Permit

Environmental Protection Act 1994

Environmental authority EPPG00968013

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

Environmental authority number: EPPG00968013

Environmental authority takes effect on 12 September 2022

The anniversary date of this environmental authority is 15 September each year.

Environmental authority holder(s)

Name(s)	Registered address
AUSTRALIA PACIFIC LNG PTY LIMITED	Level 4 139 Coronation Drive MILTON QLD 4064

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 07: A petroleum activity involving injection of a waste fluid into a natural underground reservoir or aquifer	ATP606, PFL26 PL215, PL216, PL225, PL226, PL265, PL266, PL267, PL272, PL297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413, PL1011 PPL186 WMA2013
Schedule 3 06: A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	ATP606, ATP972 PFL26 PL215, PL216, PL225, PL226, PL265, PL266, PL267, PL272, PL297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413, PL444, PL469, PL470, PL471, PL1011 PPL186 WMA2013

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Environmentally relevant activity/activities	Location(s)
Schedule 3 08: A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	ATP606, ATP972 PFL26 PL215, PL216, PL219, PL220, PL225, PL226, PL265, PL266, PL267, PL272, PL297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413, PL444, PL469, PL470, PL471, PL1011, PL1084 PPL186 WMA2013
Schedule 3 03: A petroleum activity that is likely to have a significant impact on a category A or B environmentally sensitive area	ATP606 PFL26 PL215, PL216, PL219, PL220, PL225, PL226, PL265, PL266, PL267, PL272, PL297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413, PL1011 PPL186 WMA2013
Ancillary 60 - Waste disposal 2: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(b) (b) more than 2000t but not more than 5000t	ATP606, ATP972 PL444, PL469, PL470, PL471
Schedule 3 04: Extending an existing pipeline by more than 150km under a petroleum authority	PFL26 PL215, PL216, PL225, PL226, PL272
Non-Scheduled Petroleum Activity Authority to Prospect - ATP	ATP592
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (a-ii) 21 to 100EP otherwise	ATP606, ATP972, PL444, PL469, PL470, PL471, PL215, PL216, PL225, PL226, PL272, PL1011, PL265, PL266, PL267, PL297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413 PFL26 PPL186 WMA2013
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a	PL1084

Environmentally relevant activity/activities	Location(s)
total daily peak design capacity of (a-i) 21 to 100EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	
Ancillary 63 – Sewage Treatment 1: Operating sewage treatment works, other than no release works, with a total daily peak design capacity of (b-ii) more than 100 but not more than 1,500EP otherwise	ATP606 PL215, PL216, PL225, PL226, PL272, PL1011, PL265, PL266, PL267, PL297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413 PFL26 PPL186 WMA2013
Ancillary 15 - Fuel burning Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	ATP606, ATP972 PL444, PL469, PL470, PL471

Additional information for applicants

Environmentally relevant activities

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

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

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

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days)

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term ‘duty to notify’.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority - on the nominated day; or

b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or

c) otherwise on the day the authority is issued.

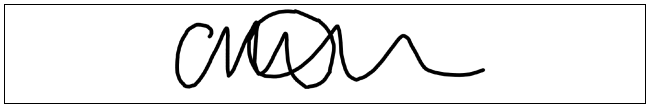
However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Planning Act 2016* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

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

The anniversary day of this environmental authority is the same day each year as the original take effect date unless you apply to change the anniversary day. The payment of the annual fee will be due each year on this day. An annual return will be due each year on 01 April.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without

the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.



Signature

12 September 2022

Date

Clancy Mackaway
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
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Privacy statement

Pursuant to section 540 of the EP Act, the Department is required to maintain a register of certain documents and information authorised under the EP Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the EP Act. There is no general discretion allowing the Department to withhold documents or information required to be kept on the public register. For more information on the Department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

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)

Other permits required

This permit only provides an approval under the *Environmental Protection Act 1994*. In order to lawfully operate you may also require permits / approvals from your local government authority, other business units within the department and other State Government agencies prior to commencing any activity at the site. For example, this may include permits / approvals with your local Council (for planning approval), the Department of Transport and Main Roads (to access state-controlled roads), the Department of Resources (to clear vegetation), and the Department of Agriculture and Fisheries (to clear marine plants or to obtain a quarry material allocation).

Conditions of environmental authority

- **Common Conditions** – All development areas
    - **Appendix A** - General
    - **Schedule E –** Noise
    - **Schedule F –** Air
    - **Schedule R –** Rehabilitation
    - **Definitions**
- **Section 1**
    - Walloons, Condabri, Combabula and Ramyard development areas common conditions
    - **Part 1** - Walloons development area specific conditions
    - **Part 2** - Condabri development area specific conditions
    - **Part 3** - Combabula development area specific conditions
    - **Part 4** - Ramyard development area specific conditions
    - **Appendix A** – Section 1 Definitions
- **Section 2**
    - **Part 5** – Injune development area specific conditions
        - **Appendix B** - Criteria for dams and evaporation ponds
    - **Part 6** - Lonesome & Membrance development area specific conditions
    - **Part 7** - Murrungama development area specific conditions

Common conditions – All development areas

Schedule A – General Conditions

Monitoring Standards

(A6) All monitoring must be undertaken by a suitably qualified person

(A7) If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.

(A8) All laboratory analysis and tests must be undertaken by must be undertaken by a laboratory that has NATA accreditation for such analysis and tests. Where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.

(A9) 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 or subject to any change in legislation:

a) for waters and aquatic environments, the Queensland Government's Monitoring and Sampling Manual - Environmental Protection (Water) Policy 2009;

b) for groundwater, *Groundwater Sampling and Analysis – A field guide* (2009:27 GeoCat #68901);

c) for noise, *Noise Measurement Manual* – Environmental Protection (Noise) Policy 2019;

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*.

Environmental Nuisance

(A10) Petroleum activities must not cause environmental nuisance at a sensitive place.

Alternative arrangements

(A11) Despite any other condition in this environmental authority, environmental nuisance caused by the activity at a sensitive place is authorised to the extent that an alternative arrangement permits that type of environmental nuisance to occur at that particular sensitive place.

Prevent or minimise likelihood of environmental harm

(A12) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Documentation

(A13) 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.

(A14) All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

(A15) All documents required to be developed under this environmental authority must be kept for five years.

(A16) 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.

(A17) A record of all complaints must be kept including the date, complaint's details, source, reason for the complaint, description of investigations and actions undertaken in resolving the complaint.

Notification - Walloons, Combabula, Condabri, Lonesome & Membrance and Murrungama project areas

(A18) 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 (B21) 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. 200 L of hydrocarbons; or

ii. 200 L of stimulation additives; or

iii. 500 L of stimulation fluids; or

iv. 1 000 L of brine; or

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

vi. 5 000 L of raw sewage; or

vii. 10 000 L of treated sewage effluent.

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.

Notification - Ramyard project area

(A19) The Administering Authority's Pollution Hotline must be telephoned as soon as reasonably practicable, but within 48 hours after becoming aware of:

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

b) when the level of the contents of any regulated dam reaches the mandatory reporting level; or

c) when a regulated dam will not have available storage to meet the design storage allowance

on the 1 November of any year;

d) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during hydraulic fracturing increases by more than 3.5 MPa from the pressure immediately preceding hydraulic fracturing); or

e) any detection of restricted stimulation fluids from stimulation fluid monitoring; or

f) any analyses result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource; or

g) any analyses result from groundwater monitoring that exceeds trigger action investigation levels, if provided in this environmental authority.

(A20) The Administering Authority's Pollution Hotline must be telephoned as soon as reasonably practicable, but within 48 hours after becoming aware of the following releases (or their mixtures)

a) releases of any volume of contaminants to water;

b) releases of volumes of contaminants to land greater than:

i. 200L of hydrocarbons; or

ii. 200 L of stimulation additives; or

iii. 500 L of stimulation fluids; or

iv. 1000 L of brine; or

v. 5 000 L of coal seam gas water.

Schedule E – Noise

Walloons, Condabri, Combabula and Ramyard project areas – Noise Management Plan

(E1) A Noise Management Plan certified by a suitably qualified person must be maintained.

Walloons, Condabri, Combabula, Ramyard and Murrungama project areas

(E2) 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 E: Table 1, Noise Limits at Sensitive Receptors*, in the event of a valid complaint about noise being made to the administering authority other than where an alternative arrangement is in place.

Schedule E: Table 1 – Noise Limits at Sensitive Receptors Walloons, Condabri, Combabula, Ramyard, Murrungama[1]

Time Period	Metric	Short Term Noise Event	Medium Term Noise Event	Long Term Noise Event
7:00 am – 6:00 pm	$L_{Aeq\ adj,15\ min}$	45 dBA	43 dBA	40 dBA
6:00 pm – 10:00 pm	$L_{Aeq\ adj,15\ min}$	40 dBA	38 dBA	35 dBA
Noise from drilling activities undertaken from 10:00pm – 7:00am	$L_{Aeq\ adj,15\ min}$	30 dBA (measured indoors at any sensitive receptor)		
Noise from fixed plant in gas fields undertaken from 10:00pm – 7:00am	$L_{Aeq\ adj,15\ min}$	28 dBA (measured indoors at any sensitive receptor)		

[1]*Noise limits in Table 1 are taken to be measured noise levels outside a sensitive receptor unless stated otherwise.*

Tonal or impulsive noise

(E3) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in *Schedule E: Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors* are to be added to the measured noise level(s) to derive $L_{Aeq,\ adj,\ 15\ min}$.

Schedule E: Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors

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

Lonesome and Membrance project area

(E4) Emission of noise from the petroleum activity(ies) at levels less than those specified in Streamlined Conditions—Protecting acoustic values, Table 1—Noise nuisance limits are not considered to be environmental nuisance.

Schedule E: Table 3 – Noise Limits at Sensitive Receptors Lonesome/Membrance[2]

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

[2]Noise limits in Table 1 are taken to be measured noise levels outside a sensitive receptor unless stated otherwise.

- *L_{ABG} is the deemed background noise levels which for the purposes of Schedule E: Table 1: Noise Limits at Sensitive Receptors are:*
  7:00am – 6:00pm: 35 dBA
  6:00pm – 10:00pm: 30 dBA
  10:00pm – 6:00am: 25 dBA
  6:00am – 7:00am: 30 dBA

Walloons, Condabri, Combabula, Ramyard, Lonesome & Membrance and Murrungama project areas Low Frequency Noise

(E5) Emission of any low frequency noise must not exceed the following limits in the event of a valid complaint about low frequency noise being made to the administering authority:

a) 60 dB(C) measured outside the sensitive receptor; and

b) the difference between the external A-weighted and C-weighted noise levels is no greater than 20 dB; or

c) 50 dB(Z) measured inside the sensitive receptor; and

d) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

Injune project area

(E6) Noise emitted from any aspect of petroleum activities must not exceed the noise levels, specified in *Schedule E: Table 4 – Noise Limits at Sensitive Receptors*, at any sensitive place or commercial place.

Schedule E: Table 4 – Noise Limits at Sensitive Receptors Injune[3]

Time period	Noise level at a sensitive place measured as the Adjusted Maximum Sound Pressure Level $L_{A,\ max\ adj,\ T}$
7am – 6pm	Background noise level plus 5 dB(A)
6pm – 10pm	Background noise level plus 5 dB(A)
10pm – 7am	Background noise level plus 3 dB(A)

Time period	Noise level at a commercial place measured as the Adjusted Maximum Sound Pressure Level $L_{A, max\ adj, T}$
7am – 6pm	Background noise level plus 10 dB(A)
6pm –10pm	Background noise level plus 10 dB(A)
10pm –7am	Background noise level plus 8 dB(A)

[3]General note: In no case is the background noise level, L_{A90}, 15 mins to be less than 25 dB(A). In the event that measured background noise level is less than 25 dB(A), then 25 dB(A) is to be used.

Vibration and Blasting - Lonesome and Membrance

(E7) No blasting is authorised in the Lonesome and Membrance Development areas

Vibration and Blasting - Walloons, Condabri, Combabula, Ramyard and Murrungama

(E8) A Blast Management Plan must be developed for each blasting activity in accordance with Australian Standard 2187.

(E9) Blasting operations must be designed to not exceed an airblast overpressure level of 120 dB (linear peak) at any time, when measured at, or extrapolated to, any sensitive receptor.

(E10) Blasting operations must be designed to not exceed a ground-borne vibration peak particle velocity of 10mm/s at any time, when measured at or extrapolated to any sensitive place

Schedule F – Air

All project areas

Flare conditions

(F1) Unless venting is authorised under the *Petroleum and Gas (Production and Safety) Act 2004* or the *Petroleum Act 1923*, waste gas must be flared in a manner that complies with all of (F2 (a)) and (F2 (b)) and (F2 1(c)), or with (F2 (d)):

a) an automatic ignition system is used, and

b) a flame is visible at all times while the waste gas is being flared, and

c) there are no visible smoke emissions other than for a total period of no more than 5 minutes in any 2 hours, or

d) it uses an enclosed flare.

Walloons, Combabula, Condabri, and Ramyard Project Areas

Fuel Burning or Combustion Equipment

(F2) Contaminants emitted from fuel burning and combustion equipment point sources, excluding ground flares, that are capable of burning at least 500 kg in an hour must be directed vertically upwards.

(F3) Prior to the installation of any new or additional fuel burning and combustion equipment that is capable of burning at least 500 kg of fuel in an hour, air dispersion modelling must be carried out to calculate the ground level concentrations of emissions from the fuel burning or combustion equipment under maximum operating conditions within the relevant airshed and identify any potential impacts to air quality within the study area.

(F4) The calculated ground level concentrations required under condition (F4) must not exceed the criteria for each air contaminant in **Schedule F: Table 1 – Maximum Ground Level Concentration Criteria.**

Schedule F: Table 1 – Maximum Ground Level Concentration Criteria

Contaminant	Concentration at 0°Celsius	Units	Averaging time
NOx as Nitrogen Dioxide	250	$\mu g/m^3$	1 hour
NOx as Nitrogen Dioxide	33	$\mu g/m^3$	1 year
Carbon monoxide	11	mg/m^3	8 hours

(F5) Emissions testing must be carried post commissioning of any fuel burning and combustion equipment capable of burning at least 500kg of fuel in an hour to verify the estimates used in the air dispersion modelling.

(F6) Where the results of the emissions testing required under condition (F6) indicate that the emission estimates used in the air dispersion modelling required under condition (F5) are exceeded, then:

a) the details must be provided to the administering authority within 10 business days;

b) modelling based on the new information must be carried out; and

c) appropriate pollution control measures must be determined and utilised to bring the emissions into compliance with the limits specified in **Schedule F, Table 1 – Maximum Ground Level Concentration Criteria.**

(F7) A register of fuel burning and combustion equipment that is capable of burning at least 500 kg of fuel in an hour must be developed and maintained and include, as a minimum, the following information for each piece of equipment:

a) fuel burning or combustion equipment name and location;

b) stack emission height (metres);

c) minimum efflux velocity (m/s);

d) mass emission rates (g/s); and

e) contaminant concentrations (mg/Nm^3 @ x %O_2 dry gas at 0°Celsius and 1 atmosphere).

(F8) The information contained in the register of fuel burning and combustion equipment must be accurate, current and complete.

Walloons, Combabula, and Condabri Project Areas

Fugitive Emissions

(F9) All reasonable and practicable measures must be taken in the design and operation of the plant to minimise fugitive VOC emissions. Reasonable and practicable measures include but are not limited to

a) implementation of a monitoring program to regularly leak test all units/components including pumps, piping and controls, vessels and tanks; and

b) operating, maintenance and management practices to be implemented to mitigate fugitive VOC sources.

(F10) A monitoring program of contaminants released to the atmosphere must be conducted at each release point recorded in the register of fuel burning and combustion equipment (as required by condition (F8)) for the contaminants listed in **Schedule F: Table 1 – Maximum Ground Level Concentration Criteria** and at the frequencies specified in **Schedule F: Table 3 – Monitoring Frequency for contaminants:**

Schedule F: Table 3 – Monitoring Frequency for contaminants:

Contaminant	Monitoring Frequency
NOx as Carbon Dioxide	Annually
Carbon Monoxide	Annually

(F11) The monitoring program must include, but not necessarily be limited to:

a) monitoring provisions for the release points which complies with the most recent edition of Australian Standard 4323;

b) tests for each sample taken at each release point specified in the register of fuel burning or combustion equipment (as required by condition (F8)), excluding flares, including:

i. gas velocity, volume and mass flow rate;

ii. temperature; and

iii. water vapour concentration (for non-continuous sampling);

c) representative samples of the contaminants discharged when operating under normal and operating conditions;

d) the collection of production rate and plant status during sampling periods; and

e) monitoring of contaminant release carried out in accordance with the latest edition of the Department of Environment and Heritage Protection Air Quality Sampling Manual 1997, as amended from time to time

Combabula and Condabri Project Areas

Air Monitoring (Point Source – concrete batching activities)

(F12) Dust and particulate matter from concrete batching activities must not exceed the following levels at any sensitive or commercial place, when monitored in accordance with Australian Standard AS3580.10.1 of 2003 (or more recent versions):

a) dust deposition of 120mg/m^2/day;

b) PM_{10} concentration of 50µg/m^3 over a 24-hour averaging time;

c) $PM_{2.5}$ concentration of 25µg/m^3 over a 24-hour averaging time.

Condabri Project Area

Fuel Burning and Combustion Equipment in Hubs and/or Places within 5 km of Populated Areas

(F13) Fuel burning or combustion equipment must only release contaminants to the atmosphere as provided for in **Schedule F, Table 4 – Release of Contaminants to Air**.

Schedule F, Table 4 – Release of Contaminants to Air

Equipment	Minimum Release Height (m)	Minimum Velocity (m/s)	Contaminant released	Maximum Release Limit	Monitoring Frequency
Gas Reciprocating Engine	7.5	35.9	NOx as Nitrogen Dioxide	500 mg/Nm^3 (dry) at 5% O_2 and 0.9 g/s at 0ºC and 101.3kPa	Annually
Gas Turbine	6	35.4	NOx as Nitrogen Dioxide	53 mg/Nm^3 (dry) at 15% O_2 and 3.01 g/s at 0ºC and 101.3kPa	Annually

Ramyard Project Area

Fuel Burning and Combustion Equipment in Hubs and/or Places within 5 km of Populated Areas

(F14) Fuel burning equipment that is capable of burning at least 500kg in an hour must not be operated in hubs or within five kilometres of populated areas

(F15) The method of measurement of point source contaminant releases to air must comply with the latest edition of the Queensland Air Quality Sampling Manual and/or Australian Standard 4323 as amended from time to time.

Schedule R – Rehabilitation

Rehabilitation Planning

(R1) 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 (R1) to (R8), inclusive; and

ii. provide for appropriate monitoring and maintenance.

(R2) 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 in areas which are not being or intended to be utilised by the landholder or overlapping tenure holder

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 Acceptance Criteria

(R3) 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

e) 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

(R4) 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 the conditions of this authority identified in Table – Acceptance Criteria) 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.

Table – Acceptance Criteria

Part	*Condition*
Section 1, Part 1 – Walloons	*D2, D3*
Section 1, Part 2 – Condabri	*D2, D3*
Section 1, Part 3 – Combabula	*D2, D3*
Section 1, Part 4 – Ramyard	*E1, E2*
Section 2, Part 5 – Injune	*PESCB 7 (a)*
Section 2, Part 6 - Lonesome and Membrance	*Biodiversity 1, Biodiversity 2.*
Section 2, Part 7 – Murrungama	*D10, D11*

Continuing conditions

(R5) Conditions (R2), (R3) and (R4) continue to apply after this environmental authority has ended or ceased to have effect.

Rehabilitation reporting for relinquishment of part of an Authority To Prospect area under the *Petroleum and Gas (Production and Safety) Act 2004*

(R6) 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 (R2), (R3) and (R4) has been met.

(R7) The report required under condition (R6) must be submitted to the administering authority at least 40 business days prior to the relinquishment notice being lodged with the administering authority for the *Petroleum and Gas (Production and Safety) Act 2004*.

Remaining dams

(R8) 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.

Definitions

administering authority	Administering authority has the meaning in the *Environmental Protection Act 1994*.
Adjacent land use	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.
Alternative arrangement	means a written agreement about the way in which a particular nuisance impact will be dealt with at a sensitive place and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.
Analogue site(s)	means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation, vegetation community attributes and other ecological characteristics. Analogue sites can be the pre-disturbed site of interest where significant surveying effort has been undertaken to establish benchmark parameters.
Australian Standard 2187	means Australian Standard 2187.0:1998 Explosives—Storage, transport and use, Part 0, Australian Standard 2187.1:1998 Explosives—Storage, transport and use Part 1 and Australian Standard 2187.2:2006 Explosives—Storage and use, Part 2 or any updated versions that becomes available from time to time.
Australian Standard 4323	means Australian Standard 4323.1:1995 Stationary source emissions method 1: Selection of sampling positions.
Authorised person	means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive or chief executive officer of a local government.
Authorised resource activities	means the resource activities authorised to be carried out under condition under this environmental authority.
Background noise level	means the sound pressure level, measured in the absence of the noise under investigation, as the $L_{A90,T}$ being the A-weighted sound pressure level exceeded for 90 percent of the measurement time period T ofnot less than 15 minutes, using Fast response.
Bankfull	means the channel flow rate that exists when the water is at the elevation of the channel bankabove which water begins to spill out onto the floodplain. The term describes the condition of the channel relative to its banks (e.g., overbank, in-bank, bankfull, low banks, high bank).
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.

Biodiversity values	for the purposes of this environmental authority, means environmentally sensitive areas, prescribed environmental matters and wetlands.
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 maybe done.
Category A Environmentally Sensitive Area	has the meaning in the Environmental Protection Regulation 2019.
Category B Environmentally Sensitive Area	has the meaning in the Environmental Protection Regulation 2019.
Category C Environmentally Sensitive Area	means any of the following areas: • nature refuges as defined in the conservation agreement for that refuge under the *Nature Conservation Act 1992* • koala habitat areas as defined under the Nature Conservation (Koala) Conservation Plan 2006 • state forests or timber reserves as defined under the *Forestry Act 1959* • regional parks (previously known as resource reserves) under the *Nature ConservationAct 1992* • an area validated as 'essential habitat' from ground-truthing surveys in accordance with the V*egetation Management Act 1999* for a species of wildlife listed as endangered or vulnerable under the *Nature Conservation Act 1992* • *'*of concern regional ecosystems' that are remnant vegetation and identified in the database called 'RE description database' containing regional ecosystem numbers anddescriptions.
Certified or certification	in relation to any matter other than a design plan, 'as constructed' drawings or an annual report regarding dams means, a Statutory Declaration by a suitably qualified person or suitably qualified third party accompanying the written document stating: • the person's qualifications and experience relevant to the function • that the person has not knowingly included false, misleading or incomplete information in the document • that the person has not knowingly failed to reveal any relevant information or document to the administering authority • that the document addresses the relevant matters for the function and is factually correct; and • that the opinions expressed in the document are honestly and reasonably held.
Closed-loop systems	means using waste on site in a way that does not release waste or contaminants in the waste to the environment.
Coal seam gas water	means underground water brought to the surface of the earth, or moved underground inconnection with exploring for, or producing coal seam gas.
Control measure	has the meaning in the *Environmental Protection Regulation 2019* and means a device, equipment, structure, or management strategy used to prevent or

	control the release of a contaminant or waste to the environment.
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.
Development wells	means a petroleum well which produces or stores petroleum. For clarity, a development welldoes not include an appraisal well.
Document	has the meaning in the *Acts Interpretation Act 1954* and means: • any paper or other material on which there is writing; and • any paper or other material on which there are marks; and • figures, symbols or perforations having a meaning for a person qualified to interpret them; and • any disc, tape or other article or any material from which sounds, images, writings or messages arecapable of being produced or reproduced (with or without the aid of another article or device).
ecological dominant layer	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means the layer making the greatest contribution to the overall biomass of the site and the vegetation community (NLWRA 2001). This is also referred to as the ecologically dominant stratum or the predominant canopy in woody ecosystems.
ecosystem functioning	means the interactions between and within living and nonliving components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.
foreseeable future	means the period used for assessing the total probability of an event occurring. Permanent structures andecological 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.
GDA	means Geocentric Datum of Australia.
Geophysical survey	means a systematic collection of geophysical data
hub	For Combabula, and Ramyard, means more than one unit of fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined, located within five (5) km of any other fuel burning or combustion equipment capable of burning fuel at a rate of at least 500 kg/hour individually or combined.
	For ~~Part 2~~ Condabri, means more than one large compressor station and multiple items of fuel burning or combustion units located within five km of each other and capable of burning fuel at a rate of at least 500kg/hr.
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.
Incidental activity	For this environmental authority means an activity that is reasonably necessary for carrying out a petroleum activity.
incidental land management	includes the use of the produced water associated with stock and stock intensive drinking water, for purposes associated with occasional low risk or emergency uses. Examples include vehicle wash downand fire prevention.

