 - c) for regulated dams, the details required under this environmental authority have been entered into a Register of Regulated Dams.

Regulated Dam Register

- C15 A register of regulated dams must be established in accordance with the administering authority's Regulated Dam Register template, as amended from time to time.
- C16 The information contained in the register of regulated dams must always be current and complete on any given day.

Mandatory Reporting Level

- C17 The Mandatory Reporting Level must be marked on each regulated structure in such a way that it is clearly observable during routine inspections of each dam.
- C18 On becoming aware that the mandatory reporting level has been reached, action must be taken to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.

Design Storage Allowance

- C19 On 1 November of each year, storage must be available in each regulated structure to meet the design storage allowance for the dam in accordance with the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, as amended from time to time.
- C20 On becoming aware that the regulated structure will not have the available storage to meet the design storage allowance on 1 November of any year, action must be taken to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.

Monitoring

- C21 The condition of all containment structures 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 consequence assessment based on the particular circumstances of each dam.
- C22 Each regulated structure must be monitored for the water quality characteristics and at the monitoring location and frequency specified in *Schedule C – Table 1 Regulated Structure Contaminant Monitoring* as follows:

Schedule C – Table 1 Regulated Structure Contaminant Monitoring

Quality Characteristic	Monitoring Location	Frequency of Monitoring
pH (pH unit)	At least three (3) different structure profile depths for each sampling event and be taken as far as practicable from the edge of the regulated structure	During the month of October every year
Electrical Conductivity (µS/m)		
Turbidity (NTU)		
Temperature		
Dissolved Oxygen (mg/L)		
Sodium adsorption ratio (SAR)		
Aluminium (µg/L)		
Arsenic (µg/L)		
Barium (µg/L)		
Boron (µg/L)		
Cadmium (µg/L)		
Chromium (CrVI) (µg/L)		
Copper (µg/L)		
Iron (µg/L)		
Fluoride (µg/L)		
Lead (µg/L)		
Manganese (µg/L)		
Mercury (µg/L)		
Nickel (µg/L)		
Selenium (µg/L)		
Silver (µg/L)		
Strontium (µg/L)		
Tin (µg/L)		
Zinc (µg/L)		
Total phosphorus (mg/L)		
Total Nitrogen (mg/L)		
Total petroleum hydrocarbons (µg/L)		
BTEX (µg/L)		
Polycyclic aromatic hydrocarbons (µg/L)		

Annual Inspection and Report

C23 Each regulated structure must:

- a) be inspected annually by a suitably qualified and experienced person.
- b) be assessed for the condition and adequacy for dam safety and against the necessary structural, geotechnical and hydraulic performance against the criteria in each annual inspection.

C24 A suitably qualified and experienced person must:

- a) prepare an annual inspection report containing details of assessment and including recommended actions to ensure the integrity of the structure;
- b) certify the annual inspection report in accordance with the *Manual for Assessing Categories and Hydraulic Performance of Dams*, as amended from time to time.

C25 The recommendations contained within the annual inspection report must be considered and action(s) taken to ensure that the regulated structure will safely perform its intended function.

C26 Within 20 days of receipt of the annual inspection report, the administering authority must be notified 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 structure.

SCHEDULE D — LAND

General

- D1 Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.
- D2 The release of contaminants to land must be carried out in a manner such that:
- a) vegetation is not damaged;
 - b) soil quality is not adversely impacted;
 - c) there is no surface ponding or runoff to waters;
 - 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.

Chemical Storage

- D3 All chemical storages must:
- a) be stored in, or serviced by, an effective containment system that is impervious to the materials stored therein; and
 - b) be stored and handled in accordance with the relevant Australian Standard where such Standard is available; and
 - c) be managed to prevent the release of substances to waters or land.

Hydrostatic Test Water and Low Point Drains

- D4 Contaminants that are hydrostatic test water from pipelines and contaminants from low point drains may be released to land in accordance with condition (D2).

