

This environmental authority is issued by the administering authority under section 715B of the *Environmental Protection Act 1994*.

Permit¹ number: EPPG00746913

Environmental authority takes effect 21 September 2015

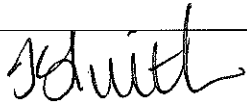
The anniversary date of this environmental authority is **7 August**.

An annual return and the payment of the annual fee will be due each year on this day.

The environmental authority is subject to the attached schedules of conditions.

Environmental authority holder(s)	Registered address
Eoil Pty Limited ACN: 063 477 369	22 Walker Street TOWNSVILLE QLD 4810

Environmentally Relevant Activity(ies)	Relevant Tenure
Resource activity that is a petroleum activity	Authority to Prospect (ATP) 662



Signature

Kimberley Shaw
Delegate of the administering authority
Environmental Protection Act 1994

21 September 2015

Date

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¹Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Department of Environment and Heritage Protection.

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 environmental 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 and notifiable activities

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.

Responsibilities under the *Environmental Protection Act 1994*

Separate to the requirements of standard conditions, the holder of the environmental authority must also meet their obligations under the *Environmental Protection Act 1994*, and the regulations made under that Act. For example, the holder must be aware of the following provisions of the *Environmental Protection Act 1994*.

General environmental duty

Section 319 of the *Environmental Protection Act 1994* states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of the successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty, however maintaining your general environmental duty is a defence against the following acts:

- (a) an act that causes serious or material environmental harm or an environmental nuisance
- (b) an act that contravenes a noise standard
- (c) a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

More information is available on the Department of Environment and Heritage Protection website www.ehp.qld.gov.au.

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Duty to notify

Section 320 of the *Environmental Protection Act 1994* explains the duty to notify. The duty to notify applies to all persons and requires a person or company to give notice where serious or material environmental harm is caused or threatened. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

The duty to notify arises where:

- a person carries out activities or becomes aware of an act of another person arising from or connected to those activities which causes or threatens serious or material environmental harm
- while carrying out activities a person becomes aware of the happening of one or both of the following events:
 - the activity negatively affects (or is reasonably likely to negatively affect) the water quality of an aquifer
 - the activity has caused the unauthorised connection of 2 or more aquifers.

For more information on the duty to notify requirements refer to the guideline *Duty to notify of environmental harm (EM467)*.

Some Relevant Offences under the *Environmental Protection Act 1994*

Non-compliance with a condition of an environmental authority (section 430)

Section 430 of the *Environmental Protection Act 1994* requires that a person who is the holder of, or is acting under an environmental authority must not wilfully contravene, or contravene a condition of the environmental authority.

Environmental authority holder responsible for ensuring conditions complied with (section 431)

Section 431 of the *Environmental Protection Act 1994* requires that the holder of an environmental authority must ensure everyone acting under the environmental authority complies with the conditions of the environmental authority. If another person acting under the environmental authority commits an offence against section 430, the holder also commits an offence, namely, the offence of failing to ensure the other person complies with the conditions.

Causing serious or material environmental harm (sections 437–39)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

Causing environmental nuisance (section 440)

Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

Depositing a prescribed water contaminant in waters (section 440ZG)

Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the *Environmental Protection Act 1994*.

It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

Placing a contaminant where environmental harm or nuisance may be caused (section 443)

A person must not cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance.

Some Relevant Offences under the *Waste Reduction and Recycling Act 2011*

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200 L or more) at a place. Illegal dumping can also include abandoned vehicles.

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 Supply (Safety and Reliability) Act 2008*
- *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.

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This environmental authority consists of the following Schedules:

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SCHEDULE A – GENERAL CONDITIONS

Authorised 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 Conventional Gas Activities, Conventional Oil Activities, Shale Gas Activities, Shale Oil Activities, and Tight Gas Activities for each petroleum tenure.

Schedule A, Table 1 – Authorised Conventional Gas Activities, Conventional Oil Activities, Shale Gas Activities, Shale Oil Activities, and Tight Gas Activities

Resource Authority Number	Petroleum Activity	Number of Existing Petroleum activities	Number of Proposed Petroleum activities	Maximum size (where applicable)
	Seismic (kilometres)	0	500 km 2D or 200 sq km 3D	500 km 2D or 200 sq km 3D
	- Exploration Wells (indicative)	0	1	1ha
	- Appraisal Wells (indicative)	0		
	Sump	0	1	2 ML
	Turkeys Nest	0	1	0.5 ML
	Sewage Treatment Plants	0	1	<21 EP
	Accommodation (Permanent and Temporary)	0	1	1ha
	Borrow Pits	0	50	<5000 tonne

Operational Plan

- (A2) At least two (2) months prior to carrying out any petroleum activity(ies), an Operational Plan must be developed and submitted to the administering authority that provides detailed information about the petroleum activity(ies) to be carried out under this environmental authority.
- (A3) The petroleum activity(ies) identified in the Operational Plan must set out the maximum scope of the petroleum activity(ies).
- (A4) The Operational Plan must include, but not be limited to:
- (a) a stated period for the Operational Plan which is at least one (1) year but does not exceed three (3) years duration and which specifies an end date;
 - (b) a description of the existing and all proposed petroleum activities under the period of the Operational Plan;
 - (c) a map or series of maps that:
 - (i) record the location of all infrastructure and its unique reference name / number that exists at the commencement of the period of the Operational Plan, including but not necessarily being limited to:
 - (a) low hazard dams;
 - (b) exploration, appraisal and development wells;