$L_{Aeq, adj, 15 mins}$	means the A-weighted sound pressure level of a continuous steady sound, adjusted for tonal character,that within any 15-minute period has the same square sound pressure as a sound level that varies with time.
$L_{A 90, adj, 15 mins}$	means the A-weighted sound pressure level, adjusted for tonal character, that is equal to or exceeded for 90 percent of any 15 minutes sample period equal, using Fast response.
Max $L_{pZ, 15 min}$	means the maximum value of the Z-weighted sound pressure level measured over 15 minutes.
$L_{A max, adj, T}$	means the adjusted average maximum A-weighted sound pressure level measured over a time period T. The maxima must be measured on a sound level meter with a frequency-weighting that corresponds to perceived loudness (“A” weighting) and the meter must be set to the “fast” response time-weighting. The measured values are to be adjusted upwards by 2 dB(A) to 5 dB(A) if the noise source has tonal characteristics. The measuring period must be in excess of five minutes. The arithmetic average of the adjusted maxima, after eliminating any extraneous noise peaks, is the measure used to characterise the noise environment. (This measure will generally be similar to a percent exceedance of 10% or less. Refer to Australian Standard AS1055.)
long term noise event	means a noise exposure, when perceived at a sensitive receptor, persists for a periodof greater than five (5) days, even when there are respite periods when the noise is inaudible within those five (5) days.
medium term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than five (5) days and does not re-occur for a period of at least four (4) weeks. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a difference sourceor source location.
month	has the meaning in the *Acts Interpretation Act 1954* and means a calendar month and is a period starting at the beginning of any day of one (1) of the 12 named months and ending— • immediately before the beginning of the corresponding day of the next named month; or • if there is no such corresponding day—at the end of the next named month.
NATA accreditation	means accreditation by the National Association of Testing Authorities Australia.
populated area	includes towns and cities which have a populated of 200 or more people and with a minimum density of 40 people / km^2.

pre-disturbed land use	means the function or use of the land as documented prior to significant disturbance occurring at that location.
predominant species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
project area	means the area covered by the tenure identified in ***Table 1 – Project areas definition*** Column 2 relevant to each of the project area names in Column 1.
regional ecosystem(s)	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 vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.
rehabilitation	means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria and, where relevant, includes remediation of contaminated land. For the purposes of pipeline rehabilitation, rehabilitation includes reinstatement, revegetation and restoration.
remnant vegetation	means vegetation, part of which forms the predominant canopy of the vegetation— • covering more than 50 percent of the undisturbed predominant canopy; and • averaging more than 70 percent of the vegetation's undisturbed height; and • composed of species characteristic of the vegetation's undisturbed predominant canopy cover.
restoration	means the replacement of structural habitat complexity, ecosystem processes, services and function from a disturbed or degraded site to that of a pre-determined or analogue site. For the purposes of pipelines, restoration applies to final rehabilitation after pipeline decommissioning.
revegetation or revegetating or revegetate	means to actively re-establish vegetation through seeding or planting techniques in accordance with site specific management plans.

	means: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or other residential premises, motel, hotel or hostel) • a library, childcare centre, kindergarten, school, university or other educational • institution • a medical centre, surgery or hospital • a protected area • a public park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment • a work place used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employee's accommodation or public roads • for noise, a place defined as a sensitive receptor for the purposes of the *Environmental Protection (Noise) Policy 2019*.
sensitive receptor	means an area or place where noise (including low frequency, vibration and blasting) is measured toinvestigate whether nuisance impacts are occurring and includes: • a dwelling (including residential allotment, mobile home or caravan park, residential marina or otherresidential 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 otherthan for sport or organised entertainment; or • a workplace used as an office or for business or commercial purposes, which is not part of the petroleum activity(ies) and does not include employee accommodation or public roads.
short term noise event	is a noise exposure, when perceived at a sensitive receptor, persists for an aggregate period not greater than eight hours and does not re-occur for a period of at least seven (7) days. Re-occurrence is deemed to apply where a noise of comparable level is observed at the same receptor location for a period of one hour or more, even if it originates from a different source or source location.
specified relevant activity	For this environmental authority means an activity that: a) But for being carried out as a resource activity, would otherwise be a prescribed ERA; b) Stimulation activities; c) Extracting material, other than dredging; d) Point source discharge of treated produced water to surface waters; e) Storing waste that is not regulated waste (including coal seam gas water) in a regulateddam; or f) Storing coal seam gas water that is not regulated waste in a low consequence dam.

significantly disturbed areas	means disturbance to land as defined in Schedule 12, section 4 of the *Environmental Protection Regulation 2008*. (1) Land is significantly disturbed if— (a) it is contaminated land; or (b) it has been disturbed and human intervention is needed to rehabilitate it— (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance. Examples of a disturbance to land— • the covering, compaction, exposure, removal or stockpiling of soil or other material • the destruction or removal of vegetation • the carrying out of a mining activity in a watercourse or wetland • the submergence of an area with a hazardous contaminant, tailings, or water (2) Without limiting subsection (1)(b), land requires human intervention to rehabilitate it if— (a) the disturbance has made the land more susceptible to erosion; or (b) the land use capability or suitability of the land is diminished; or (c) the quality of water in a watercourse downstream of the land has been significantly reduced. (3) If land is significantly disturbed land because it is contaminated land, it ceases to be significantly disturbed land if a suitability statement is issued for the land. (4) If land is significantly disturbed land under subsection (1)(b), it ceases to be significantly disturbed land if the administering authority is satisfied the land has been rehabilitated— (a) to the condition it was in immediately before the disturbance; or (b) to another condition decided by the administering authority.
species richness	means the number of different species in a given area.
stable	For a site, means the rehabilitation and restoration of the site is enduring or permanent so that the site is unlikely to collapse, erode or subside.
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.
valid complaint	means all complaints unless considered by the administering authority to be frivolous,vexatious or based on mistaken belief.
year	means a period of 12 months.

Table 1 – Project areas definition

Column 1	**Column 2**
Project Area	**Tenure**
Walloons	PFL26 PL215 PL216 PL225

	PL226
	PL272
Condabri	PL1011
	PL265
	PL266
	PL267
	PPL186
Combabula	ATP606
	PL297
	PL403
	PL404
	PL405
	PL406
	PL407
	PL408
	PL412
	PL413
	WMA2013
Ramyard	ATP606
	ATP972
	PL469
	PL470
	PL471
	PL444
Injune	ATP592
Lonesome and Membrance	PL220
	PL219
Murrungama	PL1084

End of common conditions

SECTION 1

FOR PART 1 (WALLOONS), PART 2 (CONDABRI), PART 3 (COMBABULA) AND PART 4 (RAMYARD)

SCHEDULE C – DAMS

Assessment of consequence category

(C1) The consequence category of any dam must be assessed by a suitably qualified and experienced person in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(C2) The consequence assessment required under condition (C1) must occur in any of the following situations:

g) prior to the design and construction of the dam;

h) prior to any change in its purpose or its stored contents;

i) for a dam assessed and certified as a high or significant consequence dam, at least biennially after its construction;

(C3) A Consequence Assessment Report and certification must be prepared for any dam assessed and the report may include a consequence assessment for more than one dam.

(C4) The holder must, on receipt of a Consequence Assessment Report and certification, provide to the Administering Authority an electronic copy of the Consequence Assessment Report and certification.

(C5) Where a dam is for the first time assessed as significant or high, the holder of this environmental authority must ensure that within 12 months of that assessment, the dam meets the conditions required for regulated dams under this environmental authority.

Construction of low consequence dam to contain wetting front

(C6) Where a dam is assessed as low consequence, it must be:

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

b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation.

(C7) In the event of early signs of loss of structural or hydrological integrity of a low consequence dam, the holder of this environmental authority must:

a) take immediate action to prevent or minimise any actual or potential environmental harm; and

b) report in writing to the administering authority, any findings and actions taken within 20 business days of that event.

Monitoring of low consequence dams

(C8) The condition of all low consequence dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a suitably qualified and experienced person. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the consequence assessment based on the particular circumstances of each dam.

Design and construction of a regulated dam

(C9) All regulated dams must be designed, constructed, operated, modified and decommissioned in accordance with the requirements of the most recent version of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures as amended from time to time and under the supervision of a suitably qualified and experienced person.

(C10) Construction of a regulated dam is prohibited unless the holder has:

a) submitted a Consequence Category Assessment Report and certification to the administering authority;

b) commissioned a suitably qualified and experienced person to prepare a design plan for the dam;

c) received the design plan for the dam, together with certification of that plan from the suitably qualified and experienced person, that:

i. the design plan is in accordance with the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time;

ii. the dam is capable of delivering the performance stated in the design plan; and

d) when constructed and operated in accordance with the design plan, the dam will be compliant in all respects with conditions (C9) to (C16) of this environmental authority.

e) submitted the above design plan and certification to the administering authority.

(C11) Regulated dams must be designed and constructed to prevent:

a) floodwaters from entering the regulated dam from a watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time; and

b) wall failure due to erosion by floodwaters arising from the watercourse or drainage line to the annual exceedance probability specified for determining spillway capacity in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time; and

c) overtopping as a result of a flood event of the annual exceedance probability specified for determining spillway capacity in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(C12) The design plan for a regulated dam must include, but not necessarily be limited to:

(a) a Design Report which provides:

i. certification of the design plan;

ii. a description of all the documents which constitute the design plan;

iii. a statement of:

(a) the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory documents relied upon in preparing the design plan; and

(b) all relevant facts and data used in preparing the design plan, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the design plan;

(c) the consequence category of the dam; and

(d) the reasoning of the certifying suitably qualified and experienced person as to how the design plan provides the necessary required performance;

iv. documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;

v. detailed criteria for the design, operation, maintenance and decommissioning of the dam including any assumptions;

vi. design, specification and operational rules for any related structures and systems used to prevent failure scenarios;

vii. reasoning for how the design plan provides the required performance;

viii. details of any other matter which may substantially affect, or is critical to, the design plan; and

ix. evidence that the certifier is a suitably qualified and experienced person.

(b) drawings showing the lines and dimensions of built structures and land forms associated with the regulated dam;

(c) a description of any containment systems;

(d) an operational plan that includes;

i. normal operating procedures and rules;

ii. emergency and contingency plans including operating procedures designed to avoid and / or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the dam;

(e) a plan for the decommissioning and rehabilitation of the dam at the end of its operational life;

(f) details of reports on investigations and studies done in support of the design plan; and

(g) any other matter required by the suitably qualified and experienced person.

(C13) All aggregation dams must:

(a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and rehabilitation; and

(b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the dam; and

(c) either be capable of repair to rectify any passage of the wetting front through either the floor or sides of the dam, or else be decommissioned and rehabilitated.

(C14) All brine dams must:

(a) be designed with a floor and sides of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during its operational life including any period of decommissioning and rehabilitation; and

(b) have a system that will detect any passage of the wetting front or entrained contaminants through the floor or sides of the dam; and

(c) have a system for the collection and proper disposal of any contaminants that move beyond the bounds of the containment system; and

(d) either be capable of repair to rectify any passage of the wetting front through either the floor or sides of the dam, or else be decommissioned and rehabilitated.

Operation of a regulated dam

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

(a) submitted to the administering authority an electronic copy of certificated set of 'As constructed' drawings and specifications, together with certification that the dam:

i. has been constructed in accordance with the design plan;

ii. is capable of delivering the performance stated in the design plan; and

iii. is compliant with the relevant conditions of this environmental authority;

(b) the conditions of this environmental authority relating to the construction of the dam have been met; and

(c) the holder of this environmental authority has entered the details required under this environmental authority, into a Register of Regulated Dams.

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

Mandatory reporting level

(C17) The mandatory reporting level must be marked on a regulated dam in such a way that it is clearly visible.

(C18) The holder must, on becoming aware that the mandatory reporting level has been reached, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Annual Inspection Report

(C19) Each regulated dam must be inspected annually by a suitably qualified and experienced person.

(C20) At each annual inspection, the condition and adequacy of all components of the regulated dam must be assessed:

(a) against the most recent Consequence Assessment Report and design plan;

(b) against recommendations contained in previous Annual Inspections Reports;

(c) against recognised dam safety deficiency indicators;

(d) for changes in circumstances potentially leading to a change in consequence category;

(e) for conformance with the conditions of this environmental authority;

(f) for conformance with the drawings of the certified design plan;

(g) for the adequacy of the available storage in each regulated dam, based on an actual observation(s) taken in May of each year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam.

(C21) A suitably qualified and experienced person must prepare an Annual Inspection Report containing details of the assessment and including recommended actions to ensure the integrity of the dam.

(C22) The suitably qualified and experienced person who prepared the Annual Inspection Report must certify that report in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(C23) The holder of this environmental authority must:

(a) upon receipt of the final Annual Inspection Report, consider the report and its recommendations and take action to ensure that the regulated dam will safely perform its intended function; and

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

Design storage allowance

(C24) On 1 November of each year, storage must be available in each regulated dam to meet the design storage allowance estimated for the dam in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(C25) The holder must, immediately on becoming aware that the regulated dam will not have the available storage to meet the design storage allowance on 1 November of any year, act to prevent or, if unable to prevent, to minimise, any actual or potential environmental harm.

Performance review

(C26) The holder of this environmental authority must assess the performance of each regulated dam over the preceding November to May period based on actual observations of the available storage in each regulated dam taken in May of each year.

(C27) The holder of this environmental authority must take action to modify its water management system so as to ensure that the regulated dam will perform in accordance with the requirements of this authority, for the subsequent November to May period.

Repair requirements

(C28) Where the holder of this environmental authority detects any passage of the wetting front through the floor or sides of the regulated dam, they must, as soon as practicable:

(a) repair the dam to rectify the detected passage of the wetting front or entrained contaminants through the floor or sides of the dam; or

(b) decommission and rehabilitate the dam.

Decommissioning

(C29) On cessation of operation of any dam, that dam must be maintained so as to prevent environmental harm until that dam is decommissioned.

(C30) The holder of the environmental authority must assess the disposal options available for any contaminated material, including salts and dam liners, in accordance with the waste management hierarchy and submit the results to the administering authority.

(C31) Decommissioned dams are to be rehabilitated and the landform must be reinstated such that it will not function as a dam and will be stable and sustainable for the foreseeable future, unless otherwise negotiated with landholders.

Transfer arrangements

(C32) The holder of this environmental authority must provide a copy of any reports, documentation and certifications prepared under this environmental authority, including but not limited to any Register of Regulated Dams, consequence assessment, design plan and other supporting documentation, to a new holder of an environmental authority and the administering authority on transfer of the environmental authority.

Register of Regulated Dams

(C33) A Register of Regulated Dams must be established and maintained by the holder of this environmental authority and include, but not necessarily be limited to, the following information for each regulated dam:

(a) date of entry in the register;

(b) name of the dam, its purpose and intended / actual contents;

(c) location of the dam defined by coordinates (GDA94) within five metres at any point from the outside of the dam including its storage area;

(d) the consequence category of the dam as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time;

(e) dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;

(f) name and qualifications of the certifier of the design plan and 'as constructed' drawings;

(g) for the regulated dam, other than in relation to any levees:

i. dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;

ii. dam crest volume (megalitres);

iii. spillway crest level (metres AHD);

iv. maximum operating level (metres AHD);

v. storage rating table of stored volume versus level (metres AHD);

vi. design storage allowance (megalitres);

vii. mandatory reporting level (metres AHD);

(h) design plan title and reference relevant to the dam;

(i) date construction was certified as compliant with the design plan;

(j) name and qualifications of certifier;

(k) details of the composition and construction of any liner;

(l) the system for the detection of any leakage through the floor and sides of the dam;

(m) dates when the dam underwent an annual inspection for structural and operational adequacy;

(n) dates when the dam was inspected for the purpose of annually ascertaining the available storage capacity;

(o) dates when recommendations and actions in the Annual Inspection Report were provided to the administering authority; and

(p) dam water quality as obtained from monitoring required under conditions (C39) to (C41).

Note: The dam register in the approved departmental format is available for download at: http://www.ehp.qld.gov.au/management/non-mining/documents/regulated_dam_register.xls .

(C34) The holder of this environmental authority must provisionally enter the required information in the Register of Regulated Dams when a design plan for a regulated dam is submitted to the administering authority.

(C35) The holder of this environmental authority must make a final entry of the required information in the Register of Regulated Dams once compliance with condition (C15) has been achieved.

(C36) The holder of this environmental authority must ensure that the information contained in the Register of Regulated Dams is always current and complete.

(C37) All entries in the Register of Regulated Dams must be approved by the chief executive officer for the holder of this environmental authority, or their delegate, as being accurate and correct.

(C38) The holder of this environmental authority must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Dams, in the electronic format required by the administering authority.

Regulated dam water quality monitoring

(C39) The holder of this environmental authority must monitor the quality of water in all regulated dams on the relevant resource authority(ies) in the month of October every year.

(C40) The monitoring of regulated dam water must include sufficient analytes and physico-chemical parameters to characterise water quality in the dam and must include, but not necessarily be limited to:

(a) pH;

(b) electrical conductivity [μS/m];

(c) anions (bicarbonate, carbonate, chloride, sulphate) [mg/L];

(d) cations (calcium, magnesium, potassium, sodium) [mg/L];

(C41) Water quality samples of regulated dams must be taken from at least three different dam profile depths for each sampling event and be taken as far as practicable from the edge of the regulated dam.

Requirements for evaporation dams

(C42) Evaporation dams as outlined in *Schedule C: Table 1 – Evaporation Dams*, are authorised under this approval for exploration and appraisal activities.

Schedule C: Table 1 – Evaporation Dams

Name of Evaporation Dam	Coordinates (Latitude, Longitude) GDA94	Maximum volume of dam (ML)
Ramyard Pilot Pond	26.357243 S, 149.816131 E	170.7
Combabula Pond 1	26.239541 S, 149.530939 E	621
Reedy Creek Cell 1	26.357202 S, 149.429966 E	
Reedy Creek Cell 2	26.356650 S, 149.428345 E	
Combabula Expanded Pilot Pond – Cell 1	26.231889 S, 149.572798 E	
Combabula Expanded Pilot Pond – Cell 2	26.231889 S, 149.572798 E	

(C43) Additional evaporation dams to those authorised under Condition (C42) are not authorised under this approval.

(C44) Coal seam gas: measurable criteria must be developed for the evaporation dams authorised under Conditions (C42). Measurable criteria must:

a) be prepared in accordance with the Department of Environment and Science CSG Water management: Measurable Criteria factsheet and include the objective, environmental value, task and performance indicators for each management criteria;

b) include management criteria for the disposal of waste including salt generated from the management of the water.

(C45) All existing coal seam gas evaporation dams authorised under Condition (C42) must meet the requirements of conditions (C13) or (C14) relevant to its intended use, and the requirements of the

Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, as amended from time to time.

(C46) The evaporation dams authorised under Condition (C42) must be decommissioned and the area rehabilitated to a final land use or converted to aggregation or brine dams within six months of the finalisation of exploration and appraisal activities.

(C47) Despite condition (C46), by 17 January 2024, Combabula Pond 1 must be:

a) decommissioned or rehabilitated to a final landuse; or

b) converted to no longer be used for the purpose of evaporation ponds.

PART 1 – Walloons Development Area

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Resource Activity, Schedule 3, 04: Extending an existing pipeline by more than 150km under a petroleum authority	PFL26 PL215 PL216 PL225 PL226 PL272
Resource Activity, Schedule 3, 06: A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	
Resource Activity, Schedule 3, 03: A petroleum activity that is likely to have a significant impact on a category A or B environmentally sensitive area	
Resource Activity, Schedule 3, 08: A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	
Resource Activity, Schedule 3, 07: A petroleum activity involving injection of a waste fluid into a natural underground reservoir or aquifer	
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (a-ii) 21 to 100EP otherwise	
Ancillary 63 – Sewage Treatment 1: Operating sewage treatment works, other than no release works, with a total daily peak design capacity of (b-ii) more than 100 but not more than 1,500EP otherwise	

SCHEDULE A – GENERAL CONDITIONS

Authorised petroleum activities

(A1) This environmental authority authorises the carrying out of the following resource activities:

(a) the petroleum activities and specified relevant activities listed in *Schedule A, Table 1 - Authorised petroleum activities and specified relevant activities* to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable); and

(b) incidental activities that are not otherwise specified relevant activities.

(A2) The authorised resource activities are authorised subject to the conditions of this environmental authority.

(A3) This environmental authority does not authorise a relevant act to occur in carrying out an authorised resource activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Schedule A, Table 1 – Authorised petroleum activities and specific relevant activities

Authorised petroleum activity	Scale		Intensity
	Maximum size	Location	
Petroleum activities			
Coal seam gas production and exploration	1430 ha (wells only)	Within project area	1430 wells
Petroleum facility (PFL 26)	N/A	Within PFL 26	150 TJ/day
Specified relevant activities			
Stimulation activities	N/A	Within project area	N/A
Extracting material, other than by dredging	N/A	Within project area	N/A
Electricity generation–by using gas (permanent, in isolation or combined in operation, or interconnected) at a rated capacity of 10 megawatt (MW) electrical or more	N/A	Within project area	200 MW for project area
Operating fuel burning equipment (permanent, in isolation or combined in operation, or interconnected) that is capable of burning more than 500kg of fuel in an hour	N/A	Within project area	N/A
Chemical storage (permanent) that meets any of the thresholds described in Schedule 2, Part 2, section 8 of the *Environmental Protection Regulation 2008*	>50t of chemicals of DG class 1 or 2, division 2.3 >500m^3 of chemicals of class C1 or C2 combustible liquids under AS 1940 or DG Class 3	Within project area	1430 storages at well leases; N/A at other permanent facilities

Authorised petroleum activity	Scale		Intensity
	Maximum size	Location	
	>200m^3 of chemicals that are liquids		
Sewage treatment works, other than no-release works, where treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme; or otherwise discharged	1,500 EP per facility	Within project area	9,100 EP for project area
Waste disposal onsite—operating a facility for disposing of greater than 50t of non-regulated waste in a year (including residual drilling material and drilling by-products disposal to land where the drill muds do not have any substances that would make it a regulated waste)	N/A	Within project area	1430 facilities
Waste disposal onsite—operating a facility for disposing of more than 200,000t of general waste (trial injection of treated water or wastewater)	1,200 m^3/day	Within project area	1 injection well
Regulated waste storage—any structure, including regulated, low consequence dams, and other dams containing regulated waste	N/A	Within project area	180 ha across 12 dams
Water treatment activities—treating 10ML or more of raw water in a day in a way that allows waste, whether treated or untreated, to be released into the environment	40 ML/day	Within project area	1 water treatment facility; 1 release point
Storing waste that is not regulated waste (including coal seam gas water) in a regulated dam	N/A	Within project area	30 regulated dams
Storing coal seam gas water that is not regulated waste in a low consequence dam	N/A	Within project area	1,130 low consequence dams

Prevent or minimise likelihood of environmental harm

(A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of measures, plant and equipment

(A5) 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.

(A6) 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).

(A7) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated and operated and maintained effectively in accordance with the manufacturer's specifications.

(A8) The holder of this authority must ensure that daily operation and maintenance of all plant and equipment relating to the authorised petroleum activities are carried out by suitably qualified, competent and experienced person(s).

(A9) All laboratory analyses and tests required to be conducted under this 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.

Contingency procedures for emergency environmental incidents

(A10) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.

b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.

c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.

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

e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.

f) training of staff to enable them to effectively respond.

g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Documentation and records management

(A11) A record of all documents required by this environmental authority must be:

a) kept for a minimum of five years; and

b) be made available to an authorised person upon request.

