

Permit¹

Environmental Protection Act 1994

Environmental authority

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

Permit¹ number: EPPG00340313

Project Name: Gilbert Gully

Environmental authority takes effect 3 November 2015.

The anniversary date of this environmental authority is **12 May** of each year. An annual return and the payment of the annual fee will be due each year on this day.

Environmental authority holder(s)

Name	Registered address
Australia Pacific LNG Pty Limited ACN: 001 646 331	Level 4 135 Coronation Drive MILTON QLD 4064

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Resource activity that is a petroleum activity which includes the following: Item 6, Schedule 2A of the Environmental Protection Regulation 2008 - a petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam Item 8, Schedule 2A of the Environmental Protection Regulation 2008 - a petroleum activity or GHG storage activity, other than an activity mentioned in any of items 1 to 7, Schedule 2A of the Environmental Protection Regulation, that includes 1 or more activities mentioned in schedule 2 for which an AES is stated. Fuel burning - using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour. Waste disposal - operating a facility for disposing of, in a year, more than 200,000t of regulated waste, or any combination, of the follow – a) general waste	Authority to Prospect (ATP) 663

¹ Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation



b) limited regulated waste c) if the facility is in a scheduled area – no more than 5t of untreated clinical waste in a year. Sewage treatment – Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of 21 to 100EP.	
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Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

It is a requirement of the EP Act that if an owner or occupier of land becomes aware a notifiable activity (as defined in Schedule 3 and Schedule 4) is being carried out on the land, or that the land has been, or is being, contaminated by a hazardous contaminant, the owner or occupier must, within 22 business days after becoming so aware, give written notice to the chief executive.



Signature

Andrew Langford
Department of Environment and Heritage Protection
Delegate of the administering authority
Environmental Protection Act 1994

3/11/2015

Date

Enquiries:
Petroleum and Gas (Assessment)
Department of Environment and Heritage Protection
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Responsibilities under other legislation

An environmental authority pursuant to the *Environmental Protection Act 1994* does not remove the need to obtain any additional approval for the activity that might be required by other State and/or Commonwealth legislation. Other legislation for which a permit may be required includes but is not limited to the:

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Sustainable Planning Act 2009*
- *Water Act 2000*

Applicants are advised to check with all relevant statutory authorities and comply with all relevant legislation.

An environmental authority for petroleum activities is not an authority to impact on water levels or pressure heads in groundwater aquifers in or surrounding formations. There are obligations to minimise or mitigate any such impact under other Queensland Government and Commonwealth Government legislation.

Obligations under the *Environmental Protection Act 1994*

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

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

Conditions of environmental authority

Schedule A	General Conditions
Schedule B	Water
Schedule C	Regulated Dams
Schedule D	Land
Schedule E	Environmental Nuisance
Schedule F	Air
Schedule G	Waste
Schedule H	Rehabilitation
Schedule I	Monitoring Programs
Schedule J	Community Issues
Schedule K	Notification Procedures
Schedule L	Definitions

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

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

Schedule A, Table 1 – Authorised Petroleum Activities

Tenure No.	Petroleum Activity	Number of existing activities	Number of proposed activities	Maximum size (where applicable)
ATP663P	Seismic (kms)	None	500	-
	Exploration Well(s)	20	25	-
	Appraisal Wells	18	12	-
	Development Well(s)	None	None	-
	Regulated Dam(s) >401 megalitres	None	1	-
	Regulated Dam(s) <400 megalitres	3	4	-
	Sewage Treatment Plants	None	6	100EP

Prevent or Minimise Likelihood of Environmental Harm

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

Maintenance of Measures, Plant and Equipment

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

Operational Plan

- (A5) Within three months of the granting of this environmental authority, the environmental authority holder must develop an Operational Plan that provides detailed information about the petroleum activity(ies) to be carried out under this environmental authority.
- (A6) The petroleum activity(ies) identified in the Operational Plan must set out the maximum scope of the petroleum activity(ies) and incorporate the petroleum activity(ies) set out in the approved Work Program and /or Development Plan for the relevant petroleum authority as required under the *Petroleum Act 1923* or the *Petroleum and Gas (Production Safety) Act 2004*.
- (A7) The Operational Plan must be consistent with the requirements of this environmental authority and include, but not be limited to:
- (a) a stated period for the Operational Plan which is at least one year but does not exceed five years duration and which specifies an end date;
 - (b) a description of the existing and all proposed petroleum activities under the period of the Operational Plan;
 - (c) a map or series of maps that:
 - (i). record the location of all infrastructure that exists at the commencement of the period of the Operational Plan, including but not necessarily being limited to:
 - o regulated dams;
 - o exploration, appraisal and development wells;
 - o transmission flow lines;
 - o gas processing facilities;
 - o water treatment facilities;
 - o brine encapsulation facilities;
 - o sewage treatment facilities;
 - o compressor stations;
 - o power lines;
 - o roads;
 - (ii). show the location of all programmed and approved infrastructure that will be developed during the period of the Operational Plan, including the items listed under Condition (A7)(c)(i), if applicable.
 - (iii) show major environmental features such as waters, sensitive places and environmentally sensitive areas;
 - (d) spatial datasets (GIS) which depict those requirements under conditions (A7)(c)(i), (A7)(c)(ii) and (A7)(c)(iii) in shapefile format;
 - (e) proposed maximum area of disturbance during the period of the Operational Plan;
 - (f) details on the scale and extent of any proposed disturbance to, or vegetation clearing in any Category A, B or C Environmentally Sensitive Area;
 - (g) a rehabilitation plan for disturbances to land as a result of existing and programmed and approved infrastructure during the period of the Operational Plan, including but not necessarily limited to the following:
 - i. a description of:
 - o the area to be disturbed (e.g. tenure, coordinates) and disturbance types (e.g. well lease, flow line, access track);
 - o pre-disturbance land use;
 - o timeframes for commencing rehabilitation of disturbed areas not required for the ongoing conduct of the petroleum activity(ies), not greater than three months for the rehabilitation of buried pipelines and not greater than nine months for any other disturbed area;
 - o forecasted total area to be rehabilitated during the period of the Operational Plan;
 - o soil types of areas to be rehabilitated;
 - o final land use, post rehabilitation;
 - ii. a rehabilitation monitoring program which identifies:

- suitable analogue sites to be used for measuring rehabilitation success;
 - the percentage foliage cover, flora species richness and diversity and fauna species diversity of the analogue sites;
 - the parameters to be measured in analogue and rehabilitated sites for determining rehabilitation success, including, as a minimum, vegetation cover, flora species richness and diversity and fauna species diversity at a minimum yearly frequency;
 - the experimental design for analysing analogue and rehabilitated site data including statistical methods of analysis;
 - proposed revegetation methods inclusive of plant species selection, re-profiling, respraying soil, soil ameliorants / amendments, surface preparation and method of propagation;
- (h) a high level rehabilitation strategy, including final land use, for all proposed infrastructure which is not programmed and approved at the commencement of the Operational Plan; and
- (i) the results and a description of monitoring undertaken on progressive rehabilitation carried out under the previous Operational Plan(s) in relation to the requirements and acceptance criteria set out in this environmental authority; and
- (j) the calculation of financial assurance for the proposed maximum disturbance expected during the period of the Operational Plan.
- (A8) The commencement of the first Operational Plan period is 12 July 2011.
- (A9) All subsequent Operational Plans must be developed not less than 20 business days prior to the expiry of the current Operational Plan.

Financial Assurance

- (A10) The holder of this environmental authority must:
- (a) provide to the administering authority financial assurance in the amount and form required from time to time by the administering authority for the authorised petroleum activity(ies); and
 - (b) review and maintain the amount of financial assurance based on the activities and rehabilitation to be undertaken during the period of the Plan.
- (A11) The calculation of financial assurance must be in accordance with the most recent version of the Department of Environment and Resource Management's Guideline "*Financial assurance for petroleum activities*".
- (A12) 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.

Third Party Audit

- (A13) Compliance with the conditions of this environmental authority must be audited by an appropriately qualified third party auditor, nominated by the holder of this environmental authority and accepted by the administering authority, for each period of the Operational Plan required under conditions (A5) – (A9).
- (A14) Notwithstanding condition (A13), the holder of this environmental authority may, prior to undertaking the third party audit, negotiate with the administering authority the scope and content of the third party audit.

Note: Where minimal activities have been undertaken on a tenure, the negotiation of the scope of the third party audit may also include the postponing of the third party audit to an agreeable time between the holder of this environmental authority and the administering authority

- (A15) The report of the third party auditor for the relevant prior period must be submitted to the administering authority by the holder of this environmental authority with each revised Operational Plan submitted in accordance with condition (A8) and condition (A9).
- (A16) The third party auditor must certify (including a statutory declaration) the findings of the audit in the report.
- (A17) The financial cost of the third party audit is to be borne by the holder of this environmental authority.
- (A18) The holder of this environmental authority must immediately act upon any recommendations arising from the audit report by:
 - (a) investigating any non-compliance issues identified; and
 - (b) as soon as practicable, implementing measures or taking necessary action to ensure compliance with the requirements of this environmental authority.
- (A19) Subject to condition (A18), and not more than three months following the submission of the audit report, the holder of this environmental authority must provide a written report to the administering authority addressing the:
 - (a) actions taken by the holder of this environmental authority to ensure compliance with this environmental authority; and
 - (b) actions taken to prevent a recurrence of any non-compliance issues identified.

SCHEDULE B – WATER

Contaminant Release

- (B1) Contaminants that will or may cause environmental harm must not be directly or indirectly released to any waters except as permitted under this environmental authority.

