Permit[1]

Environmental Protection Act 1994

Environmental authority

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

Permit[1] number: EPPG00699613

Project Name: Moranbah

Environmental authority takes effect 23 August 2016

The anniversary date of this environmental authority is 14 September. An annual return and the payment of the annual fee will be due each year on this day.

This environmental authority is subject to the attached schedule of conditions.

Environmental authority holder(s)

Name	Registered address
CH4 Pty Limited	Level 39 111 Eagle Street BRISBANE CITY QLD 4000
Arrow CSG (ATP364) Pty Ltd	Level 39 111 Eagle Street BRISBANE CITY QLD 4000
AGL Energy Limited	Level 22 101 Miller Street NORTH SYDNEY NSW 2060

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum Activities	ATP1103

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

Department of Environment and Heritage Protection
www.ehp.qld.gov.au ABN 46 640 294 485

Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

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

A Langford
Signature

23/8/2016
Date

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

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Obligations under the *Environmental Protection Act 1994*

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

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

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*
- *Regional Planning Interests Act 2014*
- *Sustainable Planning Act 2009*
- *Water Act 2000*

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

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

This environmental authority consists if the following schedules:

Schedule A – General conditions

Schedule B – Water

Schedule C – Dams

Schedule D – Land

Schedule E – Disturbance to land

Schedule F – Environmental nuisance

Schedule G – Air

Schedule H – Waste

Schedule I – Rehabilitation

Schedule J – Well construction, maintenance and stimulation activities

Schedule K – Notification procedures

Appendix 1 – Definitions

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

A1

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

Schedule A, Table 1 – Authorised Petroleum Activities

Petroleum Activity	Number of Existing Petroleum Activities	Number of Proposed Petroleum Activities	Maximum Disturbance Authorised
Seismic surveys	N/A	N/A	N/A
Total coal seam gas wells, including:	251	265	A total of 516 wells, 516ha
• Coal seam gas exploration wells (indicative)	105	70	175ha
• Coal seam gas appraisal wells (indicative)	146	195	341ha
• Coal seam gas development wells	0	0	0
Field compressor stations	0	0	0
Central compressor stations	0	0	0
Low hazard dams	30 low hazard dams	A total of 55 low hazard dams	A total of 85 low hazard dams
Water treatment facilities	0	0	0
Brine encapsulation facilities	0	0	0
Sewage treatment plants	0	0	0
Gas processing facilities	0	0	0
Access tracks	0km	265km	265km

Maintenance of Measures, Plant and Equipment

A2

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.

A3

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).

Financial Assurance

A4

Petroleum activities that cause **significant disturbance to land** must not be carried out until **financial assurance** has been given to the **administering authority** as security for compliance with the environmental authority and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the *Environmental Protection Act 1994*.

Existing Petroleum Activities

A5

Condition (B5) to (B7) in Schedule B – Water and conditions (E1) to (E10) in Schedule E – Disturbance to Land only apply to the petroleum activity(ies) which commenced after 28 February 2013.

Contingency Plan for Emergency Environmental

Incidents

A6

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

A7

The Contingency Plan for Emergency Environmental Incidents required by condition (A6) 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 minimise the extent and duration of environmental harm caused by environmental emergency incidents;

(d) the resources to be used in response to environmental emergency incidents;

(e) procedures for responding to incidents resulting from **stimulation** activities, including specific rectification measures in the event of non-routine stimulation events;

(f) plans for restoring loss of well mechanical integrity so as to prevent environmental harm;

(g) procedures to avoid/minimise discharges resulting from any overtopping or loss of structural integrity of a **dam**;

(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) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused;

(j) procedures for accessing monitoring locations during emergency environmental incidents;

(k) 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 0-10cm, 20-30cm and 50-60cm at both a reference site and the impact site as a minimum;

(l) 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;

(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; and

(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.

Underground Gas Storage

A8

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

Infrastructure

A9

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

(a) **low hazard dams**;

(b) **exploration** and **appraisal wells**; and

(c) any chemical storage facility associated with the environmentally relevant activity of chemical storage.

Monitoring – General

A10

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

A11

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

(a) for waters and aquatic environments, the Queensland Government's Monitoring and Sampling Manual 2009 – *Environmental Protection (Water) Policy 2009*
(b) for groundwater, *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1)
(c) for noise, the Environmental Protection Regulation 2008
(d) for air, the *Queensland Air Quality Sampling Manual* and/or Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*, as appropriate for the relevant measurement
(e) for soil, the *Guidelines for Surveying Soil and Land Resources, 2nd edition* (McKenzie *et al.* 2008), and/or the *Australian Soil and Land Survey Handbook, 3rd edition* (National Committee on Soil and Terrain, 2009);
(f) for dust, **Australian Standard AS3580**.

A12

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.

A13

Notwithstanding standard condition (A12), where there are no NATA accredited laboratories available to test for a specific analyte or substance, then duplicate samples must be sent to separate laboratories for independent testing or evaluation.

A14

Any management or monitoring plans, systems, programs or procedures required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three years in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.

A15

If monitoring conducted in accordance with this environmental authority indicates a condition or contaminant level has caused, or has potential to cause, environmental harm, the holder of this environmental authority must, as soon as is practicable, take the necessary actions to rectify the condition or contaminant level so as to avoid or minimise environmental harm.

Complaints

A16

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

Documentation

A17

A certification must be prepared by a suitably qualified person within 30 business days of completing every plan, procedure, program and report required to be developed under this environmental authority, which demonstrates that:

(a) relevant material, including current published guidelines (where available) have been considered in the written document

(b) the content of the written document is accurate and true; and

(c) the document meets the requirements of the relevant conditions of the environmental authority.

A18

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

A19

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

A20

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

A21

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

A22

The annual return must include an Update Report detailing activities during the **annual return period**, demonstrating:

(a) significant disturbance during the period;

(b) rehabilitation undertaken;

(c) a list of all valid complaints relating to environmental issues made including the date, source, reason for the complaint and a description of investigations undertaken in resolving the complaint; and

(d) the results of all monitoring undertaken.

SCHEDULE B – WATER

Contaminant Release

B1

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

Erosion and sediment control

B2

For activities involving significant disturbance to land, control measures that are commensurate to the site specific risk of erosion, and risk of sediment release to waters must be implemented to:

(a) allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities;

(b) minimise soil erosion resulting from wind, rain, and flowing water;

(c) minimise the duration that disturbed soils are exposed to the erosive forces of wind, rain, and flowing water;

(d) minimise work-related soil erosion and sediment runoff; and

(e) minimise negative impacts to land or properties adjacent to the activities (including roads).

Authorised activities in waters

B3

Petroleum activities must not occur in or within 200m of a:

(a) **wetland of high ecological significance**;

(b) **Great Artesian Basin Spring**; or

(c) **subterranean cave GDE.**

B4

Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.