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- (c) power lines;
 - (d) sewage treatment plants and any associated irrigation / disposal areas;
 - (e) tracks and roads.
 - (ii) show the location of all programmed and approved infrastructure that will be developed during the period of the Operational Plan, including the items listed under condition A4(c)(i) and their unique reference name / number, if applicable;
 - (iii) show major environmental features such as waters, sensitive places and environmentally sensitive areas; and
 - (d) spatial datasets (GIS) which depict those requirements under condition A4(c)(i), A4(c)(ii) and A4(c)(iii) in shapefile format.
- (A5) The Operational Plan must contain a record of significant disturbance to land as a result of existing and programmed and approved infrastructure during the period of the Operational Plan, which must include, but not necessarily be limited to the following:
- (a) as at the commencement of the Operational Plan period:
 - (i) minimum undisturbed area;
 - (ii) maximum existing disturbed area;
 - (iii) total areas(s) of disturbance to the primary protection zone of, and within Category A, B and C Environmentally Sensitive Areas by area type (e.g. Of concern RE, Endangered RE, State Forest);
 - (iv) total areas(s) of disturbance to State Significant Biodiversity Values;
 - (v) total area(s) of disturbance to in high value regrowth and remnant vegetation areas that are not environmentally sensitive areas; and
 - (vi) total area(s) rehabilitated;
 - (vii) identification of rehabilitated areas by category (e.g. age, status);
 - (viii) maps showing rehabilitated areas by category;
 - (ix) the results of the Rehabilitation Monitoring Program undertaken on rehabilitation carried out under the previous Operational Plan(s) and an assessment in relation to the requirements and acceptance criteria set out in this environmental authority; and
 - (b) programmed and approved infrastructure for the current Operational Plan period:
 - (i) maximum area(s) to be disturbed;
 - (ii) a description of each area(s) to be disturbed including tenure, coordinates, general site characteristics and disturbance types (e.g. well lease, flow lines, access track);
 - (iii) existing land use(s) of each area(s) to be disturbed; and
 - (iv) forecasted total area to be rehabilitated for the period of the Operational Plan.
- (A6) The Operational Plan must include a calculation of financial assurance for the maximum proposed and existing disturbance during the period of the Operational Plan.
- (A7) The commencement of the first Operational Plan period is 7 November 2012.
- (A9) A subsequent Operational Plan must be submitted to the administering authority not less than 20 business days prior to the expiry of the current Operational Plan

Contingency Plan for Emergency Environmental Incidents

- (A10) A Contingency Plan for Emergency Environmental Incidents must be developed prior to the carrying out of the petroleum activity(ies).

- (A11) The Contingency Plan for Emergency Environmental Incidents must include, but not necessarily be limited to:
- (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (b) identification of the types of environmental incidents that may occur, including but not limited to flooding impacts, relevant to the petroleum activity(ies) authorised to be carried out under this environmental authority;
 - (c) response procedures to be implemented to prevent or minimise the risk of environmental harm arising from environmental emergency incidents;
 - (d) response procedures to minimise the extent and duration of environment or mitigate any environmental harm caused;
 - (e) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;
 - (f) communication procedures and lines of communication within and beyond the organisation, including but not limited to Local Government, to be employed in responding to environmental emergency incidents;
 - (g) the resources to be used in response to environmental emergency incidents;
 - (h) procedures to investigate the cause of any incidents including releases or near misses, and where necessary, the remedial actions to be implemented to reduce the likelihood of recurrence of similar events;
 - (i) procedures for responding to incidents resulting from hydraulic fracturing activities, including specific rectification measures in the event of non-routine hydraulic fracturing events;
 - (j) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;
 - (k) procedures to avoid / minimise discharges resulting from any overtopping or loss of structural integrity of a dam;
 - (l) a receiving environment monitoring program, to be specifically implemented in the event of a release to waters or land to examine / assess environmental impacts. For monitoring of waters, this program must include upstream, downstream and impact site monitoring procedures. For soils monitoring, three replicate samples must be taken at depth intervals of 0-10 cm, 20-30 cm and 50-60 cm at both a reference site and the impact site as a minimum;
 - (m) the provision and availability of documented procedures to staff attending any emergency environmental incident to enable them to effectively respond;
 - (n) training of staff that will be called upon to respond to emergency environmental incidents to enable them to effectively respond;
 - (o) timely and accurate reporting of the circumstance and nature of emergency environmental incidents to the administering authority and any affected landholder, occupier and / or their nominated representative in accordance with conditions of this environmental authority; and
 - (p) procedures for accessing monitoring locations during emergency environmental incidents.
- (A12) The Contingency Plan for Emergency Environmental Incidents must be implemented.

Maintenance of Measures, Plant and Equipment

- (A13) 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.
- (A14) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration materially increases, or is likely to increase, the environmental harm caused by the petroleum activity(ies).

Monitoring

- (A15) All monitoring required under this environmental authority must be undertaken by a suitably qualified person.
- (A16) All plans and monitoring programs required under this environmental authority must be prepared and certified by a suitably qualified person.
- (A17) All monitoring and inspections carried out under the monitoring program and any actions taken must be documented.
- (A18) Records of all monitoring results and data must be kept for a minimum of seven (7) years.
- (A19) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated, operated and maintained effectively in accordance with the manufacturer's specifications.
- (A20) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has NATA accreditation for such analyses and tests, except as otherwise authorised by the administering authority.

SCHEDULE B – WATER

Contaminant Release

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

Sewage Treatment Works

- (B2) Sewage effluent must not be directly or indirectly released to any land or waters

Resource activities in wetlands, watercourses, lakes and springs

- (B3) Petroleum activities conducted in the former special floodplain management area and in the former high preservation area within the **designated precinct**, as identified in Appendix A – Map 1, must be in accordance with conditions (B4) – (B15).
- (B4) With the exception of activities carried out for **specified works** and temporary campsites/workforce accommodation, only limited petroleum activities are permitted in the designated precinct.
- (B5) Specified works in the designated precinct must be co-located to the greatest possible extent.
- (B6) Specified works must not be constructed across a watercourse in the designated precinct, or across *Carbine Creek* where an alternative watercourse crossing is already in existence and is within a reasonable distance.
- (B7) Limited petroleum activities and temporary campsites/workforce accommodation in the designated precinct must not increase the natural movement of sediment beyond the work area and must not increase the delivery of sediment to water either during or following construction activities.
- (B8) Limited petroleum activities and temporary campsites/workforce accommodation in the designated precinct must not:
- (a) concentrate flood flows in a way that will or may cause or threaten an adverse impact on the natural values in wetlands, watercourses, lakes and springs; or
 - (b) divert flood flows from natural drainage paths; or
 - (c) increase the local duration of floods; or
 - (d) increase the risk of detaining flood flows.
- (B9) Within the designated precinct, limited petroleum activities and specified works carried out within the bed and banks of a watercourse, wetland, lake or spring must:
- (a) not result in disturbance to the bed and banks of a watercourse, wetland, lake or spring beyond the minimum area necessary for the purpose of the disturbance; and
 - (b) be designed and undertaken by a suitably qualified person taking into account the matters listed in the 'Planning Activities' and 'Impact Management During Activities' sections of the administering authority's 'Guideline—Activities in a watercourse, lake or spring associated with mining operations' December 2010, as amended from time to time.
- (B10) Upon cessation of the works described above (Condition B9), rehabilitation must commence immediately.
- (B11) The size of any temporary campsites/workforce accommodation in the designated precinct is limited to 2250m² and no more than 30 people are accommodated at any time.
- (B12) Petroleum activities (other than activities carried out for specified works) must not occur within –
- (a) 200 lateral metres of a watercourse, lake or spring that is in the designated precinct; or