Erosion and Sediment Control

- (B2) Erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the release of sediment and contaminated stormwater to waters.
- (B3) An Erosion and Sediment Control Plan must be developed and implemented for all stages of the petroleum activity(ies) and which has been certified by a professional with appropriate experience and/or qualifications accepted by the administering authority and must include but not be limited to:
 - (a) diverting uncontaminated stormwater run-off around areas disturbed by petroleum activity(ies) or where contaminants or wastes are stored or handled that may contribute to stormwater;
 - (b) contaminated stormwater runoff and incident rainfall is collected; and treated, reused, or released in accordance with the conditions of this environmental authority;
 - (c) roofing or minimising the size of areas where contaminants or wastes are stored or handled;
 - (d) revegetating the disturbed area as soon as practicable after the completion of works;
 - (e) using alternate materials and or processes (such as dry absorbents) to clean up spills that will minimise the generation of contaminated waters;
 - (f) erosion and sediment control structures are placed to minimise erosion of disturbed areas and prevent the contamination of any waters;
 - (g) an inspection and maintenance program for the erosion and sediment control features;

- (h) provision for adequate access to maintain all erosion and sediment control measures especially during the wet season months from December to March;
 - (i) erosion and sediment control measures for construction of wells and pipelines on slopes >10%; and
 - (j) identification of remedial actions that would be required to ensure compliance with the conditions of this environmental authority.
- (B4) A copy of the Erosion and Sediment Control Plan must be submitted to the administering authority upon request.

Maintenance and Cleaning

- (B5) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants cannot be released into any waters, roadside gutter or stormwater drainage system.

Watercourses, Wetlands and Springs

- (B6) In the carrying out of the petroleum activity(ies) the holder of this environmental authority must not clear vegetation, excavate or place fill, except for the construction of roads and pipelines, in or within:
- (a) 200 metres from any natural significant wetland;
 - (b) 100 metres from any natural wetland, lakes or springs; or
 - (c) 100 metres of the high bank of any other watercourse.
- (B7) The holder of this environmental authority must not excavate or place fill in a way that interferes with the flow of water in a watercourse, wetland, or spring, including works that divert the course of flow of the water or works that impound the water.
- (B8) Despite condition (B7) pipeline and road construction works may be undertaken in watercourses, wetlands or springs where there is no practicable alternative such as the use of horizontal directional drilling methods, for a maximum period of 10 days, provided that the works are conducted in accordance with the following order of preference:
- (a) conducting work in times of no flow; and
 - (b) using all reasonable and practical measures to reduce impacts in times of flow.
- (B9) Activities or works resulting in significant disturbance to the bed or banks of a watercourse or wetland, or a spring must:
- (a) only be undertaken where necessary for the construction and/or maintenance of roads, tracks and pipelines that are essential for carrying out the authorised petroleum activity(ies) and no reasonable alternative location is feasible;
 - (b) be no greater than the minimum area necessary for the purpose of the significant disturbance;
 - (c) be designed and undertaken by a suitably qualified and experienced person taking into account the matters listed in Section 5. Planning Activities and Section 6 Impact Management During Activities of DERM's "Guideline – Activities in a watercourse, lake or spring associated with mining operations" dated April 2008, or more recent editions as such become available; and
 - (d) upon cessation of the activities or works, commence rehabilitation immediately such that the final rehabilitation is to a condition that will ensure the ongoing physical integrity and the natural ecosystem values of the site.
- (B10) Sediment control measures must be implemented to minimise any increase in water turbidity due to carrying out petroleum activity(ies) in the bed or banks of a watercourse or wetland, or a spring.

- (B11) Routine, regular and frequent visual monitoring must be undertaken while carrying out construction work and/or any maintenance of completed works in a watercourse, wetland or spring. If, due to the petroleum activity(ies), water turbidity increases in the watercourse, wetland or spring outside contained areas, works must cease and the sediment control measures must be rectified to limit turbidity before activities recommence.

Groundwater

- (B12) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to any spring, wetland or other surface waters.

Floodplains

- (B14) The holder of this environmental authority must ensure that petroleum activity(ies), excluding limited petroleum activity(ies) do not:
- (a) concentrate flood flows;
 - (b) divert flood flows from natural drainage paths and alter flow distribution;
 - (c) increase the local duration of floods;
 - (d) increase the risk of detaining flood flows;
 - (e) increase the risk to the safety of persons from flooding; or
 - (f) increase the risk of damage to property from flooding.

Release of Treated Sewage Effluent Contaminants to Land

- (B15) Sewage pump stations must be fitted with a stand-by pump and a visible or audible high level alarm.
- (B16) Treated effluent may only be released to land at the designated, fenced and delineated contaminant release area(s).
- (B17) The contaminant release area(s) must be maintained in a proper and efficient condition so as to provide adequate assimilation, percolation, evaporation and transpiration of the released contaminants.
- (B18) Treated effluent must not be applied by spray irrigation.
- (B19) Treated effluent must be applied in a manner that does not cause ponding or runoff of effluent beyond the contaminant release area(s).
- (B20) When weather conditions or soil conditions preclude the release of contaminants, the contaminants must be directed to on-site storage or lawfully disposed of off-site.

Quality of Contaminants Released from the Sewage Treatment Works

- (B21) Treated effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule B, Table 1 - Treated Sewage Effluent Standards* for each quality characteristic.
- (B22) The release of contaminants to land must be monitored at the frequency and at the sampling and in-situ measurement point specified in *Schedule B, Table 1 - Treated Sewage Effluent Standards*.

Schedule B, Table 1 - Treated Sewage Effluent Standards

Quality Characteristic	Sampling and in-situ measurement Point Location	Limit Type	Release Limit	Frequency
5-day Biochemical Oxygen Demand (inhibited)	E.g. Release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
Suspended Solids		maximum	30 mg/L	
pH		range	6.0 to 9.0	
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	

SCHEDULE C – REGULATED DAMS

- (C1) Construction of any dam or modifications to an existing dam determined to be in the high hazard or significant hazard category in accordance with the most recent version of “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams” is prohibited unless the required design plan details have been entered into the Regulated Dam Register and certified by the chief executive officer for the holder of the environmental authority, or their delegate, as being accurate and correct.

Regulated Dam Register

- (C2) The holder of this environmental authority must maintain a Register of Regulated Dams that must include, as a minimum, the following information for each Regulated Dam:
- (a) dam name, the coordinates for its location and date of entry in the register;
 - (b) dam purpose and its proposed/actual contents;
 - (c) hazard category assessed using the most recent version of “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams”;
 - (d) details of the composition and construction of any liner;
 - (e) dimensions (metres) and surface area (hectares) measured at the footprint of the dam;
 - (f) maximum operational volume (megalitres);
 - (g) design storage allowance at 1 November each year (megalitres);
 - (h) mandatory reporting level (metres);
 - (i) date construction was certified as compliant with the design plan;
 - (j) name and qualifications of certifier;
 - (k) dates on which the dam was inspected for structural and operational adequacy;
 - (l) date on which the report of the annual structural and operational adequacy inspection was provided to the administering authority;
 - (m) dates on which the dam was inspected for the detection of leakage through any liner; and
 - (n) dates on which the dam was inspected for the purpose of annually ascertaining the available storage capacity on the 1 November each year.
- (C3) The holder of this environmental authority must provisionally enter the required information in the Register of Regulated Dams when a design plan for a Regulated Dam is submitted to the administering authority.
- (C4) The holder of this environmental authority must make a final entry of the required information in the Register of Regulated Dams once compliance with condition (C16) has been achieved.

- (C5) The holder of this environmental authority must ensure that the information contained in the Register of Regulated Dams is complete and current on any given day.
- (C6) All entries in the Register of Regulated Dams must be certified by the chief executive officer for the environmental authority holder, or their delegate, as being accurate and correct.
- (C7) The holder of this environmental authority must submit the Register of Regulated Dams or information contained in the Register available to the administering authority at each annual return and when requested to do so in the form requested by the administering authority.

Construction and Operational Requirements for New Dams

- (C8) All aggregation dams must:
 - (a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and rehabilitation; and
 - (b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the dam and enable the repair of the containment system or its decommissioning and rehabilitation.
- (C9) Aggregation dams must be designed and operated so that during any period of 30 days, following the first 90 days of operation of the dam, the total volume of water leaving the dam other than by evaporation must not be less than 85% of the volume of water that has entered the dam.
- (C10) By 1 October 2011, all brine dams must:
 - (a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and rehabilitation;
 - (b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the dam, enable the repair of the containment system or its decommissioning and rehabilitation; and
 - (c) the collection and proper disposal of any contaminants that move beyond the bounds of the containment system.
- (C11) All Regulated Dams must be designed in accordance with the requirements of the most recent version of "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams" by and constructed under the supervision of a suitably qualified and experienced person.
- (C12) The hazard category of any dam must be determined by a suitably qualified and experienced person, prior to its design and construction, upon any change in its purpose or its stored contents, and at least once in each two year period after its construction.
- (C13) The construction and operation of Regulated Dams is prohibited unless the holder of this environmental authority has submitted to the administering authority a copy of the design plan, together with the certification of a suitably qualified and experienced person that the regulated dam:
 - (a) will deliver the performance stated in the design plan;
 - (b) has had its hazard category assessed and been designed in accordance with the requirements of the most recent version of "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams"; and
 - (c) when constructed and operated, will be compliant in all respects with the relevant conditions of this environmental authority.
- (C14) The design plan must include, but not be limited to:

- (a) a statement of the relevant legislation, regulatory documents and engineering practice relied upon in the design plan;
 - (b) a statement of the facts and data being used in the design plan and the limitations to the application and interpretation of that material;
 - (c) an assessment of the hazard category of the proposed dam based on the identification of potential impacts on any sensitive receptors for any applicable dam failure scenarios, including the cumulative impact should all dams fail at once;
 - (d) detailed specifications for the design, operation, maintenance and decommissioning of the dam(s);
 - (e) an operational plan that includes contingency / emergency response procedures designed to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of the dam;
 - (f) design, specification and operational rules for any related structures and systems used to prevent the overtopping of the proposed dam;
 - (g) a detailed plan for the decommissioning and rehabilitation of the dam at the end of its operational life;
 - (h) any other matter required by the certifying suitably qualified and experienced person; and
 - (i) evidence supporting the claims of the certifier that they are a suitably qualified and experienced person.
- (C15) If, within the 20 business days following the lodgement of a certified design plan the administering authority notifies the holder of this environmental authority, in writing, that the design plan is not compliant with either:
- (a) the conditions of this environmental authority; or
 - (b) the requirements set out in the most recent version of "Manual for Assessing Hazard Categories and Hydraulic Performance of Dams"
- then the construction and operation of the Regulated Dam is prohibited until the administering authority provides written advice that its construction may proceed.
- (C16) When construction of any Regulated Dam is complete, the holder of this environmental authority must submit to the administering authority one hard copy and one electronic copy of a set of 'as constructed' drawings, together with the certification of a suitably qualified and experienced person that the dam 'as constructed' will deliver the performance stated in the design plan and at the time of certification it is compliant in all respects with the conditions of this environmental authority.
- (C17) Each Regulated Dam must be maintained and operated in a manner that is consistent with the design plan and the certified 'as constructed' drawings for the duration of its operational life and until decommissioned and rehabilitated.

Livestock and Wildlife

- (C18) The holder of this environmental authority must ensure reasonable and practicable control measures are in place to ensure that harm is not caused to livestock or wildlife through the construction and operation of a Regulated Dam.

Mandatory Reporting Level

- (C19) The Mandatory Reporting Level must be marked on each Regulated Dam in such a way that it is clearly observable during routine inspections of each dam.
- (C20) The holder of this environmental authority must notify the administering authority immediately when the level of the contents of any Regulated Dam reaches the Mandatory Reporting Level, and immediately act to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.

Annual Inspection and Report

- (C21) Each Regulated Dam must be inspected annually by a suitably qualified and experienced person.
- (C22) At each annual inspection, the condition and adequacy of each Regulated Dam must be assessed for dam safety and against the necessary structural, geotechnical and hydraulic performance criteria contained in the certified design plan.
- (C23) An assessment of the adequacy of the available storage in each Regulated Dam is to be made, based on an actual dam level observed in the month of October in each year, and the resultant estimate of the level in that dam as at 1 November in each year must be equal or less than the design storage allowance for the dam.
- (C24) Where the assessment of the adequacy of the available storage in any Regulated Dam indicates that the design storage allowance will be exceeded, or at any other time the holder of this environmental authority becomes aware that the design storage allowance has been or will be exceeded, the holder of this environmental authority must immediately notify the administering authority, and immediately act to prevent or, if unable to prevent, to minimise any actual or potential environmental harm.
- (C25) For each annual inspection, a copy of a report on the condition and adequacy of each Regulated Dam, certified by the suitably qualified and experienced person and including any recommended actions to be taken to ensure the integrity of each Regulated Dam, must be provided to the administering authority upon request.
- (C26) The holder of this environmental authority must, upon receipt of the annual inspection report, consider the report and its recommendations, take action to ensure that each Regulated Dam will safely perform its intended function, and within one month of receiving the report, notify the administering authority in writing of the recommendations of the inspection report and the actions taken to ensure the integrity of each Regulated Dam.

Requirements for Existing Dams

- (C27) The construction of CSG evaporation dams after 31 May 2010 is not authorised under this approval.

SCHEDULE D — LAND

General

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

Disturbance to Land – General

- (D2) Prior to conducting petroleum activity(ies) that involve significant disturbance to land, an assessment must be undertaken of the condition, type and ecological value of any vegetation in such areas where the activity is proposed to take place.
- (D3) The assessment required by condition (D2) must be undertaken by a suitably qualified person and include the carrying out of field validation surveys, observations and mapping of any category A, B or C Environmentally Sensitive Areas (ESAs) and the presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*.
- (D4) The holder of this environmental authority, when carrying out (a) petroleum activity(ies) must:

- (a) avoid, minimise or mitigate (in order of preference) any impacts on areas of vegetation or other areas of ecological value;
- (b) minimise the risk of injury, harm, or entrapment to wildlife and stock;
- (c) minimise disturbance to land that may otherwise result in land degradation;
- (d) ensure that for land that is to be significantly disturbed by (a) petroleum activity(ies):
 - i. the top layer of the soil profile is removed;
 - ii. soils are stockpiled in a manner that will preserve its biological and chemical properties;
 - iii. soils are used for rehabilitation purposes; and
- (e) prior to carrying out field based activities, make all relevant staff, contractors or agents carrying out those activities, aware of the location of any category A, B or C ESAs and the requirements of this environmental authority.

Note: This environmental authority does not authorise the taking of protected animals or the tampering with an animal breeding place as defined under the Nature Conservation Act 1992 and Regulations.

- (D5) In accordance with condition (D4) above, if significant disturbance to land is unavoidable, the holder of this environmental authority must not clear vegetation or place fill:
 - (a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e. stepping stone or contiguous bioregional/local corridor networks) and/or results in an increase in threatening processes (e.g. potential impacts associated with edge effects or introduced species);
 - (b) on slopes greater than 10% for activities other than pipelines and wells; or
 - (c) in discharge areas.
- (D6) Clearing of remnant vegetation shall not exceed 10 metres in width for the purpose of establishing tracks and 20 metres in width for dual carriageway roads unless otherwise approved by the administering authority in writing.
- (D7) Cleared vegetation must be stockpiled in a manner that facilitates resspreading or salvaging and does not impede vehicle, stock or wildlife movements.

Disturbance to Land – Environmentally Sensitive Areas

- (D8) Notwithstanding Conditions (D2) to (D7) inclusive, the holder of this environmental authority must ensure that petroleum activity(ies):
 - (a) are not conducted in or within 200 metres of any listed category A, B or C ESAs; and
 - (b) do not involve activities other than (a) limited petroleum activity(ies) within 1km of a listed category A ESA, or within 500m of a listed category B or C ESA.
- (D9) (A) limited petroleum activity(ies) carried out in accordance with condition (D8)(b) must be preferentially located in pre-existing areas of clearing or significant disturbance to the greatest practicable extent.

Disturbance to Land – Endangered and Of Concern Regional Ecosystems

- (D10) Despite condition (D8), where it can be demonstrated that no reasonable or feasible alternative exists, (a) limited petroleum activity(ies) may be undertaken within an endangered/of concern Regional Ecosystem (RE) and its associated buffer zone, provided that the area is not part of another listed category A, B or C ESA (e.g. a National Park) or associated buffer zone unless authorised by the administering authority.

- (D11) The limited petroleum activity(ies) undertaken in accordance with condition (D10) must comply with the following:
- (a) be located and carried out in areas according to the following order of preference:
 - i. pre-existing cleared areas or significantly disturbed areas less than 200m from an Endangered/Of Concern RE;
 - ii. undisturbed areas less than 200m from an Endangered/Of Concern RE;
 - iii. pre-existing areas of significant disturbance within an endangered/of concern regional ecosystem (e.g. areas where significant clearing or thinning has been undertaken within a regional ecosystem, and/or areas containing high densities of weed or pest species which has inhibited re-colonisation of native regrowth);
 - iv. areas where clearing of an endangered or of concern regional ecosystem is unavoidable;
 - (b) any vegetation clearing in an Endangered/Of Concern RE or associated buffer zone must not exceed any of the following areas:
 - i. 10% of the remnant unit of Endangered/Of Concern regional ecosystem as ground truthed and mapped before any activity commences as per conditions (D1) and (D2) of this environmental authority for the life of the project; or
 - ii. more than 30m² for the construction of a sump; or
 - iii. six metres in width for tracks; or
 - iv. 12 metres in width for pipeline construction purposes; and
 - (c) all reasonable and practical measures are taken to minimise the area cleared and to avoid the clearing of mature trees, which must include but not be limited to, for each well site, a risk assessment to determine the minimum amount of disturbance possible.
- (D12) Details of any significant disturbance to land in or within 200m of Endangered or Of Concern regional ecosystems, along with a record of the assessment required by conditions (D2) and (D3) must be kept and submitted to the administering authority upon request.
- (D13) If the assessment required by conditions (D2) and (D3) indicates that an ecosystem mapped as Endangered or Of Concern regional ecosystem by the Queensland Herbarium should be in a lower conservation value classification and the holder of this environmental authority wishes to undertake activities as if the ecosystem is of the lower conservation value they must notify the administering authority in writing before any significant disturbance to land takes place.
- (D14) If, within the 20 business days following the lodgement of the notification under condition (D13) the administering authority notifies the holder of this environmental authority, in writing, that the regional ecosystem mapping requires further validation, then significant disturbance to land in the mapped regional ecosystem are prohibited until the administering authority provides written advice that significant disturbance to land may proceed.
- (D15) When requested by the administering authority, the holder of this environmental authority must enter into an agreement with the administering authority to provide an environmental offset to counterbalance the impacts of the activity on Endangered or Of Concern regional ecosystem.
- (D16) The holder of this environmental authority must comply with any environmental offset agreement made in accordance with the conditions of this environmental authority.