B5

The construction or maintenance of linear infrastructure in a wetland of other environmental value must not result in the:

(a) clearing of riparian vegetation outside of the minimum area practicable to carry out the works; or

(b) ingress of saline water into freshwater aquifers; or

(c) draining or filling of the wetland beyond the minimum area practicable to carry out the works.

B6

After the construction or maintenance works for linear infrastructure in a wetland of other environmental value are completed, the linear infrastructure must not:

(a) drain or fill the wetland;

(b) prohibit the flow of surface water in or out of the wetland;

(c) lower or raise the water table and hydrostatic pressure outside the bounds of natural variability that existed before the activities commenced;

(d) result in ongoing negative impacts to water quality;

(e) result in bank instability; or

(f) result in fauna ceasing to use adjacent areas for habitat, feeding, roosting or nesting.

B7
The construction or maintenance of linear infrastructure activities in a watercourse must be conducted in the following preferential order:

(a) firstly, in times where there is no water present;

(b) secondly, in times of no flow; and

(c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.

B8
The construction or maintenance of linear infrastructure authorised under condition (Water 4) must comply with the water quality limits as specified in *Schedule B, Table 1—Release limits for construction or maintenance of linear infrastructure.*

Schedule B, Table 1—Release limits for construction or maintenance of linear infrastructure

Water quality parameters	Units	Water quality limits
Turbidity	**Nephelometric Turbidity Units (NTU)**	For a wetland of other environmental value, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within 50m downstream of the construction or maintenance activity.
		For a wetland of other environmental value, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within a 50m radius of the construction or maintenance activity. For a watercourse, if background water turbidity is equal to, or below 45 NTU, a turbidity limit of no greater than 55 NTU applies, measured within 50m downstream of the construction or maintenance activity.
Hydrocarbons	-	For a wetland of other environmental value, or watercourse, no visible sheen or slick

B9
Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (B8).

Register of activities in wetlands and watercourses

B10
A register must be kept of all linear infrastructure construction and maintenance activities in a wetland of other environmental value and watercourses, which must include:

(a) location of the activity (e.g. GPS coordinates (GDA94) and watercourse name);

(b) estimated flow rate of surface water at the time of the activity;

(c) duration of works, and

(d) results of impact monitoring carried out under condition (B9).

Works in River Improvement Areas

B11
All measures must be taken to minimise adverse impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.

Activities in floodplains
B12
Petroleum activity(ies) on **floodplains** must be carried out in a way that does not:

(a) concentrate flood flows in a way that will or may cause or threaten a negative environmental impact;

(b) divert flood flows from natural drainage paths and alter flow distribution;

(c) increase the local duration of floods; or

(d) increase the risk of detaining flood flows.

Groundwater

B13
The extraction of groundwater from underground aquifers as part of the petroleum activity(ies) must not directly or indirectly cause environmental harm to any **watercourse**, **lake**, **wetland** or **spring**.

B14
A seepage monitoring program must be developed by a suitably qualified person which is commensurate with the site-specific risks of contaminant seepage from containment facilities, and which requires and plans for detection of any seepage of contaminants to groundwater as a result of storing contaminants by 22 November 2016.

B15
The seepage monitoring program required by condition (B14) must include but not necessarily be limited to:

(a) identification of the containment facilities for which seepage will be monitored

(b) identification of trigger parameters that are associated with the potential or actual contaminants held in the containment facilities

(c) identification of trigger concentration levels that are suitable for early detection of contaminant releases at the containment facilities

(d) installation of background seepage monitoring bores where groundwater quality will not have been affected by the petroleum activities authorised under this environmental authority to use as reference sites for determining impacts

(e) installation of seepage monitoring bores that:

i. are within formations potentially affected by the containment facilities authorised under this environmental authority (i.e. within the potential area of impact)

ii. provide for the early detection of negative impacts prior to reaching **groundwater dependent ecosystems**, landholder's active groundwater bores, or water supply bores

iii. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e. faults, areas of unconformities known to connect two or more formations)

(f) monitoring of groundwater at each background and seepage monitoring bore at least quarterly for the trigger parameters identified in condition (B15(b))

(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (B15(b)) and (B15(c)) trigger the early detection of seepage, or upon becoming aware of any monitoring results that indicate potential groundwater contamination

(h) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis; and

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

B16

A bore drill log must be completed for each seepage monitoring bore in condition (B15) which must include:

(a) bore identification reference and geographical coordinate location;

(b) specific construction information including but not limited to depth of bore, depth and length of casing, depth and length of screening and bore sealing details;

(c) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible trigger parameters;

(d) lithological data, preferably a stratigraphic interpretation to identify the important features including the identification of any aquifers; and

(e) target formation of the bore.

SCHEDULE C – DAMS

Low Hazard Dams

C1

Where a dam is assessed as low hazard, it must be:

(a) 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; and

(b) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the dam is intended to be used.

Assessment of Hazard Category

C2

Other than for **flare pits** and sumps used to store **residual drilling material** and drilling fluids, the **hazard category** of any **dam** or **levee** to be used in carrying out petroleum activities must be assessed in accordance with the *Queensland Government Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.

C3

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.

C4

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.

07

SCHEDULE D – LAND

General

D1

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

D2

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

Chemical and Fuel Storage

D3

Chemicals and fuels on the relevant tenures must be stored in, or serviced by, an effective containment system that meets Australian Standards, where such a standard is relevant.

Hydrostatic Test Water and Low Point Drains

D4

Hydrostatic test water from pipelines and **coal seam gas water** from low point drains may be released to land provided that it:

(a) meets the limits specified in *Schedule D, Table 1 – Limits for the Release of Hydrostatic Test Water from Pipelines and Coal Seam Gas Water from Low Point Drains to Land* for each of the water quality characteristics; and

(b) each release location is at least 100m from the nearest watercourse.

Schedule D, Table 1 – Limits for the release of Hydrostatic Test Water from Pipelines and Coal Seam Gas Water from Low Point Drains to Land

Parameter	Maximum Value
pH	6.5 - 8.5 (Range)
Aluminium (mg/L)	20
Arsenic (mg/L)	2.0
Boron (mg/L)	0.5
Cadmium (mg/L)	0.05
Chloride (mg/L)	800
Chromium (mg/L)	1
Copper (mg/L)	5

Iron (mg/L)	10
Fluoride (mg/L)	2
Lead (mg/L)	5
Manganese (mg/L)	10
Mercury (mg/L)	0.002
Nickel (mg/L)	2
Selenium (mg/L)	0.05
Silver (mg/L)	5.0
Total Petroleum Hydrocarbons	10
Vanadium	0.5
Zinc (mg/L)	5
Nitrogen (mg/L)	35
Phosphorus (mg/L)	10
Electrical Conductivity (µS/cm)	2,000

SCHEDULE E – DISTURBANCE TO LAND

Confirming biodiversity values

E1

Prior to undertaking activities that result in significant disturbance to land in areas of native vegetation, confirmation of on-the-ground **biodiversity values** of the native vegetation communities at that location must be undertaken by a suitably qualified person.