- (b) 100 lateral metres of *Carbine Creek*.
- (B13) For activities carried out for pipelines or flow lines in the designated precinct:
 - (a) any interference with overland flow and the potential for any interference with overland flow, must be temporary; and
 - (b) works must be planned in such a way as to minimise the potential for, and duration of, interference with overland flow;
 - (c) the activities must not interfere with water in a watercourse, lake or spring (other than activities that are of a temporary nature); and
 - (d) the activities must not interfere with water in *Carbine Creek* (other than activities that are of a temporary nature).
- (B14) Temporary campsites/workforce accommodation and infrastructure necessary to support their operation, are permitted within the designated precinct provided that they do not occur within 200 lateral metres of a watercourse, lake or spring in the designated precinct.
- (B15) Specified works must not be constructed across a watercourse in the designated precinct or across *Carbine Creek* where an alternative watercourse crossing is already in existence and is within a reasonable distance.

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SCHEDULE C – DAMS

(C1) Regulated structures are not permitted.

Assessment of Hazard Category

- (C2) The hazard category of any structure must be assessed by a suitably qualified and experienced person in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C3) The hazard assessment required under condition (C2) must occur in any of the following situations:
- (a) prior to the design and construction of the structure;
 - (b) prior to any change in its purpose or its stored contents;
- (C4) A hazard assessment report and certification must be prepared for any structure assessed and the report may include a hazard assessment for more than one structure.
- (C5) On receipt, one paper copy and one electronic copy of the hazard assessment report and certification must be provided to the administering authority
- (C6) All certifications must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.

Construction of Low Hazard Dam to Contain Wetting Front

- (C7) Where a dam is assessed as low hazard, it must be
- (a) constructed, operated and maintained in accordance with accepted engineering standards currently appropriate for the purpose for which the dam is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation.
- (C8) In the event of early signs of loss of structural or hydrological integrity of a low hazard dam:
- (a) immediate action to prevent or minimise any actual or potential environmental harm must be taken; and
 - (b) any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Hazard Dams

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

Repair requirements

- (C10) Where any passage of the wetting front through the floor or sides of a low hazard dam is detected, action must be taken as soon as practicable to:
- (a) repair the dam to rectify the detected passage of the wetting front or entrained contaminants through the floor or sides of the dam; or
 - (b) decommission and rehabilitate the dam.

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Decommissioning

(C11) Dams must not be abandoned but be either:

- (a) decommissioned and rehabilitated to achieve compliance with condition (H6); or
- (b) be left in-situ for a beneficial use provided that it:
 - (i) no longer contains contaminants that will migrate in to the environment; and
 - (ii) the administering authority and the landholder agree in writing that the dam will be used by the landholder following the cessation of the petroleum activity(ies).

SCHEDULE D – LAND

Contaminated Releases

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

Soil Management

- (D2) Except in areas of highly erodible soils, top soil must be:
- (a) removed from an area prior to other significant disturbance commencing in the area;
 - (b) stockpiled in a manner that will minimise erosion and preserve its biological and chemical integrity; and
 - (c) used only for on-site rehabilitation purposes.
- (D3) Highly erodible soils must not be disturbed as a result of the carrying out of the petroleum activity(ies).

Chemical Storage

- (D4) 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.
- (D5) 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.
- (D6) Where no relevant Australian Standard is available for the chemical and / or fuel storage activity, the following requirements apply:
- (a) storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110 % of a single storage tank or 100 % of the largest storage tank plus 10 % of the second largest storage tank in multiple storage areas; and
 - (b) drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25 % of the maximum design storage volume within the bund.
- (D7) All containment systems must be designed to minimise rainfall collection within the system.

SCHEDULE E – DISTURBANCE TO LAND

Pre-disturbance assessment

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

Mapping Validation

- (E4) If the assessment required by conditions E1 to E3 indicates that that an Environmentally Sensitive Area or wetland is incorrectly identified through State mapping, or is present and not identified by State mapping, the administering authority must be advised in writing before any significant disturbance to land takes place.

Site Planning

- (E5) When carrying out the petroleum activity(ies), the location of activities must be determined to:
 - (a) in order of preference, avoid, minimise or mitigate any impacts on areas of vegetation or other areas of ecological value;
 - (b) minimise disturbance to land that may otherwise result in land degradation;
 - (c) ensure that for land that is to be significantly disturbed by the petroleum activity(ies):
 - (i) the top layer of the soil profile is removed;

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- (ii) soil is stockpiled in a manner that will preserve its biological and chemical properties; and
 - (iii) soils are used for rehabilitation purposes;
 - (d) avoid clearing mature trees.
- (E6) Prior to carrying out field based petroleum activities, make all relevant staff, contractors or agents carrying out those petroleum activities, aware of the location of any Category A, B or C Environmentally Sensitive Areas, wetlands and presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992* and the requirements of this environmental authority.
- (E7) Despite condition E8, significant disturbance to land caused by the carrying out of the petroleum activity(ies) must not involve clearing vegetation or placing fill:
- (a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e. stepping stone or contiguous bioregional / local corridor networks) and / or results in an increase in threatening processes;
 - (b) on slopes greater than 10 % for the petroleum activity(ies) other than for pipelines and wells; or
 - (c) in discharge areas.
- (E8) Where petroleum activities are undertaken within high value regrowth or remnant vegetation that is other than a Category A, B or C Environmentally Sensitive Area and their associated protection zones, it must be demonstrated that there is no reasonable or practicable alternative.
- (E9) Documentation demonstrating compliance with the requirements of condition (E8) must be prepared before any disturbance to land takes place.

Environmentally Sensitive Areas

- (E10) Petroleum activities must not be carried out within, or in the primary protection zones of a Category A, B or C Environmentally Sensitive Area.
- (E11) Only limited petroleum activities are permitted in the secondary protection zone of Category A, B and C Environmentally Sensitive Area.
- (E12) Limited petroleum activities carried out within a secondary protection zone must not be conducted in those areas where there is an overlap with another ESA or primary protection zone where low impact or limited petroleum activities are not authorised.
- (E13) Limited petroleum activities carried out within a secondary protection zone must be located in pre-existing areas of clearing or significant disturbance to the greatest practicable extent and must avoid the clearing of mature trees where possible.
- (E14) For limited petroleum activities carried out within a secondary protection zone, vegetation clearing must not exceed 6 metres in width for access tracks

SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, dust and other airborne nuisance

- (F1) The release of odour, dust or any other airborne contaminant(s), or light from the petroleum activity(ies) must not cause an environmental nuisance at any sensitive place.
- (F2) Individual or combined fuel burning equipment, including flaring, that is capable of burning at least 500 kg in an hour is not permitted under this environmental authority.