Disturbance to Land – State Forests and Timber Reserves

- (D17) Despite condition (D8), activities may be undertaken within State Forests or Timber Reserves provided the holder of the environmental authority has written approval from the authority responsible for the administration of the *Forestry Act 1959*.
- (D18) Where activities are to be undertaken in a State Forest or Timber Reserve that are also Endangered or Of Concern Regional Ecosystems, such activities may be undertaken in accordance with condition (D10) of this environmental authority, provided the holder of this environmental authority has written approval from the authority responsible for the administration of the *Forestry Act 1959*.

Soil Management

- (D19) The holder of this environmental authority must develop and implement soil management procedures for areas to be disturbed by (a) petroleum activity(ies) prior to commencement of (a) petroleum activity(ies) in these areas to prevent or minimise the impacts of soil disturbance. These procedures must include but not be limited to:
- (a) establishment of baseline soil information for areas to be disturbed including soil depth, pH, electrical conductivity (EC), chloride, cations (calcium, magnesium, sodium, aluminium and potassium), exchangeable sodium percentage (ESP), particle size and soil fertility (including nitrogen, phosphorous, potassium, sulphur and micronutrients);
 - (b) a soils monitoring program outlining parameters to be monitored, frequency of monitoring and maximum limits for each parameter;
 - (c) identification of soil units within areas to be disturbed by petroleum activities at a scale of 1:100000, in accordance with the "Guidelines for Surveying Soil and Land Resources, 2nd Edition" (McKenzie *et al.* 2008), "Australian Soil and Land Survey Handbook, 3rd Edition" (National Committee on Soil and Terrain 2009) and "The Australian Soil Classification" (Isbell 2002);
 - (d) development of soil descriptions that are relevant to assessment for agricultural suitability, topsoil assessment, erodibility and rehabilitation, for example:
 - i. shallow cracking clay soils;
 - ii. deep cracking clay soils;
 - iii. deep saline and/or sodic cracking clay soils with melonholes;
 - iv. thin surface, sodic duplex soils;
 - v. medium to thick surface (say >15 cm), sodic duplex soils; and
 - vi. non-sodic duplex soils;
 - (e) detailed mitigation measures and procedures to manage the risk of adverse soil disturbance in the carrying out of the petroleum activity; and
 - (f) for areas of good quality agricultural land, detailed methods to be undertaken to minimise potential impacts.
- (D20) A copy of the soil management procedures must be made available to the administering authority upon request.

Acid Sulfate Soils

- (D21) The holder of this environmental authority must, when clearing in areas with acid sulfate soils, develop and implement an acid sulfate soil environmental management plan prepared in accordance with the "State Planning Policy 2/02 Guideline Planning and Managing Development

Involving Acid Sulfate Soils” and the Department of Environment and Resource Management’s “Queensland Acid Sulfate Soil Technical Manual” (Version 2.2 September 2004) or more recent editions or supplements to these documents as such become available.

Note: Condition (D21) is only applicable in areas of acid sulfate soils or potential acid sulfate soils. These areas should be identified in the Environmental Management Plan accompanying the application.

Fauna Management

- (D22) The holder of this environmental authority must develop and implement fauna management procedures for the carrying out of the petroleum activity(ies), in particular pipeline construction, construction and use of dams, to prevent or minimise harm or the potential risk of causing harm to fauna.
- (D23) The fauna management procedures must include training and awareness of staff and contractors and ensure that any planned fauna handling is undertaken by a suitably qualified person.
- (D24) A copy of the fauna management procedures must be made available to the administering authority upon request.

Note: The procedures required by conditions (D22) and (D23) should consider the “Australian Pipeline Industry Association Code of Environmental Practice – Onshore Pipelines” dated October 2005, or subsequent versions thereof.

Pest Management

- (D25) In carrying out the petroleum activity(ies) the holder of this environmental authority must develop and implement an effective pest management program that includes but is not limited to the following:
 - (a) identification of pest species and infestation areas;
 - (b) prevents and/or minimises the introduction and/or spread of pests; and
 - (c) control and management of pest outbreaks as a result of petroleum activities.
- (D26) A copy of the pest management program must be made available to the administering authority upon request.

Note: The pest management program required by Condition (D25) should consider the “Petroleum Industry (including coal seam methane gas) Minimising Pest Spread Guidelines” dated June 2008, or subsequent versions thereof. This document is available for download from:
http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Minimising-Pest-Spread-Advisory-Guidelines.pdf

Chemical and Fuel Storage

- (D27) All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids (including petroleum products and associated piping and infrastructure) must be stored and handled in accordance with the relevant Australian Standard where such is available.

- (D28) Notwithstanding the requirements of any Australian Standard, any liquids stored on site that have the potential to cause environmental harm must be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian Standard is available, the following must be applied:
- (a) storage tanks must be banded so that the capacity and construction of the band is sufficient to contain at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas; and
 - (b) drum storages must be banded so that the capacity and construction of the band is sufficient to contain at least 25% of the maximum design storage volume within the band.
- (D29) All containment systems must be designed to minimise rainfall collection within the system.

Stimulation

- (D30) Within three months of issuing this environmental authority, the holder of this environmental authority must develop a hydraulic stimulation risk assessment to ensure that stimulation activities are managed to prevent environmental harm.
- (D31) The hydraulic stimulation risk assessment required in condition (D30) 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;
 - (s) seismic history of the region relevant to design and propagation of frac (e.g. earth tremors, earthquakes);
 - (e) proximity of overlying and underlying aquifers;
 - (f) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation.
 - (g) the environmental values of groundwater in the area;
 - (h) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
 - (i) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
 - (j) a description of the well mechanical integrity testing program;
 - (k) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc);
 - (l) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation;
 - (m) locations of landholders' active groundwater bores;
 - (n) groundwater transmissivity, flow rate, hydraulic conductivity and direction(s) of flow;
 - (o) 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;
 - (p) 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;
 - (q) 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;
 - (s) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities;
 - (t) an environmental hazard assessment of leaving stimulation chemicals in the target gas producing formation for extended periods subsequent to stimulation;
 - (u) human health exposure pathways to operators and the regional population;
 - (v) risk characterisation of environmental impacts based on the environmental hazard assessment; and
 - (w) 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.
- (D32) The hydraulic stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation activities being carried out.
- (D33) The hydraulic stimulation risk assessment required by conditions (D30) and (D31) must be reviewed at least annually and when new or additional toxicological information becomes available for the chemicals used.
- (D34) The updated hydraulic stimulation risk assessment required by condition (D33) must be provided to the administering authority upon request.
- (D35) The holder of this environmental authority must take all reasonable and practicable measures to ensure the stimulation activities must not:
 - (a) cause the connection of a target gas producing formation and another aquifer; and
 - (b) result in a change of water quality other than that within the stimulation impact zone of the target gas producing formation.
- (D36) The holder of this environmental authority must have procedures in place capable of as soon as practicable detecting any fractures that are not contained within the target coal seam formation that results in the condition described in (D35).
- (D37) Rectification measures must be taken immediately if the holder of this environmental authority either becomes aware that stimulation activities have resulted in a change in water quality other than that within the stimulation impact zone of the target gas producing formation or that stimulation activities have caused the connection of the target gas producing formation and another aquifer.
- (D38) As soon as practicable, but not more than 48 hours, after becoming aware of one of the circumstances described in condition (D35), the holder of this environmental authority must:
 - (a) give written notice to the administering authority of the event, its nature and the circumstances in which it happened; and
 - (b) give written notice of the event, its nature and the circumstances in which it happened to each owner and occupier of land that is, has been, or is reasonably likely to be, affected by the event.
- (D39) If the holder of this environmental authority becomes aware of a fracture that has not been contained within the target coal seam formation steps to remedy the lack of containment must be taken immediately, much may include but not be limited to plugging and abandoning the well.
- (D40) Restricted stimulation fluids must not be used in stimulation.
- (D41) Oil based drilling muds must not be used in the carrying out of the petroleum activity(ies).
- (D42) Synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies)-

SCHEDULE E – ENVIRONMENTAL NUISANCE

Odour, Dust and other Airborne Contaminants

- (E1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activity(ies) must not cause an environmental nuisance at any sensitive place.

Noise

- (E2) In the event of a complaint about noise from the carrying out of the petroleum activity(ies) being made to the administering authority and that the administering authority considers is not frivolous nor vexatious nor based on mistaken belief, then the emission of noise from the licensed place must not result in levels greater than those specified in *Schedule E, Table 1 – Noise limits for fixed activities* or *Schedule E, Table 2 – Noise limits for itinerant activities* as appropriate.
- (E3) In the event of a complaint about noise nuisance that the administering authority considers is not frivolous or vexatious then the holder of the environmental authority must prepare and submit a noise management plan to the administering authority within the reasonable and practicable timeframe specified in writing by the administering authority.
- (E4) The noise management plan must address, but not be limited to, the following matters:
- (a) identification of component noise sources and activities at the place(s) which impact on noise sensitive areas;
 - (b) the measured and/or predicted level of these noise sources and activities at noise sensitive places;
 - (c) the reasonable and practicable control or abatement measures (including hours of operation) that can be undertaken to reduce identified intrusive noise sources;
 - (d) the level of noise at noise sensitive places that would be achieved from implementing these measures.
 - (e) the handling of future noise complaints;
 - (f) community liaison and consultation; and
 - (g) training of staff and contractors in noise management practices.
- (E5) The holder of this environmental authority must commence implementation of the noise abatement recommendations of the noise management plan not more than 30 days following its submission to the administering authority, accounting for any comments made by the administering authority within that time.