E2

A suitably qualified person must develop and certify a methodology so that condition (E1) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.

E3

For conditions (E4) to (E6), where mapped biodiversity values differ from those confirmed under conditions (E1) and (E2), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.

Planning for land disturbance

E4

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

(a) maximise the use of areas of pre-existing disturbance;

(b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative impacts, on areas of native vegetation or other areas of ecological value;

(c) minimise disturbance to land that may result in land degradation;

(d) in order of preference, avoid then minimise isolation, fragmentation, edge effects or dissection of tracts of native vegetation; and

(e) in order of preference, avoid then minimise clearing of native mature trees.

Planning for land disturbance – linear infrastructure

E5

Linear infrastructure construction corridors must:

(a) maximise co-location;

(b) be minimised in width to the greatest practicable extent; and

(c) for linear infrastructure that is an **essential petroleum activity** authorised in an environmentally sensitive area or its **protection zone**, be no greater than 40m in total width.

Authorised disturbance to Environmentally Sensitive Areas

E6

Where petroleum activities are to be carried out in environmentally sensitive areas or their protection zones, the petroleum activities must be carried out in accordance with *Protection of Biodiversity Values, Table 1— Authorised petroleum activities in environmentally sensitive areas and their protection zones.*

Protecting biodiversity values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones

ESA Category	Within the ESA	Primary Protection Zone of the ESA (within 200m of ESA)	Secondary Protection Zone of the ESA (within 300m of ESA)
Category A ESAs	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.
Category B ESAs that are other than 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Petroleum activities permitted.
Category B ESAs that are 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.
Category C ESAs that are 'natural refuges' or 'koala habitat'	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	
Category C ESAs that are 'essential habitat', 'essential regrowth habitat', or 'of concern' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	
Category C ESAs that are 'regional parks' (previously known as 'resource reserves')	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.	
Category C ESAs that are 'state forests' or 'timber reserves'	Only essential petroleum activities permitted.	Petroleum activities permitted.	
Areas of vegetation that are 'critically limited'	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	

E7

A report must be prepared for each annual return period for all petroleum activities that involved clearing of any environmentally sensitive area or protection zone which includes:

(a) records able to demonstrate compliance with conditions (E4), (E5) and (E6);

(b) a description of the works;

(c) a description of the area and its pre-disturbance values (which may include maps or photographs, but must include GPS coordinates for the works); and

(d) based on the extent of environmentally sensitive areas and primary protection zones on the relevant resource authority(ies), the proportion of native vegetation cleared per environmentally sensitive area and primary protection zone, including regional ecosystem type, over the annual return period.

Disturbance to Land – General

E8

When conducting any petroleum activity(ies) that will result in significant disturbance to land, the holder of this environmental authority must ensure that:

(a) the top layer of the soil profile is removed and stockpiled separately;

(b) any soils removed are retained for use for **rehabilitation** purposes;

(c) the clearing of mature trees has been preferentially avoided; and

(d) any clearing of vegetation or placing of **fill** does not:

(i) occur on slopes greater than 10% for the petroleum activity(ies) other than for **linear infrastructure** and wells; or

(ii) occur in **discharge areas**.

Impacts to prescribed environmental matters

E9

Significant residual impacts to **prescribed environmental matters** are not authorised under this environmental authority or the *Environmental Offsets Act 2014.*

Disturbance to Land – Linear Infrastructure

E10

For linear infrastructure activity(ies) that will result in significant disturbance to land, the holder of this environmental authority must be able to demonstrate the following:

(a) clearing of vegetation in association with the linear infrastructure has been minimised to the maximum extent possible, taking into account the following matters:

(i) safe vehicle movement;

(ii) drainage devices installed are of a type that is appropriate for the track type and location;

(iii) erosion and sediment control measures installed are in accordance with the Erosion and Sediment Control Plan required by Conditions (B2);

(iv) powerline stays have been preferentially located within the pipeline right-of-way where possible; and

(a) the maximum clearing widths specified in *Schedule E, Table 2 – Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule E, Table 2 – Authorised Disturbance for Linear Infrastructure

Type of Linear Infrastructure	Maximum Clearing Width (m)
(A) Access track(s) not associated with a pipeline(s) or overhead power line(s):	
(a) single carriage access tracks	18
(b) dual carriage access tracks	21
(c) additional clearing for take-off drains associated with (A)(a) or (b)	10
(B) Pipeline(s) including provision for a utility corridor and access track, including:	
(a) single pipeline trench containing one gas or water pipeline and/or one parallel gas or water pipeline	25
(b) additional clearing for any additional parallel trench for a gas or water pipeline	13
(c) total clearance for a pipeline with turnaround bays and other associated work areas	50
(C) Co-located tracks, pipelines and power lines:	
(a) single carriage access tracks with a single pipeline trench	24
(b) single carriage access tracks with overhead power lines only, or single carriage access tracks with overhead power lines and a single pipeline trench	29
(c) dual carriage access tracks with a single pipeline trench	27
(d) dual carriage access tracks with overhead power lines only, or dual carriage access tracks with overhead power lines and a single pipeline trench	32
(e) additional clearing for take-off drains associated with (C)(a), (b) or (c)	10
(D) Power lines:	
(a) overhead power lines not associated with access tracks or pipelines	23
(b) additional clearing for power line stays associated with (C)(a), (b), (c), (d), or (D)(a)	10

SCHEDULE F – ENVIRONMENTAL NUISANCE

Odour, dust and other airborne nuisance

F1

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

Nuisance monitoring

F2

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

F3

The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the **valid complaint** within three business days of completing the complaint investigation.

F4

If the investigation or monitoring in accordance with condition (F2) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then:

(a) the complaint must be addressed including the use of alternative dispute resolution services if required; and/or

(b) abatement or attenuation measures must be implemented so that the authorised petroleum activity(ies) does not result in further environmental nuisance.

F5

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

Noise

F6

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

[1] The noise limits in Schedule F, Table 1 – Noise Limits at Sensitive Receptors have been set based on the following deemed **background noise levels** (L_{ABG}):
7:00am – 6:00pm: 35dBA
6:00pm – 10:00pm:30dBA
10:00pm – 6:00am: 25dBA
6:00am – 7:00am: 30dBA

F7
If the noise subject to a complaint is tonal or impulsive noise, 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 $L_{Aeq, adj, 15min}$.

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

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

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

Vibration and Blasting

F9
This environmental authority does not authorise blasting operations.

SCHEDULE G – AIR

Fuel Burning or Combustion Equipment

G1

This environmental authority does not authorise the use of fuel burning equipment that is capable of burning at least 500kg of fuel in an hour.

SCHEDULE H – WASTE

General

H1

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

H2

All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.

H3

Waste must not be burned on the site, unless:

(a) it is vegetation and is authorised in writing under the *Forestry Act 1959*; and/or

(b) it is gas being burned for flaring in accordance with the instrument authorising activities on ATP1103.