Infrastructure

(A12) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

a. regulated dams;

b. exploration, appraisal and development wells;

c. gas processing facilities;

d. water treatment facilities;

e. brine encapsulation facilities;

f. sewage treatment facilities;

g. authorised discharge points to air, land and waters;

h. any chemical storage facility associated with the environmentally relevant activity of chemical storage;

i. field compressor stations; and

j. central compressor stations.

Monitoring Program

(A13) All monitoring under this environmental authority must be undertaken by a suitably qualified person.

(A14) All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

SCHEDULE B – WATER

Contaminant release

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

Release of treated CSG water to waters

(B2) Treated CSG water may be released from the release point specified in *Schedule B, Table 1 – Treated CSG water release point and receiving waters* to the receiving environment specified in *Schedule B, Table 1 – Treated CSG water release point and receiving waters* until 31 December 2040.

(B3) The treated CSG water authorised to be released in accordance with condition (B2) must not contain stimulation fluid.

(B4) For the period commencing 1 January 2015 up to and including 31 December 2040, the total volume of treated CSG water authorised to be released in accordance with condition (B2) must not exceed 4.8 GL in any one calendar year that falls within the peak water production period**,** calculated as the total volume of release from the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme.

(B5) For the period commencing 1 January 2015 up to and including 31 December 2040, the total volume of treated CSG water authorised to be released in accordance with condition (B2) must not exceed 2.8 GL in any one calendar year that falls within the high-water production period**,** calculated as the total volume of release from the Integrated Condabri-Talinga Coal Seam gas Water Management Scheme.

(B6) For the period commencing 1 January 2015 up to and including 31 December 2040, the total volume of treated CSG water authorised to be released in accordance with condition (B2) must not exceed 2.3 GL per annum in any one calendar year that falls within the low water production period, calculated as the total volume of release from the Integrated Condabri-Talinga Coal Seam gas Water Management Scheme.

(B6A) Despite conditions B4, B5 and B6, the total volume of treated CSG water authorised to be released from the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme from 1 January 2022 to 1 January 2023 is 8.2GL.

Schedule B, Table 1 – Treated CSG water release point and receiving waters

Release point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Treated CSG Water source and location and description of release point	Receiving waters description
U1	-26.84978	150.34830	Reverse Osmosis Treatment Plant Discharge Structure located on PL226	Condamine River downstream of the release point to the Cotswold gauging station.

(B7) The release of treated CSG water to waters in accordance with condition (B2) must not exceed any of the quality characteristic release limits specified in *Schedule B, Table 2 – receiving environment contaminant limits*.

(B8) The release of treated CSG water to waters in accordance with condition (B2) must be monitored:

(a) at the monitoring point specified in *Schedule B, Table 2 – Receiving environment contaminant limits*;

(b) for each of the quality characteristics specified in *Schedule B, Table 2 – Receiving environment contaminant limits*; and

(c) at the monitoring frequencies specified in *Schedule B, Table 2 – Receiving environment contaminant limits* for each quality characteristic.

(B9) If the monitoring required by condition (B8) indicates that any of the quality characteristic release limits specified in *Schedule B, Table 2 – Receiving environment contaminant limits*, other than at Condamine River – 100m upstream of U1, have been exceeded at any time during any release of treated CSG water, the environmental authority holder must, within three months of notifying the administering authority of the exceedance, unless a longer time is agreed to by the administering authority:

(a) complete an investigation in accordance with the methodology ANZECC and ARMCANZ 2000 into the potential for environmental harm resulting from the exceedance; and

(b) provide a written report to the administering authority on completion of the investigation that includes:

i. details of the investigation carried out; and

ii. any actions taken to prevent environmental harm.

(B10) Where an exceedance of a quality characteristic release limit specified in *Schedule B, Table 2 – receiving environment contaminant limits* is being investigated in accordance with condition (B9), the investigation and reporting required by condition (B9) is not required if a subsequent exceedance occurs, during investigation of the initial exceedance, which has resulted from the same cause that triggered the initial exceedance.

Schedule B, Table 2 – Receiving environment contaminant limits

Monitoring point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality characteristic	Release limit	Limit type	Monitoring frequency
U1	-26.84978	150.34830	Dissolved Oxygen	4 mg/L	Minimum	Daily during discharge
			Electrical Conductivity	500 µS/cm	Maximum	
			pH	6.5 – 8.5 units	Range	
			Temperature	+/- 4 ºC	Range	
Condamine River – 100m upstream of U1	-26.85042	150.34916				
Condamine River – 500m downstream of U1	-26.84566	150.34640				
U1	-26.84978	150.34830	Calcium	5 mg/L	Minimum	Weekly during discharge
			Magnesium	2 mg/L	Minimum	
			Boron	1 mg/L	Maximum	

(B11) The release of treated CSG water to waters in accordance with condition (B2) must not exceed any of the quality characteristic release limits specified in *Schedule B, Table 3 – Release contaminant limits*.

(B12) The release of treated CSG water to waters in accordance with condition (B2) must be monitored:

(a) at the monitoring points specified in *Schedule B, Table 3 – Release contaminant limits*;

(b) for each of the quality characteristics specified *in Schedule B, Table 3 – Release contaminant limits*; and

(c) at the monitoring frequencies specified in *Schedule B, Table 3 – Release contaminant limits* for each quality characteristic.

(B13) If the monitoring required by condition (B12) indicates that any of the quality characteristic release limits specified in *Schedule B, Table 3 – Release contaminant limits* have been exceeded at any time during any release of treated CSG water, the environmental authority holder must, within three months of notifying the administering authority of the exceedance, unless a longer time is agreed to by the administering authority:

a) complete an investigation into the potential for impacts to drinking water resulting from the exceedance, which includes an analysis of the (potential and actual) causes for the exceedance; and

b) provide a written report to the administering authority and the local Public Health Unit (https://www.health.qld.gov.au/system-governance/contact-us/contact/public-health-units/default.asp) on completion of the investigation that includes:

i. details of the investigation carried out;

ii. any actions taken to prevent impacts to drinking water;

iii. the cause for the exceedance;

iv. all water quality monitoring results pertaining to the investigation;

v. any general observations;

vi. methodology(ies) and any relevant calculations used; and

vii. corrective actions to rectify the cause of the exceedance.

(B14) Where an exceedance of a quality characteristic release limit specified in *Schedule B, Table 3 – Release contaminant limits* is being investigated in accordance with condition (B13), the investigation and reporting required by condition (B13) is not required if a subsequent exceedance occurs, during investigation of the initial exceedance, which has resulted from the same cause that triggered the initial exceedance.

Schedule B, Table 3 – Release contaminant limits

Monitoring point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality characteristic	Release limit	Limit type	Monitoring frequency
Discharge tank	-26.85404	150.34780	N-Nitrosodimethylamine (NDMA)	0.0001 mg/L	Maximum	On first release day of each calendar year
			Alpha Activity	0.5 Bq/L	Maximum	
			Beta Activity	0.5 Bq/L	Maximum	
			Aluminium	0.2 mg/L	Maximum	
			Ammonia	0.5 mg/L	Maximum	
			Arsenic	0.01 mg/L	Maximum	
			Barium	0.7 mg/L	Maximum	
			Bisphenol A	0.2 mg/L	Maximum	
			Boron	4 mg/L	Maximum	
			Bromide	7 mg/L	Maximum	
			Bromoform	0.1 mg/L	Maximum	
			BTEX		Maximum	
			Benzene	0.001 mg/L		
			Toluene	0.800 mg/L		
			Ethylbenzene	0.300 mg/L		
			Xylene (m & p)	0.600 mg/L		
			Cadmium	0.002 mg/L	Maximum	

Monitoring point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality characteristic	Release limit	Limit type	Monitoring frequency
			Chlorine	5 mg/L	Maximum	
			Chloroform	0.2 mg/L	Maximum	
			Chromium	0.05 mg/L	Maximum	
			Copper	2 mg/L	Maximum	
			Cyanide	0.08 mg/L	Maximum	
			Fluoride	1.5 mg/L	Maximum	
			Iodide	0.1 mg/L	Maximum	
			Iron	0.3 mg/L	Maximum	
			Lead	0.01 mg/L	Maximum	
			Manganese	0.5 mg/L	Maximum	
			Mercury	0.001 mg/L	Maximum	
			Molybdenum	0.05 mg/L	Maximum	
			Nickel	0.02 mg/L	Maximum	
			PAH (as B(a)P TEF) Species: / TEF: benz[a]anthracene 0.1 benzo[b+j]fluoranthene 0.1 benzo[k]fluoranthene 0.1 benzo[a]pyrene 1.0 chrysene 0.01 dibenz[a,h]anthracene 5.0 indeno[1,2,3-cd]pyrene 0.1	0.01 µg/L	Maximum	
			Selenium	0.01 mg/L	Maximum	
			Sulphate	500 mg/L	Maximum	
			Strontium	4 mg/L	Maximum	
			Total Petroleum Hydrocarbons (TPH)	0.2 mg/L	Maximum	
			Vanadium	0.05 mg/L	Maximum	
			Zinc	3 mg/L	Maximum	

(B15) The daily quantity of treated CSG water released from the release point specified in *Schedule B, Table 1 – Treated CSG water release point and receiving waters* must be measured and recorded.

(B16) A stream flow gauging station must be utilised to determine and record stream flows of the receiving waters at the location and frequency specified in *Schedule B, Table 4 – Stream flow gauging station*.

Schedule B, Table 4 – Stream flow gauging station

Gauging station description	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Flow record frequency
Chinchilla Weir	−26.8001	150.57495	Continuous

(B17) The release of treated CSG water to waters in accordance with condition (B2) must not:

(a) cause erosion of the bed and banks of the receiving waters specified in *Schedule B, Table 1 – Treated CSG water release point and receiving environment*;

(b) cause a material build-up of sediment in the receiving waters specified in *Schedule B, Table 1 – Treated CSG water release point and receiving environment*.

(B18) During the transitional period, the release of treated CSG water is only authorised during any of the following conditions:

(a) if the volume of the release is less than or equal to 20 percent of the mean daily flow (m^3/sec) of the receiving waters as measured at the gauging station specified in *Schedule B, Table 4 – Stream flow gauging station*;

(b) once the design storage allowance (DSA) of the feed pond and the maximum operating level (1873 ML) in the Monreagh Dam have been reached.

(B19) During the operational period, the release of treated CSG water is only authorised during any of the following conditions:

(a) once the maximum operating level (1873 ML) in the Monreagh Dam has been reached;

(b) if the volume of produced treated water exceeds irrigation demand when measured on a daily basis.

(B20) If a release event has been triggered under conditions (B19(a)), the release is authorised to continue until the volume of water contained in the Monreagh Dam has decreased to 180 ML.

(B21) The maximum release rate of treated CSG water authorised in conditions (B19) and (B20) must not exceed:

(a) 20 ML/d from the Talinga water treatment facility; and

(b) 40 ML/d from the Monreagh Dam.

(B22) The release of treated CSG water to waters during no flow conditions must not cause an adverse impact to aquatic biota in the receiving waters.

Notification

(B23) If circumstances prevent the monitoring required by either condition (B8), (B12) or (B16) during or following severe weather events, the administering authority must be notified within 48 hours.

Recording

(B24) The release days into no flow conditions for the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme must be reported in the annual return consistent with the requirements of condition (B25).

(B25) Records of all releases required by condition (B24) must include the following information:

(a) release commencement date and time;

(b) expected release cessation date and time;

(c) estimated release volume and actual volume of treated CSG water released;

(d) the flow rate of the receiving waters;

(e) all in-situ water quality monitoring results;

(f) any other matters pertinent to the water release event; and

(g) any details including available data regarding likely impacts on the receiving water.

Receiving Environment Monitoring Program (REMP)

(B26) A REMP must be developed and implemented to monitor and record the effects of the release of treated CSG water to the receiving environment with the aims of identifying and describing the extent of any adverse environmental impacts to local environmental values and monitoring any changes in the receiving water.

(B27) The REMP must be maintained by a person possessing appropriate qualifications and experience in the field of hydrology and surface water monitoring program design.

(B28) The REMP must address, but not be limited to:

(a) a description of potentially affected receiving waters including key communities and background water quality characteristics based on accurate and reliable monitoring data that takes into consideration any temporal variation (e.g. seasonality);

(b) a description of applicable environmental values, including but not limited to:

i. hydrology (flow, duration, periodicity, connectivity with groundwater systems;

ii. physiochemical properties;

iii. drinking water;

iv. aquatic ecosystem parameters including flow and fauna habitat; and

v. geomorphological features;

(c) a description of water quality objectives to be achieved (i.e., as scheduled pursuant to the Environmental Protection (Water) Policy 2009);

(d) any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment within which the REMP is proposed;

(e) water quality targets within the receiving environment to be achieved, and clarification of contaminant concentrations or levels indicating adverse environmental impacts during the REMP.

(f) monitoring for any potential adverse environmental impacts caused by the release including impacts to bank stability and erosion;

(g) monitoring of stream flow and hydrology;

(h) measurement of the banks and beds of the receiving environment for SAR and an assessment of soil sodicity and erosion;

(i) an assessment of bank stability and an evaluation of water course bank slumping;

(j) monitoring of contaminants should consider the limits specified in *Schedule B, Table 2 – Receiving environment contaminant limits* to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ 2000 guidelines for slightly to moderately disturbed ecosystems;

(k) monitoring of contaminants including ammonia, aluminium, arsenic, cadmium, chromium, copper, cobalt, iron, fluoride, lead, manganese, mercury, molybdenum, nickel, selenium, silver, sulphate, uranium, vanadium and zinc to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ 2000 guidelines for slightly to moderately disturbed ecosystems;

(l) monitoring of physical chemical parameters as a minimum those specified in *Schedule B, Table 2 – Receiving environment contaminant limits* (in addition to dissolved oxygen saturation);

(m) monitoring biological indicators (including but not limited to vertebrate and invertebrate species) for permanent, semi-permanent water holes and water storages using sampling techniques sufficient to reliably detect significant differences between impacted (test) and unimpacted sites;

(n) monitoring of a selection of zooplankton species to assess health (e.g., exoskeleton density) in respect to the availability of calcium and magnesium.

(o) the methods for analysis and interpretation all monitoring results;

(p) the locations of monitoring points (including the locations of proposed background and downstream impacted sites for each release point);

(q) the frequency or scheduling of sampling and analysis sufficient to determine water quality objectives and to derive site specific reference values within two years (depending on wet season flows) in accordance with the Queensland Water Quality Guidelines 2009. For ephemeral streams, this should include periods of flow irrespective of mine or other discharges;

(r) specify sampling and analysis methods and quality assurance and control;

(s) any historical data sets to be relied upon;

(t) description of the statistical basis on which conclusions are drawn,

(u) any control or reference sites; and

(v) recording of planned and unplanned releases to watercourses, procedures for event monitoring, monitoring methodology used and procedure to establish background surface water quality.

Erosion and Sediment Control Plan

(B29) 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).

Maintenance and cleaning

(B30) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants cannot be released into any waters.

Stormwater management

(B31) There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.

Watercourses, Wetlands, lakes and springs

(B32) The infrastructure specified in *Schedule B Table 5 – Authorised petroleum activity disturbance in wetland, wetland of high ecological significance buffer, lake, spring and watercourses* is permitted in the location specified in *Schedule B, Table 5 – Authorised petroleum activity disturbance in wetland, lake, spring and watercourses*.

Schedule B, Table 5 – Authorised petroleum activity disturbance in wetland, wetland of high ecological significance buffer, lake, spring and watercourses

Tenure	Description of infrastructure	Number	Location
PL226	Temporary camp during construction of monitoring bore leases authorised by condition (B33)	1	Existing cleared land on Lot 9 on Plan RG9
PL272	Temporary camp during construction of monitoring bore leases authorised by condition (B33)	1	Existing cleared land on Lot 2 on Plan RP53252
PL272	Monitoring equipment and ancillary infrastructure associated with the Condamine Seeps.	3	Lot 2 RP188524 Lot 15 SP193253
	Low impact surface capture equipment associated with the Condamine Seep Investigations	Not specified	Condamine River
	Flowline (TAL300-1)	1	Existing cleared land on Lot 92 BWR373 located within 200 metres of a wetland of high ecological significance
	Access track (AT101)	1	Existing cleared land on Lot 92 BWR373 located within 200 metres of a wetland of high ecological significance
	Access track (AT102)	1	Existing cleared land on Lot 92 BWR373 located within 200 metres of a wetland of high ecological significance
PL226 and PL227	Access track (AT01)	1	Existing cleared land on Lot 92 BWR373 located within 200 metres of a wetland of high ecological significance
PL215	Well site ORA150	1	Lot 5 RP190989
PL215	Well site ORA129	1	Lot 8 RP138762

(B33) Single and multi-monitoring bore leases may be undertaken within 200 metres of a lake or spring and within 100 metres of a watercourse within existing cleared land.

Authorised impacts to wetlands

(B34) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

Authorised activities in waters

(B35) Petroleum activities must not occur in or within 200m of a:

(a) wetland of high ecological significance

(b) Great Artesian Basin Spring

(c) subterranean cave GDE

unless the petroleum activity is an authorised petroleum activity disturbance listed in Schedule B, Table 5.

(B36) Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.

(B37) 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.

(B38) 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.

(B39) 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
(c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.

(B40) The construction or maintenance of linear infrastructure authorised under condition (B36) must comply with the water quality limits as specified in *Schedule B, Protecting water values, Table 5—Release limits for construction or maintenance of linear infrastructure.*

Schedule B, Protection water values, Table 6—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 HTU, 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

(B41) Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (B40).

Register of activities in wetlands and watercourses

(B42) 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 (B41).

Activities in river improvement areas

(B43) Measures must be taken to minimise negative impacts to, or reversal of, any river improvement works carried out in river Improvement Areas by Queensland's River Improvement Trusts.

Activities in floodplains

(B44) 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; or

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

(c) increase the local duration of floods; or

(d) increase the risk of detaining flood flows.

(B45) Pipeline waste water, may be released to land provided that it:

(a) can be demonstrated it meets the acceptable standards for release to land; and
(b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.

(B46) Any release of hydrostatic test water must be located at least 100m from the nearest watercourse.

(B47) The holder of this authority must undertake hydrotesting of pipe sections crossing water bodies prior to commissioning of these pipe sections.

Seepage monitoring program

(B48) 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 31 May 2015.

(B49) The seepage monitoring program required by condition (B48) 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 background and seepage monitoring bores for the trigger parameters identified in condition (B49)(b) at a frequency, determined by a suitably qualified person and:

i. at least once every two years where baseline data has been established; or

ii. at least quarterly for two years to establish baseline data for any impact to groundwaters, after which time monitoring may continue at the frequency according to condition (B49)(f)(i).

(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (B49(b)) and (B49(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.

(B50) All groundwater monitoring bores must be maintained in an operative condition and be accessible at all times to any authorised person.

(B51) The method of water sampling required by this environmental authority must comply with that set out in the most recent version of the Queensland Government Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009 Version 2 September 2010 as amended from time to time.

Coal Seam Gas Water Management

(B52) The holder of this environmental authority must ensure that coal seam gas water is contained, is not released to land or waters, and is only used for purposes specifically authorised:

(a) under this environmental authority; or

(b) under the *Petroleum and Gas (Production and Safety) Act 2004* as an authorised activity; or

(c) under section 86 of the *Petroleum Act 1923*; or

(d) under an approval of resource for beneficial use as provided for under the *Waste Reduction and Recycling Act 2011.*

Produced water use

(B52A) Produced water may be re-used in:

(a) drilling and well hole activities; or

(b) stimulation activities.

(B52B) Produced water from the authorised petroleum activity(ies) may be used for irrigation, dust suppression, construction, operational and incidental land management purposes for the petroleum activity(ies) authorised by this environmental authority. The use of produced water must not cause:

(a) on-site ponding;

(b) runoff from the site where the resource is applied;

(c) vegetation die-off;

(d) visible salting; or

(e) serious or material environmental harm.

(B52C) Produced water from the authorised petroleum activity(ies) which is used for:

(a) domestic, stock or stock intensive purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time;

(b) irrigation purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for irrigation purposes, as amended from time to time.

Transfer of Assets

(B52D) Despite condition (Common Conditions Schedule- R8), the holder of the environmental authority is authorised to transfer produced water to a low consequence dam, left in-situ for a beneficial use, in accordance with the following:

(a) The landholder must agree in writing to the transfer ownership of the low consequence dam;

(b) The landholder must agree in writing to the beneficial re-use of produced water;

(c) The dam must be assessed as being a low consequence dam 12 months prior to the transfer of water;

(d) A suitably qualified person must identify that the dam is adequate for the intended on-going use by the landholder within three months prior to transfer the transfer of the dam;

(e) A suitably qualified person must identify that the low consequence dam and the land on which it is located, must be safe, stable, non-polluting and able to support the post-activity land use within three months prior to the transfer of the dam;

(f) On cessation of the transfer of water, low consequence dams must be decommissioned to no longer accept inflow from the petroleum activity(ies);

(g) Produced water transferred to the landholder must meet the relevant quality guidelines for the intended purpose prior to the water being given.

Produced Water– Third Party Use Off tenure

(B52E) Produced water may be transferred to a third party to be used off tenure for the following purposes:
(a) Dust suppression, construction, operational and incidental land management purposes;
(b) livestock watering purposes; and
(c) irrigation purposes.

(B52F) If the responsibility of produced water is given or transferred to a third party for use off tenure, the holder of environmental authority must ensure that:
(a) the water meets the relevant quality guidelines for the intended purpose prior to the water being given;
(b) the responsibility of the produced water is given or transferred in accordance with a written agreement (the third-party agreement) signed by both parties to the agreement; and
(c) the third party is made aware of the General Environmental Duty (GED) under s. 319 of the *Environmental Protection Act 1994,* environmental sustainability of the water disposal and protection of environmental values of waters.

Produced water – Third Party use Generally

(B52G) The holder of the environmental authority must ensure that the water meets the relevant quality guidelines for the intended purpose prior to the water being given on:

(a) initial transfer of the water; and
(b) thereafter monthly.

(B52H) Written agreement for the use of produced water by a third party, must include the following in writing:

(a) the intended use of the water;
(b) confirmation that the water meets ANZECC and ARMCANZ Water Quality Guidelines for the approved use;
(c) confirmation that the produced water being provided is compliant with the environmental authority conditions; and
(d) a current and complete laboratory certificate of analysis that outlines the quality of the produced water as per the ANZECC and ARMCANZ Water Quality Guidelines

(B52I) The holder of this environmental authority must cease using, selling or giving away produced water immediately upon becoming aware that:

(a) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at or before the point of supply; or
(b) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at the point in which it is used by a third party.

(B52J) When the produced water is transferred to a third party, the holder of the environmental authority must retain the following records of the resource:

(a) origin of the produced water;
(b) intent of the water;

(c) date of dispatch of the produced water;
(d) location of delivery of the produced water to the third-party user by real property description;
(e) date of delivery of the produced water to the third party;
(f) contact details for the person responsible for the use of the produced water at the site of use;
(g) quantity (volume) of the produced water supplied;
(h) relating to sampling and monitoring including: laboratory results, field data and monitoring report; and
(i) any written procedures developed to manage the produced water.

(B52K) Upon written agreement, the administering authority must be notified with the following details:

(a) the person responsible for the use of the produced water;
(b) the location of use of the produced water; and
(c) the intended use of the produced water.

Coal Seam Gas Water Management Criteria

(B53) Prior to the commencement of each petroleum activity authorised by this environmental authority, Coal Seam Gas Water Management Criteria need to be developed and implemented which must:

(a) be developed in accordance with section 126 (1)(e) of the *Environmental Protection Act 1994*;

(b) be consistent with the requirements of this environmental authority.

(B54) Coal seam gas water may be removed from the site to a facility that is lawfully able to accept the water under the *Environmental Protection Act 1994*.

CSG Water injection trial

(B55) Prior to undertaking fluid injection, the holder of this environmental authority must develop a Phase 1 and 2 – Injection Management Plan, which must include but not necessarily be limited to:

(a) Injection fluid characteristics, including:

i. estimated volumes and rates of water to be injected;

ii. a description of the physical, chemical and biological components and their concentrations of the fluid to be injected.