Schedule E, Table 1 – Noise Limits for fixed activities

Sensitive place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L _{A90} , adj, 15 mins	lesser of bg+3 or 48	lesser of bg+0 or 40	lesser of bg+0 or 40	lesser of bg+0 or 40	lesser of bg+0 or 40	lesser of bg+0 or 40
L _{A10} , adj, 15 mins	lesser of bg+5 or 50	lesser of bg+5 or 45	lesser of bg+0 or 40	lesser of bg+5 or 45	lesser of bg+5 or 40	lesser of bg+0 or 35
L _{A1} , adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
Commercial place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L _{A90} , adj, 15 mins	lesser of bg+5 or 50	lesser of bg+0 or 45	lesser of bg+0 or 40	lesser of bg+3 or 43	lesser of bg+0 or 40	lesser of bg+0 or 40
L _{A10} , adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
L _{A1} , adj, 15 mins	lesser of bg+15 or 60	lesser of bg+15 or 55	lesser of bg+10 or 50	lesser of bg+15 or 55	lesser of bg+15 or 50	lesser of bg+10 or 45

- bg = background noise level
- In the event that measured bg is less than 25 dB(A), then 25 dB(A) is to be substituted for the measured level
- If the background is higher than the number shown on the second line in any box, the limit is to be background plus 0.

Schedule E, Table 2 – Noise limits for itinerant activities

Sensitive place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L _{A90} , adj, 15 mins	lesser of bg+3 or 48	lesser of bg+0 or 40	lesser of bg+0 or 40	lesser of bg+0 or 40	lesser of bg+0 or 40	lesser of bg+0 or 40
L _{A10} , adj, 15 mins	lesser of bg+5 or 50	lesser of bg+5 or 45	lesser of bg+0 or 40	lesser of bg+5 or 45	lesser of bg+5 or 40	lesser of bg+0 or 35
L _{A1} , adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
Commercial place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and public holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
L _{A90} , adj, 15 mins	lesser of bg+5 or 50	lesser of bg+0 or 45	lesser of bg+0 or 40	lesser of bg+3 or 43	lesser of bg+0 or 40	lesser of bg+0 or 40
L _{A10} , adj, 15 mins	lesser of bg+10 or 55	lesser of bg+10 or 50	lesser of bg+5 or 45	lesser of bg+10 or 50	lesser of bg+10 or 45	lesser of bg+5 or 40
L _{A1} , adj, 15 mins	lesser of bg+15 or 60	lesser of bg+15 or 55	lesser of bg+10 or 50	lesser of bg+15 or 55	lesser of bg+15 or 50	lesser of bg+10 or 45

- bg = background noise level
- In the event that measured bg is less than 25 dB(A), then 25 dB(A) is to be substituted for the measured level
- If the background is higher than the number shown on the second line in any box, the limit is to be background plus 0.

- (E6) Upon completion of the noise abatement recommendations contained in the noise management plan, the holder of this environmental authority must undertake verification noise measurements. Not more than 30 days following such noise assessment, the holder of this environmental authority must submit to the administering authority a noise report confirming compliance with noise limits in *Schedule E, Table 1 – Noise limits for fixed activities* and/or *Schedule E and/or Table 2 – Noise limits for itinerant activities*.

SCHEDULE F – AIR

Fuel Burning or Combustion Equipment

- (F1) Contaminants emitted from fuel burning or combustion equipment point sources must be directed vertically upwards.
- (F2) Air dispersion modelling must be used to calculate the ground level concentrations of emissions from fuel burning or combustion equipment (that is capable of burning at least 500kg of fuel in an hour) and identify any potential impacts to air quality within the study area. The results must be made available to the administering authority on request.
- (F3) The calculated ground level concentration of contaminants discharged to the atmosphere under maximum operating conditions must not exceed the criteria in *Schedule F, Table 1 – Maximum Ground Level Concentration Criteria* for each air contaminant.
- (F4) Prior to the installation of any new or additional fuel burning or combustion equipment following the issue of this environmental authority, the holder of this environmental authority must ensure that proper and effective pollution control equipment is provided for in the design of the equipment to ensure that emissions as modelled in accordance with condition (F2) demonstrate compliance with the criteria specified in *Schedule F, Table 1 – Maximum Ground Level Concentration Criteria*.

Schedule F, Table 1 – Maximum Ground Level Concentration Criteria

Contaminant	Concentration at 0°Celsius	Units	Averaging time
NOx as Nitrogen Dioxide	250	µg/m ³	1 hour
NOx as Nitrogen Dioxide	33	µg/m ³	1 year
Carbon monoxide	11	mg/m ³	8 hour

- (F5) The holder of this environmental authority must maintain a Register of Fuel Burning or Combustion Equipment that must include, as a minimum, the following information for each of the equipment:
- (a) Fuel Burning or Combustion Equipment Name and Location
 - (b) Stack emission height (metres)
 - (c) Minimum efflux velocity (metres /s)
 - (d) Mass emission rates (g/s)
 - (e) Contaminant concentrations (mg/Nm³ @ x %O₂ dry gas at 0°Celsius and 1 atmosphere)
- (F6) The holder of this environmental authority must ensure that the information contained in the Register of Fuel Burning or Combustion Equipment is complete and current on any given day.
- (F7) All entries in the Register of Fuel Burning or Combustion Equipment must be certified by the chief executive officer for the holder of this environmental authority, or their delegate, as being accurate and correct.

- (F8) The holder of this environmental authority must make the Register of Fuel Burning or Combustion Equipment or information contained in the Register available to the administering authority on request.

SCHEDULE G – WASTE

General

- (G1) All general waste must be removed from the site and sent to a recycling facility or disposal facility licensed to accept the waste.
- (G2) All regulated waste must be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.
- (G3) Waste must not be burned or allowed to be burned on the licensed site.
- (G4) All waste fluids and muds resulting from drilling and exploration activities must be contained in a dam or containment structure for disposal, remediation or reuse where applicable.

Coal Seam Gas Water Management

- (G5) The holder of this environmental authority must develop and implement a coal seam gas water (CSG water) management plan (CWM Plan) for the authorised petroleum activities which must adequately identify and quantify all CSG water generated under this environmental authority and propose management options for treating and/or disposing of or beneficially reusing CSG water.
- (G6) The holder of this environmental authority must ensure that CSG water is contained, is not released to land or waters and is only used for purposes specifically authorised:
- (a) under this environmental authority; or
 - (b) under Section 186 of the *Petroleum and Gas (Production and Safety) Act 2004*; or
 - (c) under Section 86 of the *Petroleum Act 1923*; or
 - (d) under an approval of resource for beneficial use as provided for under the *Environmental Protection Act 1994*.
- (G7) The holder of this environmental authority must ensure that the coal seam gas water to be used for domestic or stock purposes meets the ANZECC 2000 Water Quality Guidelines, or subsequent versions thereof, for stock and domestic purposes.
- (G8) CSG water released to the environment in accordance with condition (G6) must not have any properties that could cause, nor contain any contaminants in concentrations that are capable of causing environmental harm.
- (G9) Where any inconsistency exists between the conditions of this environmental authority and the CWM Plan, the conditions of this environmental authority prevail.

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

Coal Seam Gas Water Use for Dust Suppression

- (G10) CSG water produced from the authorised petroleum activities may be used for dust suppression within tenures covered by this environmental authority, provided the water quality meets the limits specified in *Schedule G, Table 1 – Road Dust Suppression Water Contaminant Release Limits* for each of the water quality characteristics.

Schedule G, Table 1 – Road Dust Suppression Water Contaminant Release Limits.

Water Quality Characteristics	Unit	Limit	Limit Type
pH	pH Units	6.0 to 9.0	range
Total Suspended Solids	mg/L	30	maximum
Total Dissolved Solids	mg/L	2000	maximum
Total Petroleum Hydrocarbons	mg/L	10	maximum

(G11) Use of CSG water for dust suppression activities must be carried out in a manner that:

- (a) vegetation is not damaged;
- (b) soil erosion and soil structure damage is avoided;
- (c) there is no surface damming of the CSG water;
- (d) minimises deep drainage below the root zone of any vegetation;
- (e) quality of shallow aquifers is not adversely affected; and
- (f) there are no releases of CSG waters to any surface waters.

Salt Management

Brine Salt Reuse, Recycle or Off Site Disposal

(G12) Following cessation of petroleum activities, any residual brine or solid salt present in a CSG water dam must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste.

SCHEDULE H – REHABILITATION

(H1) The holder of this environmental authority must not abandon any **dam** but must decommission each **dam** so as to prevent and/or minimise any environmental harm.

(H2) As a minimum, decommissioning must be conducted such that each **dam** either:

- (a) becomes a **stable** landform similar to that of surrounding undisturbed areas, that no longer contains substances that will migrate into the environment to cause adverse impacts; or
- (b) is approved or authorised by the administering authority for use by the landholder following cessation of the petroleum activity(ies).

Rehabilitation of Pipeline Trenches

(H3) Pipelines trenches must be backfilled immediately after pipe laying and rehabilitated as soon as practicable but not longer than three months after completion.

(H4) During backfilling of pipeline trenches, soils must be replaced so that the soil horizons are consistent with the soils of the immediately surrounding area.