H4

All waste fluids and muds resulting from drilling and exploration petroleum activities, including stimulation activities if authorised by this environmental authority, must be contained in a lined dam or containment structure prior to off-site disposal, remediation or reuse.

Supply of Coal Seam Gas Water to a Third Party

H5

Coal seam gas water may be transferred to a third party to be used for dust suppression and **construction purposes** if the coal seam gas water quality complies with the limits specified in *Schedule H, Table 1 –Water Contaminant Release Limits*.

Schedule H, Table 1 – Water Contaminant Release Limits

Water Quality Characteristics	Unit	Limit	Limit Type
pH	pH units	6.0 to 9.0	Range
Sodium Adsorption Ratio	ratio	8	80th Percentile
		14	Maximum
Total Dissolved Solids	mg/L	3000	Maximum
Total Petroleum Hydrocarbons	mg/L	10	Maximum

H6

Produced water may be used for dust suppression provided the following criteria are met:

(a) the amount applied does not exceed the amount required to effectively suppress dust; and

(b) the application:

i. does not cause on-site ponding or runoff

ii. is directly applied to the area being dust suppressed

iii. does not harm vegetation surrounding the area being dust suppressed; and

iv. does not cause visible salting.

H7

Produced water may be used for construction purposes provided the use:

(a) does not result in negative impacts on the composition and structure of soil or subsoils

(b) is not directly or indirectly released to waters

(c) does not result in runoff from the construction site; and

(d) does not harm vegetation surrounding the construction site.

H8

If there is any indication that any of the circumstances in condition (H5)(b)(i) to (H5(b)(iv)) or (H6)(a) to (H6(d)) is occurring the use must cease immediately and the affected area must be remediated without delay.

H9

Irrigation of produced water is authorised providing it ensures:

(a) ensures that soil structure, stability and productive capacity can be maintained or improved

(b) toxic effects to crops do not result; and

(c) yields and produce quality are maintained or improved.

H10

Irrigation of produced water is authorised providing a written report is provided to the chief executive which:

(a) certifies that the outcomes in condition (H9) will be achieved

(b) states water quality criteria, which has been determined in accordance with the assessment procedures outlined in *Schedule H, Table 1—Assessment procedures for water quality criteria*

(c) includes a water monitoring program to monitor that the outcomes listed in condition (H9) are being achieved.

Schedule H, Table 1—Assessment procedures for water quality criteria

Water quality criteria Assessment procedure	Water quality criteria Assessment procedure
electrical conductivity sodium adsorption ratio pH	Salinity Management Handbook, with reference to Chapter 11; and/or Australian and New Zealand Guidelines for Fresh and Marine Water Quality, with reference to Volume 1 Chapter 4 and Volume 3 Chapter 9. The assessment should consider: • soil properties within the root zone to be irrigated (e.g. clay content, cation, exchange capacity, exchangeable sodium percentage); • water quality of the proposed resource (e.g. salinity, sodicity);

	• climate conditions (e.g. rainfall); • leaching fractions; • average root zone salinity (calculated); • crop salt tolerance (e.g. impact threshold and yield decline); • management practices and objectives (e.g. irrigation application rate, amelioration techniques); • broader landscape issues (e.g. land use, depth to groundwater); and • any additional modelling and tests undertaken to support the varied water quality parameters.
heavy metals	Australian and New Zealand Guidelines for Fresh and Marine Water Quality, with reference to Volume 1 Chapters 3 and 4 and Volume 3 Chapter 9. The assessment should aim to derive site specific trigger values (e.g. cumulative contaminant loading limit) based on the methodology provided in the above mentioned procedure.

H11

Coal seam gas water may be transferred to a third party to be used for irrigation and livestock watering purposes if the coal seam gas water quality complies with the relevant trigger values contained in *ANZECC and ARMCANZ Water Quality Guidelines 2000*, or subsequent versions thereof.

H12

Coal seam gas water may be transferred to a third party to be used for **operational purposes**.

H13

Coal seam gas water must only be transferred to a third party for the following industrial purposes if the coal seam gas water is fit for purpose:

(i) coal washing;
(ii) power stations; and
(iii) water treatment facilities.

Sewage Treatment Works

H14

All sewage treatment works undertaken on ATP1103 must not exceed a combined daily peak design capacity for the treatment of sewage of more than 21 **equivalent persons** (EP).

H15

Treated sewage effluent must not be released to any land or waters.

Brine and Salt Management

H16

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

Residual drilling material

H17

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

H18

Residual drilling material can only be disposed of on-site:

(a) by **mix-bury-cover** method if the residual drilling material meets the **approved quality criteria**; or

(b) if it is certified by a suitably qualified third party as being of acceptable quality for disposal to land by the proposed method and that environmental harm will not result from the proposed disposal.

H19

Records must be kept to demonstrate compliance with condition H17 and H18.

SCHEDULE I – REHABILITATION

Rehabilitation Planning

I1

A Rehabilitation Plan must be developed by a suitably qualified person and must include the:

(a) rehabilitation goals; and

(b) procedures to be undertaken for rehabilitation that will:

i. achieve the requirements of conditions (I2) to (I8), inclusive; and

ii. provide for appropriate monitoring and maintenance.

Transitional rehabilitation

I2

Significantly disturbed areas that are no longer required for the on-going petroleum activities, must be rehabilitated within 12 months (unless an exceptional circumstance in the area to be rehabilitated (e.g. a flood event) prevents this timeframe being met) and be maintained to meet the following acceptance criteria:

(a) contaminated land resulting from petroleum activities is remediated and rehabilitated

(b) the areas are:

i. non-polluting

ii. a **stable** landform

iii. re-profiled to contours consistent with the surrounding landform

(c) surface drainage lines are re-established

(d) top soil is reinstated; and

(e) either:

i. groundcover, that is not a **declared pest species**, is growing; or

ii. an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final rehabilitation acceptance criteria

I3

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

(a) greater than or equal to 70% of native ground cover species richness

(b) greater than or equal to the total per cent of ground cover

(c) less than or equal to the per cent species richness of **declared plant pest species**; and

(d) where the adjacent land use contains, or the pre-clearing land use contained, one or more regional ecosystem(s), then at least one regional ecosystem(s) from the same broad vegetation group, and with the equivalent biodiversity status or a biodiversity status with a higher

conservation value as any of the regional ecosystem(s) in either the adjacent land or pre-disturbed land, must be present.

Final rehabilitation acceptance criteria in environmentally sensitive areas

I4

Where significant disturbance to land has occurred in an environmentally sensitive area, the following final rehabilitation criteria as measured against the pre-disturbance biodiversity values assessment (required by conditions (E1) and (E2)) must be met:

(a) greater than or equal to 70% of native ground cover species richness

(b) greater than or equal to the total per cent ground cover

(c) less than or equal to the per cent species richness of declared plant pest species

(d) greater than or equal to 50% of organic litter cover

(e) greater than or equal to 50% of **total density of coarse woody material**; and

(f) all **predominant species** in the **ecologically dominant layer**, that define the pre-disturbance regional ecosystem(s) are present.