Use of Coal Seam Gas Water

- D5 Coal seam gas water produced from the authorised petroleum activity(ies) which is used for:
- a) domestic or stock purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for stock and domestic purposes, as amended from time to time;
 - b) irrigation purposes must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for irrigation purposes, as amended from time to time.
- D6 Coal seam gas water produced from the authorised petroleum activity(ies) may be used for:
- a) dust suppression on roads; and
 - b) for construction and operational purposes for the petroleum activity(ies) authorised by this environmental authority.
- D7 Coal seam gas water may be transferred to a third party to be used for the following purposes subject to compliance with conditions (D8) and (D9):
- a) dust suppression;
 - b) construction and operational purposes;
 - c) livestock watering purposes.
- D8 Any coal seam gas water supplied to a third party for livestock watering purposes in accordance with condition (D7)(c) must meet the *ANZECC and ARMCANZ Water Quality Guidelines 2000* for livestock watering purposes, as amended from time to time.

- D9 If the responsibility of coal seam gas water is given or transferred to a third party in accordance with condition (D7), the holder of environmental authority must ensure that:
- a) the responsibility of the coal seam gas water is given or transferred in accordance with a written agreement (the third party agreement); and
 - b) the third party is made aware of the General Environmental Duty under section 319 of the *Environmental Protection Act 1994*.

Sewage Treatment Works

- D10 Treated sewage effluent may only:
- a) be released to land by sub-surface or spray irrigation at designated, fenced contaminant release area(s);
 - b) be used for dust suppression, construction and operational purposes in accordance with conditions (D21) and (D23).

Conditions (D11) to (D14) apply to temporary and permanent sewage treatment plant operations

- D11 Treated sewage effluent may only be released to land by large droplet or by subsurface irrigation at designated, fenced and signed contaminant release areas.
- D12 A buffer distance of 50 meters must be applied from the location of the effluent irrigation area to any watercourse, wetland or protected area and 100m from any potable water supply (bore or a catchment) or stock drinking water supply.
- D13 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.
- D14 The quantity of treated sewage effluent used in accordance with condition (D10) must be determined by an appropriate method, for example, a flow meter.

Conditions (D15) to (D16) apply to temporary and permanent sewage treatment plant operations with a design capacity of greater than 21 to 100 equivalent persons

- D15 Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land*.
- D16 Treated sewage effluent released to land must be monitored at the frequency and for each quality characteristic specified in *Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land*.

Schedule D, Table 1 – Treated Sewage Effluent Standards for Release to Land

Quality Characteristic	Sampling and <i>in situ</i> measurement point location	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment works	Maximum	20 mg/L	Quarterly
E. coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100 mL	
		Maximum	10000 cfu per 100 mL	
pH		Range	6.0-8.5	Monthly
Dissolved Oxygen		Minimum	2mg/L	
Electrical Conductivity	Monitor only	-		

Conditions (D17) through (D20) apply only to permanent sewage treatment plant operations with a design capacity of greater than 100 to 450 equivalent persons

- D17 Prior to construction of a sewage treatment facility, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated.
- D18 All nominated locations and minimum areas of land in condition (D17) must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.
- D19 A copy of results of the determinations required in condition (D18) must be submitted to the administering authority.
- D20 If, within 20 business days following the submission of the results required by condition (D19) the administering authority provides comments on the submission, the holder of this environmental authority must:
- a) have due regard to that comment in the finalisation of the amended results; and
 - b) submit the finalised amended results within 40 business days after the administering authority provided comments; and
 - c) implement the amended results.

Conditions (D21) through (D23) apply only to treated sewage effluent use for the purposes of dust suppression, construction and operational purposes.

- D21 Treated sewage effluent produced from the authorised petroleum activity(ies) 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 and;
 - b) the treated sewage effluent quality meets the release limits specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each of the water quality characteristics; and
 - c) on local government controlled roads, written approval from the relevant Local Government has been given to the holder of this environmental authority.