(H5) Backfilled and rehabilitated pipeline trenches must:

- (a) be a **stable** landform;
- (b) exhibit no subsidence or erosion gullies for at least five years; and
- (c) be re-profiled to a level consistent with surrounding soils; and

- (d) be re-profiled to original contours and established drainage lines; and
- (e) be visually consistent with the surround land features; and
- (f) be vegetated with floristic species composition found in immediately surrounding area(s).

Progressive Rehabilitation for Significantly Disturbed Areas

- (H6) Progressive rehabilitation of significantly disturbed areas caused by the carrying out of the petroleum activity(ies) that are not required for the ongoing conduct of the petroleum activity(ies) must commence as soon as practicable, but not longer than nine months following the completion of any construction or operational works associated with the petroleum activity(ies).
- (H7) Progressive rehabilitation of significantly disturbed areas caused by the carrying out of the petroleum activity(ies) must:
 - (a) remediate any contaminated land (e.g. contaminated soils, decommissioned dams containing salt);
 - (b) reshape all significantly disturbed land to a stable landform;
 - (c) reprofile all significantly disturbed land to original contours and to a level consistent with that of surrounding undisturbed areas;
 - (d) on all significantly disturbed land:
 - i. re-establish surface drainage lines;
 - ii. reinstate the top layer of the soil profile; and
 - iii. establish vegetation of floristic species composition found in immediately surrounding area(s);
 - (e) undertake rehabilitation in a manner such that any actual and potential acid sulfate soils in or on the site are either not disturbed, or submerged, or are treated to prevent and/or minimise environmental harm.

Final Acceptance Criteria for Significantly Disturbed Areas

- (H8) All significantly disturbed land caused by the carrying out of the petroleum activity(ies) must be rehabilitated to meet the following final acceptance criteria:
 - (a) all significantly disturbed land is reinstated to the pre-disturbed land use unless otherwise agreed to between the holder of this environmental authority, the landholder and the administering authority;
 - (b) all significantly disturbed land is reinstated to the pre-disturbed soil suitability class;
 - (c) the landform is safe for humans and fauna;
 - (d) the landform is stable with no subsidence or erosion gullies for at least five (5) years;
 - (e) the minimum percent foliage cover of immediate surrounding area is maintained in the rehabilitated sites for at least three years;
 - (f) a minimum of 80% of the flora species in the analogue sites is maintained in the rehabilitated sites for at least three years;
 - (g) salvage logs and fallen timber have been installed as habitat features at a density no lower than the analogue site (structures per hectare);
 - (h) erosion is minimised with appropriate sediment traps and erosion control measures installed as determined by a suitably qualified person;
 - (i) the water quality of any residual void or water bodies constructed by petroleum activity(ies) meets criteria for subsequent uses and does not have potential to cause environmental harm;
 - (j) there is no ongoing contamination to waters;

- (k) there is no ongoing contamination to groundwater from dams or monocells (demonstrated via groundwater monitoring and leak detection); and
 - (l) the maintenance requirements for rehabilitated land is no greater than that required for the land prior to its disturbance by petroleum activity(ies).
- (H9) Notwithstanding condition (H8), all buried pipelines must be decommissioned in accordance with the requirements of Australian Standard 2885.

SCHEDULE I – MONITORING PROGRAMS

General

- (11) The holder of this environmental authority must develop and implement a monitoring program, the result of which will demonstrate compliance with the conditions of this environmental authority.
- (12) All monitoring under this environmental authority must be conducted by a suitably qualified person.
- (13) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated, and operated and maintained effectively.
- (14) The method of water sampling required by this environmental authority must comply with the most recent edition of the Department of Environment and Resource Management – Water Quality Sampling Manual.
- (15) All determinations of water quality must be:
 - (a) performed by a person or body possessing appropriate experience and qualifications to perform the required measurements; and
 - (b) made in accordance with methods prescribed in the latest edition of the Department of Environment and Resource Management - Water Quality Sampling Manual; and
 - (c) carried out on representative samples.

Note: this condition requires the Monitoring and Sampling Manual – Environmental Protection (Water) Policy 2009 to be followed and where it is not followed because of exceptional circumstances this should be explained and reported with the results.

- (16) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has NATA certification for such analyses and tests, except as otherwise authorised by the administering authority.
- (17) If monitoring conducted in accordance with this environmental authority indicated a condition or contaminant level that has caused, or has potential to cause, environmental harm, the environmental authority holder must:
 - (d) as soon as is practicable, take the necessary actions to rectify the condition or contaminant level so as to avoid or minimise environmental harm; and
 - (e) notify the administering authority of the condition or contaminant level and the actions taken to rectify it.
- (18) Any management or monitoring plans, systems or programs required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended if required on an annual basis.

- (I9) The holder of this environmental authority must record, compile and keep for a minimum of five years all monitoring results required by this environmental authority and make available for inspection all or any of these records upon request by the administering authority.

Stimulation Monitoring

- (I10) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the quality of:
- (a) all active landholders' groundwater bores (subject to access being permitted by the landholder) that are:
 - (i) located within a one kilometre horizontal radius of a well subject to stimulation activity(ies); and
 - (ii) within 200 metres vertically of the target location for the stimulation activity(ies); and
 - (b) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the hydraulic stimulation risk assessment required by conditions (D30) and (D31).
- (I11) Prior to undertaking any stimulation activity(ies), the holder of this environmental authority must undertake a baseline well assessment of the quality of water in each well to be stimulated provided the formation has sufficient yield to produce a representative sample.
- (I12) The baseline bore and well assessments must include relevant parameters to be monitored in order to establish baseline water quality and must include, but not necessarily be limited to:
- (a) pH;
 - (b) electrical conductivity [$\mu\text{S}/\text{m}$];
 - (c) turbidity [NTU];
 - (d) total dissolved solids [mg/L];
 - (e) temperature [$^{\circ}\text{C}$];
 - (f) dissolved oxygen [mg/L];
 - (g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L];
 - (h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [mg/L];
 - (i) residual alkali [mg/L];
 - (j) sodium adsorption ratio (SAR);
 - (k) anions (bicarbonate, carbonate, hydroxide, chloride, fluoride, sulphate) [mg/L];
 - (l) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];
 - (m) dissolved and total metals (including but not necessarily being limited to: aluminium, arsenic III, cadmium, copper, iron, lead, manganese, mercury, nickel and zinc) [$\mu\text{g}/\text{L}$];
 - (n) total petroleum hydrocarbons [$\mu\text{g}/\text{L}$];
 - (o) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [$\mu\text{g}/\text{L}$];
 - (p) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [$\mu\text{g}/\text{L}$];
 - (q) sodium hypochlorite [mg/L];
 - (r) sodium hydroxide [mg/L];
 - (s) formaldehyde [mg/L];
 - (t) ethanol [mg/L]; and
 - (u) gross alpha radiation [Bq/L].
- (I13) A Stimulation Impact Monitoring Program which has been certified by a suitably qualified person must be developed prior to the carrying out of stimulation activities.
- (I14) The Stimulation Impact Monitoring Program must be able to detect adverse impacts to water quality from stimulation activities and must include, but not necessarily be limited to:
- (a) consideration of the findings of the risk assessment required by conditions (D30) and (D31) that relate to stimulation activities; and

- (b) provision of monitoring for relevant analytes that will enable detection of adverse impacts from the stimulation activity(ies) including chemical compounds that are actually or potentially formed by chemical reactions with each other or coal seam materials during the stimulation activity(ies); and
 - (c) provision of monitoring of the quality of stimulation fluids, coal seam gas water produced from every stimulated well and landholders bores for parameters relevant to baseline bore and well assessments to enable data referencing and comparison which is to include, but not necessarily be limited to the parameters in condition (I13)(a) – (I13)(t).
- (I15) The Stimulation Impact Monitoring Program must provide for the analysis of the quality and quantity of stimulation fluids to be used for the stimulation event at least once prior to undertaking the stimulation activity. Quality monitoring must include, but not be necessarily limited to, the parameters in condition (I12)(a) – (I12)(t).
- (I16) The Stimulation Impact Monitoring Program must provide for monitoring of the quantity and quality of coal seam gas water produced from every stimulated well after stimulation but prior to its containment for the parameters including, but not necessarily limited to, those in condition (I13)(a) – (I13)(t) at a minimum frequency of:
- (a) daily or in 15% increments of produced fluid until a volume of coal seam gas water equivalent to 150% of the stimulation fluid volume used in the stimulation activity has been pumped out of the stimulated well; and
 - (b) monthly thereafter for six months or until parameters listed in condition (I12)(b), (I12)(n) – (I13)(t) and where applicable to stimulation activities, condition (I12)(u), are not detected in concentrations above baseline well monitoring data on two consecutive monitoring occasions.
- (I17) The Stimulation Impact Monitoring Program must provide for impact monitoring of the quality of water, for the for the parameters including, but not necessarily limited to, those in Condition (I12)(a) – (I12)(t), in:
- (a) all active landholders' groundwater bores (subject to access being permitted by the landholder that are located:
 - (i). within a one kilometre horizontal radius of a well subject to stimulation activity(ies); and
 - (ii). within 200 metres vertically of the target location for the stimulation activity(ies); and
 - (b) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings risk assessment required by conditions (D30) and (D31).
- (I18) The monitoring of bores required by condition (I17) must be carried out at least:
- (a) monthly for the first six months subsequent to the stimulation activity(ies) being undertaken; then
 - (b) annually for the first five years subsequent to the stimulation activity(ies) being undertaken or until analytes listed in Condition (I12)(b), (I12)(n) – (12)(t) and where applicable to stimulation activities, Condition (I12)(u), are not detected in concentrations above baseline bore monitoring data on two consecutive monitoring occasions.