Continuing conditions

I5

Conditions (I2), (I3) and (I4) continue to apply after this environmental authority has ended or ceased to have effect.

I6

Prior to relinquishing all or part of an authority to prospect area, a rehabilitation report must be prepared which specifically relates to the area to be relinquished and demonstrates condition (I2), (I3) and (I4) has been met.

Remaining dams

I7

The report required under condition (I6) must be submitted to the administering authority at least 40 business days prior to the relinquishment notice being lodged with the administering authority for the *Petroleum and Gas (Production and Safety) Act 2004*.

I8

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

I9

Prior to any changes in petroleum activities which would result in an increase to the maximum disturbance since the last financial assurance calculation was submitted, the holder of the environmental authority must submit, and the administering authority must have approved, an application to amend the financial assurance.

SCHEDULE J – WELL CONSTRUCTION, MAINTENANCE AND STIMULATION ACTIVITIES

Well Drilling, Completion and Stimulation

J1

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

J2

Synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).

J3

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

J4

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

Stimulation Activities

J5

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

J6

Stimulation activities must not result in:

(a) negative impacts to groundwater quality beyond the stimulation impact zone; or

(b) negative impacts to water quality in landholder's active groundwater bore(s) which tap into the target formation; or

(c) interconnectivity between the target formation and another aquifer.

J7

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

(a) no significant leakage in the casing, tubing, or packer; and

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

J8

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

Stimulation Risk Assessment

J9

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

J10

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

(a) a process description of the stimulation activity to be applied, including equipment and a comparison to best international practice

(b) provide details of where, when and how often stimulation is to be undertaken on the tenures covered by this environmental authority

(c) a geological model of the field to be stimulated including geological names, descriptions and depths of the target gas producing formation(s)

(d) naturally occurring geological faults

(e) seismic history of the region (e.g. earth tremors, earthquakes)

(f) proximity of overlying and underlying aquifers

(g) description of the depths that aquifers with environmental values occur, both above and below the target gas producing formation

(h) identification and proximity of **landholders' active groundwater bores** in the area where stimulation activities are to be carried out

(i) the environmental values of groundwater in the area

(j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to stimulation monitoring in order to accurately assess the risks to environmental values of groundwater

(k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity

(l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers

(m) a description of the well mechanical integrity testing program

(n) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc.)

(o) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation

(p) groundwater **transmissivity**, flow rate, hydraulic conductivity and direction(s) of flow

(q) a description of the chemical compounds used in stimulation activities (including estimated total mass, estimated composition, chemical abstract service numbers and properties), their mixtures and the resultant compounds that are formed after stimulation

(r) a mass balance estimating the concentrations and absolute masses of chemical compounds that will be reacted, returned to the surface or left in the target gas producing formation subsequent to stimulation

(s) an environmental hazard assessment of the chemicals used including their mixtures and the resultant chemicals that are formed after stimulation including:

i. toxicological and ecotoxicological information of chemical compounds used

ii. information on the persistence and bioaccumulation potential of the chemical compounds used; and

iii. identification of the chemicals of potential concern in stimulation fluids derived from the risk assessment

(t) an environmental hazard assessment of use, formation of, and detection of polycyclic aromatic hydrocarbons in stimulation activities

(u) identification and an environmental hazard assessment of using radioactive tracer beads in stimulation activities

(v) an environmental hazard assessment of leaving chemical compounds in stimulation fluids in the target gas producing formation for extended periods subsequent to stimulation

(w) human health exposure pathways to operators and the regional population

(x) risk characterisation of environmental impacts based on the environmental hazard assessment

(y) potential impacts to landholder bores as a result of stimulation activities

(z) an assessment of cumulative underground impacts, spatially and temporally of the stimulation activities to be carried out on the tenures covered by this environmental authority; and

(aa) potential environmental or health impacts which may result from stimulation activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

J11

Prior to undertaking any stimulation activity, 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 2km horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and

(b) all landholders' active groundwater bores (subject to access being permitted by the landholder) in any aquifer that is within 200m above or below the target gas producing formation and is spatially located with a 2km radius from the location of the stimulation initiation point; and

(c) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the risk assessment required by conditions (J9) and (J10).

J12

Prior to undertaking stimulation activities at a well, 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 (J13).

J13

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 [µS/m];

(c) turbidity [NTU];

(d) total dissolved solids [mg/L];

(e) temperature [°C];

(f) dissolved oxygen [mg/L]

(g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L];

(h) alkalinity (bicarbonate, carbonate, hydroxide and total as $CaCO_3$) [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) [µg/L];

(m) total petroleum hydrocarbons [µg/L];

(n) **BTEX** (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [µg/L];

(o) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [µg/L];

(p) sodium hypochlorite [mg/L];

(q) sodium hydroxide [mg/L];

(r) formaldehyde [mg/L];

(s) ethanol [mg/L]; and

(t) gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L].

Stimulation Impact Monitoring Program

J14

A Stimulation Impact Monitoring Program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings

of the risk assessment required by conditions (J9) and (J10) that relate to stimulation activities and must include, as a minimum, monitoring of:

(a) the stimulation fluids to be used in stimulation activities at sufficient frequency and which sufficiently represents the quantity and quality of the fluids used; and

(b) flow back waters from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and

(c) flow back waters from stimulation activities at sufficient frequency and accuracy to demonstrate that 150% of the volume used in stimulation activities has been extracted from the stimulated well; and

(d) all bores in accordance with condition (J11).

J15

The Stimulation Impact Monitoring Program must provide for monitoring of:

(a) analytes and physico-chemical parameters relevant to baseline bore and well assessments to enable data referencing and comparison including, but not necessarily being limited to the analytes and physico-chemical parameters in condition (J11); and

(b) any other analyte or physico-chemical parameters that will enable detection of adverse water quality impacts and the inter-connection with a non-target aquifer as a result of stimulation activities including chemical compounds that are actually or potentially formed by chemical reactions with each other or coal seam materials during stimulation activities.

J16

The Stimulation Impact Monitoring Program must provide for monitoring of the bores in condition (J14)(d) at the following minimum frequency:

(a) monthly for the first six months subsequent to stimulation activities being undertaken; then

(b) annually for the first five years subsequent to stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (J13)(b), (J13)(n) – (J13)(t) are not detected in concentrations above baseline bore monitoring data on two consecutive monitoring occasions.