(b) target aquifer characteristics, including:

i. the pre-existing state of the aquifer including faults or geological features that exist in the target and adjacent aquifers to the outer extent of the hydraulic impact zone and a history of seismic events within the hydraulic impact zone;

ii. physical characteristics including, storage characteristics, distribution and depth, recharge and flow characteristics and history of use;

iii. characterisation of the physiochemical properties of the target formation;

iv. compatibility of the injection fluid with the target formation and formation water;

v. identification of the value of the target aquifer in respect to economic output, supported population and natural assets;

vi. groundwater levels and / or pressure;

(c) identification of the hydraulic impact zone;

(d) identification of the water quality impact zone;

(e) identification of the environmental values and water quality objectives of the potential water quality impact zone of the target formation in accordance with the Environmental Protection (Water) Policy 2009 and the Queensland Water Quality Guidelines 2006;

(f) identification of the impacts on the environmental values due to the injection fluid;

(g) an assessment of the reactivity of the injection fluid with the target formation and native groundwater;

(h) details of how and where the fluid will be produced, aggregated, stored and kept separate from other waters until it is, treated and reinjected into the target aquifer;

(i) identification of any fluid injection well, all existing bores, springs, environmental assets and watercourses connected to groundwater, faults and other geologic features that occur within the water quality impact zone and the hydraulic impact zone;

(j) an assessment of the potential for migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourses, faults or other geologic features likely to impact on other aquifers;

(k) a risk assessment consistent with the risk framework specified in Australian Guidelines for Water Recycling: Managed Aquifer Recharge, identifying potential hazards, their inherent risk, preventative measures for the management of potential hazards and after consideration of the operational monitoring to manage potential hazards identified in the risk assessment including details on sampling and analysis methods including frequency and locations, and quality assurance and control;

(l) verification methods to assess performance of the injection activities,

(m) control measures that will be implemented for fluid storage, treatment and injection to prevent or control the release of a contaminant or waste to the environment;

(n) the indicators or other criteria against which the performance of fluid injection will be assessed;

(o) procedures that will be adopted to regularly review the monitoring program and to report to management and the administering authority should unforeseen or non-compliant monitoring results be recorded;

(p) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;

(q) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and

(r) development of a public consultation program to be implemented at commencement of Stage 3 – Field test program of the CSG Water Injection Trial.

CSG Water Injection Trial – Phase 3

(B56) The only fluids authorised to be injected into an aquifer(s) during the trial period are those fluid types to be injected into the aquifer formations and locations listed in *Schedule B, Table 11 – Details of authorised fluid injection*.

Schedule B, Table 11 – Details of authorised fluid injection

Well Location (Latitude, Longitude) (Decimal degrees GDA94)	Well Number/ Reference	Target Formation	Fluid Type	Water Quality Impact Zone	Hydraulic Impact Zone
-26.89, 150.37	Talinga INJ2-G	Gubberamunda	Reverse osmosis permeate; or a blend of reverse osmosis permeate and raw CSG water	285 m	15.7 km

Note: The water quality impact zone and hydraulic impact zone area shall be described as a polygon with boundary references specified in grid references to GDA94.

(B57) If the holder of this environmental authority becomes aware that environmental harm is caused or threatened to be caused, as a result of injection activities, injection must cease immediately.

(B58) The injection trial is limited to a maximum period of 12 months, commencing from the date of the injection trial.

(B59) The holder of this environmental authority must notify the administering authority the commencement date of the trial seven days prior to its commencement.

Well integrity

(B60) The construction of fluid injection wells must be carried out in accordance with well construction requirements in the most recent version of the Department of Environment and Heritage Protection CSG Water Injection Well Construction Requirements, as amended from time to time.

(B61) Fluid injection well(s) authorised by this environmental authority must have appropriate records and documents which support and indicate mechanical integrity and which hold a certificate of mechanical integrity prepared and certified by a suitably qualified person, available for inspection such that:

(a) there is no significant leakage from the surface casing; and

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

(B62) For fluid injection:

(a) at depth less than 100 m, the injection operation must not exceed the dry overburden pressure of the base of the overlying aquitard; or

(b) at depth greater than 100 m, the injection operation must not exceed 90 percent of the formation fracture pressure.

Fluid injection quality

(B63) Fluid used in the well injection trial must comply with the contaminant limits prescribed in *Schedule B, Table 12 – Specific contaminant limits for injection fluid*, at the point of injection for the wells outlined in condition (B56).

Schedule B, Table 12 – Specific contaminant limits for injection fluid

Contaminants/ Parameters of concern: release limits (µg/L)	Column A: Reinjection to coal formation	Column B: Ground water dependent ecological assets absent: maximum contaminant limits	Column C: Ground water dependent ecological assets present: maximum contaminant limits	Column D: Target aquifer 95 percentile
Organics				
Benzene	-	600	600	

Contaminants/ Parameters of concern: release limits (µg/L)	Column A: Reinjection to coal formation	Column B: Ground water dependent ecological assets absent: maximum contaminant limits	Column C: Ground water dependent ecological assets present: maximum contaminant limits	Column D: Target aquifer 95 percentile
2-Chlorophenol (DB)	-	-	340	-
4-Chlorophenol (DB)	-	-	220	-
Cyanide	-	-	7	-
1, 2 Dichlorobenzene (DB)	-	-	160	-
1, 4 Dichlorobenzene (DB)	-	-	60	-
Ethylbenzene	-	300	-	-
Haloacetic acids (DB)	-	60	-	-
N-Nitrosodimethylamine (NDMA) (DB)	-	0.01	-	-
Toluene	-	800	-	-
2,4,6-Trichlorophenol	-	-	3	-
Trihalomethanes	-	250	-	-
Xylene (total)	-	600	-	-
Inorganics – metals/metalloids				
Aluminium	-	200	55	-
Antimony	-	3	-	-
Arsenic	-	7	AsIII-24 AsV-13	-
Barium	-	700		-
Boron	-	4,000	370	-
Cadmium	-	2	0.2	-
Chromium (as Cr(VI))	-	50	1	-
Copper	-	2,000	1.4	-
Iron	-	300		-
Lead	-	10	3.4	-
Manganese	-	500	500	-
Mercury	-	1	0.6	-
Molybdenum	-	50	-	-
Nickel	-	20	11	-
Selenium	-	10	10	-
Silver	-	100	0.05	-
Thallium (Stable) (Total)	-	2	-	-
Zinc	-	-	8	-
Inorganics – non-metals				-
Ammonia	-	-	900	-
Bromate	-	10	-	-
Chlorine (DB)	-	5,000	3	-
Chlorite (DB)	-	300	-	-
Fluoride	-	1,500	-	-
Iodide	-	100	-	-
Dissolved oxygen	200	200	200	200
Nitrate	-	10,000	-	-
Radionuclides				
Alpha/photon emitters	-	0.6 Bq/L	0.6 Bq/L	-
Radium 226 & Radium 228	-	0.2 Bq/L	0.2 Bq/L	-
Uranium	-	20	20	-

Contaminants/ Parameters of concern: release limits (µg/L)	Column A: Reinjection to coal formation	Column B: Ground water dependent ecological assets absent: maximum contaminant limits	Column C: Ground water dependent ecological assets present: maximum contaminant limits	Column D: Target aquifer 95 percentile
Other parameters				
Calcium	-	±25% of formation water median	±25% of formation water median	±25% of formation water median
Magnesium	-	±25% of formation water median	±25% of formation water median	±25% of formation water median
Potassium	-	±25% of formation water median	±25% of formation water median	±25% of formation water median
Sodium	-	±25% of formation water median	±25% of formation water median	±25% of formation water median
Sulphate	-	±25% of formation water median and not to exceed 500,000	±25% of formation water median and not to exceed 500,000	±25% of formation water median and not to exceed 500,000
Carbonate/bicarbonate	-	±25% of formation water median	±25% of formation water median	±25% of formation water median
Chloride	-	±25% of formation water median	±25% of formation water median	±25% of formation water median
Total dissolved solids (TDS)	Mean TDS shall not exceed formation water 95%ile	Mean TDS shall not exceed formation water 95%ile	Mean TDS shall not exceed formation water 95%ile	Mean TDS shall not exceed formation water 95%ile
pH units	-	± 0.5 units of formation water median	± 0.5 units of formation water median	± 0.5 units of formation water median
Temperature	-	±5^{o} C of formation water median	±5^{o} C of formation water median	±5^{o} C of formation water median
Total organic carbon		1,000	1,000	1,000
Total suspended solids	25,000	25,000	25,000	25,000
Turbidity	-	0.2 NTU 95% ile 0.5 NTU max	0.2 NTU 95% ile 0.5 NTU max	0.2 NTU 95% ile 0.5 NTU max
Heterotrophic plate count	<500/ml	<500/ml	<500/ml	<500/ml

Injection Monitoring Program

(B64) The holder of this environmental authority must implement the Injection Monitoring Program described in the Environmental Management Plan entitled, Australia Pacific LNG Talinga Aquifer Injection Trial Management Plan Environmental Authority No PEN100067807 or updated documents thereafter.

(B65) The Injection Monitoring Program must be certified by a suitably qualified person.

(B66) In addition to the parameters outlined in *Table 4 - Summary of Target Aquifer and Injectate Water Quality* in the Australia Pacific LNG Talinga Aquifer Injection Trial Management Plan Environmental Authority No PEN100067807 the additional following parameters must be monitored prior to reinjection:

(a) N-Nitrosodimethylamine;

(b) benzene [μg/L];

(c) toluene [μg/L];

(d) ethylbenzene [μg/L];

(e) ortho-xylene [μg/L];

(f) para-xylene [μg/L];

(g) meta-xylene [μg/L];

(h) total xylene [μg/L].

(B67) The injection monitoring program must undertake monitoring for all parameters outlined in *Table 4 - Summary of Target Aquifer and Injectate Water Quality* in the Australia Pacific LNG Talinga Aquifer Injection Trial Management Plan Environmental Authority No PEN100067807 and parameters outlined in condition (B71) at all monitoring bore locations outlined under this plan and an analysis provided of how these measured parameters comply with the relevant water quality guidelines for environmental and human health.

Reporting requirements for injection trials

(B68) The holder of this environmental authority must submit to the administrating authority three months from the commencement of the trial a water compatibility analysis of the injection fluid and native groundwater prepared by a suitably qualified and experienced person that includes the following information:

(a) identification of potential impacts on water quality and physical integrity of the aquifer or geological formation within the hydraulic impact zone and water quality impact zone.

(b) reporting on the parameters outlined in *Schedule B, Table 12 – Specific contaminant limits for injection fluid* outlining if compliance with these parameters has been met.

(B69) Upon completion and within two months of a Phase Three injection trial, the holder of the authority must submit to the administering authority a Phase Three Report prepared by a suitably qualified person.

(B70) The Phase Three Report must include, but not necessarily be limited to:

For any well to be used for fluid injection:

(a) details of the well including but not limited to:

i. location details (GDA94);

ii. the inferred lithology;

iii. casing details (type, outer diameter (mm), wall thickness (mm) & locations (depth from & to in metres));

iv. cementing details (type, hole diameter (mm), casing outer diameter (mm) and locations (depth from & to in metres));

v. target formation fracture pressure; and

vi. target formation pressure prior to injection;

(b) a detailed interpretation of the logs and other tests conducted during drilling and construction or refurbishment of the well against their specific objectives;

(c) a completed well schematic diagram;

(d) a temperature survey;

(e) a casing integrity assessment technique such as:

i. radioactive tracer survey;

ii. oxygen activation log;

iii. cement integrity log; or

iv. an equivalent survey technique approved by the administering authority;

(f) outcomes of the injection trial including, but not limited to:

i. well head injection rates versus formation pressure;

ii. target formation pressure within the hydraulic impact zone during and upon completion of the trial;

iii. hydraulic gradient of the target formation within the hydraulic impact zone upon completion of the trial;

iv. the effectiveness of aquitards (including the stability of the aquitard) and aquicludes of confining the injected fluid within the target formation; and

v. a detailed interpretation of the logs and other tests conducted during the injection trial against their specific objectives;

(g) the results of the monitoring program as required by condition (B64) to (B67);

(h) analysis of monitoring and operational data in terms of:

i. validation of conceptual framework for injection; and

ii. additional hazards that were not identified earlier;

(i) a revised risk analysis that identifies all potential hazards, likelihood of various risk elements and associated consequences;

(j) a re-evaluation of the hydraulic impact zone; and

(k) a re-evaluation of the water quality impact zone.

(l) Additional requirements for a new well:

i. information considered in the design of the well and casing string; and

ii. detailed lithology including depths (in meters) of strata, strata descriptions and locations including details on the location of water bearing beds and water quality details.

Well closure

(B71) A Well Closure Plan which has been certified by a suitably qualified person must be submitted to the administering authority within six months prior to the cessation of fluid injection at a well.

(B72) The Well Closure Plan must include, but not necessarily be limited to the following:

(a) details of when and under what circumstances the injection well will be decommissioned;

(b) sealing details including the method, type of material to be used and the location and the depth (metres) from ground surface of the bottom of the seal will be located; and

(c) any proposed test or measure to be made.

(B73) Actions outlined in the well closure plan must be completed within three months of the cessation of fluid injection at the injection well.

(B74) Upon completion of injection activities at a fluid injection well, a well closure report demonstrating compliance with the well closure plan as required by conditions (B69) and (B76) for that well must be prepared by a suitably qualified person and submitted to the administering authority with the next annual return.

(B75) Injection wells must be decommissioned in accordance with the Minimum Construction Requirement for Water Bores in Australia as amended from time to time.

(B76) Prior to abandoning an injection well, the well must be completely sealed with concrete, cement grout or bentonite cement grout from the terminal depth to the surface.

Injection Cessation Report

(B77) A fluid Injection Cessation Report which has been certified by a suitably qualified person must be submitted to the administering authority within two months of completion of fluid injection activities.

(B78) The fluid Injection Cessation Report must include, but not necessarily be limited to:

(a) volumes of fluid injected at each well;

(b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the verification monitoring, preventative measures and the residual risk; and

(c) a monitoring report outlining the methods and results of verification monitoring undertaken to assess the performance of the injection activities and preventative measures for identified hazards.

Fluid injection notification

(B79) The holder of this environmental authority must telephone the Department of Environment and Heritage Protection Pollution Hotline (telephone: 1300 130 373) as soon as reasonably practicable, but within 24 hours of becoming aware of:

(a) migration of injected fluid out of the target formation; or

(b) a loss of hydraulic isolation of the target formation; or

(c) the detection of groundwater contaminants that were not detected in background samples; or

(d) an injection fluid monitoring result that does not comply with the any one of parameters in *Schedule B, Table 12 – Specific contaminant limits for injection fluid*.

Full scale water reinjection

(B80) Phase 4 – Full Scale CSG Water Injection is not authorised under this environmental authority.

SCHEDULE D — LAND

General

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

Confirming biodiversity values

(D2) Prior to undertaking activities that result in the 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.

(D3) A suitably qualified person must develop and certify a methodology so that condition (D2) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.

(D4) Where mapped biodiversity values differ from those confirmed under conditions (D2) and (D3), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.

Disturbance to land – General

(D5) The holder of this environmental authority, when carrying out the petroleum activity(ies) must:

- (a) avoid, minimise or mitigate (in order of preference) any impacts on areas of vegetation or other areas of ecological value;
- (b) minimise disturbance to land that may otherwise result in land degradation;
- (c) manage topsoil in a manner that will preserve its biological and chemical properties;
- (d) utilise stockpiled soils for rehabilitation purposes;
- (e) avoid clearing mature trees; and
- (f) prior to carrying out field-based petroleum activities, make all relevant staff, contractors or agents carrying out those petroleum activities, aware of the location of any Category A, B or C Environmentally Sensitive Areas, wetlands and presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992* and the requirements of this environmental authority.

(D6) Despite condition (D5), significant disturbance to land caused by the carrying out of the petroleum activities must not involve clearing vegetation or placing fill:

- (a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e., stepping stone or contiguous bioregional / local corridor networks) and / or results in an increase in threatening processes (e.g., potential impacts associated with edge effects or introduced species); or
- (b) in discharge areas.

Disturbance to Land – Environmentally Sensitive Areas

(D7) Petroleum activities must be carried out in accordance with *Schedule D, Table 1 – Petroleum activities in Environmentally Sensitive Areas.*

Schedule D, Table 1 – Petroleum activities in Environmentally Sensitive Areas

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. Subject to condition (D14) and (D15).
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to condition (D13), (D14) and (D15).	Petroleum activities permitted.
Category C ESAs that are Nature Refuges Koala Habitat, Declared Catchment Areas	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to condition (D13), (D14) and (D15).	Petroleum activities permitted.
Category B ESAs that are 'Endangered' Regional Ecosystems Category C ESAs that are Essential Habitat, Essential Regrowth Habitat, Critically Limited or Threshold or 'Of Concern' Regional Ecosystems	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Only essential petroleum activities permitted. Subject to condition (D13), (D14) and (D15).	Petroleum activities permitted.
Category C ESAs that are Resource Reserves	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Only essential petroleum activities permitted. Subject to condition Subject to condition (D13), (D14) and (D15).	Petroleum activities permitted.
Category C ESAs that are State Forests, Timber Reserves.	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Petroleum activities permitted.	Petroleum activities permitted.

(D8) Despite condition (D7) of this environmental authority, the infrastructure (and associated activities necessary for construction, operational and maintenance purposes) specified in *Schedule D, Table 2 – Authorised petroleum activity(ies) disturbance* are permitted in the locations specified in *Schedule D, Table 2 – Authorised petroleum activity(ies) disturbance*.

Schedule D, Table 2 – Authorised petroleum activity(ies) disturbance

Tenure	Description of Infrastructure	Number	Location	Size of disturbance in ESA	ESA
PL226	Brine Pond - Talinga Pond C (including temporary construction activities within location)	1	Lot 4 on Plan RG30 **Perimeter co-ordinates** **Latitude** / **Longitude** -26.910589 / 150.38097 -26.907117 / 150.381498 -26.907152 / 150.381867 -26.906146 / 150.381988 -26.906231 / 150.382716 -26.906025 / 150.382715 -26.905004 / 150.382527 -26.904958 / 150.381941 -26.904062 / 150.38199 -26.903479 / 150.382531 -26.903451 / 150.382555 -26.906315 / 150.386848 -26.907932 / 150.387056 -26.908641 / 150.387595 -26.909112 / 150.386179 -26.909746 / 150.384866	30.7 ha	Primary Protection Zone (PPZ) of Category B 'Endangered Regional Ecosystem' RE:11.4.12 and 11.4.3 PPZ of Category C 'Of Concern Regional Ecosystem' RE:11.3.4 and 11.3.25
	Construction activities associated with Talinga Pond C (two stockpiles and temporary construction activities area)	1	Lot 4 on Plan RG30 **Approximate Centrepoint** **Latitude** / **Longitude** -26.903235 / 150.384643	12.52 ha	PPZ of Category B 'Endangered Regional Ecosystem' RE:11.4.12 PPZ of Category C 'Of Concern Regional Ecosystem' RE:11.3.4 and 11.3.25
	Ancillary Operational Infrastructure – Water Pipeline (associated with Talinga Pond C)	1	Lot 3 on Plan RG247 Lot 4 on Plan RG30	0.2 ha	Category B 'Endangered Regional Ecosystem' ESA and PPZ of Category B 'Endangered Regional Ecosystem' RE:11.4.12
	Temporary Camp during construction of monitoring bore leases authorised by condition (D10)	1	Lot 9 on Plan RG9 **Approximate Centrepoint** **Latitude** / **Longitude** -26.82 / 150.485	2ha	PPZ of Category C 'Of Concern Regional Ecosystem' RE: 11.3.2 and 11.3.3
	Temporary Camp, during construction of monitoring bore leases authorised by condition (D10)	1	Lot 2 on Plan RP53252 **Approximate Centrepoint** **Latitude** / **Longitude** -26.777 / 150.549	0.4ha	PPZ of Category C 'Of Concern Regional Ecosystem' RE:11.3.25, 11.3.4 and 11.3.3

<table>
<tr>
<td></td>
<td>Talinga North Water Transfer Station</td>
<td>1</td>
<td>Lot 440 on Plan BUL3415
<table><tr><th colspan="2">Perimeter co-ordinates</th></tr><tr><th>Longitude</th><th>Latitude</th></tr><tr><td>150.353639</td><td>-26.836082</td></tr><tr><td>150.352822</td><td>26.835758</td></tr><tr><td>150.353208</td><td>-26.835020</td></tr><tr><td>150.353883</td><td>-26.835281</td></tr><tr><td>150.354274</td><td>-26.834844</td></tr><tr><td>150.354399</td><td>-26.834908</td></tr><tr><td>150.354819</td><td>-26.834715</td></tr><tr><td>150.355075</td><td>-26.834559</td></tr><tr><td>150.355340</td><td>-26.834647</td></tr><tr><td>150.355555</td><td>-26.834843</td></tr><tr><td>150.356123</td><td>-26.835209</td></tr><tr><td>150.356474</td><td>-26.835580</td></tr><tr><td>150.356479</td><td>-26.835938</td></tr><tr><td>150.356779</td><td>-26.836195</td></tr><tr><td>150.356966</td><td>-26.836626</td></tr><tr><td>150.356377</td><td>-26.837308</td></tr></table></td>
<td>1.4 ha</td>
<td>PPZ of Category C ‘Of Concern Regional Ecosystem’
RE:11.3.3</td>
</tr>
<tr>
<td></td>
<td>Brine Pond – Talinga Pond D</td>
<td>1</td>
<td>Lot 1 on Plan RG491
<table><tr><th colspan="2">Approximate Centrepoint</th></tr><tr><th>Latitude</th><th>Longitude</th></tr><tr><td>-26.912</td><td>150.353</td></tr></table></td>
<td>7.6ha</td>
<td>PPZ of Category B ‘Endangered Regional Ecosystem’
RE:11.4.3</td>
</tr>
<tr>
<td></td>
<td>Soil remediation area</td>
<td>1</td>
<td>Lot 1 on Plan RG491</td>
<td>9.5ha</td>
<td>PPZ of Category B ‘Endangered Regional Ecosystem’
RE:11.4.3</td>
</tr>
<tr>
<td></td>
<td>Talinga Pond D Inter Pond Transfer Pipeline (to Talinga Pond B)</td>
<td>1</td>
<td>Lot 1 on Plan RG491
Lot 32 on Plan RG247</td>
<td>2.1ha</td>
<td>PPZ of Category B ‘Endangered Regional Ecosystem’
RE:11.4.3 and 11.4.10</td>
</tr>
<tr>
<td></td>
<td rowspan="2">Talinga Orana Gas Gathering Station</td>
<td rowspan="2">1</td>
<td>Lot 52 on Plan BWR104
Perimeter co-ordinates
Longitude Latitude
150.4151 -26.7638
150.4176 -26.7641
150.4173 -26.7659
150.4148 -26.7656</td>
<td>5.02ha</td>
<td>PPZ of Category B ‘Endangered Regional Ecosystem’
RE:11.4.3</td>
</tr>
<tr>
<td>Lot 52 on Plan BWR104
Approximate Perimeter Coordinates
150.4151 -26.7638
150.4176 -26.7641
150.4175 -26.7647
150.4157 -26.7646
150.4150 -26.7644</td>
<td>1.76</td>
<td>PPZ of Category C PPZ – Essential Habitat</td>
</tr>
<tr>
<td></td>
<td rowspan="2">Ancillary Linear Infrastructure associated with Talinga Orana Gas Gathering Station</td>
<td rowspan="2">1</td>
<td>Lot 52 on Plan BWR104
Approximate End Points
150.3996 -26.7643 to 150.4009 -26.7645
150.4027 -26.7647 to 150.4040 -26.7649</td>
<td>0.68ha</td>
<td>Category B ESA – Endangered Regional Ecosystem RE 11.4.3</td>
</tr>
<tr>
<td>Lot 52 on Plan BWR104
Approximate End Points
150.3977 -26.7641 to 150.4060 -26.7651
150.4063 -26.7655 to 150.4175 -26.7661</td>
<td>2.85ha</td>
<td>PPZ of Category B– Endangered Regional Ecosystem RE 11.4.3</td>
</tr>
</table>

			Lot 52 on Plan BWR104 Approximate End Points 150.4087 -26.7655 to 150.4099 -26.7656	0.16ha	Category C ESA – Essential Habitat
			Lot 52 on Plan BWR104 Approximate End Points 150.4066 -26.7652 to 150.4087 -26.7655 150.4099 -26.7656 to 150.4164 -26.7660	1.74ha	PPZ of Category C – Essential Habitat
PL272	Monitoring equipment and ancillary infrastructure associated with the Condamine Seeps.	3	Lot 2 on Plan RP188524 Lot 15 on Plan SP193253	0.7ha	Category C 'Of Concern Regional Ecosystem' RE:11.3.4 and 11.3.3 PPZ of Category B 'Endangered Regional Ecosystem' RE:11.3.1
	Low impact surface capture equipment associated with the Condamine Seep Investigations	NA	Condamine River	NA	PPZ of Category C 'Of Concern Regional Ecosystem' RE 11.3.4 and 11.3.3
	Temporary Drill Camp (CA01)	1	Lot 14 on Plan DER34206 **Approximate Centrepoint** **Latitude** -26.821181 **Longitude** 150.528606	0.7ha	PPZ of Category B 'Endangered Regional Ecosystem' RE:11.9.10
	Laydown (LD01)	1	Lot 14 on Plan DER34206 **Approximate Centrepoint** **Latitude** -26.821362 **Longitude** 150.526874	1ha	PPZ of Category B 'Endangered Regional Ecosystem' R.E 11.9.10 PPZ of Category C 'of Concern Regional Ecosystem' R.E 11.3.2

Note: All Co-ordinates in Schedule D Table 2 are in GDA 94 Datum.