Note: Monthly monitoring required by condition (I19)(a) may extend beyond six months depending on the outcomes of the risk assessment and the transmissivity of groundwater in the area.

- (I19) Notwithstanding conditions (I14) – (I17), the Stimulation Impact Monitoring Program must provide for monitoring of gross alpha radiation in stimulation fluids, coal seam gas water produced from the stimulated well and in landholders bores as per condition (I17) when radioactive tracers are used in the stimulation activity.
- (I20) The holder of this environmental authority must implement the Stimulation Impact Monitoring Program.

- (I21) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

Groundwater Monitoring

- (I22) The holder of this environmental authority must prepare and implement a groundwater monitoring program within 40 business days of this environmental authority taking effect.
- (I23) The groundwater monitoring program must be developed and implemented by a person possessing appropriate qualifications and experience in the fields of hydrogeology and groundwater sampling design.
- (I24) The groundwater monitoring program must be able to detect any significant risks and changes to groundwater quality caused by petroleum activity(ies) authorised under this environmental authority. As a minimum the program must include:
- (a) a groundwater monitoring network designed and installed for the petroleum activities; and
 - (b) a sufficient number of monitoring sites to provide information on the following:
 - (i) seepage to groundwater and surrounding soils from any regulated dam authorised under this environmental authority and its effect on groundwater and soils;
 - (ii) background monitoring sites (i.e. groundwater quality in representative bore(s) that have not been affected by the activities authorised under this environmental authority).
 - (iii) baseline monitoring and data capture intent prior to the conducting of proposed petroleum activity(ies).
 - (c) the location of monitoring points, parameters to be measured, frequency of monitoring, monitoring methodology used, trigger values; and
 - (d) the development of procedures to establish background ground water quality.
- (I25) The groundwater monitoring program must provide for monitoring of groundwater quality as often as necessary to detect impacts of the petroleum activities authorised under this environmental authority, but not less frequently than biannually (every six months) for the first year of carrying out the petroleum activities and annually thereafter.
- (I26) If groundwater contamination caused by the petroleum activities is encountered, the following must be considered to satisfy requirements under condition (I28).
- (a) the level of environmental harm caused as a result of such contamination to soils and groundwater;
 - (b) the conduct of a geodetic survey of all monitoring bores to determine the relative water surface elevations of each bore and reported in metres relative to the Australian Height Datum; and
 - (c) the determination of groundwater flow direction, groundwater flow rate and hydraulic conductivity.
- (I27) The holder of this environmental authority must ensure that the groundwater monitoring data gathered in accordance with this environmental authority is analysed and interpreted to assess the nature and extent of any environmental impact of the environmentally relevant activity. The data, analysis and assessment must be submitted to the administering authority with each Annual Return.
- (I28) If groundwater monitoring indicates that any significant changes in groundwater quality caused by petroleum activities are detected, then information must be submitted to the administering authority within 10 business days of receipt of the analysis indicating these changes, including any proposed actions to mitigate the changes in groundwater quality.

Air Monitoring (Point Source)

- (I29) The holder of this environmental authority must conduct a monitoring program of contaminants released to the atmosphere at each release point recorded in the Register of Fuel Burning or Combustion Equipment (condition (F5)) for the contaminants listed in *Schedule F, Table 1 – Maximum Ground Level Concentration Criteria* and at the frequencies specified in *Schedule I, Table 1 – Monitoring Frequency of Contaminants*.

Schedule I, Table 1 – Monitoring Frequency for Contaminants

Contaminant	Monitoring frequency
NOx as Nitrogen Dioxide	During commissioning of the plant, twice a year for the first two (2) years of operation and then annually thereafter
Carbon monoxide	

- (I30) The monitoring program must comply with the following:
- (a) Monitoring provisions for the release points must comply with the most recent edition of AS4323.1 Stationary source emissions method 1: Selection of sampling provisions.
 - (b) The following tests must be performed for each sample taken at each release point specified in the Register of Fuel Burning or Combustion Equipment (condition F5):
 - i. Gas velocity, volume and mass flow rate.
 - ii. Temperature.
 - iii. Water vapour concentration (for non-continuous sampling).
 - (c) Samples taken must be representative of the contaminants discharged when operating under maximum operating conditions.
 - (d) During the sampling period the following additional information must be gathered:
 - i. Production rate.
 - ii. Plant status.
 - (e) Monitoring of contaminant release must be carried out in accordance with the latest edition of the administering authority's Air Quality Sampling Manual.

Noise Monitoring

- (I31) The holder of this environmental authority must undertake noise monitoring when requested by the administering authority to investigate a complaint of environmental nuisance at a sensitive or commercial place within the reasonable and practicable timeframe nominated by the administering authority, and report the results to the administering authority within three business days of completion of the monitoring.
- (I32) Noise monitoring and recording must include the following descriptor, characteristics and matters:
- (a) $L_{AN,T}$ (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins);
 - (b) background noise $L_{A90,T}$;
 - (c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels;
 - (d) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (e) effects due to any extraneous factors such as traffic noise;
 - (f) location, date and time of monitoring;
 - (g) if the complaint concerns low frequency noise, $Max L_{PZ,15 min}$; and
 - (h) 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.
- (I33) The method of measurement and reporting of noise levels and background sound pressure levels must comply with the latest edition of the administering authority's Noise Measurement

Manual or the most recent version of AS1055 Acoustics – description and measurement of environmental noise.

Nuisance Monitoring (other than Noise)

- (I34) When the administering authority advises the holder of this environmental authority of a complaint alleging nuisance other than noise, the holder must investigate the complaint and advise the administering authority in writing of the action proposed or undertaken to resolve the complaint.
- (I35) When requested by the administering authority, the holder of this environmental authority must undertake monitoring as specified by the administering authority, within a reasonable and practical timeframe nominated by the administering authority to investigate any complaint of environmental harm at any sensitive or commercial place.
- (I36) The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures implemented must be provided to the administering authority within 10 business days of completion of the investigation, or receipt of the monitoring results, whichever is the latter.
- (I37) If monitoring in accordance with condition (I35) and (I36) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then the holder of this environmental authority must:
 - (a) address the complaint including the use of alternative dispute resolution services if required; and/or
 - (b) as soon as practicable implement abatement or attenuation measures so that light, dust, particulate or odour emissions from the authorised activities do not result in further environmental nuisance.

SCHEDULE J – COMMUNITY ISSUES

- (J1) The holder of this environmental authority must maintain a record of complaints and incidents causing environmental harm, and actions taken in response to the complaint or incident.
- (J2) 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.
- (J3) The holder of this environmental authority must retain the record of complaints required by this condition for five years.

SCHEDULE K - NOTIFICATION PROCEDURES

- (K1) In addition to the requirements under Chapter 7, Part 1, Division 2 of the *Environmental Protection Act 1994*, the administering authority must be notified through the Pollution Hotline and in writing, as soon as possible, but within 48 hours of becoming aware of any of the following events:
 - (a) any unauthorised significant disturbance to land



- (b) potential or actual loss of structural or hydraulic integrity of a dam
 - (c) when the level of the contents of any regulated dam reaches the mandatory reporting level
 - (d) when a regulated dam will not have available storage to meet the design storage allowance on 1 November of any year
 - (e) potential or actual loss of well integrity
 - (f) unauthorised releases of any volume of prescribed contaminants to waters
 - (g) unauthorised releases of volumes of contaminants, in any mixture, to land 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 untreated coal seam gas water; or
 - vi. 5 000 L of raw sewage; or
 - vii. 10 000 L of treated sewage effluent.
 - (h) the use of restricted stimulation fluids
 - (i) groundwater monitoring results from a landholder's active groundwater bore monitored under the stimulation impact monitoring program which is a 10% or greater increase from a previous baseline value for that bore and which renders the water unfit for its intended use
 - (j) monitoring results where two out of any five consecutive samples do not comply with the relevant limits in the environmental authority.
- (K2) As soon as practicable, but not more than six weeks following the conduct of any environmental monitoring performed in relation to the emergency or incident, which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority, a written report on the results of any such monitoring must be provided to the administering authority.

SCHEDULE L – DEFINITIONS

Note: Where a term is not defined in this environmental authority the definition in the Environmental Protection Act 1994, its regulations and Environmental Protection Policies or the Petroleum and Gas (Production and Safety) Act 2004 and its regulations must be used in that order.