J17

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

SCHEDULE K – NOTIFICATION PROCEDURES

K1

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

(a) any unauthorised significant disturbance to land;

(b) potential or actual loss of structural or hydraulic integrity of a dam;

(c) when the level of the contents of any regulated dam reaches the mandatory reporting level;

(d) when a regulated dam will not have available storage to meet the design storage allowance on 1 November of any year;

(e) potential or actual loss of well integrity;

(f) when the seepage trigger action response procedure required under condition (B15(g)) is or should be implemented;

(g) unauthorised releases of any volume of prescribed contaminants to waters;

(h) unauthorised releases of volumes of contaminants, in any mixture, to land greater than:

i. 200L of hydrocarbons; or

ii. 200L of stimulation additives; or

iii. 500L of stimulation fluids; or

iv. 1,000L of brine; or

v. 5,000L of untreated coal seam gas water; or

vi. 5,000L of raw sewage; or

vii. 10,000L of treated sewage effluent.

(i) the use of restricted stimulation fluids

(j) groundwater monitoring results from a landholder's active groundwater bore monitored under the stimulation impact monitoring program which is a 10% or greater increase from a previous baseline value for that bore and which renders the water unfit for its intended use

(k) monitoring results where two out of any five consecutive samples do not comply with the relevant limits in the environmental authority.

K2

Unless a longer time is agreed to in writing by the administering authority, a written report must be provided to the administering authority within 10 business days of notification under condition (K1) including the following (where relevant to the emergency or incident):

(a) the root cause of the emergency or incident;

(b) the confirmed quantities and types of any contaminants involved in the incident;

(c) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);

(d) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;

(e) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;

(f) results and current status of landholder consultation, including commitment to resolve any outstanding issues/concerns; and

(g) actions and/or procedural changes to prevent a recurrence of the emergency or incident.

Appendix 1 – DEFINITIONS

Explanatory note: *Where a term is not defined in this document, the definition in the* Environmental Protection Act 1994*, its regulations and* environmental protection policies*, then the* Acts Interpretation Act 1954 *then the Macquarie Dictionary should be used in that order.*

Term	Definition
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.
adjacent land use(s)	means the ecosystem function adjacent to an area of significant disturbance, or where there is no ecosystem function, the use of the land. An adjacent land use does not include an adjacent area that shows evidence of edge effect.
administering authority	means: (a) for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the *Environmental Protection Act 1994* – the local government; or (b) for all other matters – the Chief Executive of the Department of Environment and Heritage Protection; or (c) another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.
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.
analyte(s)	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.
annual return period	means the most current 12-month period between 2 anniversary dates.
appraisal well	means a petroleum well to test the potential of one or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.
approved quality criteria	For the purposes of the residual drilling materials, means the residual drilling material will meet the following quality standards: Part A

	In all cases: **Parameter** / **Maximum concentration** pH: 6 – 10.5 (range) Electrical: 20dS/m (20,000µS/cm) Chloride*: 8,000mg/L *Chloride analysis is only required if an additive containing chloride was used in the drilling process. The limits in Part A must be measured in the clarified filtrated of oversaturated solids prior to mixing. Part B If any of the following metals are a component of the drilling fluids, then for that metal: **Parameter** / **Maximum Concentration** Arsenic: 20mg/kg Selenium: 5mg/kg Boron: 100mg/kg Cadmium: 3mg/kg Chromium: 400mg/kg Copper: 100mg/kg Lead: 600mg/kg The limits in Part B and Part C refer to the post soil/by-product mix. **Part C** If a hydrocarbon sheen is visible, the following hydrocarbon fractions: **TPH** / **Maximum concentration** C6-C10: 170mg/kg C10-C16: 150mg/kg C16-C34: 1,300mg/kg C34-C40: 5,600mg/kg Total Polycyclic Aromatic Hydrocarbons (PAHs): 20mg/kg Phenols (halogenated): 1mg/kg Phenols (non-halogenated): 60mg/kg Monocyclic Aromatic Hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para, and meta xylenes) and styrene): 7mg/kg The limits in Part C refer to the post soil/by-product mix.
aquifer	means an identifiable stratigraphic formation that has the potential to produce useful flows of water and may include formations where due to

	hydraulic fracturing activity a changed hydraulic conductivity allows such water flows.
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 2885	means Australian Standard 2885.0:2008 *Pipelines – Gas and Liquid Petroleum General Requirements*, Australian Standard 2885.1:2007 *Pipelines – Gas and Liquid Petroleum Design and Construction* and Australian Standard 2885.3:2001 *Pipelines – Gas and Liquid Petroleum Operation and Maintenance*, or any updated versions that becomes available from time to time.
Australian Standard AS3580	means any of the following publications: • AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method. • AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet— Gravimetric method • AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter— PM10 low volume sampler—Gravimetric sampler.
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% of the measurement time period T of not less than 15 minutes, using Fast response.
being or intended to be utilised by the landholder or overlapping tenure holder	for significantly disturbed land, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.
beneficial use	means • with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is: o of benefit to that owner in that it adds real value to their business or to the general community, o in accordance with relevant provisions of the *Environmental Protection Act 1994*, o sustainable by virtue of written undertakings given by that owner to maintain that dam, and

	○ the transfer and use have been approved or authorised under any relevant legislation. Or • with respect to coal seam gas water, refer to the Department of Environment and Resource Management's Operational Policy – Management of water produced in association with petroleum activities and Notice of decision to approve a resource for beneficial use – CSG water as amended from time to time.
biodiversity values	for the purposes of this environmental authority, means environmentally sensitive areas, prescribed environmental matters and wetlands.
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 40,000mg/l.
brine dam	means a regulated dam that is designed to receive, contain or evaporate brine.
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 ESA	means any area listed in Section 25 of the Environmental Protection Regulation 2008.
Category B ESA	means any area listed in Section 26 of the Environmental Protection Regulation 2008.
Category C ESA	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. • Threshold regional ecosystems as defined and listed in Appendix 6 of the Queensland Biodiversity Offsets Policy; or • Critically limited regional ecosystems as defined and listed in Appendix 5 of the Queensland Biodiversity Offsets Policy.
certification or certified by a suitably qualified	in relation to a **design plan**, 'as constructed' drawings or an annual report regarding dams, means that a statutory declaration has been made by that

and experienced person	person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time: • exactly what is being **certified** and the precise nature of that certification. • the relevant legislative, regulatory and technical criteria on which the certification has been based; • the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and • the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.
certify or certification or certified	in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that: • all relevant material has been considered in the written document; and • that the content of the written document is accurate and true; and • that the written document meets the requirements of the relevant conditions of the environmental authority.
clearing	for vegetation means removing, cutting down, ringbarking, pushing over, poisoning or destroying in any way including by burning, flooding or draining; but does not include destroying standing vegetation by stock, or **lopping** a tree.
coal seam gas water	means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. CSG water is a waste, as defined under s13 of the *Environmental Protection Act 1994*.
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.
construction purposes	in relation to the use of coal seam gas water means the **construction**, use, modification, maintenance, replacement, operation and decommissioning of industrial sites.
dam(s)	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.
declared pest species	has the meaning in the Land Protection (Pest and Stock Route Management) Regulation 2003 and is a live animal or plant declared to be a declared pest under section 36 (Declaring Pests by Regulation) or section 37(2) (Declaring Pest under Emergency Pest Notice) of that Act and includes reproductive material of the animal or plant.
declared plant pest species	has the meaning in the Land Protection (Pest and Stock Route Management) Regulation 2003 and is a plant declared to be a declared