(D9) Despite condition (D7) of this environmental authority, single and multi-monitoring bore leases are authorised within the Primary Protection Zone of Category C Environmentally Sensitive Areas that are 'Of Concern' Regional Ecosystems and the Primary Protection Zone of Category B environmentally sensitive areas that are 'Endangered' Regional Ecosystems within existing cleared land.

(D10) Despite condition (D7) of this environmental authority, electrical distribution equipment are authorised within Environmentally Sensitive Areas and associated Primary Protection Zones when:

(a) located within the well site; and

(b) used to provide electric power to a wellhead(s).

(D11) Despite condition (D7) of this environmental authority, investigation activities to determine the appropriate rehabilitation and remediation requirements for Talinga Pond A are authorised within the Primary Protection Zone of Category B Environmentally Sensitive Areas that are 'Endangered Regional Ecosystems' within existing cleared land.

(D12) Prior to carrying out essential petroleum activities undertaken within Environmentally Sensitive Areas in accordance with *Schedule D, Table 1 - Petroleum activities in Environmentally Sensitive Areas*, it must be demonstrated, in the following order of preference that:

1. no reasonable or practicable alternative exists for carrying out the essential petroleum activities within the Environmentally Sensitive Area;

2. the essential petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance.

(D13) Linear infrastructure construction corridors must, for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area or its primary protection zone, be no greater than 40m in total width.

(D14) Prior to carrying out essential petroleum activities subject to condition (D7) within the primary and Secondary Protection Zones of an Environmentally Sensitive Area, the holder of the environmental authority must demonstrate, in the following order of preference:

1. the essential petroleum activities are preferentially located in areas of pre-existing disturbance;
2. significant disturbance to land from the carrying out of the essential petroleum activities is minimised to the greatest extent practicable.

(D15) If petroleum or essential petroleum activity(ies) are located within a Primary Protection Zone or Secondary Protection Zone of an Environmentally Sensitive Area, that the activity(ies) must not impact the adjacent Environmentally Sensitive Area.

(D16) The record of the assessment required by conditions (D2) to (D3) and the extent of significant disturbance to land in the following areas must be prepared for each annual return period and made available to the administering authority upon request:

(a) The primary protection zone of, or within a Category B or C Environmentally Sensitive Area; and

(b) in the Secondary Protection Zone of Environmentally Sensitive Areas; and

(c) other remnant vegetation areas; and

(d) wetlands.

Offsets

(D17) Prior to construction of significant construction work, the environmental authority holder must submit to the administering authority for approval an Environmental Offsets Strategy.

(D18) The Environmental Offset Strategy must address the Queensland Government Environmental Offset Policy 2008 and associated specific issue policies and includes requirements for listed/scheduled species under the *Nature Conservation Act 1992*. The strategy must address impacts on biodiversity, vegetation, wetlands, and coastal and marine areas arising from:

(a) exploration, development and operation of the coal seam gas fields; and

(b) other activities (e.g., construction camps, port works for the project, ancillary works).

(D19) The Environmental Offset Strategy must be supported by a program detailing the following:

(a) principles adopted for the environmental offsets strategy; and

(b) procedures to identify the requirements for environmental offsets for specific components of the project over the life of the project; and

(c) relevance to any legislative requirements for offsets; and

(d) mechanisms to secure and manage the environmental offset for long term protection of values; and

(e) location, size and values that must be offset; and

(f) location, size and values of the offsets proposed; and

(g) management measures, including funding, required to maintain or enhance values for the life of the offset, and

(h) a system for reporting to the Coordinator General on offset arrangements; their management; how offset values are met and maintained; and the reconciliation process.

(D20) The environmental authority holder must enter into an environmental offset agreement with the administering authority.

Top Soil

(D21) Top soil must be managed in a manner that preserves its biological and chemical properties.

Fauna management procedures

(D22) Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.

Acid Sulfate Soils Environmental Management Plan

(D23) An Acid Sulfate Soil Environmental Management Plan that meets the content requirements of Appendix 4 of the State Planning Policy 2/02 Guideline Acid Sulfate Soils must be prepared prior to undertaking either of the following activities in acid sulfate soils:

(a) any excavation or otherwise removing 100 m^3 or more of soil or sediment; or

(b) filling of land involving 500 m^3 or more of material with an average depth of 0.5 m or greater.

(D24) Any Acid Sulfate Soil Environmental Management Plan required by condition (D23) must be prepared and certified by a suitably qualified person.

(D25) The holder of this environmental authority must implement the Acid Sulphate Soil Environmental Management Plan.

Note: Conditions (D23) to (D25) are only applicable in areas of acid sulphate soils, or potential acid sulphate soils.

Chemical and fuel storage

(D26) Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipelines

(D27) Pipelines must be preferentially located alongside existing linear infrastructure such as roads, tracks and powerlines.

(D28) Pipeline trenches must only be left open for the minimum time practicable.

(D29) The length of pipeline trench open at any one time must be minimised as far as practicable.

(D30) Measures must be employed to prevent fauna entrapment in pipe sections or within the pipeline trench.

(D31) Open trenches and pipes must be checked for fauna prior to backfill and any trapped animals removed.

Access tracks in Environmentally Sensitive Areas

(D32) New access tracks are not permitted within Category B or C Environmentally Sensitive Areas unless they are co-located with gas collection or CSG associated water pipelines, unless otherwise authorised by the administering authority.

Pad drilling

(D33) The environmental authority holder must assess the use of pad drilling wherever medium or high environmental values, including strategic cropping lands are impacted by the petroleum activities. The environmental authority holder must demonstrate that where pad drilling is shown not to be feasible, alternative ways of siting drilling rigs and other petroleum facilities are proposed to protect environmental values.

Gas trunkline easements

(D34) The construction of co-located trunklines must be undertaken in a manner to minimise width and total disturbance required for the right of way.

Sewage treatment plants

(D35) Sewage pump stations must be fitted with a stand-by pump and a visible or audible high-level alarm. All alarms must be able to operate without mains power.

Sewage treatment plants > 150 EP

(D36) Treated effluent may only be released to land within the petroleum tenure at a designated, fenced and delineated contaminant release area(s).

(D37) Prior to construction of a sewage treatment facility, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated by the holder of the environmental authority.

(D38) All nominated locations and minimum areas of land must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.

(D39) A copy of the MEDLI program results required in condition (D38) must be submitted to the administering authority.

(D40) All treated effluent released to land must be in accordance with the contaminant release limits stated in *Schedule D, Table 3 – Treated sewage effluent release limits to land* and the conditions of this environmental authority.

Treated sewage effluent dust suppression construction activities

(D41) Notwithstanding condition (D36), treated sewage effluent that meets or exceeds the standards specified in *Schedule D, Table 3 – Treated sewage effluent release limits to land* may be used for dust suppression or construction activities, provided the use meets the criteria in conditions (D42), as relevant to the use.

Schedule D, Table 3 – Treated sewage effluent release limits to land

Discharge Type	Quality Characteristic / Contaminant	Sampling and *in situ* measurement point location	Limit Type	Release Limit	Frequency
Irrigation at designated contaminant release areas	5-day Biochemical oxygen demand (BOD)	e.g., release pipe from sewage treatment plant	Maximum	20 mg/L	Quarterly
	E.Coli		80th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100mL	

Discharge Type	Quality Characteristic / Contaminant	Sampling and *in situ* measurement point location	Limit Type	Release Limit	Frequency
			Maximum	10,000 cfu per 100mL	
	pH		Range	6.0 – 8.5	Monthly
	Electrical Conductivity		Monitor only		
Use for dust suppression or construction activities	5-day Biochemical oxygen demand (inhibited)	e.g., release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
	pH		range	6.0 to 8.5	
	e-Coli (use for dust suppression or construction activities)		80th percentile based on at least 5 samples with not less than 30 minutes between samples	100 cfu per 100 mL	
			maximum	1000 cfu per 100 mL	

(D42) The release of treated sewage effluent under condition (D41) must:

(a) not exceed the amount required to effectively supress dust; and

(b) not cause on-site ponding or runoff; and

(c) be directly applied to the area being dust supressed; and

(d) not harm vegetation surrounding the area the subject of condition (D41).

(D43) Notwithstanding the quality characteristic limits specified in *Schedule D, Table 3 – Treated sewage effluent release limits to land*, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.

(D44) All sewage effluent released to land must be in accordance with the contaminant release limits and monitored at the frequency and specified in *Schedule D, Table 3 – Treated sewage effluent release limits to land* and the conditions of this environmental authority.

(D45) The daily volume of contaminants released to land must be determined or estimated by an appropriate method, for example a flow meter, and records kept of such determinations and estimates.

(D46) Notices must be prominently displayed on areas undergoing effluent irrigation, warning the employees and the general public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.

(D47) When circumstances prevent the irrigation of treated sewage effluent to land, such as during or following rain events, waters must be directed to wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent.

(D48) The wet weather storage capacity outlined in condition (D47) must have a capacity to hold effluent for a minimum of three days.

(D49) Pipelines and fittings associated with the effluent irrigation system must be clearly identified.

(D50) Lockable valves or removable handles must be fitted to all release pipes situated in public access areas.

Sewage treatment plants between >21 EP and <150 EP

(D51) Treated sewage effluent or greywater can be released to land provided it:

(a) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of between 21 and 150EP.

(D52) The release of treated sewage effluent or greywater authorised in condition (D51) must:

(a) be to a fenced and signed contaminant release area(s);

(b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off;

(c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is:

i. not a declared pest species;

ii. kept in a viable state for transpiration and nutrient uptake; and

iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.

Sewage treatment plants <21 EP

(D53) Treated sewage effluent may only be released to land by irrigation at designated, fenced contaminant release area(s).

(D54) The release of contaminants to land authorised under this environmental authority must be carried out in a manner such that:

(a) vegetation is not damaged;

(b) soil quality is not adversely impacted;

(c) there is no surface ponding or runoff to waters;

(d) there is no aerosols or odours;

(e) deep drainage below the root zone of any vegetation is minimised; and

(f) the quality of shallow aquifers is not adversely affected.

SCHEDULE G – WASTE

General

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

(G2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.

(G3) Waste must not be burned on the site unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

(G4) All waste fluids and muds resulting from drilling and exploration petroleum activities must be contained in a properly lined dam or containment structure for disposal, remediation or reuse where applicable.

(G5) Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised to be disposed of or used on site under this environmental authority.

Waste management

(G6) Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.

Brine and salt management

(G7) The holder of this environmental authority must develop and implement a Brine and Salt Management Plan.

(G8) The Brine and Salt Management Plan required by condition (G7) must address, but not be limited to:

- (a) the Queensland Government policy on Coal Seam Gas Water Management;
- (b) the Administrating Authority's guideline Preparing an Environmental Management Plan (EM Plan) for Coal Seam Gas (CSG) activities;
- (c) a plan for the containment, use and disposal of salt brought to the surface through CSG production, and produced through the treatment of CSG water;
- (d) any plan for reinjection of brine or untreated water;
- (e) any long-term plan for the utilisation of salts extracted from CSG water;
- (f) an assessment of the potential impacts of options considered and appropriate mitigation measures for the preferred option having regard to the decision hierarchy identified in government policy and guidelines;
- (g) a risk assessment methodology which will identify the potential for secondary salinity due to the company's activities. This must include an investigation into wind-borne salt from brine ponds and aggregation dams;
- (h) a list of identified management tools and mitigations that will be used in those locations to minimise and manage the risk of secondary salinity;
- (i) a commitment to assess and report to the administering authority disturbance and rehabilitation activities which affect salinity risk for each 12-month period of the environmental authority.

(G9) 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*.

Investigation into alternative CSG water management

(G10) The holder of the environmental authority must investigate:

(a) the viability of waste reuse or recycling through chemically processing or treating brine or salt residues to create useable or saleable products;

(b) the viability of the injection of brine into a natural underground structure that is geologically isolated and does not contain groundwater that does or could supply water for potable or agricultural purposes;

(c) report the outcomes of the investigations in each annual return until the information required by condition (G11) has been provided to the administering authority.

(G11) By 31 December 2015, the holder of this environmental authority must submit to the administering authority the following:

(a) updated Brine and Salt Management Plan documenting information required by condition (G7); and

(b) report on the results of investigations required by condition (G10); and

(c) a summary of ranking from most to least preferred of all brine management options investigated; and

(d) the preferred management option for the beneficial use of brine and salt.

Residual drilling material and drilling by-products disposal to land

(G12) Residual drilling material may be disposed of on-site by the mix-bury-cover method if the residual drilling material meets the approved quality criteria.

(G13) Residual drilling material or drilling by-products may be disposed of on-site if the method 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.

SCHEDULE I – STIMULATION ACTIVITIES

Well drilling, completion and stimulation

(I1) Restricted stimulation fluids must not be used in stimulation.

(I2) The holder of this environmental authority must ensure that polycyclic aromatic hydrocarbons are not added by design to stimulation fluids to be injected into the target gas producing formation.

(I3) Oil-based drilling muds must not be used in the carrying out of the petroleum activity(ies).

(I4) Synthetic based drilling muds must not be used in the carrying out of the petroleum activity other than with the written approval of the administering authority.

(I5) Treated coal seam gas water may be used in the stimulation process providing that the coal seam gas water is not of a lower quality than the water in the formation to be stimulated. The water quality of the well to be stimulated is to be assessed by monitoring and parameters required by conditions (I15) to (I17).

(I6) Accurate and current material safety data sheets for all fluids used in stimulation activities must be published on the environmental authority holder's website.

(I7) Prior to undertaking well stimulation activities, the holder of this environmental authority must develop a risk assessment to ensure that stimulation activities are managed to prevent environmental harm.

(I8) The stimulation risk assessment 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 landholder bores in the area where stimulation activities are to be carried out;
- (i) the environmental values of groundwater in the area;
- (j) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
- (k) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
- (l) a description of the well mechanical integrity testing program;
- (m) process control and assessment techniques to be applied for determining extent of stimulation activities (e.g. microseismic measurements, modelling etc);
- (n) practices and procedures to ensure that the stimulation activities are designed to be contained within the target gas producing formation;
- (o) locations of landholders' active groundwater bores;
- (p) groundwater transmissivity, flow rate, hydraulic conductivity and direction(s) of flow;

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

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

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

i. toxicological and ecotoxicological information of chemicals used;

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

iii. identification of the stimulation fluid chemicals of potential concern derived from the risk assessment;

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

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

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

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

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

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

(z) 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.

(I9) The stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well.

(I10) Stimulation activities must not result in a change in water quality other than that within the stimulation impact zone of the target gas producing formation.

(I11) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.

(I12) The holder of this authority must ensure the internal and external mechanical integrity of the well system prior to and during stimulation such that there is:

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

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

(I13) 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.

(I14) Rectification measures must be taken immediately if the holder of this environmental authority either becomes aware that stimulation activities have resulted in a change in water quality other than that within the stimulation impact zone of the target gas producing formation or that stimulation activities have caused the connection of the target gas producing formation and another aquifer.

Stimulation baseline monitoring

(I15) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the water quality of:

(a) all active landholders' groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two kilometre horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and

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

(c) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the risk assessment required by conditions (I7) and (I8).

(I16) Prior to undertaking stimulation activities at a well, the holder of this environmental authority must have sufficient water quality data to accurately represent the water quality in the well to be stimulated. The data must include as a minimum the results of analyses for the parameters in condition (I17).

(I17) 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 [ºC];

(f) dissolved oxygen [mg/L]

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

(h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO3) [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

(I18) A Stimulation Impact Monitoring Program which has been certified by a suitably qualified person must be developed prior to the carrying out of stimulation activities.

(I19) The Stimulation Impact Monitoring Program 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 (I7) and (I8) 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 percent of the volume used in stimulation activities has been extracted from the stimulated well; and

(d) all bores in accordance with condition (I15).

(I20) 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 (I17); 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.

(I21) The Stimulation Impact Monitoring Program must provide for monitoring of the bores in condition (I15) at the following minimum frequency:

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

(b) annually for the first years subsequent to the stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (I17(b)), (I17(m)) to (I17(t)) are not detected in concentrations above baseline bore monitoring data on two consecutive monitoring occasions.

(I22) The holder of this environmental authority must implement the Stimulation Impact Monitoring Program.

(I23) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE L – DEFINITIONS

Refer to Appendix A for definitions for this Part.

End of Part 1 - Walloons Development Area

PART 2 – CONDABRI DEVELOPMENT AREA

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Resource Activity, Schedule 3, 07: A petroleum activity involving injection of a waste fluid into a natural underground reservoir or aquifer	PL1011 PL265 PL266 PL267 PPL186
Resource Activity, Schedule 3, 08: A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	
Resource Activity, Schedule 3, 03: A petroleum activity that is likely to have a significant impact on a category A or B environmentally sensitive area	
Resource Activity, Schedule 3, 06: A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (a-ii) 21 to 100EP otherwise	
Ancillary 63 – Sewage Treatment 1: Operating sewage treatment works, other than no release works, with a total daily peak design capacity of (b-ii) more than 100 but not more than 1,500EP otherwise	

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

(A1) This environmental authority authorises the carrying out of the following resource activities:

(a) the petroleum activities and specified relevant activities listed in *Schedule A, Table 1 - Authorised petroleum activities and specified relevant activities* to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable); and

(b) incidental activities that are not otherwise specified relevant activities.

(A2) The authorised resource activities are authorised subject to the conditions of this environmental authority.

(A3) This environmental authority does not authorise a relevant act to occur in carrying out an authorised resource activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Schedule A, Table 1 – Authorised Petroleum Activities

Authorised Petroleum Activity	Scale		Intensity
	Maximum size	Location	
Petroleum activities			
Coal seam gas production and exploration	1200ha (wells only)	Within project area	1200 wells
Petroleum Pipeline	N/A	PPL186	Less than 150km
Specified relevant activities			
Stimulation activities	N/A	Within project area	Approved, limited by the conditions contained in this environmental authority
Extracting material, other than by dredging	N/A	Within project area	N/A
Electricity generation by using gas permanent, in isolation or combined in operation, or interconnected) at a rated	N/A	Within project area	150MW for project area

capacity of 10 megawatt (MW) electrical or more			
Operating fuel burning equipment (permanent, in isolation or combined in operation, or interconnected) that is capable of burning more than 500kg of fuel in an hour	N/A	Within project area	N/A
Chemical storage (permanent) that meets any of the thresholds described in Schedule 2, Part 2, section 8 of the Environmental Protection Regulation 2008	>50t of chemicals of DG class 1 or 2, division 2.3 >500m3 of chemicals of class C1 or C2 combustible liquids under AS 1,940 or DG Class 3 >200m3 of chemicals that are liquids	Within project area	761 storages at well leases; N/A at other permanent facilities
Sewage treatment works, other than no-release works, where treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme; or otherwise discharged	1,500EP per facility	Within project area	8,800EP for project area
Waste disposal onsite—operating a facility for disposing of greater than 50t of non-regulated waste in a year (including residual drilling material and drilling by-products disposal to	N/A	Within project area	763 facilities

land where the drill muds do not have any substances that would make it a regulated waste)			
Waste disposal—Injection of treated water or wastewater	4.3ML/day	Within project area	3 wells
Regulated waste storage—Any structure, including regulated, low consequence dams, and other dams containing regulated waste.	N/A	Within project area	252ha across 18 dams
Water treatment activities - treating 10ML or more of raw water in a day in a way that allows waste, whether treated or untreated, to be released into the environment	60ML/day	Within project area	1 water treatment facility 1 release point
Storing waste that is not regulated waste (including coal seam gas water) in a regulated dam	N/A	Within project area	30 regulated dams
Storing coal seam gas water that is not regulated waste in a low consequence dam	N/A	Within project area	695 low consequence dams

Prevent or minimise likelihood of environmental harm

(A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of measures, plant and equipment

(A5) 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.

(A6) 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).

(A7) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated and operated and maintained effectively in accordance with the manufacturer's specifications.

(A8) The holder of this authority must ensure that daily operation and maintenance of all plant and equipment relating to the authorised petroleum activities are carried out by suitably qualified, competent and experienced person(s).

(A9) All laboratory analyses and tests required to be conducted under this 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.

Contingency procedures for emergency environmental incidents

(A10) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.

(b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.

(c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.

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

(e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.

(f) training of staff to enable them to effectively respond.

(g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Documentation and records management

(A11) A record of all documents required by this environmental authority must be:

(a) kept for a minimum of five years; and

(b) be made available to an authorised person upon request.

Infrastructure

(A12) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

a. regulated dams;

b. exploration, appraisal and development wells;

c. gas processing facilities;

d. water treatment facilities;

e. brine encapsulation facilities;

f. sewage treatment facilities;

g. authorised discharge points to air, land and waters;

h. any chemical storage facility associated with the environmentally relevant activity of chemical storage;

i. field compressor stations; and

j. central compressor stations.

Monitoring Program

(A13) All monitoring under this environmental authority must be undertaken by a suitably qualified person.

(A14) All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented

SCHEDULE B – WATER

Contaminant Release

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

Release of Treated CSG Water to Waters

(B2) Treated CSG water may be released from the release point specified *in Schedule B, Table 1 – Treated CSG Water Release Point and Receiving Waters* to the receiving environment specified in *Schedule B, Table 1 – Treated CSG Water Release Point and Receiving Waters* until 31 December 2040.

(B3) The treated CSG water authorised to be released in accordance with condition (B2) must not contain stimulation fluid.

(B4) For the period commencing 1 January 2015 up to and including 31 December 2040, the total volume of treated CSG water authorised to be released in accordance with condition (B2) must not exceed 4.8GL in any one calendar year that falls within the peak water production period, calculated as the total volume of release from the Integrated Condabri-Talinga Coal Seam gas Water Management Scheme.

(B5) For the period commencing 1 January 2015 up to and including 31 December 2040, the total volume of treated CSG water authorised to be released in accordance with condition (B2) must not exceed 2.8GL in any one calendar year that falls within the high water production period, calculated as the total volume of release from the Integrated Condabri-Talinga Coal Seam gas Water Management Scheme.

(B6) For the period commencing 1 January 2015 up to and including 31 December 2040, the total volume of treated CSG water authorised to be released in accordance with condition (B2) must not exceed 2.3GL per annum in any one calendar year that falls within the low water production period, calculated as the total volume of release from the Integrated Condabri-Talinga Coal Seam gas Water Management Scheme.

(B6A) Despite conditions B4, B5 and B6, the total volume of treated CSG water authorised to be released from the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme from 1 January 2022 to 1 January 2023 is 8.2GL.