- D22 Treated sewage effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes* for each quality characteristic.
- D23 Treated sewage effluent released to land must be monitored at the frequency and for each quality characteristics specified in *Schedule D, Table 2 – Treated Sewage Effluent Standards for Dust Suppression, Construction and Operational Purposes*.

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

Quality Characteristic	Sampling and in-situ measurement point location	Limit type	Release Limit	Frequency
pH	e.g. treated sewage effluent storage	Range	6.0 to 8.5	Weekly ¹
5 – day Biochemical Oxygen Demand (BOD)		Median	20 mg/L	
E.Coli		Median	<10 cfu per 100 mL	
Electrical Conductivity		Maximum	1600 uS/cm	
Turbidity		95%ile (max)	2 (5) NTU	
Total Suspended Solids		Median	5 mg/L	

1 Monitoring is to be conducted on a weekly basis until 12 months of monitoring demonstrates no exceedances of the release limits. Monthly monitoring can occur thereafter, excluding E.Coli.

SCHEDULE E – DISTURBANCE TO LAND

Soil and land Management

E1 Top soil must be managed in a manner that preserves its biological and chemical properties.

E2 Land that has been significantly disturbed by the petroleum activities must be managed in accordance with the Erosion and Sediment Control Management Plan.

Fauna Management

E3 Measures must be employed to prevent fauna entrapment:

- a) during the construction of pipelines in pipe sections and pipeline trenches; or
- b) during the construction and operation of well infrastructure and dams.

Confirming environmentally sensitive areas, wetlands and springs

E4 Prior to undertaking petroleum activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground environmentally sensitive areas, wetlands and springs at that location must be undertaken by a suitably qualified person.

E5 A suitably qualified person must develop and certify a methodology so that condition (E4) can be complied with and which is appropriate to confirm on-the-ground environmentally sensitive areas, wetlands and springs.

E6 Where areas mapped as environmentally sensitive areas, wetlands and springs differ from those confirmed under conditions (E4) and (E5), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground values.

E7 All documentation survey information photographs, field data or any material associated with the field validation requirements in (E4) 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 (E5).

Planning for land disturbance

E8 The location of the petroleum activity(ies) 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 otherwise result in land degradation;
- d) minimise isolation, fragmentation or dissection of tracts of native vegetation; and
- e) minimise clearing of native mature trees.

Disturbance to Land – Environmentally Sensitive Areas

E9 Petroleum activities must be carried out in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas, Schedule E, Table 2 – Authorised Disturbance* and any other relevant conditions of this environmental authority.

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
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted	Only limited petroleum activities permitted Subject to condition (E11)	N/A
Category C ESAs that are Nature Refuges, Koala Habitat and/or Declared Catchment Areas	Only low impact petroleum activities permitted	Only limited petroleum activities permitted Subject to condition (E11)	N/A
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted Subject to condition (E10)	Only limited petroleum activities permitted Subject to condition (E11)	N/A
Category C ESAs that are Essential Habitat, Essential Regrowth Habitat and/or 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted Subject to condition (E10)	Only limited petroleum activities permitted Subject to condition (E11)	N/A
Category C ESAs that are Resource Reserves	Only limited petroleum activities permitted Subject to condition (E10)	Only limited petroleum activities permitted Subject to condition (E11)	N/A
Category C ESAs that are State Forests and/or Timber Reserves	Limited petroleum activities permitted subject to condition (E10) Petroleum activities that are extraction activities and screening activities permitted.	N/A	N/A

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

Schedule E, Table 2 – Authorised Disturbances

Authorised Activity	Authorised Activity Section	Location of Development (GDA94)		Size of Development		ESA
		Latitude	Longitude	Length (m)	Area of Disturbance (ha)	

E10 Prior to carrying out limited petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, it must demonstrated, in the following order of preference that:

1. no reasonable or practicable alternative exists for carrying out the limited petroleum activities within the **environmentally sensitive area**;
2. the **limited petroleum activities** are preferentially located in pre-existing areas of clearing or significant disturbance;
3. clearance widths for linear infrastructure is minimised to the maximum extent possible, taking into account the following matters:
 - (a) safe vehicle movement;
 - (b) drainage devices installed are of a type that is appropriate for the track type and location;
 - (c) erosion and sediment control measures installed are in accordance with the Erosion and Sediment Control Plan required by conditions (B2) and (B3); and
 - (d) power line stays have been preferentially located within the pipeline right of way where possible.
4. the maximum clearance widths specified in *Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure

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

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

(E11) If limited petroleum activity(ies) are located within a primary protection zone or secondary protection zone of an environmentally sensitive area, that the activity(ies) must not negatively affect the adjacent environmentally sensitive area.

SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, dust and other airborne contaminants

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

Nuisance Monitoring

- F2 When the administering authority advises of a complaint alleging nuisance, the complaint must be investigated as soon as practicable. The investigation is to include monitoring of environmental nuisance at any sensitive place within a reasonable and practical timeframe as specified by the administering authority.
- F3 The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the complaint within five (5) business days of completing the complaint investigation, unless a longer time is agreed to by the administering authority.
- F4 If the investigation or monitoring in accordance with condition (F2) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then:
- the complaint must be addressed including the use of alternative dispute resolution services if required; and / or
 - abatement or attenuation measures must be implemented so that the authorised petroleum activity(ies) do not result in further environmental nuisance.
- F5 Noise monitoring and recording under this environmental authority must include, but not necessarily be limited to:
- $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and T=15);
 - $L_{Aeq\ adj, 15\ mins}$;
 - background noise level as $L_{A\ 90, 15\ mins}$;
 - Max $L_{pA, 15\ mins}$
 - the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to measured noise levels;
 - atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - effects due to any extraneous factors such as traffic noise;
 - location, date and time of monitoring;
 - if the complaint concerns low frequency noise, Max $L_{pZ, 15\ min}$; and
 - 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.

Noise

- F6 Noise planning must be undertaken in accordance with the *Santos GLNG Upstream Noise Management Plan* or any subsequent version.
- F7 Any subsequent revision of the *Santos GLNG Upstream 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 are likely to exceed the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
- 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 (F7)(j); and
- l) mediation processes to be used in the event that noise complaints are not able to be resolved.

F8 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, and where there are no alternative arrangements in place, any potential noise emissions from the relevant petroleum activity(ies) must be modelled or calculated to demonstrate that noise emissions will not exceed the noise levels specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*.

F9 The emission of noise from the petroleum activities 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	LAeq,adj,15 min	45dBA	43dBA	40dBA
6:00 pm – 10:00 pm	LAeq,adj,15 min	40dBA	38dBA	35dBA
10:00 pm – 6:00 am	LAeq,adj,15 min	28dBA	28dBA	28dBA
	Max LpA, 15 mins	55dBA	55dBA	55dBA
6:00 am – 7:00 am	LAeq,adj,15 min	40dBA	38dBA	35dBA

Note – 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

- F10 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 audible	+ 5 dBA

- F11 Where alternative arrangements are in place with an affected person(s) at a sensitive receptor as referred to by condition (F7)(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

- F12 Notwithstanding condition (F9), 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:
- 60 dB(C) measured outside the sensitive receptor; and
 - the difference between external A-weighted and C-weighted noise levels is no greater than 20 dB; or
 - 50 dB(Z) measured inside the sensitive receptor; and
 - the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Vibration and Blasting

- F13 A Blast Management Plan must be developed for each blasting activity in accordance with **Australian Standard 2187**.
- F14 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.

F15 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

F16 Monitoring and recording of the air blast overpressure and ground borne vibration of every blast must be undertaken.

F17 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 G – AIR

Fuel Burning or Combustion Equipment

G1 Fuel burning or combustion equipment must:

- a) not be operated unless it is listed in *Schedule G, Table 1 – Authorised releases of contaminants to air from point sources*;
- b) not exceed the release limits specified in *Schedule G, Table 1 - Authorised releases of contaminants to air from point sources*;
- c) be monitored for the release limits at the release point locations and at the monitoring frequency specified in *Schedule G, Table 1 - Authorised releases of contaminants to air from point sources*.