Noise

- (F3) The emission of noise from the petroleum activity(ies) authorised under this environmental authority must not result in levels greater than those specified in Schedule F, Table 1 – Noise limits at Sensitive Receptors in the event of a valid complaint about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

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

Notes:

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

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

- (F4) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors are to be added to the measured noise level(s) to derive $L_{Aeq, adj, 15\ min}$.

Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

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

- (F5) The method of measurement and reporting of noise levels must comply with the latest edition of the Administering Authorities (Environmental Protection Agency's) Noise Measurement Manual (2000) or the most recent version of *AS1055 Acoustics – Description and measurement of environmental noise*.

Low Frequency Noise

- (F6) Notwithstanding condition (F6), emission of any low frequency noise must not exceed the following limits in the event of a valid complaint about low frequency noise being made to the administering authority:
- (a) 60 dB(C) measured outside the sensitive receptor; and
 - (b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB; or
 - (c) 50 dB(Z) measured inside the sensitive receptor; and
 - (d) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Noise Monitoring

- (F7) Noise monitoring must be undertaken as soon as practicable when requested by the administering authority.
- (F8) The results of the noise monitoring must be reported to the administering authority within three (3) business days of completion of the monitoring event.

Vibration and Blasting

- (F9) Blasting activities are not permitted under this environmental authority.

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SCHEDULE G – WASTE

General waste management

- (G1) All general waste must only be removed from the site and sent to a recycling facility or disposal facility licensed to accept the waste under the *Environmental Protection Act 1994*.

Regulated waste

- (G2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.
- (G3) Regulated waste generated in carrying out the petroleum activity(ies) can be temporarily stored on site awaiting removal provided:
- (a) it is stored in a place and circumstance in which there is minimal risk of causing contamination to land or waters or a fire hazard; and
 - (b) each container of regulated waste stored awaiting movement off site is clearly marked to identify the contents.
- (G4) A record of all regulated waste (excluding trackable waste) must be kept detailing the following information:
- (a) date of pickup of waste;
 - (b) description of waste;
 - (c) quantity of waste;
 - (d) origin of waste; and
 - (e) destination of waste.
- (G5) All waste fluids and muds resulting from drilling and exploration petroleum activities, including hydraulic fracturing activities if authorised by this environmental authority, must be contained in a lined dam or containment structure for off-site disposal, remediation or reuse.

Waste burning

- (G6) Waste must not be burned or be allowed to be burned under this environmental authority.

Storage

- (G7) All containment systems for waste liquids stored on site that have the potential to cause environmental harm must be designed to minimise rainfall collection within the system.

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SCHEDULE H – REHABILITATION

Analogue Site for Rehabilitation Monitoring

- (H1) Analogue sites for measuring the success of rehabilitation activities on significantly disturbed land must be identified, mapped and surveyed prior to rehabilitation activities commencing.

Progressive Rehabilitation for Significantly Disturbed Land

- (H2) Progressive rehabilitation of significantly disturbed land caused by the carrying out of the petroleum activity(ies) (other than constructing pipelines) which is not required for the ongoing conduct of the petroleum activity(ies) must commence as soon as practicable, but not longer than nine (9) months following the completion of any construction or operational works associated with the petroleum activity(ies).
- (H3) Progressive rehabilitation of significantly disturbed land caused by the carrying out of the petroleum activity(ies) must be undertaken in accordance with the Schedule of Disturbance as submitted to the administering authority as part of the financial assurance calculations.
- (H4) Progressive rehabilitation of significantly disturbed land caused by the carrying out of the petroleum activity(ies) must:
- (a) remediate any contaminated land (e.g. contaminated soils, decommissioned dams containing salt);
 - (b) reshape all significantly disturbed land to a stable landform;
 - (c) reprofile all significantly disturbed land to original contours;
 - (d) on all significantly disturbed land;
 - (i) re-establish surface drainage lines;
 - (ii) reinstate the top layer of the soil profile;
 - (iii) establish groundcover to ensure that erosion is minimised;
 - (iv) establishing vegetation of similar species composition and density cover to the analogue site;
 - (e) undertake rehabilitation in a manner such that any actual and potential acid sulfate soils in or on the site are either not disturbed, or submerged, or are treated to prevent and / or minimise environmental harm.

Final Acceptance Criteria for Significantly Disturbed Land

- (H5) All significantly disturbed land caused by the carrying out of the petroleum activity(ies) must be rehabilitated to meet the following final acceptance criteria:
- (a) For all land use(s):
- (i) all significantly disturbed land is reinstated to the pre-disturbed soil suitability class;
 - (ii) the landform is safe for humans and fauna;
 - (iii) the landform is stable with no subsidence or erosion gullies for at least three (3) years;
 - (iv) all significantly disturbed land is reinstated so that the distribution of vegetation communities represents that of the analogue site;
 - (v) the water quality of any residual void or water bodies constructed by the petroleum activity(ies) meets criteria for subsequent uses and does not have potential to cause environmental harm;
 - (vi) there is no ongoing contamination to waters;

- (vii) there is no ongoing contamination to groundwater from dams (demonstrated via groundwater monitoring and leak detection monitoring systems); and
 - (viii) the maintenance requirements for rehabilitated land is no greater than that required for the land prior to its disturbance caused by carrying out the petroleum activity(ies).
- (b) Additional requirements for sites that are being reinstated to native ecosystems:
- (i) each vegetation community must be re-established so that the following rehabilitation parameters are maintained for at least three (3) years:
 - (ii) the rehabilitated site shows distinct and progressive re-establishment of the various strata which characterise the vegetation community in the analogue site;
 - (iii) all dominant species within each strata are re-established at densities equivalent to that of the analogue site;
 - (iv) notwithstanding (H5)(b)(i) and (H5)(b)(ii), a minimum of 70% species richness and species diversity is observed when compared to the relevant analogue site;
 - (v) a minimum of 50% foliage cover is observed when compared to the relevant analogue site;
 - (vi) each vegetation community must be rehabilitated and maintained until it can be demonstrated that it is resilient and self-sustaining (demonstrated by reproduction and colonisation); and
 - (vii) percent organic litter cover, count and density of hollow bearing logs and nest boxes (as replacement for trees with hollows $\geq 10\text{cm}$ diameter) and fallen woody material (total length of logs $\geq 10\text{ cm}$ diameter per hectare and number of logs $\geq 10\text{cm}$ per hectare) have been installed at numbers and densities no lower than the analogue site.