Schedule B, Table 1 – Treated CSG Water Release Point and Receiving Waters

Release Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Treated CSG Water Source and Location and Description of Release Point	Receiving Waters Description
U1	-26.8227	150.1934	Reverse Osmosis Treatment Plant Discharge Structure located on PL265	Condamine River downstream of the release point to the Cotswold gauging station.

(B7) The release of treated CSG water to waters in accordance with condition (B2) must not exceed any of the quality characteristic release limits specified in *Schedule B, Table 2 – Release Contaminant Limits*.

(B8) The release of treated CSG water to waters in accordance with condition (B2) must be monitored:

(a) at the monitoring point specified in *Schedule B, Table 2 – Receiving Environment Contaminant Limits*;

(b) for each of the quality characteristics specified in Schedule B, Table 2 – Receiving Environment Contaminant Limits; and

(c) at the monitoring frequencies specified in Schedule B, Table 2 – Receiving Environment Contaminant Lim*its* for each quality characteristic.

(B9) If the monitoring required by condition (B8) indicates that any of the quality characteristic release limits specified in *Schedule B, Table 2 – Release Contaminant Limits*, other than at Condamine River - 200m upstream of release tributary confluence with Condamine River, have been exceeded at any time during any release of treated CSG water, the environmental authority holder must, within three months of notifying the administering authority of the exceedance, unless a longer time is agreed to by the administering authority:

(a) complete an investigation in accordance with the methodology ANZECC and ARMCANZ 2000 into the potential for environmental harm resulting from the exceedance; and

(b) provide a written report to the administering authority on completion of the investigation that includes:

(i) details of the investigation carried out; and
(ii) any actions taken to prevent environmental harm.

(B10) Where an exceedance of a quality characteristic release limit specified in *Schedule B, Table 2 – Release Contaminant Limits* is being investigated in accordance with condition (B9), the investigation and reporting required by condition (B9) is not required if a subsequent exceedance occurs, during investigation of the initial exceedance, which has resulted from the same cause that triggered the initial exceedance.

Schedule B, Table 2 – Release Contaminant Limits

Monitoring Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality Characteristic	Release Limit	Limit Type	Monitoring Frequency
U1	-26.8227	150.1934	Dissolved Oxygen	4mg/L	Minimum	Daily during discharge
			Electrical Conductivity	500µS/cm	Maximum	
			pH	6.5–8.5 units	Range	
Condamine River - 200m upstream of release tributary confluence with Condamine River	-26.82693	150.19768	Temperature	+/- 4ºC	Range	

Condamine River - 500m downstream of release tributary confluence with Condamine River	-26.82780	150.19213				
U1	-26.8227	150.1934	Calcium	5mg/L	Minimum	Weekly during discharge
			Magnesium	2mg/L	Minimum	
			Boron	1mg/L	Maximum	

(B11) The release of treated CSG water to waters in accordance with condition (B2) must not exceed any of the quality characteristic release limits specified in *Schedule B, Table 3 – Release Contaminant Limits*.

(B12) The release of treated CSG water to waters in accordance with condition (B2) must be monitored:

(a) at the monitoring points specified in *Schedule B, Table 3 – Release Contaminant Limits*;

(b) for each of the quality characteristics specified in *Schedule B, Table 3 – Release Contaminant Limits*; and

(c) at the monitoring frequencies specified in *Schedule B, Table 3 – Release Contaminant Limits* for each quality characteristic.

(B13) If the monitoring required by condition (B12) indicates that any of the quality characteristic release limits specified in *Schedule B, Table 3 – Release Contaminant Limits* have been exceeded at any time during any release of treated CSG water, the environmental authority holder must, within three (3) months of notifying the administering authority of the exceedance, unless a longer time is agreed to by the administering authority:

(a) complete an investigation into the potential for impacts to drinking water resulting from the exceedance, which includes an analysis of the (potential and actual) causes for the exceedance; and

(b) provide a written report to the administering authority and the local Public Health Unit (https://www.health.qld.gov.au/system-governance/contact-us/contact/public-health-units/default.asp) on completion of the investigation that includes:

i. details of the investigation carried out;
ii. any actions taken to prevent impacts to drinking water;
iii. the cause for the exceedance;
iv. all water quality monitoring results pertaining to the investigation;
v. any general observations;
vi. methodology(ies) and any relevant calculations used; and
vii. corrective actions to rectify the cause of the exceedance.

(B14) Where an exceedance of a quality characteristic release limit specified in *Schedule B, Table 3 – Release Contaminant Limits* is being investigated in accordance with condition (B13), the investigation and reporting required by condition (B13) is not required if a subsequent exceedance occurs, during

investigation of the initial exceedance, which has resulted from the same cause that triggered the initial exceedance.

Schedule B, Table 3 – Release Contaminant Limits

Monitoring Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality Characteristic	Release Limit	Limit Type	Monitoring Frequency
Condabri Central Water Treatment Facility: Supply to River 4520-5	-26.80315	150.19069	N-Nitrosodimethylamine (NDMA)	0.0001mg/L	Maximum	On first release day of each calendar year
			Alpha Activity	0.5Bq/L	Maximum	
			Beta Activity	0.5Bq/L	Maximum	
			Aluminium	0.2mg/L	Maximum	
			Ammonia	0.5mg/L	Maximum	
			Arsenic	0.01mg/L	Maximum	
			Barium	0.7mg/L	Maximum	
			Bisphenol A	0.2mg/L	Maximum	
			Boron	4mg/L	Maximum	
			Bromide	7mg/L	Maximum	
			Bromoform	0.1mg/L	Maximum	
			BTEX Benzene Toluene Ethylbenzene Xylene (m & p)	0.001mg/L 0.800mg/L 0.300mg/L 0.600mg/L	Maximum	
			Cadmium	0.002mg/L	Maximum	
			Chlorine	5mg/L	Maximum	
			Chloroform	0.2mg/L	Maximum	

Monitoring Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality Characteristic	Release Limit	Limit Type	Monitoring Frequency
			Chromium	0.05mg/L	Maximum	
			Copper	2mg/L	Maximum	
			Cyanide	0.08mg/L	Maximum	
			Fluoride	1.5mg/L	Maximum	
			Iodide	0.1mg/L	Maximum	
			Iron	0.3mg/L	Maximum	
			Lead	0.01mg/L	Maximum	
			Manganese	0.5mg/L	Maximum	
			Mercury	0.001mg/L	Maximum	
			Molybdenum	0.05mg/L	Maximum	
			Nickel	0.02mg/L	Maximum	
			PAH (as B(a)P TEF) Species: TEF: benz[a]anthracene 0.1 benzo[b+j]fluoranthene 0.1 benzo[k]fluoranthene 0.1 benzo[a]pyrene 1.0 chrysene 0.01 dibenz[a,h]anthracene 5.0 indeno[1,2,3-cd]pyrene 0.1	0.01 g/L	Maximum	
			Selenium	0.01mg/L	Maximum	
			Sulphate	500mg/L	Maximum	

Monitoring Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality Characteristic	Release Limit	Limit Type	Monitoring Frequency
			Strontium	4mg/L	Maximum	
			Total Petroleum Hydrocarbons (TPH)	0.2mg/L	Maximum	
			Vanadium	0.05mg/L	Maximum	
			Zinc	3mg/L	Maximum	

(B15) The daily quantity of treated CSG water released from the release point specified in *Schedule B, Table 1 – Treated CSG Water Release Point* must be measured and recorded.

(B16) A stream flow gauging station must be utilised to determine and record stream flows of the receiving waters at the location and frequency specified in *Schedule B, Table 4 – Stream Flow Gauging Station*.

(B17) The release of treated CSG water to waters in accordance with condition (B2) must not:

(a) cause erosion of the bed and banks of the receiving waters specified in *Schedule B, Table 1 – Treated CSG Water Release Point and Receiving Environment*;

(b) cause a material build-up of sediment in the receiving waters specified in *Schedule B, Table 1 – Treated CSG Water Release Point and Receiving Environment*.

Schedule B, Table 4 – Stream Flow Gauging Station

Gauging station description	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Flow Record Frequency
Chinchilla Weir	−26.8001	150.57495	Continuous

(B18) During the transitional period, the release of treated CSG water is only authorised during any of the following conditions:

(a) if the volume of the release is less than or equal to 20% of the mean daily flow (m^3/sec) of the receiving waters as measured at the gauging station specified in *Schedule B, Table 4 – Stream Flow Gauging Station*;

(b) once the design storage allowance (DSA) of the feed pond and the maximum operating level (1,873ML) in the Monreagh Dam have been reached.

(B19) During the operational period, the release of treated CSG water is only authorised during any of the following conditions:

(a) once the maximum operating level (1,873ML) in the Monreagh Dam has been reached;

(b) if the volume of produced treated water exceeds irrigation demand when measured on a daily basis.

(B20) If a release event has been triggered under conditions (B19)(a), the release is authorised to continue until the volume of water contained in the Monreagh Dam has decreased to 180ML.

(B21) The maximum release rate of treated CSG water authorised in conditions (B19) and (B20) must not exceed 40ML/d from the Condabri water treatment facility.

(B22) The release of treated CSG water to waters during no flow conditions must not cause an adverse impact to aquatic biota in the receiving waters.

Notification

(B23) If circumstances prevent the monitoring required by either condition (B8), (B12) or (B16) during or following severe weather events, the administering authority must be notified within 48 hours.

Recording

(B24) The release days into no flow conditions for the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme must be reported in the annual return consistent with the requirements of condition (B25).

(B25) Records of all releases required by condition (B24) must include the following information:

(a) release commencement date and time;
(b) expected release cessation date and time;
(c) estimated release volume and actual volume of treated CSG water released;
(d) the flow rate of the receiving waters;
(e) all in-situ water quality monitoring results;
(f) any other matters pertinent to the water release event; and
(g) any details including available data regarding likely impacts on the receiving water.

Receiving Environment Monitoring Program (REMP)

(B26) A REMP must be developed and implemented to monitor and record the effects of the release of treated CSG water to the receiving environment with the aims of identifying and describing the extent of any adverse environmental impacts to local environmental values and monitoring any changes in the receiving water.

(B27) The REMP must be maintained by a person possessing appropriate qualifications and experience in the field of hydrology and surface water monitoring program design.

(B28) The REMP must address, but not be limited to:

(a) a description of potentially affected receiving waters including key communities and background water quality characteristics based on accurate and reliable monitoring data that takes into consideration any temporal variation (e.g. seasonality);

(b) a description of applicable environmental values, including but not limited to:

(i) hydrology (flow, duration, periodicity, connectivity with groundwater systems;

(ii) physiochemical properties;

(iii) drinking water;

(iv) aquatic ecosystem parameters including flow and fauna habitat; and

(v) geomorphological features;

(c) a description of water quality objectives to be achieved (i.e. as scheduled pursuant to the Environmental Protection (Water) Policy 2009);

(d) any relevant reports prepared by other governmental or professional research organisations that relate to the receiving environment within which the REMP is proposed;

(e) water quality targets within the receiving environment to be achieved, and clarification of contaminant concentrations or levels indicating adverse environmental impacts during the REMP.

(f) monitoring for any potential adverse environmental impacts caused by the release including impacts to bank stability and erosion;

(g) monitoring of stream flow and hydrology;

(h) measurement of the banks and beds of the receiving environment for SAR and an assessment of soil sodicity and erosion;

(i) an assessment of bank stability and an evaluation of water course bank slumping;

(j) monitoring of contaminants should consider the limits specified in *Schedule B, Table 2 – Release Contaminant Limits* to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ 2000 guidelines for slightly to moderately disturbed ecosystems;

(k) monitoring of contaminants including ammonia, aluminium, arsenic, cadmium, chromium, copper, cobalt, iron, fluoride, lead, manganese, mercury, molybdenum, nickel, selenium, silver, sulphate, uranium, vanadium and zinc to assess the extent of the compliance of concentrations with water quality objectives and/or the ANZECC & ARMCANZ 2000 guidelines for slightly to moderately disturbed ecosystems;

(l) monitoring of physical chemical parameters as a minimum those specified in *Schedule B, Table 2 – Release Contaminant Limits* (in addition to dissolved oxygen saturation);

(m) monitoring biological indicators (including but not limited to vertebrate and invertebrate species) for permanent, semi-permanent water holes and water storages using sampling techniques sufficient to reliably detect significant differences between impacted (test) and unimpacted sites;

(n) monitoring of a selection of zooplankton species to assess health (e.g. exoskeleton density) in respect to the availability of calcium and magnesium;

(o) the methods for analysis and interpretation all monitoring results;

(p) the locations of monitoring points (including the locations of proposed background and downstream impacted sites for each release point);

(q) the frequency or scheduling of sampling and analysis sufficient to determine water quality objectives and to derive site specific reference values within two years (depending on wet season flows) in accordance with the Queensland Water Quality Guidelines 2009. For ephemeral streams, this should include periods of flow irrespective of mine or other discharges;

(r) specify sampling and analysis methods and quality assurance and control;

(s) any historical data sets to be relied upon;

(t) description of the statistical basis on which conclusions are drawn,

(u) any control or reference sites; and

(v) recording of planned and unplanned releases to watercourses, procedures for event monitoring, monitoring methodology used and procedure to establish background surface water quality.

Erosion and sediment control

(B29) 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).

Maintenance and Cleaning

(B30) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants cannot be released into any waters.

Stormwater Management

(B31) There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.

Authorised impacts to wetlands

(B32) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

Authorised activities in waters

(B33) Unless otherwise authorised under this environmental authority, petroleum activities must not occur in or within 200m of a:

(a) wetland of high ecological significance (HES)
(b) Great Artesian Basin Spring
(c) subterranean cave GDE.

(B34) Notwithstanding condition (B33), petroleum activities occurring in or within 200m of a wetland of high ecological significance, can only occur for the infrastructure and at the locations specified in Schedule B, Table 5 – Authorised Petroleum Activities within 200m of a High Ecological Significance Wetland.

(B35) Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.

(B36) The construction or maintenance of linear infrastructure in a wetland of other environmental value, and/or the construction or maintenance of infrastructure authorised under condition (B35), 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.

(B37) After the construction or maintenance works for linear infrastructure in a wetland of other environmental value and/or the construction or maintenance of infrastructure authorised under condition (B35) 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.

Schedule B, Table 5 – Authorised Petroleum Activities within 200m of a High Ecological Significance Wetland

Tenure	Infrastructure	Location (GDA 94, MGA zone 56)		Maximum Length or Area
		Latitude	Longitude	
PL265	Flowline *in an HES wetland*	-26.8450° -26.8440°	150.1886° 150.1888°	125 m
	Flowline *within 200m of an HES wetland*	Segment 1 -26.8465° -26.8450° Segment 2 -26.8440° -26.8414°	Segment 1 150.1871° 150.1886° Segment 2 150.1888° 150.1885°	Segment 1 270 m Segment 2 310 m
	Well and well-pad *within 200m of an HES wetland*	centre point -26.8414°	centre point 150.1885°	1.0 ha
	Access track *in an HES wetland*	-26.8449° -26.8448°	150.1885° 150.1886°	14m
	Access track *within 200m of an HES wetland*	-26.8449° -26.8459	150.1885° 150.1867°	220m

(B38) 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

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

(B39) The construction or maintenance of linear infrastructure authorised under condition (B34) and/or the construction or maintenance of infrastructure authorised under condition (B35) must comply with the water quality limits as specified in Schedule B, Table 6 — Release limits for construction or maintenance of linear infrastructure.

(B40) Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (B39).

Schedule B, Table 6 — Release limits for construction or maintenance of linear infrastructure

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

Register of activities in wetlands and watercourses

(B41) 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 (B40).

Activities in river improvement areas

(B42) Measures must be taken to minimise negative impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.

Activities in floodplains

(B43) 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; or

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

(c) increase the local duration of floods; or

(d) increase the risk of detaining flood flows.

Management of Hydrostatic Test Water

(B44) Pipeline wastewater, may be released to land provided that it:

(a) can be demonstrated it meets the acceptable standards for release to land; and

(b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.

(B45) The holder of this authority must undertake hydrotesting of pipe sections crossing water bodies prior to installation of these pipe sections.

CSG Water Injection Trial

(B46) Prior to undertaking fluid injection, the holder of this environmental authority must develop a Stage 1 - Injection Management Plan, which must include but not necessarily be limited to:

(a) Injection fluid characteristics, including:

(i) estimated volumes and rates of water to be injected;

(ii) a description of the physical, chemical and biological components and their concentrations of the fluid to be injected

(b) target aquifer characteristics, including:

(i) the pre-existing state of the aquifer including faults or geological features that exist in the target and adjacent aquifers to the outer extent of the hydraulic impact zone and a history of seismic events within the hydraulic impact zone;

(ii) physical characteristics including, storavity, pressure, location, accessibility, inflow, outflow and history of use;

(iii) characterisation of the physiochemical properties of the target formation;

(iv) compatibility of the injection fluid with the target formation and formation water;

(v) identification of the value of the target aquifer in respect to economic output, supported population and natural assets;

(vi) groundwater levels and/or pressure;

(c) identification of the hydraulic impact zone;

(d) identification of the water quality impact zone;

(e) identification of the environmental values and water quality objectives of the potential water quality impact zone of the target formation in accordance with the Environmental Protection (Water) Policy 1997 and the Queensland Water Quality Guidelines 2006;

(f) identification of the impacts on the environmental values due to the injection fluid;

(g) details of how and where the fluid will be produced, aggregated, stored and kept separate from other waters until it is, treated and reinjected into the target aquifer;

(h) identification of any fluid injection well, all existing bores, springs, environmental assets and watercourses connected to groundwater, faults and other geologic features that occur within the water quality impact zone and the hydraulic impact zone;

(i) an assessment of the potential for migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourses, faults or other geologic features likely to impact on other aquifers;

(j) a risk assessment consistent with the risk framework specified in Australian Guidelines for Water Recycling: Managed Aquifer Recharge, identifying potential hazards, their inherent risk, preventative measures for the management of potential hazards and after consideration of the operational monitoring to manage potential hazards identified in the risk assessment including details on sampling and analysis methods including frequency and locations, and quality assurance and control;

(k) verification methods to assess performance of the injection activities,

(l) control measures that will be implemented for fluid storage, treatment and injection to prevent or control the release of a contaminant or waste to the environment;

(m) the indicators or other criteria against which the performance of fluid injection will be assessed;

(n) procedures that will be adopted to regularly review the monitoring program and to report to management and the administering authority should unforeseen or non-compliant monitoring results be recorded;

(o) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results;

(p) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection; and

(q) development of a public consultation program to be implemented at commencement of Stage 2 – Field test program of the CSG Water Injection Trial.

(B47) Stage 3 – Full Scale CSG Water Injection is not authorised under this environmental authority.

CSG Water Injection Trial – Stage 2

(B48) Injection activities are only authorised to be conducted at the locations and for the fluid types and maximum time periods listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials*.

Schedule B, Table 7 – Details of Authorised Fluid Injection Trials

Trial Reference	Well Location	Well Number	Target Formation	Fluid Type	Maximum Time Period	Water Quality Impact Zone	Hydraulic Impact Zone
1	224184, 7034187	CON-INJ3-G	Gubberamunda Sandstone	Treated[1] CSG water and surface water runoff	12 months	110m	11km
2	224234, 7034229	CON-INJ1-H	Hutton Sandstone		12 months	85m	9km
3	224205, 7034204	CON-INJ2-P	Precipice Sandstone		12 months	168m	12km

[1] *Treated means fluid that:*

- *Has undergone filtration to remove suspended solids;*
- *Disinfection by ultra-violet irradiation; and*
- *Meeting contaminant limits prescribed in* Schedule B, Table 8 – Specific Contaminant Limits for Injection Fluid*.*

Note: Well locations in easting and northing map zone 56 MGA 94,
Note: The water quality impact zone and hydraulic impact zone area shall be described as a polygon with boundary references specified in grid references to MGA 94.
Note: The maximum time period for the trial into each formation does not include the aquifer injection commissioning timeframe.

(B49) Injection must cease immediately upon becoming aware that environmental harm is caused or threatened to be caused as a result of the injection activities.

(B50) The administering authority must be notified of the commencement date of each trial listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials* up to seven days prior to its commencement.

Well Integrity

(B51) The construction of fluid injection wells must be carried out in accordance with well construction requirements in the most recent version of the Department of Environment and Heritage Protection Treated Coal Seam Gas (CSG) Water Injection Well Construction Requirements, as amended from time to time.

(B52) Fluid injection well(s) authorised by this environmental authority must have appropriate records and documents which support and indicate mechanical integrity and which hold a certificate of mechanical integrity prepared and certified by a suitably qualified person, available for inspection such that:

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

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

(B53) For fluid injection:

(a) at depth less than 100m, the injection operation must not exceed the dry overburden pressure of the base of the overlying aquitard; or

(b) at depth greater than 100m, the injection operation must not exceed 90% of the formation fracture pressure.

Fluid Injection Quality

(B54) Fluid used in the well injection trials listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials* must comply with the contaminant limits prescribed in *Schedule B, Table 8 - Specific Contaminant Limits for Injection Fluid*, at the point of injection for the wells listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials*.

Schedule B, Table 8 – Specific Contaminant Limits for Injection Fluid

Contaminants/Parameters of concern: release limits	**Gubberamunda Sandstone**	**Hutton Sandstone**	**Precipice Sandstone**
Dissolved oxygen	200ppb	200ppb	N/A
Total dissolved solids (TDS)[2]	Mean TDS shall not exceed formation water 95%ile	Mean TDS shall not exceed formation water 95%ile	Mean TDS shall not exceed formation water 95%ile
pH units	6.5-10	6.5-10	6.5-10

[2] Electrical conductivity (EC) is an acceptable proxy measurement for measuring TDS of the injection fluid. If used, the conversion from EC to TDS must be stated and confirmed with laboratory monitoring results.

(B55) The Injection Monitoring Program described in the *Condabri Aquifer Injection Trial Management Plan Environmental Authority EPPG00853013* must be implemented.

(B56) The Injection Monitoring Program must be certified by a suitably qualified person.

(B57) The Injection Monitoring Program must include, but not necessarily be limited to:

(a) monitoring for all parameters listed in Section 6.2 of the *Condabri Aquifer Injection Trial Management Plan Environmental Authority EPPG00853013*;

(b) monitoring of radionuclides: gross alpha and beta;

(c) monitoring at monitoring bore locations listed in Section 6.1 of the Condabri Aquifer Injection Trial Management Plan Environmental Authority EPPG00853013;

(d) monitoring at injection well locations listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials*; and

(e) an analysis of how the measured parameters compare with the relevant water quality guidelines for environmental and human health.

(B58) Upon completion and within three months of each trial listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials*, a Stage 2 Report, prepared by a suitably qualified person, must be submitted to the administering authority.

(B59) The Stage 2 Report must include, but not necessarily be limited to:

For any well to be used for fluid injection activities:

(a) details of the wells including but not limited to:

(i) location details (GDA94);

(ii) the inferred lithology;

(iii) casing details (type, outer diameter (mm), wall thickness (mm) & locations (depth from & to in metres));

(iv) cementing details (type, hole diameter (mm), casing outer diameter (mm) and locations (depth from & to in metres));

(v) target formation fracture pressure; and

(vi) target formation pressure prior to injection;

(b) a detailed interpretation of the logs and other tests conducted during drilling and construction or refurbishment of the well against their specific objectives;

(c) a completed well schematic diagram;

(d) a temperature survey;

(e) a casing integrity assessment technique such as:

(i) radioactive tracer survey;

(ii) oxygen activation log;

(iii) cement integrity log; or

(iv) an equivalent survey technique approved by the administering authority;

(f) outcomes of the injection trial including, but not limited to:

(i) well head injection rates versus formation pressure;

(ii) target formation pressure within the hydraulic impact zone during and upon completion of the trial;

(iii) hydraulic gradient of the target formation within the hydraulic impact zone upon completion of the trial;

(iv) the effectiveness of aquitards (including the stability of the aquitard) and aquicludes of confining the injected fluid within the target formation; and

(v) a detailed interpretation of the logs and other tests conducted during the injection trial against their specific objectives;

(g) the results of the monitoring program as required by conditions (B55) and (B57);

(h) analysis of monitoring and operational data in terms of:

(i) validation of conceptual framework for injection; and

(j) additional hazards that were not identified earlier;

(k) a revised risk analysis that identifies all potential hazards, likelihood of various risk elements and associated consequences;

(l) a re-evaluation of the hydraulic impact zone; and

(m) a re-evaluation of the water quality impact zone.