Schedule G, Table 1 – Authorised releases of contaminants to air from point sources

Resource Authority	Facility	Release Point Locations	Release Limits			Monitoring Frequency
			Minimum Release Height (m)	Minimum Efflux Velocity (m/sec)	NOx as Nitrogen Dioxide Maximum mass emission rate (g/s)	
						At least one release point must be monitored per year on a rotational basis.

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

SCHEDULE H – WASTE

General

- H1 All general and regulated waste must only be removed from the site and sent to a facility licensed to accept the waste under the *Environmental Protection Act 1994* except as permitted under another condition of this environmental authority.
- 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*.
- H3 Waste must not be burned unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

Brine and Salt Management

- H4 Following the completion of the petroleum activity(ies), any residual brine and / or solid salt present in any structure 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 Planning

- 11 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 (I2) to (I7), inclusive; and
 - (ii) provide for appropriate monitoring and maintenance.
 - c) approach to establishing an alternative outcome to (I3) and (I4) by achieving a higher environmental value than that which was present prior to the significant disturbance from petroleum activities

Transitional Rehabilitation

- 12 Significantly disturbed areas that are no longer required for the on-going petroleum activities, must be transitionally 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 so that:
- 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 where the land has not been subject to significant cut and fill activities;
 - (iv) made safe to humans and livestock where significant cut and fill operations have been undertaken;
 - c) surface drainage lines are re-established
 - d) top soil is reinstated; and
 - e) either:
 - (i) groundcover, that is not a declared pest species, is growing; or
 - (ii) an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final Rehabilitation Acceptance Criteria

- 13 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 declared plant 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 (I3)(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.

- 14 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 (E4) and (E5)) must be met:
- 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 declared plant pest species;
 - d) greater than or equal to 50 per cent of organic litter cover;
 - e) greater than or equal to 50 per cent 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.
- 15 Where it can be demonstrated that a higher environmental value than that which was present prior to the significant disturbance associated with petroleum activity(ies) has been achieved through means other than on-site rehabilitation required by (13) and (14), the criteria in (12) apply as the final acceptance criteria and (13) and (14) are not required to be met.

Remaining Infrastructure

- 16 Infrastructure that is no longer required for the carrying out of the petroleum activity(ies) is not subject to conditions (12) to (15), inclusive, if the infrastructure has been approved in writing by the landholder(s) to remain in-situ.
- 17 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.

SCHEDULE J – WELL CONSTRUCTION, MAINTENANCE AND STIMULATION ACTIVITIES

Drilling Activities

- J1 Oil based or synthetic based drilling must not be used in the carrying out of the petroleum activity(ies).
- J2 Drilling activities must not result in the connection of the target gas producing formation and another aquifer.
- J3 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

- J4 Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.
- J5 Stimulation activities must not negatively affect water quality, other than that within the stimulation impact zone of the target gas producing formation.
- J6 Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.
- J7 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.
- J8 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

- J9 Prior to undertaking well stimulation activities, a risk assessment be developed to ensure that stimulation activities are managed to prevent environmental harm.
- J10 The stimulation risk assessment required must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well and address issues at a relevant geospatial scale such that changes to features and attributes are adequately described and must include, but not necessarily be limited to:
 - a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice;
 - b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority;
 - c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s);
 - d) naturally occurring geological faults;
 - e) seismic history of the region (e.g. earth tremors, earthquakes);
 - f) proximity of overlying and underlying aquifers;
 - g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation.

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

Water Quality Baseline Monitoring

- J11 Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the 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 active landholders' 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 (J9) and (J10).
- J12 Prior to undertaking stimulation activities at a well, the holder of this environmental authority 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 (J13).
- J13 Stimulation baseline bore assessments required in Condition (J11) must include the minimum water quality analytes and physico-chemical parameters identified in the *Baseline Assessment Guideline* (EHP) and any restricted stimulation fluids as defined in the *Environmental Protection Act 1994*, as amended from time to time, in order to establish baseline water quality.