Rehabilitation Monitoring Program

- (H6) A Rehabilitation Monitoring Program must be developed by 7 November 2012.
- (H7) The Rehabilitation Monitoring Program must include, but not necessarily be limited to:
- (a) monitoring of indicators identified in the Rehabilitation Plan at analogue sites to measure progressive and final rehabilitation success relevant to the final land use(s); and
 - (b) frequency and seasonality of monitoring analogue sites and rehabilitated areas to **assess** rehabilitation success; and
 - (c) identification of the experimental design for analysing analogue and rehabilitated site data including statistical methods of analyses.
- (H8) The Rehabilitation Monitoring Program must be implemented

Monitoring of Progressive Rehabilitation

- (H9) Regular maintenance and at least yearly monitoring of rehabilitated areas must take place to measure compliance with condition (H4).

Monitoring of Final Rehabilitation Success

- (H10) Final acceptance criteria are deemed to be met when monitoring of rehabilitated areas demonstrate compliance with the requirements of condition H5 for three (3) consecutive years.

SCHEDULE I – WELL DRILLING, COMPLETION AND STIMULATION

Drilling Activities

- (I1) Oil based drilling muds must not be used in the carrying out of the petroleum activity(ies).
- (I2) Synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).
- (I3) Drilling activities must not cause the connection of the target gas producing formation and another aquifer.
- (I4) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.
- (I5) Rectification measures must be taken as soon as practicable if the holder of this environmental authority becomes aware that drilling activities have resulted in a change in ground water quality, groundwater levels or have caused the connection of the target formation and another aquifer.

Hydraulic Fracturing Activities

- (I6) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in hydraulic fracturing fluids in concentrations above the reporting limit.
- (I7) Accurate and current material safety data sheets for all chemicals and products used in hydraulic fracturing activities must be published on the environmental authority holder's website.
- (I8) Hydraulic fracturing activities must not negatively affect water quality, other than that within the stimulation impact zone of the target gas producing formation.
- (I9) Hydraulic fracturing activities must not cause the connection of the target gas producing formation and another aquifer.
- (I10) The holder of this authority must ensure the internal and external mechanical integrity of the well system prior to and during stimulation such that there is:
 - (a) no significant leakage in the casing, tubing, or packer; and
 - (b) there is no significant fluid movement into another aquifer through vertical channels adjacent to the well bore hole.
- (I11) Practices must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer
- (I12) Rectification measures must be taken immediately if the holder of this environmental authority either becomes aware that hydraulic fracturing 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 hydraulic fracturing activities have caused the connection of the target gas producing formation and another aquifer.

Stimulation Risk Assessment

- (I13) Prior to undertaking hydraulic fracturing activities, a risk assessment must be developed to ensure that hydraulic fracturing activities are managed to prevent environmental harm.

Water Quality Baseline Monitoring

- (I14) Prior to undertaking any stimulation activity, a baseline bore assessment must be undertaken of the water quality of:
 - (a) all landholders' active groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two (2) kilometre horizontal radius from the location of the hydraulic fracturing initiation point within the target gas producing formation; and

- (b) all landholders' active groundwater bores (subject to access being permitted by the landholder) in any aquifer that is within 200 metres above or below the target gas producing formation and is spatially located with a two (2) kilometre radius from the location of the hydraulic fracturing initiation point; and
 - (d) any other bore that could potentially be adversely impacted by the hydraulic fracturing activity(ies) in accordance with the findings of the risk assessment required by conditions I13.
- (I15) Prior to undertaking hydraulic fracturing activities at a well, there must be sufficient water quality data to accurately represent the water quality in the well to be stimulated. The data must include as a minimum the results of analyses for the parameters in condition I16.
- (I16) Baseline bore and well assessments must include relevant analytes and physico-chemical parameters to be monitored in order to establish baseline water quality and must include, but not necessarily be limited to:
- (a) pH;
 - (b) electrical conductivity [$\mu\text{S/m}$];
 - (c) turbidity [NTU];
 - (d) total dissolved solids [mg/L];
 - (e) temperature [$^{\circ}\text{C}$];
 - (f) dissolved oxygen [mg/L];
 - (g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L];
 - (h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO_3) [mg/L];
 - (i) sodium adsorption ratio (SAR);
 - (j) anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L];
 - (k) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];
 - (l) dissolved and total metals and metalloids (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, chromium III, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [$\mu\text{g/L}$];
 - (m) total petroleum hydrocarbons [$\mu\text{g/L}$];
 - (n) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [$\mu\text{g/L}$];
 - (o) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [$\mu\text{g/L}$];
 - (q) sodium hypochlorite [mg/L];
 - (r) sodium hydroxide [mg/L];
 - (s) formaldehyde [mg/L];
 - (t) ethanol [mg/L]; and
 - (u) gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L].

Stimulation Impact Monitoring Program

- (I17) A Stimulation Impact Monitoring Program which has been certified by a suitably qualified person must be developed prior to the carrying out of hydraulic fracturing activities.
- (I18) A Stimulation Impact Monitoring Program must be developed prior to the carrying out of hydraulic fracturing activities which must be able to detect adverse impacts to water quality from hydraulic

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fracturing activities and must consider the findings of the risk assessment required by conditions (I13) and that relate to hydraulic fracturing activities and must include, as a minimum, monitoring of:

- (a) the stimulation fluids to be used in hydraulic fracturing activities at sufficient frequency and which sufficiently represents the quantity and quality of the fluids used; and
- (b) flow back waters from hydraulic fracturing activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and
- (c) flow back waters from hydraulic fracturing activities at sufficient frequency and accuracy to demonstrate that 150 % of the volume used in hydraulic fracturing activities has been extracted from the stimulated well; and
- (d) all bores in accordance with condition (I14).

(I19) The Stimulation Impact Monitoring Program must provide for monitoring of:

- (a) analytes and physico-chemical parameters relevant to baseline bore and well assessments to enable data referencing and comparison including, but not necessarily being limited to the analytes and physico-chemical parameters in condition (I16); and
- (b) any other analyte or physico-chemical parameters that will enable detection of adverse water quality impacts and the inter-connection with a non-target aquifer as a result of hydraulic fracturing activities including chemical compounds that are actually or potentially formed by chemical reactions with each other or coal seam materials during hydraulic fracturing.