Well Closure

(B60) A Well Closure Plan which has been certified by a suitably qualified person must be submitted to the administering authority at least six months prior to the cessation of fluid injection at each well.

(B61) The Well Closure Plan must include, but not necessarily be limited to the following:

(a) details of when and under what circumstances the injection well will be decommissioned;

(b) sealing details including the method, type of material to be used and the location and the depth (metres) from ground surface of the bottom of the seal will be located; and

(c) any proposed test or measure to be made.

(B62) Actions outlined in the well closure plan must be completed within three months after the cessation of fluid injection at each injection well listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials*.

(B63) A well closure report demonstrating compliance with the well closure plan as required by conditions (B60) and (B61) for each well must be prepared by a suitably qualified person and submitted to the administering authority with the next annual return following completion of injection activities.

(B64) Injection wells must be decommissioned in accordance with the Minimum Construction Requirement for Water Bores in Australia as amended from time to time.

(B65) Prior to abandoning an injection well, the well must be completely sealed with concrete, cement grout or bentonite cement grout from the terminal depth to the surface.

Injection Cessation Report

(B66) A fluid injection cessation report which has been certified by a suitably qualified person must be submitted to the administering authority within two months of completion of each trial listed in *Schedule B, Table 7 – Details of Authorised Fluid Injection Trials*.

(B67) The fluid injection cessation reports required by condition (B66) must include, but not necessarily be limited to:

(a) volumes of fluid injected at each well;

(b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the verification monitoring, preventative measures and the residual risk; and

(c) a monitoring report outlining the methods and results of verification monitoring undertaken to assess the performance of the injection activities and preventative measures for identified hazards.

Fluid Injection Notification

(B68) The Department of Environment and Heritage Protection Pollution Hotline (telephone: 1300 130 373) must be contacted as soon as reasonably practicable, but within 24 hours of becoming aware of:

(a) migration of injected fluid out of the target formation; or

(b) a loss of hydraulic isolation of the target formation; or

(c) the detection of groundwater contaminants that were not detected in background samples; or

(d) an injection fluid monitoring result that does not comply with the any one of parameters in *Schedule B, Table 8 - Specific Contaminant Limits for Injection Fluid*.

Seepage Monitoring Program

(B69) 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 31 May 2015.

(B70) The seepage monitoring program required by condition (B69) 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 background and seepage monitoring bores for the trigger parameters identified in condition (B70)(b) at a frequency, determined by a suitably qualified person and:

(i) at least once every two years where baseline data has been established; or

(ii) at least quarterly for two years to establish baseline data for any impact to groundwaters, after which time monitoring may continue at the frequency according to condition (B70)(f)(i).

(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (B70(b)) and (B70(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.

(B71) All groundwater monitoring bores must be maintained in an operative condition and be accessible at all times to any authorised person.

(B72) The method of water sampling required by this environmental authority must comply with that set out in the most recent version of the Department of Environment and Heritage Protection Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009, Version 2 September 2010 as amended from time to time.

Coal Seam Gas Water Management

(B73) The holder of this environmental authority must ensure that coal seam gas water is contained, is not released to land or waters, and is only used for purposes specifically authorised:

(a) under this environmental authority; or

(b) under the *Petroleum and Gas (Production and Safety) Act 2004* as an authorised activity; or

(c) under Section 86 of the *Petroleum Act 1923*; or

(d) under an approval of resource for beneficial use as provided for under the *Waste Reduction and Recycling Act 2011.*

Produced Water Use

(B73A) Produced water may be re-used in:

(a) drilling and well hole activities; or

(b) stimulation activities.

(B73B) Produced water from the authorised petroleum activity(ies) may be used for irrigation, dust suppression, construction, operational and incidental land management purposes for the petroleum activity(ies) authorised by this environmental authority. The use of produced water must not cause:

(a) on-site ponding;
(b) runoff from the site where the resource is applied;
(c) vegetation die-off;
(d) visible salting; or
(e) serious or material environmental harm.

(B73C) Produced water from the authorised petroleum activity(ies) which is used for:

(a) domestic, stock or stock intensive purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time;
(b) irrigation purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for irrigation purposes, as amended from time to time.

Transfer of Assets

(B73D) Despite condition (Common Conditions Schedule (R8)), the holder of the environmental authority is authorised to transfer produced water to a low consequence dam left in-situ for beneficial use, in accordance with the following:

(a) The landholder must agree in writing to the transfer ownership of the low consequence dam;

(b) The landholder must agree in writing to the beneficial re-use of produced water;

(c) The dam must be assessed as being a low consequence dam 12 months prior to the transfer of water;

(d) suitably qualified person must identify that the dam is adequate for the intended on-going use by the landholder within three months prior to transfer the transfer of the dam;

(e) a suitably qualified person must identify that the low consequence dam and the land on which it is located, must be safe, stable, non-polluting and able to support the post-activity land use within three months prior to the transfer of the dam;

(f) On cessation of the transfer of water, low consequence dams must be decommissioned to no longer accept inflow from the petroleum activity(ies);

(g) Produced water transferred to the landholder must meet the relevant quality guidelines for the intended purpose prior to the water being given.

Produced Water – Third Party Use Off tenure

(B73E) Produced water may be transferred to a third party to be used off tenure for the following purposes:

(a) Dust suppression, construction, operational and incidental land management purposes;
(b) livestock watering purposes;
(c) irrigation purposes; and
(d) provide to an entity authorised to supply water for public consumption under the *Water Supply (Safety and Reliability) Act 2008* or any subsequent legislation to supplement a potable water supply.

(B73F) If the responsibility of produced water is given or transferred to a third party for use off tenure, the holder of environmental authority must ensure that:

(a) the responsibility of the produced water is given or transferred in accordance with a written agreement (the third-party agreement) signed by both parties to the agreement;
(b) for condition (B75E)(a), (b) and (c), the water meets the relevant quality guidelines for the intended purpose prior to the water being given;
(c) for condition (B75E)(d), the water meets the agreed quality detailed in the third-party agreement; and
(d) the third party is made aware of the General Environmental Duty (GED) under s. 319 of the *Environmental Protection Act 1994,* environmental sustainability of the water disposal and protection of environmental values of waters.

Produced water – Third Party use Generally

(B73G) The holder of the environmental authority must ensure that the water meets the relevant quality guidelines for the intended purpose prior to the water being given on:

(a) initial transfer of the water; and
(b) thereafter monthly.

(B73H) The written agreement as per condition (B73F) must include the following in writing:

(a) the intended use of the water;
(b) for the transfer of water in accordance with Condition (B73E)(a), (b) and (c), confirmation that the water meets ANZECC and ARMCANZ Water Quality Guidelines for the approved use;
(c) for the transfer of water in accordance with Condition (B73E)(d), the agreed water quality and confirmation that the water meets this quality;

(d) confirmation that the produced water being provided is compliant with the environmental authority conditions; and
(e) for the transfer of water in accordance with Condition (B73E)(a), (b) and (c), a current and complete laboratory certificate of analysis that outlines the quality of the produced water as per the ANZECC and ARMCANZ Water Quality Guidelines.

(B73I) The written agreement as per condition (B73D) must include the following in writing:

(a) the intended use of the water;
(b) confirmation that the water meets ANZECC and ARMCANZ Water Quality Guidelines for the approved use;
(c) confirmation that the produced water being provided is compliant with the environmental authority conditions; and
(d) a current and complete laboratory certificate of analysis that outlines the quality of the produced water as per the ANZECC and ARMCANZ Water Quality Guidelines

(B73J) The holder of this environmental authority must cease using, selling or giving away produced water immediately upon becoming aware that:

(a) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at or before the point of supply; or
(b) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at the point in which it is used by a third party; or
(c) the water does not meet the agreed water quality as per condition (B73H)(c).

(B73K) When the produced water is transferred to a third party, the holder of the environmental authority must retain the following records of the resource:

(a) origin of the produced water;
(b) intent of the water;
(c) date of dispatch of the produced water;
(d) location of delivery of the produced water to the third-party user by real property description;
(e) date of delivery of the produced water to the third party;
(f) contact details for the person responsible for the use of the produced water at the site of use;
(g) quantity (volume) of the produced water supplied;
(h) relating to sampling and monitoring including: laboratory results, field data and monitoring report; and
(i) any written procedures developed to manage the produced water.

(B73L) Upon written agreement, the administering authority must be notified with the following details:

(a) the person responsible for the use of the produced water;
(b) the location of use of the produced water; and
(c) the intended use of the produced water.

Coal Seam Gas Water Management Criteria

(B74) Prior to the commencement of each petroleum activity authorised by this environmental authority, Coal Seam Gas Water Management Criteria need to be developed and implemented which must:

(a) be developed in accordance with section 126(1)(e) of the *Environmental Protection Act 1994*;

(b) be consistent with the requirements of this environmental authority.

SCHEDULE D – LAND

General

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

Disturbance to Land – General

(D2) 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.

(D3) A suitably qualified person must develop and certify a methodology so that condition (D2) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.

(D4) Where mapped biodiversity values differ from those confirmed under conditions (D2) and (D3), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.

(D5) The holder of this environmental authority, when carrying out the petroleum activity(ies) must:

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

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

(c) manage topsoil in a manner that will preserve its biological and chemical properties;

(d) utilise stockpiled soils for rehabilitation purposes;

(e) avoid clearing mature trees; and

(f) prior to carrying out field based petroleum activities, make all relevant staff, contractors or agents carrying out those petroleum activities, aware of the location of any Category A, B or C Environmentally Sensitive Areas and the requirements of this environmental authority.

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

(D6) Despite condition (D5), significant disturbance to land caused by the carrying out of the petroleum activities must not involve clearing vegetation or placing fill:

(a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e. stepping stone or contiguous bioregional / local corridor networks) and/or results in an increase in threatening processes (e.g. potential impacts associated with edge effects or introduced species); or

(b) in discharge areas.

(D7) Petroleum activities must be carried out in accordance with *Schedule D, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*.

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

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. Subject to condition (D12) and (D13).
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Petroleum activities permitted.
Category C ESAs that are Nature Refuges Koala Habitat, Declared Catchment Areas	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Petroleum activities permitted.
Category B ESAs that are 'Endangered' Regional Ecosystems Category C ESAs that are Essential Habitat, Essential Regrowth Habitat, Critically Limited or Threshold or 'Of Concern' Regional Ecosystems	Only essential petroleum activities permitted. Subject to condition (D10) and (D11)	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Petroleum activities permitted.
Category C ESAs that are Resource Reserves	Only essential petroleum activities permitted. Subject to condition (D10) and (D11)	Only essential petroleum activities permitted. Subject to condition (D12) and (D13).	Petroleum activities permitted.
Category C ESAs that are State Forests, Timber Reserves.	Only essential petroleum activities permitted. Subject to condition (D10) and (D11)	Petroleum activities permitted.	Petroleum activities permitted.

(D8) Despite condition (D7) of this environmental authority, the infrastructure (and associated activities necessary for construction, operational and maintenance purposes) specified in *Schedule D, Table 2 – Authorised Petroleum Activity(ies) Disturbance* and depicted in *Schedule M,* Figure 1 to Figure 3 are permitted in the location specified in *Schedule D, Table 2 – Authorised Petroleum Activity(ies) Disturbance*.

Schedule D, Table 2 – Authorised Petroleum Activity(ies) Disturbance

<table>
<tr><th>Tenure</th><th>Description of Infrastructure</th><th>Number</th><th>Location</th></tr>
<tr><td rowspan="8">Condabri South (PL265)</td><td>Gas Wells</td><td>2</td><td>Existing cleared land in the Primary Protection Zone of the Category C ‘Essential Habitat’ ESA.</td></tr>
<tr><td>Switchyard (associated with the Gas Processing Facility Power Station)</td><td>1</td><td>Existing cleared land in the Secondary Protection Zone of the Category C ‘Essential Habitat’ ESA</td></tr>
<tr><td>Water gathering station</td><td>1</td><td>Existing cleared land in the Secondary Protection Zone of the Category C ‘Of Concern Regional Ecosystem’ ESA</td></tr>
<tr><td>Laydown areas and stockpiles</td><td>1</td><td>Existing cleared land in the Secondary Protection Zone of the Category B ‘Endangered Regional Ecosystem’.</td></tr>
<tr><td>Detention/sediment basin</td><td>1</td><td>Existing cleared land in the Secondary Protection Zone of the Category B ‘Endangered Regional Ecosystem’ ESA.</td></tr>
<tr><td>30m wide Condabri South Access Track

Lot 2 on Plan SP179380</td><td>1</td><td>Within the Primary and Secondary Protection Zone of the Category C ‘Of Concern Regional Ecosystem’ ESA. 0.75ha of clearing is required in the Primary Protection Zone and 0.96 ha of clearing is required in the Secondary Protection Zone.</td></tr>
<tr><td>Property boundary access track (6m width):
<table>
<tr><td></td><td>Longitude</td><td>Latitude</td></tr>
<tr><td>Start</td><td>150.225801</td><td>-26.915513</td></tr>
<tr><td>Finish</td><td>150.232849</td><td>-26.911475</td></tr>
</table></td><td>1</td><td>Existing cleared land in the Primary and Secondary Protection Zone of the Category C 'Essential Habitat'.</td></tr>
<tr><td>Condamine River Horizontal Directional Drilling crossing of pipelines:
<table>
<tr><td></td><td>Longitude</td><td>Latitude</td></tr>
<tr><td rowspan="4">HDD Drill-rig area</td><td>A: 150.2115</td><td>A: -26.8237</td></tr>
<tr><td>B: 150.2099</td><td>B: -26.8247</td></tr>
<tr><td>C: 150.2109</td><td>C: -26.8230</td></tr>
<tr><td>D: 150.2093</td><td>D: -26.8239</td></tr>
<tr><td rowspan="3">HDD Pipe-</td><td>A: 150.2151</td><td>A:-26.8287</td></tr>
<tr><td>B: 150.2138</td><td>B: -26.8295</td></tr>
<tr><td>C: 150.2191</td><td>C: -26.8363</td></tr>
</table></td><td>7</td><td>Existing cleared disturbed land (except minor clearing required for non-remnant vegetation) in the Primary and Secondary Protection Zones of a Category B 'Endangered' Regional Ecosystem ESA, Category C ‘Of Concern’ Regional Ecosystem and</td></tr>
</table>

Tenure	Description of Infrastructure	Number	Location
	stringing area D: 150.2204 D: -26.8354		Category C 'Referable Wetland' ESA. Underground pipelines to be located below Category C 'Of Concern' and 'Referable Wetlands' ESA.
Condabri Central (PL265)	Brine Pond: 1 Pond (4 cells)	1	Existing cleared land within the Primary Protection Zone and Secondary Protection Zone of the Category B 'Endangered' Regional Ecosystem and Category C 'Of Concern' ESA up to 100m distance from the edge of the 'Endangered' Regional Ecosystem ESA. Disturbance is allowed within existing cleared land up to 50m from the edge of the 'Endangered' and 'Of Concern' Regional Ecosystem ESA temporarily during construction only, as shown in Figure 2.
	Water Treatment Facility	1	
	Stockpiles	5	
	Gas Plant	1	
	Switchyard	1	
	Power Station	1	
	Permanent Operations Camp and IOC	1	
	Flares	3	
	Laydown Areas	2	
	Gathering Village	1	
	Temporary Construction Camp	1	
	Construction Water Pond	1	
	Ponds: 1 feed pond (2 cells) and 1 effluent pond (2 cells)	2	
	Sediment Pond	2	
	Sewage Treatment Irrigation Area	2	
	Brine Pond 7 (including embankment, access road, perimeter fencing and spillway swale)	1	Pre-existing disturbed area within the Primary Protection Zone of a Category C ESA 'Of Concern' Regional Ecosystem ESA, with a maximum disturbance area of 0.27 hectares (Schedule M, Figure 1 Area 1A and 1B)
	Brine Ponds 5 and 6, and associated operational infrastructure	2	Pre-existing disturbed area within the Primary Protection Zone of Category C 'Of Concern' Regional Ecosystem' ESA. Disturbance is allowed up to 50m from the boundary of Category C ESA as shown in *Schedule M, Figure 2*.
	Brine Pond 5, 6 and 7 Stockpile	1	Pre-existing cleared land within the Primary Protection Zone of a Category C ESA that is an Of Concern Regional Ecosystem, with a maximum

<table>
<tr><th>Tenure</th><th>Description of Infrastructure</th><th>Number</th><th>Location</th></tr>
<tr><td rowspan="5"></td><td></td><td></td><td>disturbance area of 2.64 hectares ((Schedule M, Figure 1 Area 2).</td></tr>
<tr><td>Disturbance associated with the construction of Brine Pond 7</td><td>1</td><td>Existing cleared land within the Primary Protection Zone of a Category C ESA that is an Of Concern Regional Ecosystem, with a maximum disturbance area of 2.45 hectares (Schedule M, Figure 1 Area 3). Temporary during construction of Brine Pond 7.</td></tr>
<tr><td>30m wide Co-located access road and service trench.</td><td>As outlined in Figure 2</td><td>Within the Category B ‘Endangered Regional Ecosystem’ ESA area and Primary Protection Zone, requiring clearing of approximately 36 small trees and shrubs.</td></tr>
<tr><td>Co-located access road and service trench.</td><td>As outlined in Figure 2</td><td>Within Category C ‘Of Concern’ ESA area and Primary Protection Zone, requiring clearing of up to 0.68ha.</td></tr>
<tr><td>Borrow Pit
<table><tr><th>Name</th><th>Longitude</th><th>Latitude</th></tr><tr><td>Drury 1 Borrow Pit</td><td>150.21714</td><td>-26.81598</td></tr></table></td><td>1</td><td>Existing cleared land that is within 100m of the Primary Protection Zone of a Category C ESA ‘Of concern Regional Ecosystem’.</td></tr>
<tr><td rowspan="2">Condabri Central (PL265) and Condabri North (PL267)</td><td>Gas Wells
<table><tr><th>Well</th><th>Longitude</th><th>Latitude</th></tr><tr><td>CNX367</td><td>150.231</td><td>-26.815</td></tr><tr><td>CNX372</td><td>150.229</td><td>-26.81</td></tr><tr><td>CNX235</td><td>150.228</td><td>-26.8039</td></tr><tr><td>CNX375</td><td>150.221</td><td>-26.8027</td></tr></table></td><td>4</td><td>Existing cleared land and existing access tracks (for access to the wells) in the Primary Protection Zone of the Category C ‘Referrable Wetland’ ESA.</td></tr>
<tr><td>Associated gas gathering infrastructure including gas gathering pipelines and CSG water flow lines for four wells outlined above.</td><td>-</td><td>Existing cleared land and existing access tracks (for co-locating the pipelines and for access to the wells) in the Primary Protection Zone of the Category C ‘Referrable Wetland’ ESA.</td></tr>
<tr><td>PL265</td><td>DC Campbell Temporary site office Lot 62 on Plan RG44</td><td>1</td><td>Within existing cleared land of the Secondary Protection Zone of Category B – ‘Endangered Regional Ecosystem’.</td></tr>
<tr><td>PL265</td><td>Drury South – Water gathering / transfer station
<table><tr><th>Name</th><th>Longitude</th><th>Latitude</th></tr><tr><td>WGS</td><td>150.1965</td><td>-26.8564</td></tr></table></td><td>1</td><td>Within already cleared land within the primary and Secondary Protection Zones of Category B – ‘Endangered Regional Ecosystem’.</td></tr>
</table>

<table>
<tr><th>Tenure</th><th>Description of Infrastructure</th><th>Number</th><th>Location</th></tr>
<tr><td>PL265</td><td>Borrow pit<table><tr><th>Name</th><th>Longitude</th><th>Latitude</th></tr><tr><td>Keys Borrow Pit</td><td>150.1900</td><td>-26.9267</td></tr></table></td><td>1</td><td>Within already cleared land within the Primary Protection Zone of Category C – ‘Of Concern Regional Ecosystem’.</td></tr>
<tr><td>PL265</td><td>Condabri South – Pinehurst (wells and flow lines)<table><tr><th>Well lease</th><th>Longitude</th><th>Latitude</th></tr><tr><td>CON154</td><td>150.2256</td><td>-26.9216</td></tr><tr><td>CON155</td><td>150.2318</td><td>-26.9209</td></tr></table></td><td>2</td><td>Within existing cleared land in the Primary Protection Zone of Category C – ‘Essential Habitat’.</td></tr>
<tr><td>PL265</td><td>Condabri WTF discharge pipeline</td><td>1</td><td>Clearing of up to 0.31ha within Category C ‘Of Concern Regional Ecosystem’ ESA, and up to 0.3ha of High Value Regrowth in the Primary Protection Zone as shown in Figure 3.</td></tr>
<tr><td>PL265</td><td>Extra Work Space (EWS)21</td><td>1</td><td>Existing cleared land within Primary Protection Zone of Category B ESA, Endangered Regional Ecosystem 11.4.10 (100). Maximum disturbance area of 0.5ha</td></tr>
<tr><td>PL1011</td><td>EWS100</td><td>1</td><td>Within Category C ESA, ‘Of Concern’ Regional Ecosystems 11.3.25 and 11.3.2. Maximum disturbance area of 0.07ha</td></tr>
</table>

Note: All Co-ordinates in Schedule D, Table 2 are in GDA 94 Datum.

(D9) Despite condition (D7) of this environmental authority, monitoring bore leases are authorised within the Primary Protection Zone of Category C Environmentally Sensitive Areas that are 'Of Concern' Regional Ecosystems within existing cleared land.

(D9A) Despite condition (D7) of this environmental authority, electrical distribution equipment are authorised within Environmentally Sensitive Areas and associated Primary Protection Zones when:

(c) located within the well site; and

(b) used to provide electric power to a wellhead(s).

(D10) Prior to carrying out essential petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule D, Table 1 - Petroleum Activities in Environmentally Sensitive Areas*, it must be demonstrated, in the following order of preference that:

1. no reasonable or practicable alternative exists for carrying out the essential petroleum activities within the Environmentally Sensitive Area;
2. the essential petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance;

(D11) Linear infrastructure construction corridors must, for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area, be no greater than 40m in total width

(D12) Prior to carrying out essential petroleum activities subject to condition (D7) within the primary and Secondary Protection Zones of an Environmentally Sensitive Area, the holder of the environmental authority must demonstrate, in the following order of preference:

1. the essential petroleum activities are preferentially located in areas of pre-existing disturbance;
2. significant disturbance to land from the carrying out of the essential petroleum activities is minimised to the greatest extent practicable.

(D13) If petroleum or essential petroleum activity(ies) are located within a Primary Protection Zone or Secondary Protection Zone of an Environmentally Sensitive Area, that the activity(ies) must not impact the adjacent Environmentally Sensitive Area.

(D14) The record of the assessment required by conditions (D2) to (D3) and the extent of significant disturbance to land in the following areas must be prepared for each annual return period and made available to the administering authority upon request:

(a) The primary protection zone of, or within a Category B or C Environmentally Sensitive Area; and

(b) The Secondary protection zone of Environmentally sensitive areas;

(c) Other remnant vegetation areas; and

(d) Wetlands.

Offsets

(D15) The environmental authority holder must enter into an environmental offset agreement with the administering authority where disturbance to land caused by the carrying out of the petroleum activities will have a remaining adverse environmental impact on an environmental value.

(D16) The environmental offset agreement must be entered into within six months after submitting the record of disturbance required by condition (D15), unless otherwise agreed to by the administering authority.

(D17) The environmental authority holder must implement any environmental offset agreement entered into in accordance with conditions (D15) and (D16) as soon as practicable after finalisation.

(D17A) Petroleum activities are not permitted in areas which are:

(a) Listed in *Schedule D, Table 2A – Offset Area Restricted from Petroleum Activities*; and

(b) Protected by a Voluntary Declaration under the *Vegetation Management Act 1999* or other legally binding mechanism.