Stimulation Impact Monitoring Program

- J14 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 (J9) and (J10) 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 % of the volume used in stimulation activities has been extracted from the stimulated well; and
 - d) all bores in accordance with condition (J11) at the following minimum frequency:
 - e) monthly for the first six (6) months subsequent to the stimulation activities being undertaken; then
 - f) annually for the first five (5) years subsequent to the stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (J13) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.
- J15 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 (J13); 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.
- J16 The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholders upon request by that landholder.

SCHEDULE K – COMMUNITY ISSUES

- K1 A record of all complaints and actions taken in response to the valid complaint must be maintained and kept.
- K2 The holder of this environmental authority must record the following details for all complaints received and provide this information to the administering authority on request:
- a) name, address and contact number for complainant;
 - b) time and date of complaint;
 - c) reasons for the complaint as stated by the complainant;
 - d) investigations undertaken in response to the complaint;
 - e) conclusions formed;
 - f) actions taken to resolve complaint;
 - g) any abatement measures implemented to mitigate the cause of the complaint; and
 - h) name and contact details of the person responsible for resolving the complaint.

SCHEDULE L NOTIFICATION PROCEDURES

- L1 The Department of Environment and Heritage Protection Pollution Hotline must be notified 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, in accordance with Condition (D5)(b), inside a designated irrigation area.
 - 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;
 - 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.
- L2 The notification of emergencies or incidents as required by condition (L1) 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 (eg. 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.

- L3 Within 10 business days following the initial notification under conditions (L1) and (L2) 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 M - DEFINITIONS

“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.

“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.

“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 arrangements 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 which may be required under the 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.

“areas of pre-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.

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

- a) any kind and all things associated with the construction and operation of a dam; and
- b) 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

- a) with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - o of benefit to that owner in that it adds real value to their business or to the general community,
 - o in accordance with relevant provisions of the Waste Reduction and Recycling Act 2011,
 - o sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - o the transfer and use have been approved or authorised under any relevant legislation.; or

- b) with respect to coal seam gas water, refer to the Department of Environment and Heritage Protection's Guideline – Approval of Coal Seam Gas Water for Beneficial Use.

“**bore**” means a water observation bore or a water supply bore that is either sub-artesian or artesian.

“**brine**” means saline water with a total dissolved solid concentration greater than 40 000 mg/l.

“**brine dam**” means a regulated dam that is designed to receive, contain or evaporate brine.

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

“**bund or 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 *Environmental Protection Act 1994* and means a day that is not—

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

“**Category A Environmentally Sensitive Area**” means any area listed in Schedule 12, part 1, section 1 of the *Environmental Protection Regulation 2008*.

“**Category B Environmentally Sensitive Area**” means any area listed in Schedule 12, part 1, section 2 of the *Environmental Protection Regulation 2008*.

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

- a) Nature Refuges as defined under the Nature Conservation Act 1992;
- b) Koala Habitat Areas as defined under the Nature Conservation (Koala) Conservation Plan 2006;
- c) State Forests or Timber Reserves as defined under the Forestry Act 1959;
- d) Declared catchment areas under the Water Act 2000;
- e) Resources reserves under the Nature Conservation Act 1992
- f) 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;
- g) Of Concern Regional Ecosystems identified in the database maintained by the Department of Environment and Heritage Protection 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:

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

“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:

- a) all relevant material has been considered in the written document; and
- b) that the content of the written document is accurate and true; and
- c) 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. Coal seam gas water is a waste defined under section 13 of the *Environmental Protection Act 1994*.

“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 consequence Categories and Hydraulic Performance of Structures*, prepared

by the Department of Environment and Heritage Protection, 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:

- a) that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- b) 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
- c) identified by an approved salinity hazard map held by the Department of Environment and Heritage Protection.