Term	Definition
active	for the purposes of landholders' groundwater bores means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use.
aggregation dam	means a dam that is used to aggregate and contain CSG water or CSG water concentrate prior to use, treatment or disposal of that water (by means other than evaporation). The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.
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.
associated works	in relation to a dam, means: • operations of any kind and all things constructed, erected or installed for that dam; and • any land used for those operations.
background noise level	means the sound pressure level, measured in the absence of the noise under investigation, as the 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.
beds and banks	for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.
beneficial use	means • with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is: ◦ of benefit to that owner in that it adds real value to their business or to the general community ◦ in accordance with relevant provisions of the <i>Environmental Protection Act 1994</i> ◦ sustainable by virtue of written undertakings given by that owner to maintain that dam; and ◦ the transfer and use have been approved or authorised under any relevant legislation; Or • with respect to coal seam gas water, refer to the Queensland Government Operational Policy - Management of water produced in association with petroleum activities and Notice of decision to approve a resource for beneficial use – CSG water as amended from time to time which can be accessed on the Department of Environment and Heritage Protection website at www.ehp.qld.gov.au.
brine	means either saline water with a total dissolved solid concentration greater than 40 000mg/l or CSG water after it has been concentrated through water treatment processes and/or evaporation.
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

Term	Definition
	perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or bunded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.
Category A Environmental Sensitive Area	means any area listed in Section 12, Part 1, section 1 of the Environmental Protection Regulation 2008.
Category B Environmentally Sensitive Area	means any area listed in Section 12, Part 1, section 2 of the Environmental Protection Regulation 2008.
Category C Environmentally Sensitive Area	means any of the following areas: • nature refuges as defined in the conservation agreement for that refuge under <i>the Nature Conservation Act 1992</i> • koala habitat areas as defined under the Nature Conservation (Koala) Conservation Plan 2006 • state forests or timber reserves as defined under the <i>Forestry Act 1959</i> • regional parks (previously known as resource reserves) under the <i>Nature Conservation Act 1992</i> • an area validated as 'essential habitat' or 'essential regrowth habitat' from ground-truthing surveys in accordance with the <i>Vegetation Management Act 1999</i> for a species of wildlife listed as endangered or vulnerable under the <i>Nature Conservation Act 1992</i> • 'of concern regional ecosystems' that are remnant vegetation and identified in the database 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 or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time • exactly what is being certified and the precise nature of that certification. • the relevant legislative, regulatory and technical criteria on which the certification has been based; • the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and • the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.
certified by a suitably qualified and experienced person in relation to a hazard assessment of a dam	means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time: • exactly what has been assessed and the precise nature of that assessment; • the relevant legislative, regulatory and technical criteria on which the assessment has been based; • the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

Term	Definition
clearing	means: - in relation to grass, scrub or bush—the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include— - the flattening or compaction of vegetation by vehicles if the vegetation remains living; or - the slashing or mowing of vegetation to facilitate access tracks; or - the clearing of noxious or introduced plant species; and - in relation to trees—cutting down, ringbarking, pushing over, poisoning or destroying in any way.
commercial place	means a work place used as an office or for business or commercial purposes, which is not part of the petroleum activities and does not include employees accommodation or public roads.
construction	in relation to a dam includes building a new dam and modifying or lifting an existing dam.
CSG water	means groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production. CSG water typically contains significant concentrations of salts, has a high sodium adsorption ratio (SAR) and may contain other contaminants that have the potential to cause environmental harm if released to land or waters through inappropriate management. CSG water is a waste, as defined under s13 of the EP Act.
CSG water concentrate	is the concentration of saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000mg/L.
CSG evaporation dams	is defined as an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.
dam	means a land-based structure or a void that is designed to contain, divert or control flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does <i>not</i> 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.
design plan	means 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.
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; or (c) identified by an approved salinity hazard map held by the Department of Environment and Heritage protection.
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 activities such as rehabilitation. In other words, it does not refer to the 'completion' of the petroleum activity, 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	means an equivalent person under volume 1, section 2 of the Planning guidelines for

Term	Definition
or EP	water supply and sewerage, Department of Energy and Water Supply, March 2014.
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.
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.
foreseeable future	means the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptably low probability of failure before that time.
hazard	in relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.
hazard category	In relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.
heritage place	means any place that may be of cultural heritage significance, or any place with potential to contain archaeological artefacts that are an important source of information about Queensland's history.
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.
highly erodible soils	means very unstable soils that are generally described as Sodosols with hard – setting, fine sandy loam to silty clay loam surfaces (solodics, solodised, and solonetz) or soils with a dispersible layer located less than 25cm deep or soils less than 25cm deep.
hydraulic performance	means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the Manual for assessing consequence categories and hydraulic performance of structures (EM635).
impulsive sound	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 water storage dams, roads and tracks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activities, but does not include other facilities required for the long term management of the impact of those 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.
itinerant activities	means activities that are carried out at various locations using transportable plant or equipment and carried out at one location and for less than 14 consecutive days and on more than two occasions in each calendar year.
lake	means: (a) a lagoon, swamp or other natural collection of water, whether permanent or intermittent; and (b) the bed and banks and any other element confining or containing the water.
landfill monocell	means a specialised, isolated landfill facility where a single specific waste type is exclusively disposed (i.e. salt).
leachate	means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of on site which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

Term	Definition
levee	means a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or flowable substances at any other times.
limited petroleum activities	mean activities including geophysical surveys (including seismic activities), well sites, well pads, sumps, flare pits, flow lines and supporting access tracks. Limited petroleum activities do not include the construction of production infrastructure for processing or storing petroleum or by-products, dams, compressor stations, campsites/workforce accommodation, power supplies, waste disposal or other supporting infrastructure for the project.
material impact	means an increase in concentration of a chemical of >10% above background, detection of a chemical that was not present in the background sample or a chemical present at a concentration in excess of drinking water quality guidelines.
max L _{PZ} , 15min	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
mg/L	means milligrams per litre.
overland flow water	means water, including floodwater, flowing over land, otherwise than in a watercourse or lake: • after having fallen as rain or in any other way; or • after rising to the surface naturally from underground.
permanent infrastructure	includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc), which is to be left by agreement with the landowner.
pest	means species: (a) declared under the <i>Land Protection (Pest and Stock route Management) Act 2002</i>; (b) declared under Local Government model local laws; and (c) which may become invasive in the future
programmed and approved	means when the location of infrastructure has been approved by the authorised person(s) with the organisation(s).
regulated dam	means any dam in the significant or high hazard category as assessed using the Manual for assessing consequence Categories and Hydraulic Performance of Structures or any updated version of the Manual that becomes available 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 area of remnant vegetation representative of a single Regional Ecosystem type or a single heterogeneous unit (multiple Regional Ecosystem types that cannot be distinguished individually due to the scale of mapping).
restricted stimulation fluids	means restricted stimulation fluids as defined in the <i>Environmental Protection Regulation 2008</i> , or where it is not defined, means a fluid(s) used for the purpose of stimulation, including fracturing, that contain, produce or are likely to produce the following chemicals above the following concentrations: • Benzene 1 part per billion (ppb); • Toluene 180 ppb; • Ethylbenzene 80 ppb; • o-xylene 350 ppb • m-xylene 75 ppb • p-xylene 200ppb
River Improvement Trust Area	means an area within a River Improvement Area declared under the <i>River Improvement Trust Act 1940</i> that is or has been subject to restoration or flood mitigation works. The locations and details of these areas can be obtained from the relevant River Improvement Trust.

Term	Definition
sensitive place	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or • a library, childcare centre, kindergarten, school, university or other educational institution; • a medical centre, surgery or hospital; or • a protected area; or • a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment; or a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads.
significantly disturbed land or significant disturbance to land	means disturbance to land as defined in schedule 12, section 4 of the Environmental Protection Regulation 2008.
site	means the petroleum authority(ies) to which the environmental authority relates.
spring	means the land to which water rises naturally from below the ground and the land over which the water then flows.
stable	in relation to land, means landform dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.
state heritage place	means a place entered in the Queensland heritage register under Part 4 of the <i>Queensland Heritage Act 1992</i> .
stimulation	means a technique used to increase the permeability of a natural underground reservoir, including, for example, hydraulic fracturing, cavitations, fracture acidising and the use of proppant treatments.
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 dams	means one who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the <i>Professional Engineers Act 1988</i>, OR registered as a National Professional Engineer (NPER) with the Institution of Engineers Australia, OR holds equivalent professional qualifications to the satisfaction of the administering authority for the Act; AND the administering authority for the Act is satisfied that person has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below: • knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impacts of dams; and • a total of five years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry, and • a total of five years of suitable experience and demonstrated expertise each, in three of the following categories: ◦ investigation and design of dams. ◦ Construction, operation and maintenance of dams. ◦ hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology. ◦ hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes.

Term	Definition
	◦ hydrogeology with particular reference to seepage, groundwater. ◦ solute transport processes and monitoring thereof. ◦ dam safety.
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 activities 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. For example 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. For example, 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 300mm in depth from the natural surface.
valid complaint	means a complaint the administering authority considers is not frivolous, nor vexatious, nor based on mistaken belief.
void	means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).
waters	includes all or any part of a creek, river, stream, lake, lagoon, dam, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
watercourse	means a river, creek or stream in which water flows permanently or intermittently: (a) in a natural channel, whether artificially improved or not; or (b) in an artificial channel that has changed the course of the watercourse; but, in any case, only: (c) unless a regulation under paragraph (d), (e) or (f) declares otherwise-at every place upstream of the point (point A) to which the high spring tide ordinarily flows and reflows, whether due to a natural cause or to an artificial barrier; or (d) if a regulation has declared an upstream limit for the watercourse-the part of the river, creek or stream between the upstream limit and point A; or (e) if a regulation has declared a downstream limit for the watercourse-the part of the river, creek or stream upstream of the limit; or (f) if a regulation has declared an upstream and a downstream limit for the watercourse-the part of the river, creek or stream between the upstream and the downstream limits. (g) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
wetland	means an area shown as a wetland on a 'Map of referable wetlands', a document approved by the chief executive (environment). A map of referable wetlands can be viewed at www.ehp.qld.gov.au
80 th percentile release limits	means that not more than one of the measured values is to exceed the stated release limit for any five consecutive samples where: (1) the consecutive samples are taken over a five month period; and (2) the consecutive samples are taken at approximately equal periods.

END OF PERMIT