	pest under section 36 (Declaring Pests by Regulation) or section 37(2) (Declaring Pest under Emergency Pest Notice) of that Act and includes reproductive material of the plant.
deed of agreement	means a legal agreement between the holder of the environmental authority and the administering authority. The deed of agreement governs the obligations of the holder of the environmental authority in relation to the *Queensland Biodiversity Offset Policy*. For clarity, the term deed of agreement in this environmental authority includes any subsequent version or amendment of the signed deed of agreement.
design plan	is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.
design storage allowance or DSA	means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Resource Management, as amended from time to time, that must be provided in a dam to an **annual exceedance probability** specified in that Manual.
development well	means a petroleum well which produces or stores petroleum. For clarity, a development well does not include an appraisal well.
discharge area	means: • that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and • identified by an assessment process consistent with the document Salinity Management Handbook Queensland Department of Natural Resources, 1997, as amended from time to time; or • identified by an approved salinity hazard map held by the Department of Environment and Heritage Protection.
ecologically dominant layer	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means the layer making the greatest contribution to the overall biomass of the site and the vegetation community (NLWRA 2001). This is also referred to as the ecologically dominant stratum or the predominant canopy in woody ecosystems.
ecological connectivity	is a measure of ecological condition and means the flow or connection of organisms and ecological processes across landscapes at multiple scales. Ecological connectivity has a positive relationship with landscape connectivity and habitat connectivity and effects vary between species. It includes connectivity by stepping stone or contiguous bioregional/local corridor networks.
ecosystem function or 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.
environmentally sensitive area	means Category A, B or C environmentally sensitive areas (ESAs).
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.
essential petroleum activities	means activities that are essential to bringing the resource to the surface and are only the following: • low impact petroleum activities • geophysical, geotechnical, geological, topographic and cadastral surveys (including seismic, sample /test / geotechnical pits, core holes) • single well sites not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance • well sites with monitoring equipment (including monitoring bores): o for single well sites, not exceeding 1.25 hectares disturbance o for multi-well sites, not exceeding 1.75 hectares disturbance • well sites with monitoring equipment (including monitoring bores) and tanks (minimum 1 ML) for above ground fluid storage: o for single well sites, not exceeding 1.5 hectares disturbance o for multi-well sites, not exceeding 2.0 hectares disturbance well sites with monitoring equipment (including monitoring bores) and tanks (minimum 1ML) for above ground fluid storage: o for single well sites, not exceeding 1.5 hectares disturbance o for multi-well sites, not exceeding 2.0 hectares disturbance • associated infrastructure located on a well site necessary for the construction and operations of wells: o water pumps and generators o flare pits o chemical/fuel storages o sumps for residual drilling material and drilling fluids tanks, or dams which are not significant or high consequence dams to contain wastewater (e.g. stimulation flow back waters, produced water) o pipe laydown areas o soil and vegetation stockpile areas o a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works o temporary administration sites and warehouses o dust suppression activities using water that meets the quality and operational standards approved under the environmental authority

	• 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 • supporting access tracks • gathering/flow pipelines from a well head to the initial compression facility • activities necessary to achieve compliance with the conditions of the environmental authority in relation to another essential petroleum activity (e.g. sediment and erosion control measures, rehabilitation).
existing dam	means any containment structure that was constructed and / or whose construction had substantially commenced by 28 February 2013.
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.
financial assurance	for an environmental authority, means financial assurance given for the authority under Chapter 5, part 12, division 2 of the *Environmental Protection Act 1994*.
flare pit(s)	means a containment area where any hydrocarbon that is discovered in an over-pressured reservoir during the drilling operation is diverted to, and combusted. The flare pit is only used during the drilling and workover process.
floodplain(s)	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
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.
Great Artesian Basin (GAB) Spring	means an area protected under the *Environment Protection and Biodiversity Conservation Act 1999* because it is considered to be a Matter of National Environmental Significance and identified as a: • community of native species dependent on natural discharge of groundwater from the Great Artesian Basin; or • Great Artesian Basin spring; or • Great Artesian Basin discharge spring wetland. A GAB spring includes a spring vent, spring complex or watercourse spring and includes the land to which water rises naturally from below the ground and the land over which the water then flows. Note: The Australian Government's Protected Matters Search Tool should be used to get an indication of whether the area of interest may contain an MNES spring. Note: The GAB springs dataset can be requested from the Queensland Government Herbarium
groundwater dependent ecosystems (GDE)	means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services. For the purposes of the environmental authority, groundwater dependent ecosystems do not include those mapped as "unknown".
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-value regrowth vegetation	means
	• any of the following:
	  ○ an endangered regional ecosystem;
	  ○ an of concern regional ecosystem;
	  ○ a least concern regional ecosystem; and
	• that has not been cleared since 31 December 1989; and is shown on a **regrowth vegetation map**.

hydraulic fracturing	means a technique used to create cracks in underground coal seams to increase the flow and recovery of gas or oil out of a well. It involves pumping a fluid, comprised largely of water and sand, under pressure, into

	a coal seam. This action fractures the coal seam which provides a pathway that increases the ability for gas to flow through the coal.
hydraulic performance	means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant **hazard category** *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, published by the Department of Environment and Heritage Protection, as amended from time to time.
impacts to mapped State significant biodiversity values	means to have a negative effect on a State significant biodiversity value as defined in this environmental authority. Examples may include, but are not necessarily limited to: • clearing, removal or fragmentation of vegetation • interference or disturbance of fauna habitat
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.
$L_{Aeq,adj,\ 15mins}$	means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character, that within any 15 minute period has the same square sound pressure as a sound level that varies with time.
$L_{A90,adj,\ 15mins}$	means the A-weighted sound pressure level, adjusted for tonal character, that is equal to or exceeded for 90% of any 15 minutes sample period equal, using Fast response
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.
levee	means a dyke or bund that is designed only to provide for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from unplanned releases from other works of infrastructure, during the progress of those stormwater or flood flows or those unplanned releases; and does not store any significant volume of water or **flowable substances** at any other times.
linear infrastructure	means communication and power lines, pipelines, 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 days, even when there are respite periods when the noise is inaudible within those five 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 Resource Management and which contains contaminants in concentrations which exceed or will exceed during the dam's operational life, the values or range shown in Table 3 of said Manual.
low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, earthworks or excavation work that cause either a significant disruption to the soil profile or permanent damage to vegetation that cannot be easily rehabilitated immediately after the activity is completed. Examples of such activities include by are not necessarily limited to: • chipholes; • coreholes; • geophysical surveys; • seismic surveys; • soil surveys; • topographic surveys; • cadastral surveys; • ecological surveys; and • installation of environmental monitoring equipment (including surface water).
mapped State significant biodiversity values	means the regional ecosystems, essential habitat, wetlands, watercourses, legally secured offset areas and connectivity areas provided in Appendix 1 of the *Queensland Biodiversity Offset Policy* (Department of Environment and Resource Management, 2011) that are mapped in State mapping.
Max $L_{pZ, 15\ min}$	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
Max $L_{pA, 15\ min}$	means the absolute maximum instantaneous A-weighted sound pressure level, measured over 15 minutes.
mandatory reporting level	means a warning and reporting level determined in accordance with the criteria in the *Manual for Assessing Hazard Categories and Hydraulic*