(I20) The Stimulation Impact Monitoring Program must provide for monitoring of the bores in condition I18(d) at the following minimum frequency:

- (a) monthly for the first six (6) months subsequent to the hydraulic fracturing being undertaken; then
- (b) annually for the first five (5) years subsequent to the hydraulic fracturing being undertaken or until analytes and physico-chemical parameters listed in condition (I16(b)), (I16(n)) – (I16(u)) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.

(I21) The Stimulation Impact Monitoring Program must be implemented.

(I22) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE J – COMMUNITY ISSUES

- (J1) A record of all valid complaints and incidents causing environmental harm, and actions taken in response to the valid complaint or incident must be kept.
- (J2) The following details for all valid complaints received must be recorded:
- (a) name, address and contact number for valid complainant;
 - (b) time and date of valid complaint;
 - (c) reasons for the complaint as stated by the valid complainant;
 - (d) investigations undertaken in response to the valid complaint;
 - (e) conclusions formed;
 - (f) actions taken to resolve the valid complaint;
 - (g) any abatement measures implemented to mitigate the cause of the valid complaint; and
 - (h) name and contact details of the person responsible for resolving the valid complaint.

SCHEDULE K – NOTIFICATION PROCEDURES

- (K1) The administering authority's Pollution Hotline (telephone: 1300 130 372) and any affected landholder, occupier or their nominated representative must be telephoned as soon as reasonably practicable, but within 24 hours after becoming aware of:
- (a) a release of contaminants as provided for in condition (K3); or
 - (b) any event where environmental harm (excluding environmental nuisance) has been caused or may be caused; or
 - (c) any detection of restricted stimulation fluids from stimulation fluid monitoring; or
 - (d) any analyses result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource.
- (K2) Notwithstanding condition (K1), the administering authority's Pollution Hotline (telephone: 1300 130 372) must be telephoned as soon as reasonably practicable, but within 24 hours after becoming aware of:
- (a) any non-compliance with any condition of this environmental authority other than in relation to a release of contaminants; or
 - (b) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (c) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during stimulation increases by more than 3.5 MPa from the pressure immediately preceding stimulation).
- (K3) Subject to condition (K1), spills of contaminants (including but not limited to hydrocarbons, coal seam gas water, stimulation fluids or any mixtures) of the following volumes or kind must be reported:
- (a) releases of any volume of contaminants to water;
 - (b) releases of volumes of contaminants to land greater than:
 - (i). 200L of hydrocarbons; or
 - (ii). 200 L of stimulation additives; or
 - (iii). 500 L of stimulation fluids; or
 - (iv). 1000 L of brine; or
 - (v). 5 000 L of coal seam gas water;
 - (c) any other release not authorised under this environmental authority which has caused or has the potential to cause serious or material environmental harm.
- (K4) The notification of emergencies or incidents as required by conditions (K1) and (K3) must include but not be limited to the following information:
- (a) the environmental authority number and name of the holder;
 - (b) the tenure type and number where the emergency or incident occurred;
 - (c) the name and telephone number of the designated contact person;
 - (d) the location of the emergency or incident (GDA94);
 - (e) the date and time that the emergency or incident occurred;
 - (f) the date and time the holder of this environmental authority became aware of the emergency or incident;
 - (g) details of the nature of the event and the circumstances in which it occurred;
 - (h) the estimated quantity and type of any contaminants involved in the incident;
 - (i) the actual or potential suspected cause of the emergency or incident;

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- (j) a description of the land use at the site of the emergency or incident (e.g. grazing, pasture, forest etc) and/or the name of any relevant waters and other environmentally sensitive features;
 - (k) a description of the possible impacts from the emergency or incident;
 - (l) a description of whether stock and/or wildlife were actually or potentially exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
 - (m) any sampling conducted or proposed, relevant to the emergency or incident;
 - (n) landholder details and details of landholder consultation;
 - (o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
 - (p) whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.
- (K5) Within ten (10) business days following the initial notification unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):
- (a) the information required by condition (K4(a)) – (K4(p));
 - (b) the root cause of the emergency or incident;
 - (c) the confirmed quantities and types of any contaminants involved in the incident;
 - (d) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
 - (e) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
 - (f) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
 - (g) results and current status of landholder consultation, including commitment to resolve any outstanding issues/concerns; and
 - (h) actions and/or procedural changes to prevent a recurrence of the emergency or incident.
- (K6) If groundwater contamination caused by the petroleum activity(ies) is encountered, the following must be reported to the administering authority within ten (10) business days following the initial notification of results indicating significant change:
- (a) the level of environmental harm caused as a result of such contamination to soils and groundwater;
 - (b) the conduct of a geodetic survey of all monitoring bores to determine the relative water surface elevations of each bore and reported in metres relative to the AHD; and
 - (c) the determination of groundwater flow direction, groundwater flow rate and hydraulic conductivity.

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SCHEDULE L – DEFINITIONS

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

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

“administering authority” means:

- (a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the *Environmental Protection Act 1994* – the local government; or
- (b) for all other matters – the Chief Executive of the Department of Environment and Heritage Protection; or
- (c) another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.

“AHD” means Australian Height Datum and is the datum used for the determination of elevations in Australia. The determination uses a national network of benchmarks and tide gauges and sets mean sea level at zero elevation.

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

“analogue site” means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters such as that ground truthing assessment required under the Land Schedule of this environmental authority.

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

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

“appraisal well” means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.

“assessed or assess” 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:

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

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

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

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

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

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

“background noise level” means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T of not less than 15 minutes, using Fast response.

“bed and banks” for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.

“beneficial use” means

- with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Environmental Protection Act 1994*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and
 - the transfer and use have been approved or authorised under any relevant legislation. Or
- with respect to coal seam gas water, refer to the *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 and published by the Department of Environment and Heritage Protection. These documents can be accessed on the Department of Environment and Heritage Protection website at www.ehp.qld.gov.au.

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

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

“bund or banded” in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

“business day” has the meaning in the *Acts Interpretation Act 1954* and means a day that is not—

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

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

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

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

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

- Nature Refuges as defined under the *Nature Conservation Act 1992*;
- Koala Habitat Areas as defined under the *Nature Conservation (Koala) Conservation Plan 2006*;
- State Forests or Timber Reserves as defined under the *Forestry Act 1959*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*;
- An area identified as “Essential Habitat” or “Essential Regrowth Habitat” under the *Vegetation Management Act 1999* for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*; or
- Of Concern Regional Ecosystems identified in the database called ‘RE description database’ containing Regional Ecosystem numbers and descriptions.