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

- a) any paper or other material on which there is writing; and
- b) any paper or other material on which there are marks; and
- c) figures, symbols or perforations having a meaning for a person qualified to interpret them; and
- d) 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 an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.

“existing dam” means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on 2 June 2011.

“existing low hazard dam” means a low hazard dam that was constructed and/or whose construction had substantially commenced on 2 June 2011.

“exploration well” means a petroleum well that is drilled to:

- a) explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or
- b) 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:

- a) conducting a geochemical, geological or geophysical survey;
- b) drilling a well;
- c) carrying out testing in relation to a well;
- d) taking a sample for chemical or other analysis.

“field validation surveys” means vegetation assessments undertaken in accord with the most current version of the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*.

“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—

- a) is covered from time to time by floodwater overflowing from the watercourse; and
- b) does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- c) 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.

“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 “wetlands of other environmental value” on the map of referable wetlands

“geophysical survey” means a systematic collection of geophysical data.

“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 consequence Categories and Hydraulic Performance of Structures*, prepared by the Department of Environment and Heritage Protection, 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

- a) any of the following:

- b) an endangered regional ecosystem;
- c) an of concern regional ecosystem;
- d) a least concern regional ecosystem; and
- e) have not been cleared since 31 December 1989; and
- f) is shown on a regrowth vegetation map.

“**hydraulic fracturing**” means a technique used to create cracks in underground coal seams to increase the flow and recovery of gas or oil out of a well. It involves pumping a fluid, comprised largely of water and sand, under pressure, into a coal seam. This action fractures the coal seam which provides a pathway that increases the ability for gas to flow through the coal.

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

“**hydraulic testing**” means the testing of a geological formation to evaluate the hydrogeological characteristics of the formation.

“**impulsive noise**” means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.

“**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.

“**land degradation**” has the meaning in the *Vegetation Management Act 1999* and means the following:

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

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

“landholders’ active groundwater bores” for the purposes of stimulation baseline and impact monitoring in this environmental authority 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*.

“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.

“limit of reporting” means the lowest amount of an analyte in a sample that can be quantifiably determined with stated, acceptable precision and accuracy under stated analytical conditions (i.e. the lower limit of quantification).

“limited petroleum activities” mean any low impact petroleum activity, and:

- a) 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,
- b) 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,
- c) 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
- d) upgrading or maintenance of existing roads or tracks,
- e) power and communication lines,
- f) gas gathering lines from a well site to the initial compression facility,
- g) water gathering lines from a well site to the initial water storage or dam,
- h) camps within well site that may involve sewage treatment works that are a no release works.

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

“long term noise event” is a noise exposure, when perceived at a sensitive receptor, persists for a period of greater than five (5) days, even when there are respite periods when the noise is inaudible within those five (5) days.

“lopping” a tree, means cutting or pruning its branches, but does not include —

- a) removing its trunk; and
- b) cutting or pruning its branches so severely that it is likely to die.

“low flow” means flow up to the one month average recurrence interval.

“low hazard dam” means any dam in the low hazard category as assessed using the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.

“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:

- a) chipholes
- b) coreholes
- c) geophysical surveys
- a) seismic surveys
- b) soil surveys
- c) topographic surveys
- d) cadastral surveys
- e) ecological surveys
- f) installation of environmental monitoring equipment (including surface water)

“Max $L_{pZ, 15 \text{ min}}$ ” means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.

“Max $L_{pA, 15 \text{ min}}$ ” means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.

“mandatory reporting level” or **“MRL”** means a warning and reporting level determined in accordance with the criteria in the “Manual for Assessing consequence Categories and Hydraulic Performance of Structures” prepared by the Department of Environment and Heritage Protection, 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—

- a) immediately before the beginning of the corresponding day of the next named month; or
- b) 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.

“overburden pressure” means the pressure or stress imposed on a layer of soil or rock by the weight of overlying material. The overburden pressure at a depth z is given by $p(z) = p_0 + g \int_0^z \rho(z) dz$ where $p(z)$ is the density of the overlying rock at depth z and g is the acceleration due to gravity. p_0 is the datum pressure, like the pressure at the surface.