	Performance of Dams prepared by the Department of Environment and Resource Management, as amended from time to time.
medium term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five days and does not re-occur for a period of at least four 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.
mix-bury-cover	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in a accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=10–8m/s) or subsoil with a clay content of >20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and • **topsoil** is replaced.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
offset area management plan	means a site-specific plan prepared to address the requirements of the Queensland Biodiversity Offset Policy (Department of Environment and Resource Management, 2011) that includes, but is not necessarily limited to: • the applicant(s) name, postal address, contact details; • lot/plan, stage (or area) to which the OAMP relates, GPS coordinates for the stage (or area); • a demonstration that the activity has avoided, then minimised impacts to State significant biodiversity values; • a detailed description of the State significant biodiversity values to be offset; • a detailed description of the extent of impact on each of the State significant biodiversity values; • the offset delivery mechanism(s): o direct land based offsets: ▪ values to be offset using a direct land based offset; ▪ an assessment of the offset area to demonstrate how it meets the requirements of the Queensland Biodiversity Offsets Policy (Department of Environment and Resource Management, 2011); ▪ an assessment of ecological equivalence carried out in accordance with the Ecological Equivalence Methodology; ▪ legally binding mechanism; and ▪ offset area management plan; o offset transfer:

	▪ values to be offset using an offset transfer; ▪ evidence that State significant biodiversity values to be impacted can be offset within the landscape; ▪ an assessment of ecological equivalence carried out in accordance with the Ecological Equivalence Methodology; ▪ Brokers Agreement or applicant letter; and ▪ identification of financial surety amount; o offset payment: ▪ the values to which the proposed offset payment relates; and ▪ offset payment amount and calculation method.
oil based drilling mud	means mud where the base fluid is a petroleum product such as diesel fuel.
operational purposes	means the authorized petroleum activities, limited to drilling and the construction, maintenance and decommissioning of wells.
pre-disturbed land use	means the function or use of the land as documented prior to significant disturbance occurring at that location.
predominate species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
prescribed environmental values	has the meaning in section 10 of the Environmental Offsets Act 2014, limited to the matters of State environmental significant listed in schedule 2 of the Environmental Offsets Regulation 2014.
prescribed storage gases	has the meaning provided in section 12 of the *Petroleum and Gas (Production and Safety) Act 2004.*
primary protection zone	means an area within 200m of the boundary of any Category A, B or C Environmentally Sensitive Area.
protection zone	means the primary protection zone of any Category A, B or C ESA or the secondaryprotection zone of any Category A or B ESA.
regulated structure	means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time.
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— o are any of the following: (i) an endangered regional ecosystem; (ii) an of concern regional ecosystem; (iii) a least concern regional ecosystem; and o have not been cleared since 31 December 1989; and • 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.

rehabilitation	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.
remnant vegetation	means vegetation, part of which forms the predominant canopy of the vegetation— • covering more than 50% of the undisturbed predominant canopy; and • averaging more than 70% of the vegetation's undisturbed height; and • composed of species characteristic of the vegetation's undisturbed predominant canopy cover.
reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as "less than" the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation.
residual drilling material	means waste drilling materials including muds and cuttings returned from well holes and which have been left behind after the drilling fluids are pumped out.
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 or Category B Environmentally Sensitive Area means an area within a 100m of the boundary of a relevant **primary protection zone**.
subterranean cave GDE	• means an area identified as a subterranean cave in the mapping produced by the Queensland Government and identified in the Queensland Government Information System, as amended from time to time; and • means a cave ecosystem which requires access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain its communities of plants and animals, ecological processes and ecosystem services. Subterranean cave GDEs are caves dependent on the subterranean presence of groundwater. Subterranean cave GDEs have some degree of groundwater connectivity and are indicated by either high moisture levels or the presence of stygofauna, or both, referred to in the Queensland Government WetlandsInfo mapping program, as amended from time to time. Note: the Subterranean GDE (caves) dataset can be displayed through

	the Queensland Government WetlandInfo mapping program. Note: the Subterranean GDE (caves) dataset can be obtained from the Queensland Government Information System.
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 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.
significant residual impact(s)	has the meaning in section 8 *Environmental Offsets Act 2014*.
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 that is undertaken above the formation pressure and involved the addition of chemicals. It includes hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments.
stimulation fluid	means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir.
structure	means a dam or **levee**.
suitably qualified person	means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature.
sump	means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.
synthetic based drilling mud	means a mud where the base fluid is a synthetic oil, consisting of chemical compounds which are artificially made or synthesised by chemically modifying petroleum components or other raw materials rather than the whole crude oil.
third party auditor	means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority
tolerable limits	means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).
topsoil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300mm in depth from the natural surface.
total density of coarse woody material	means the total length of logs on the ground greater than or equal to 10cm diameter per hectare and number of logs on the ground greater than or equal to 10cm diameter per hectare.
transmissivity	means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
valid complaint	means a complaint the administering authority considers is not frivolous, nor vexatious, nor based on mistaken belief.

void	means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).
waters	includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
watercourse	has the meaning provided in section 5 of the *Water Act 2000* and includes the bed and banks and any other element of a river, creek or stream confining or containing water.
watercourse, wetland, lake or spring with State significant biodiversity values	are those described in Appendix 1 of the Queensland Biodiversity Offsets Policy (Department of Environment and Resource Management, 2011).
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 6m. To be classified as a wetland, the area must have one or more of the following attributes: • at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or • the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or • the substratum is not soil and is saturated with water, or covered by water at some time. For the purposes of Chapter 5A activities, wetlands do not include springs and watercourse and those wetlands that are defined in the document entitled *Wetland Mapping and Classification Methodology* (Department of Environment and Resource Management, 2005) as: • H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel; • H2M3p Ponded pastures; • H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (e.g. cropping); • H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage; • H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;

	• H3C1 Artificial stand-alone water storages not within a natural water body or channel; or • H3C2 Artificial Channel drain / canal –bore drains, swales, bores and irrigation channel overflows / ponding.
wetland of high ecological significance	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'high ecological significance' or wetland of 'high ecological value' on the Map of referable wetlands.

END OF PERMIT