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

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

“coal seam gas water concentrate” means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.

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

“construction” in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.

“dam” means a land-based structure or a void that is designed to 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 *not* mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

“DEHP” means Queensland Department of Environment and Heritage Protection.

“declared pest plants” are listed in Schedule 2 of the *Land Protection (Pest and Stock Route Management) Regulation 2003*.

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

“designated precinct” has the meaning in Schedule 2 of the *Regional Planning Interests Regulation 2014*.

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

“discharge area” means:

- that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- identified by an assessment process consistent with the document “Salinity Management Handbook” Queensland Department of Natural Resources, 1997, as amended from time to time; or

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- identified by an approved salinity hazard map.

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

- any paper or other material on which there is writing; and
- any paper or other material on which there are marks; and
- figures, symbols or perforations having a meaning for a person qualified to interpret them; and
- any disc, tape or other article or any material from which sounds, images, writings or messages are capable of being produced or reproduced (with or without the aid of another article or device).

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

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

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

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

- explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum; or
- obtain stratigraphic information for the purpose of exploring for petroleum.

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

“exploring for petroleum” means carrying out an activity for the purpose of finding petroleum or natural underground reservoirs as per section 14 of the *Petroleum and Gas (Production and Safety) Act 2004* for example including:

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

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

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

- is covered from time to time by floodwater overflowing from the watercourse; and
- does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and
- has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.

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

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the

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crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

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

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

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

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

“high value regrowth” vegetation means

- any of the following:
 - an endangered regional ecosystem;
 - an of concern regional ecosystem;
 - a least concern regional ecosystem; and
- have not been cleared since 31 December 1989; and
- is shown on a regrowth vegetation map.

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

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

“infrastructure” means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps.

Infrastructure does not include other facilities required for the long term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams, pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.

“ $L_{Aeq, adj, 15 mins}$ ” means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.

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

“lake” means:

- a lagoon, swamp or other natural collection of water, whether permanent or intermittent; and
- the bed and banks and any other element confining or containing the water.

“landholders’ active groundwater bores” for the purposes of stimulation baseline and impact monitoring in this environmental authority means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use. This term does not include monitoring bores owned by the administering authority of the *Water Act 2000*.

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

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

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

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

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

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

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

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

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

“low hazard dam” means any dam that is not classified as high or significant as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, as amended from time to time.

“low impact petroleum activities” means limited petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land. Examples of such activities include but are not necessarily limited to soil surveys, topographic surveys, cadastral surveys and ecological surveys and traversing land by car or

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foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.

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

"medium term noise event" is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference source or source location.

"month" has the meaning in the Acts Interpretation Act 1954 and means a calendar month and is a period starting at the beginning of any day of one (1) of the 12 named months and ending—

- immediately before the beginning of the corresponding day of the next named month; or
- if there is no such corresponding day—at the end of the next named month.

"NATA accreditation" means accreditation by the National Association of Testing Authorities Australia.

"oil-based drilling mud" means mud where the base fluid is a petroleum product such as diesel fuel.

"pest" means species:

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

"petroleum activity(ies)" means:

- (a) activities that, under the *Petroleum Act 1923*, are authorised activities for a 1923 Act petroleum tenure under that Act; or
- (b) activities that, under the *Petroleum and Gas (Production and Safety) Act 2004*, are authorised activities for a petroleum authority under that Act; or
- (c) exploring for, exploiting or conveying petroleum resources under a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*; or
- (d) rehabilitating or remediating environmental harm because of an activity mentioned in paragraphs (a) to (c);
- (e) actions taken to prevent environmental harm because of activities mentioned in paragraphs (a) to (d);
- (f) activities required under a condition of an environmental authority for activities mentioned in paragraphs (a) to (e); or
- (g) activities required under a condition of an environmental authority mentioned in paragraphs (a) to (e) that has ended or ceased to have effect, if the condition-
 - (i) continues to apply after the authority has ended or ceased to have effect, and
 - (ii) has not been complied with.

"petroleum authority" is:

- (a) a 1923 Act petroleum tenure granted under the *Petroleum Act 1923*; or
- (b) a resource authority granted under the *Petroleum and Gas (Production and Safety) Act 2004*; or
- (c) a licence, permit, pipeline licence, primary licence, secondary licence or special prospecting authority granted under the *Petroleum (Submerged Lands) Act 1982*.

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

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

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

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

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

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

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

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

“release” of a contaminant into the environment includes:

- (a) to deposit, discharge, emit or disturb the contaminant; and
- (b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
- (c) to allow the contaminant to escape; and
- (d) to fail to prevent the contaminant from escaping.

“reporting limit” means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as “less than” the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation.

“restricted stimulation fluids” means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amounts prescribed under section 81B of the *Environmental Protection Regulation 2008*:

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

The amount of any chemical is not measured in relation to water included in the restricted stimulation fluid.

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

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"secondary protection zone" in relation to a Category B or C Environmentally Sensitive Area means a area within a 300 metre buffer from the boundary of a primary protection zone.

"sensitive place" means:

- a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- a library, childcare centre, kindergarten, school, university or other educational institution;
- a medical centre, surgery or hospital; or
- a protected area; or
- a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment; or
- a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads.

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

- a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel; or
- a library, childcare centre, kindergarten, school, university or other educational institution;
- a medical centre, surgery or hospital; or
- a protected area; or
- a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment; or
- a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employees accommodation or public roads.

"short term noise event" is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than eight hours and does not re-occur for a period of at least seven (7) days. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.

"significantly disturbed land or significant disturbance to land or significant disturbance" means disturbance to land as defined in section 28 of the *Environmental Protection Regulation 2008*.

"site" means the area within the petroleum authority or authorities to which this environmental authority relates.

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

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

"specified works" means:

- (a) infrastructure and works prescribed under a regulation to be necessary for disaster management; or
- (b) desnagging that is the minimum necessary to allow safe navigation of a marked navigable channel; or
- (c) the following infrastructure and works—
 - (i) roads;
 - (ii) railways;
 - (iii) jetties and boat ramps for use by the public;
 - (iv) works for the rehabilitation of land, including, for example, rehabilitation of abandoned mines;
 - (v) infrastructure for the transmission or distribution of electricity;
 - (vi) pipelines;
 - (vii) conveyor belts;
 - (viii) cables;

- (ix) other infrastructure, prescribed under a regulation, that relates to the transportation, movement, transmission or flow of anything through the **strategic environmental area** including, for example, goods, materials, substances, matter, particles with or without charge, light, energy, information and anything generated or produced.