“permanent sewage treatment plant operations” means sewage treatment plant operations with a design capacity of greater than 21 but less than 450 equivalent persons carried out at one location for of a period of greater than six months in a calendar year.

“pest” means species:

- a) declared under the Land Protection (Pest and Stock route Management) Act 2002;

- b) declared under Local Government model local laws; and
- c) which may become invasive in the future.

“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).

“receiving wetland” - for the purposes of conditions (B41) to (B63) means the receiving water that has the following characteristics: off-stream ephemeral oxbow wetland system subject to grazing land use.

“reference wetland” – means a wetland that has the similar characteristics to the receiving wetland located within 50km of the receiving wetland.

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

- a) areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - o are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - o have not been cleared since 31 December 1989; and
- b) particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- c) areas the chief executive decides under section 20AI of the Vegetation Management Act 1999 to show on the map as high value regrowth vegetation.

“regulated dam” means any dam in the significant or high hazard category as assessed using the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, published by the Department of Environment and Heritage Protection, as amended from time to time.

“regulated structure” means any dam or levee in the significant or high hazard category as assessed using the *Manual for Assessing consequence Categories and Hydraulic Performance of Structures*, published by the Department of Environment and Heritage Protection, 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

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

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

- a) covering more than 50% of the undisturbed predominant canopy; and
- b) averaging more than 70% of the vegetation’s undisturbed height; and
- c) composed of species characteristic of the vegetation’s undisturbed predominant canopy cover.

“reporting limit” means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as “less than” the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L – 0.02 ug/L.

“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*:

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

The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.

secondary protection zone in relation to a Category A, B or C Environmentally Sensitive Area means an area within an 100 metre buffer from the boundary of a **primary protection zone**.

“sensitive place” means:

- a) a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- b) a library, childcare centre, kindergarten, school, university or other educational institution;
- c) a medical centre, surgery or hospital; or
- d) a protected area; or
- e) 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
- f) 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 investigate whether nuisance impacts are occurring and includes:

- a) a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- b) a library, childcare centre, kindergarten, school, university or other educational institution;
- c) a medical centre, surgery or hospital; or
- d) a protected area; or
- e) 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
- f) 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 Schedule 12, Part 1, section 4 of the *Environmental Protection Regulation 2008*.

“site” means the relevant petroleum activity(ies) to which the environmental authority relates.

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

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

“specified relevant activities” means an environmentally relevant activity that, but for being a resource activity, would otherwise be an environmentally relevant activity under section 18 of the *Environmental Protection Act 1994*.

“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.

“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. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.

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

“structure” for the purposes of Schedule C means a dam or levee.

“suitably qualified person” means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject 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:

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

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

“suitably qualified and experienced person” in relation to regulated structures means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 1988*, and has demonstrated competency and relevant experience:

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

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.

“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.

“temporary sewage treatment plant operations” means sewage treatment plant operations with a design capacity of equal to or less than 100 equivalent persons carried out at one location for a period of no greater than six months in a calendar year.

“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).

“topsoil” means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300 mm in depth from the natural surface.

“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:

- a) moling
b) pipe ramming method
c) horizontal directional drilling
d) utility tunneling, pipe jacking, auger boring
e) microtunnelling and pipe jacking
f) 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.

“visible salt” means where salt crystals accumulate on the soil surface.

“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 and completion of a well including but not limited to cellar pits, dams and drill sumps.

“well site” means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.

“wetland” for the purpose of this environmental authority means:

- a) 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
- b) are wetlands as defined under the Queensland Wetlands Program as 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, and possess one or more of the following attributes:
 - o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
 - o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
 - o the substratum is not soil and is saturated with water, or covered by water at some time.

“Wetland of high ecological significance” otherwise known as a “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

“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:

- a) the consecutive samples are taken over a five (5) month period; and
- b) the consecutive samples are taken at approximately equal periods.