“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.

“stimulation” means a technique used to increase the permeability of a natural underground reservoir, using processes that change the formation pressure and /or involve the addition of chemicals. For the purposes of the environmental authority, stimulation includes hydraulic fracturing / hydrofracking, fracture acidizing and the use of proppant treatments. For the purposes of the environmental authority, stimulation activities do not include mechanical processes alone such as underbalanced drilling and/or perforating, under-reaming, well deepening, perforation, sand or gravel packing, well washing and formation opening using existing surface, formation, and/or council water with no added chemicals, mechanical cleaning or cavitations.

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

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

strategic environmental area has the meaning in section 11 of the *Regional Planning Act 2014*.

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

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

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

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

- knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams; and
- a total of five (5) years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry, and
- a total of five (5) years of suitable experience and demonstrated expertise each, in three (3) of the following categories:

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- investigation and design of dams.
- construction, operation and maintenance of dams.
- hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology.
- hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes.
- hydrogeology with particular reference to seepage, groundwater.
- solute transport processes and monitoring thereof.
- dam safety.

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

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

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

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

“transmissivity” means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.

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

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

“waters” includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.

“watercourse” has the meaning provided in Schedule 12 of the Environmental Protection Regulation 2008 and is a river, creek or stream in which water flows permanently or intermittently in a natural channel, whether artificially improved or not, or in an artificial channel that has changed the course of the watercourse. A watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.

“well infrastructure” means infrastructure required for the construction, completion and operation of a well including but not limited to cellar pits, dams and drill sumps.

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

“wetland” means a wetland as defined under the Queensland Wetlands Program and are areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres. To be classified as a wetland, the area must have one or more of the following attributes:

- at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or

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

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

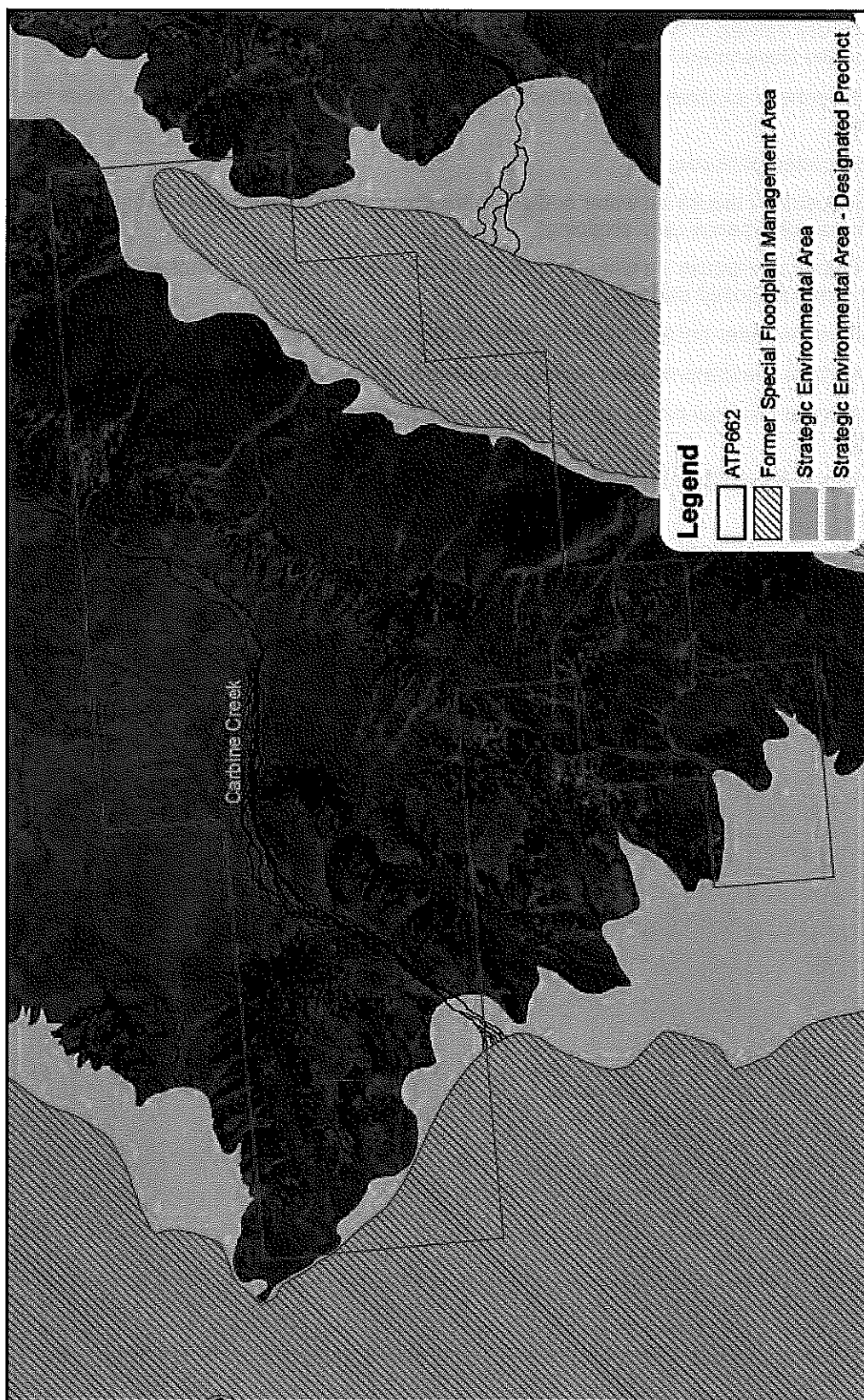
- H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel;
- H2M3p Ponded pastures;
- H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (e.g. cropping);
- H2M6 Palustrine / lacustrine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

“year” means a period of 12 months.

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APPENDIX A

Map 1 – ATP662



ATP 662 - EPPG00746913

ATP 662 is a Special Environmental Area (SEA) under the Environmental Protection Act 1986 (EPA) and is managed by the Queensland Government. The SEA is located in the Carbine Creek area, south of the Brisbane River. The SEA is managed to protect the environment and to provide for the sustainable use of the land. The SEA is managed in accordance with the Environmental Protection Act 1986 (EPA) and the Environmental Protection Act 1986 (EPA) Regulations 1986. The SEA is managed to protect the environment and to provide for the sustainable use of the land. The SEA is managed in accordance with the Environmental Protection Act 1986 (EPA) and the Environmental Protection Act 1986 (EPA) Regulations 1986.

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