Schedule D, Table 2A - Offset Area Restricted from Petroleum Activities

Tenure	Description of Area	Legally binding mechanism	Location (Latitude/Longitude)	
PL265	Offset area (79.79ha)	Voluntary Declaration (D13/003614)	-26.9441 -26.9489 -26.9488 -26.9441 -26.9441 -26.9383	150.2290 150.2282 150.2264 150.2271 150.2290 150.2155

			-26.9387	150.2161
			-26.9390	150.2168
			-26.9391	150.2174
			-26.9392	150.2182
			-26.9394	150.2190
			-26.9395	150.2195
			-26.9416	150.2195
			-26.9443	150.2193
			-26.9439	150.2202
			-26.9438	150.2208
			-26.9439	150.2215
			-26.9439	150.2221
			-26.9440	150.2228
			-26.9439	150.2234
			-26.9440	150.2252
			-26.9440	150.2261
			-26.9452	150.2259
			-26.9487	150.2254
			-26.9483	150.2234
			-26.9481	150.2223
			-26.9470	150.2167
			-26.9466	150.2156
			-26.9461	150.2145
			-26.9426	150.2147
			-26.9419	150.2148
			-26.9404	150.2150
			-26.9381	150.2153

(D17B) Despite condition (D17A) of this environmental authority, offset conservation activities including weed and pest management, planting and other rehabilitation activities are permitted within the areas identified in *Schedule D, Table 2A - Offset Area Restricted from Petroleum Activities*.

Top soil management

(D18) Top soil must be managed in a manner that preserves its biological and chemical properties.

Erosion and sediment control

(D19) 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).

Fauna Management Procedures

(D20) 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

(D21) Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipelines

(D22) Pipelines must be preferentially located alongside existing linear infrastructure such as roads, tracks and powerlines.

(D23) Pipeline trenches must only be left open for the minimum time practicable.

(D24) The length of pipeline trench open at any one time must be minimised as far as practicable.

Access Tracks in Environmentally Sensitive Areas

(D25) New access tracks are not permitted within Category B or C Environmentally Sensitive Areas unless they are co-located with gas collection or CSG associated water pipelines, unless otherwise authorised by the administering authority.

Pad Drilling

(D26) The environmental authority holder must assess the use of pad drilling wherever medium or high environmental values, including strategic cropping lands are impacted by the petroleum activities. The environmental authority holder must demonstrate that where pad drilling is shown not to be feasible, alternative ways of siting drilling rigs and other petroleum facilities are proposed to protect environmental values.

Gas Trunkline Easements

(D27) The construction of co-located trunklines must be undertaken in a manner to minimise width and total disturbance required for the right of way.

Sewage Treatment Plants

(D28) Sewage pump stations must be fitted with a stand-by pump and a visible or audible high-level alarm. All alarms must be able to operate without mains power.

Sewage Treatment Plants >150 EP

(D29) Treated effluent may only be released to land within the petroleum tenure at a designated, fenced and delineated contaminant release area(s).

(D30) Prior to construction of a sewage treatment facility, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated by the holder of the environmental authority.

(D31) All nominated locations and minimum areas of land must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.

(D32) A copy of the MEDLI program results required in condition (D31) must be submitted to the administering authority.

(D33) If, within 20 business days following the submission of the MEDLI program results the administering authority provides comments on the submission, the holder of this environmental authority must:

(a) implement that comment in the finalisation of the amended MEDLI program results; and

(b) submit the finalised amended MEDLI program results within 40 business days after the administering authority provided comments; and

(c) implement the amended MEDLI program results.

(D34) All treated effluent released to land must be in accordance with the contaminant release limits and monitoring frequency stated in *Schedule D: Table 3 – Treated Sewage Effluent Release Limits to Land* and the conditions of this environmental authority.

(D35) Notwithstanding the quality characteristic limits specified in *Schedule D: Table 3 – Treated Sewage Effluent Release Limits to Land*, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.

(D36) The daily volume of contaminants released to land must be determined or estimated by an appropriate method, for example a flow meter, and records kept of such determinations and estimates.

(D37) Notices must be prominently displayed on areas undergoing effluent irrigation, warning the employees and the general public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.

(D38) When circumstances prevent the irrigation of treated sewage effluent to land, such as during or following rain events, waters must be directed to wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent.

(D39) The wet weather storage capacity outlined in condition (D38) must have a capacity to hold effluent for a minimum of three days.

(D40) Pipelines and fittings associated with the effluent irrigation system must be clearly identified.

(D41) Lockable valves or removable handles must be fitted to all release pipes situated in public access areas.

Treated Sewage Effluent Dust Suppression or Construction Activities

(D42) Notwithstanding condition (D29), treated sewage effluent that meets or exceeds the standards specified in *Schedule D, Table 3 – Treated Sewage Effluent Limits to Land* may be used for dust suppression or construction activities, provided the use meets the criteria in condition (D43), as relevant to the use.

(D43) The release of treated sewage effluent under condition (D42) must:

(a) not exceed the amount required to effectively supress dust; and

(b) not cause on-site ponding or runoff; and

(c) be directly applied to the area being dust supressed; and

(d) not harm vegetation surrounding the release area .

Schedule D, Table 3 – Treated Sewage Effluent Release Limits to Land

Discharge Type	**Quality Characteristic / Contaminant**	**Sampling and *in situ* measurement point location**	**Limit Type**	**Release Limit**	Frequency
Irrigation at designated contaminant release areas	5-day Biochemical oxygen demand (BOD)	e.g. release pipe from sewage treatment plant	Maximum	20mg/L	Quarterly
	E.coli		80th percentile based on at least 5 samples with not less than 30 minutes between samples	1000cfu per 100mL	
			Maximum	10,000cfu per 100mL	
	pH		Range	6.0–8.5	Monthly
	Electrical Conductivity		Monitor only		
Use for dust suppression or construction activities	5-day Biochemical oxygen demand (inhibited)	e.g. Release pipe from sewage treatment plant	maximum	20mg/L	Monthly
	pH		range	6.0-8.5	
	e-Coli		80th percentile based on at least 5 samples with not less than 30	100cfu per 100mL	

Discharge Type	Quality Characteristic / Contaminant	Sampling and *in situ* measurement point location	Limit Type	Release Limit	Frequency
	(use for dust suppression or construction activities)		minutes between samples.		
			maximum	1000cfu per 100mL	

Sewage treatment plants between >21 EP and <150 EP

(D44) Treated sewage effluent or greywater can be released to land provided it:

(a) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of between 21 and 150EP.

(D45) The release of treated sewage effluent or greywater authorised in condition (D44) must:

(a) be to a fenced and signed contaminant release area(s)

(b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off;

(c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is:

i. not a declared pest species;

ii. kept in a viable state for transpiration and nutrient uptake; and

iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.

Sewage treatment plants <21 EP

(D46) Treated sewage effluent may only be released to land by irrigation at designated, fenced contaminant release area(s).

(D47) The release of contaminants to land authorised under this environmental authority must be carried out in a manner such that:

(a) vegetation is not damaged;

(b) soil quality is not adversely impacted;

(c) there is no surface ponding or runoff to waters;

(d) there is no aerosols or odours;

(e) deep drainage below the root zone of any vegetation is minimised; and

(f) the quality of shallow aquifers is not adversely affected.

SCHEDULE G – WASTE

General

(G1) Unless being beneficially used in accordance with conditions (B75A to B75I), 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*.

(G2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.

(G3) Waste must not be burned or be allowed to be burned on the site.

(G4) All waste fluids and muds resulting from drilling and exploration petroleum activities must be contained in a dam or containment structure for disposal, remediation or reuse where applicable.

(G5) Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised to be disposed of or used on site under this environmental authority.

Waste Management

(G6) Measures must be implemented so that waste is managed in accordance with the **waste and resource management hierarchy** and the **waste and resource management principles.**

Brine and Salt Management

(G7) The holder of this environmental authority must develop and implement a Brine and Salt Management Plan.

(G8) The Brine and Salt Management Plan required by condition (G7) must address, but not be limited to:

(a) the Queensland Government policy on Coal Seam Gas Water Management;

(b) the administrating authority guideline Preparing an environmental management plan (EM Plan) for Coal Seam Gas (CSG) activities;

(c) a plan for the containment, use and disposal of salt brought to the surface through CSG production, and produced through the treatment of CSG water;

(d) any plan for reinjection of brine or untreated water;

(e) any long-term plan for the utilisation of salts extracted from CSG water;

(f) an assessment of the potential impacts of options considered and appropriate mitigation measures for the preferred option having regard to the decision hierarchy identified in government policy and guidelines;

(g) a risk assessment methodology which will identify the potential for secondary salinity due to the company's activities. This must include an investigation into wind-borne salt from brine ponds and aggregation dams;

(h) a list of identified management tools and mitigations that will be used in those locations to minimise and manage the risk of secondary salinity;

(i) a commitment to assess and report to the administering authority disturbance and rehabilitation activities which affect salinity risk for each 12-month period of the environmental authority.

(G9) 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*.

Investigation into Alternative Coal Seam Gas Water Management Options

(G10) The holder of the environmental authority must investigate:

(a) the viability of waste reuse or recycling through chemically processing or treating brine or salt residues to create useable or saleable products;

(b) the viability of the injection of brine into a natural underground structure that is geologically isolated and does not contain groundwater that does or could supply water for potable or agricultural purposes;

(c) report the outcomes of the investigations in each annual return until the information required by condition (G11) has been provided to the administering authority.

(G11) By 31 December 2015, the holder of this environmental authority must submit to the administering authority the following:

(a) updated Brine and Salt Management Plan documenting information required by condition (G7);

(b) report on the results of investigations required by condition (G8);

(c) a summary and ranking from most to least preferred of all brine management options investigated; and

(d) the preferred management option for the beneficial use of brine and salt.

Residual drilling material

(G12) Residual drilling material may be disposed of on-site by the mix-bury-cover method if the residual drilling material meets the approved quality criteria.

(G13) Residual drilling material or drilling by-products may be disposed of on-site if the method 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.

SCHEDULE I – STIMULATION ACTIVITIES

Well Drilling, Completion and Stimulation

(I1) Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).

(I2) Drilling activities must not result in the connection of the target gas producing formation and another aquifer.

(I3) Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target formation and another aquifer as a result of drilling activities.

(I4) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.

(I5) Stimulation activities must not negatively affect water quality, other than that within the stimulation impact zone of the target gas producing formation.

(I6) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.

(I7) The internal and external mechanical integrity of the well system prior to and during stimulation must be ensured such that there is:

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

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

(I8) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

(I9) Prior to undertaking stimulation activities, a risk assessment must be developed to ensure that stimulation activities are managed to prevent environmental harm.

Stimulation Risk Assessment

(I10) 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 landholder' 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

(I11) A summary of each stimulation risk assessment must be submitted to the administering authority upon request.

(I12) Prior to undertaking any stimulation activity, a baseline bore assessment must be undertaken of the water quality of:

(a) all landholder's active groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two (2) kilometre horizontal radius from the location of the 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 two (2) kilometre radius from the location of the stimulation initiation point; and

(c) any other bore that could potentially be adversely impacted by the stimulation activities in accordance with the findings of the risk assessment required by conditions (I9) and (I10).

(I13) 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 (I14).

(I14) 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 [ºC]

(f) dissolved oxygen [mg/L]

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

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

(i) sodium adsorption ratio (SAR)

(j) anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L]

(k) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L]

(l) dissolved and total metals and metalloids (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, total chromium, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [μg/L]

(m) total petroleum hydrocarbons [μg/L]

(n) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para- and 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

(I15) A stimulation impact monitoring program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (I9) and (I10) that relate to stimulation activities and must include, as a minimum, monitoring of:

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

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

(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 (I12).

(I16) 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 (I14); 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.

(I17) The stimulation impact monitoring program must provide for monitoring of the bores in condition (Well activities 15(d)) at the following minimum frequency:

(a) monthly for the first six (6) months subsequent to stimulation activities being undertaken; then

(b) annually for the first five (5) years subsequent to stimulation being undertaken or until analytes and physico-chemical parameters listed in conditions (I14(a)) to (I14(t)) inclusive, are not

detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.

(I18) The results of the stimulation impact monitoring program must be made available to any potentially affected landholder upon request by that landholder.

(I19) The holder of this environmental authority must develop and implement the stimulation impact monitoring program.

SCHEDULE L – DEFINITIONS

Refer to Appendix A for definitions for this Part.

SCHEDULE M –FIGURES

Figure 1 – Site Constraints: Condabri Brine Pond 7 and Stockpile Area (associated with Ponds 5,6,7)

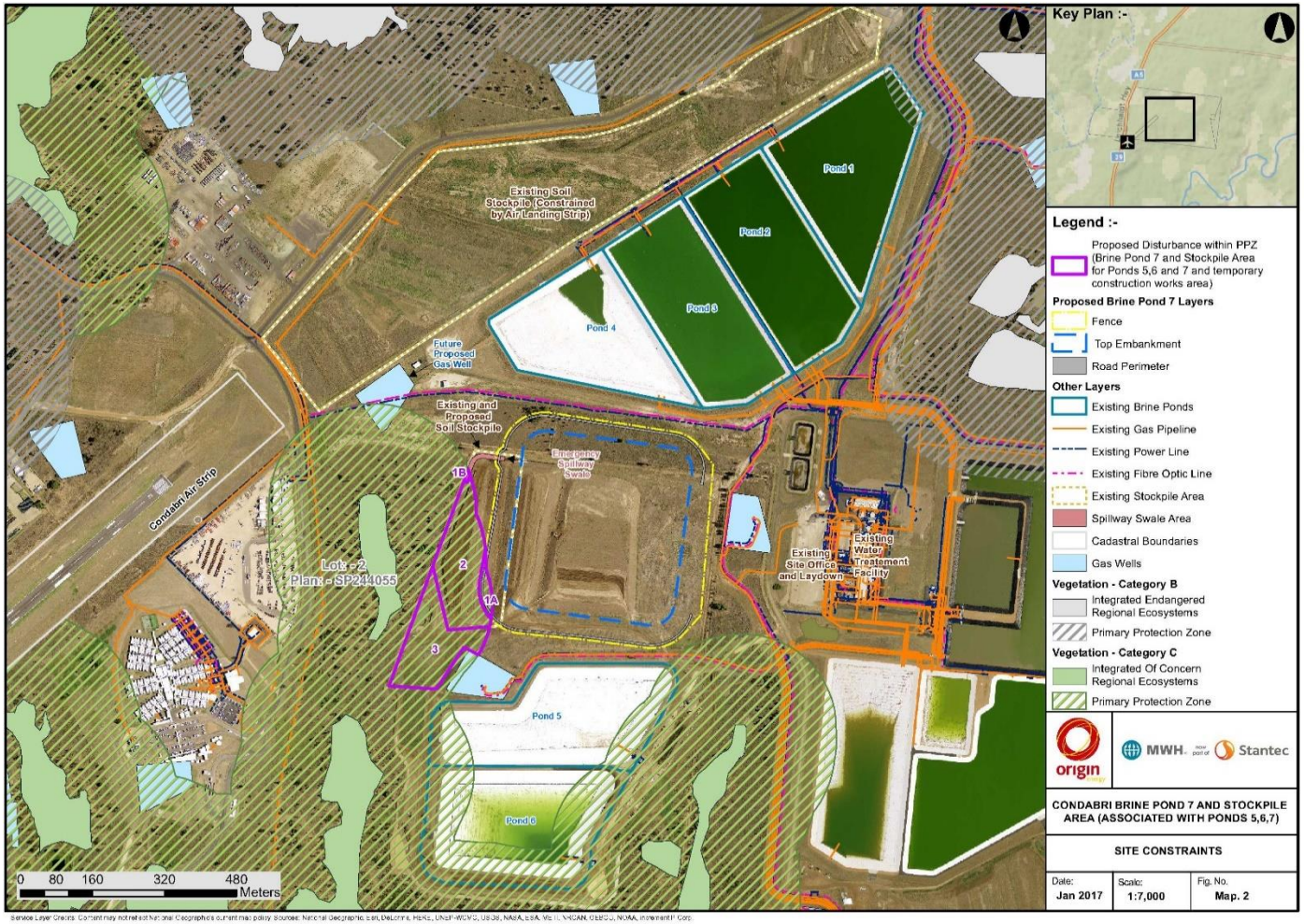


Figure 2 - Condabri Central disturbance footprint within ESA buffers

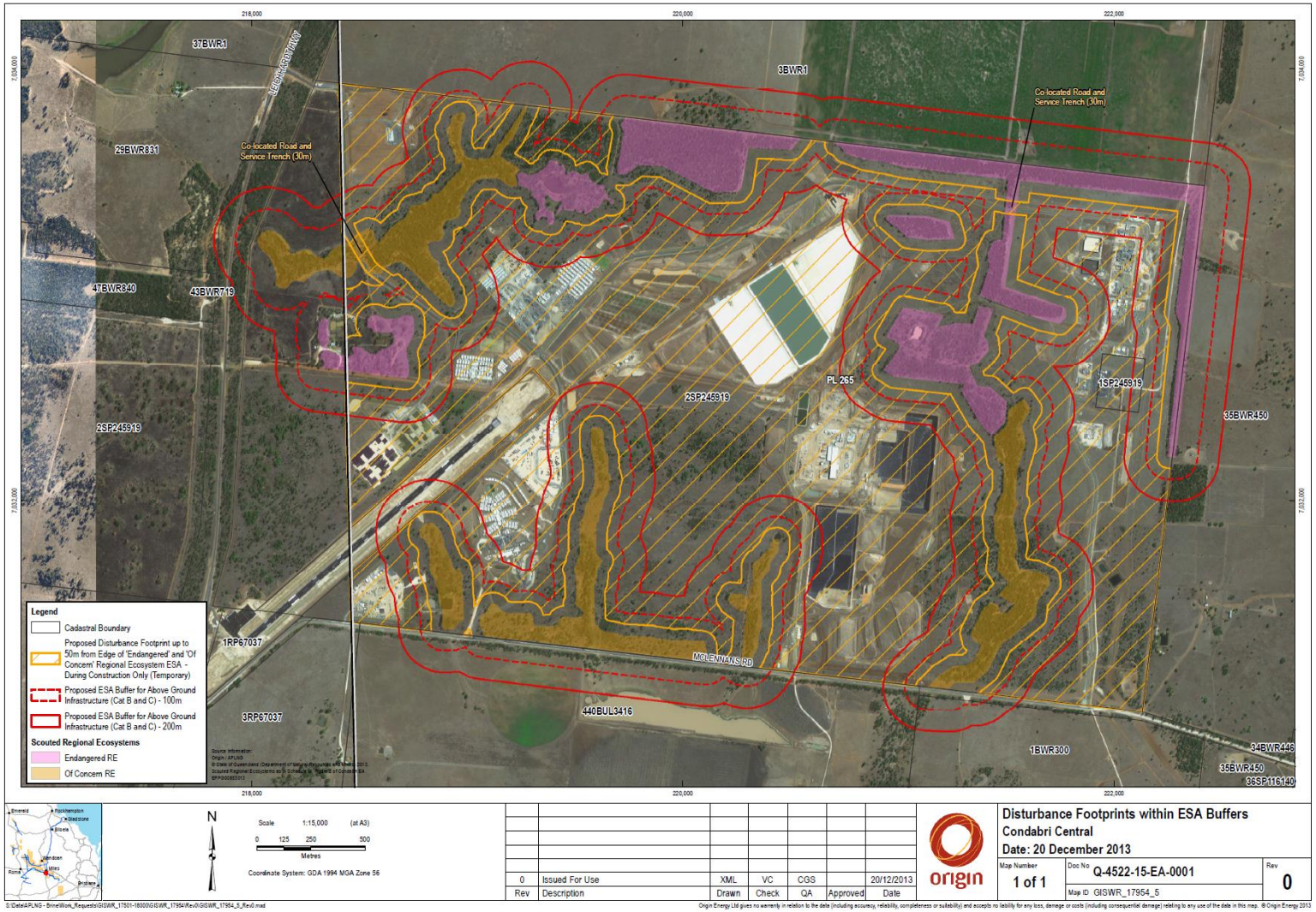
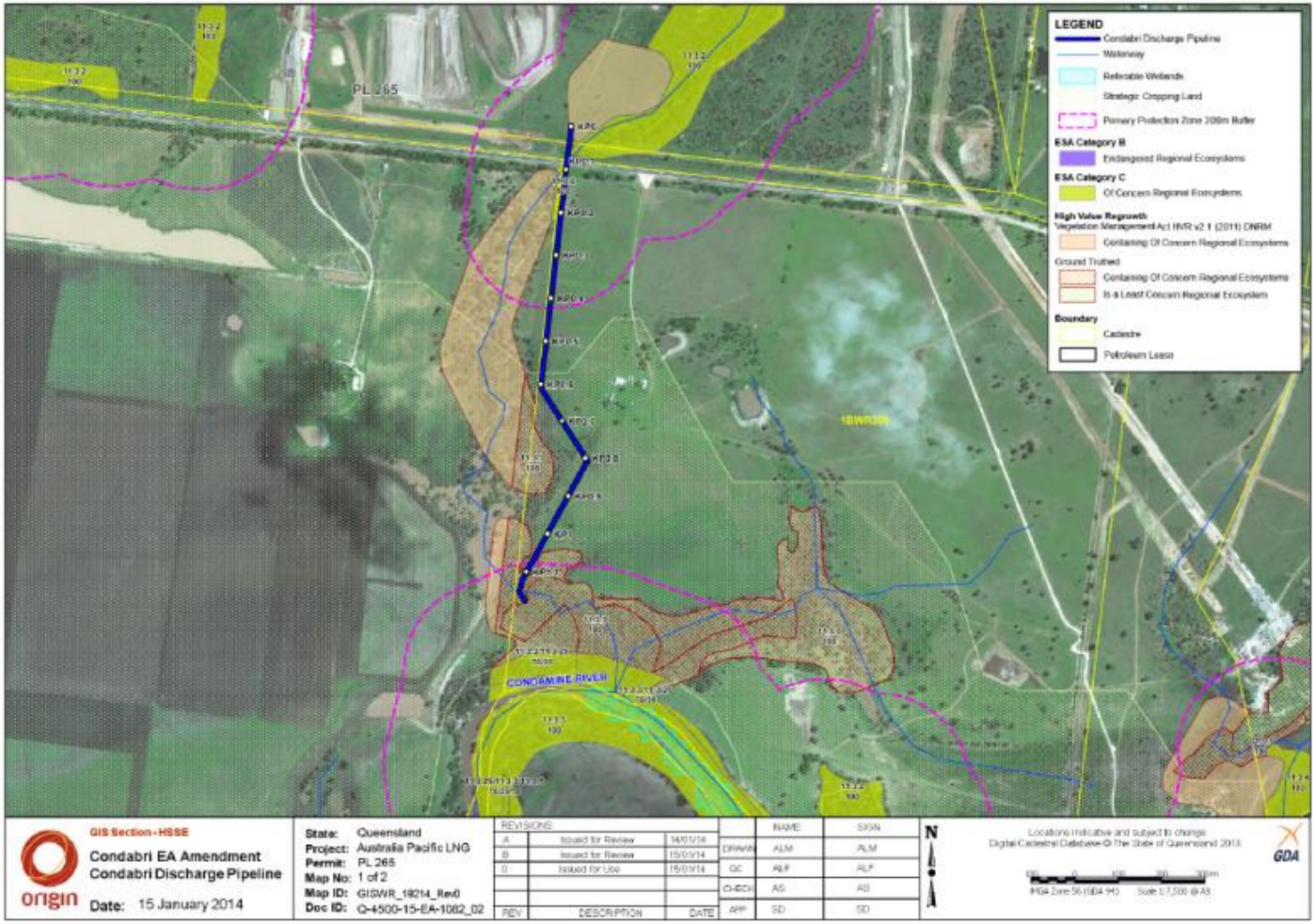


Figure 3 – Condabri WTF discharge pipeline



End of Part 2 – Condabri Development Area

PART 3 – COMBABULA DEVELOPMENT AREA

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Resource Activity, Schedule 3, 07: A petroleum activity involving injection of a waste fluid into a natural underground reservoir or aquifer	ATP606 PL297 PL403 PL404 PL405 PL406 PL407 PL408 PL412 PL413 WMA2013
Resource Activity, Schedule 3, 08: A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	
Resource Activity, Schedule 3, 03: A petroleum activity that is likely to have a significant impact on a category A or B environmentally sensitive area	
Resource Activity, Schedule 3, 06: A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (a-ii) 21 to 100EP otherwise	
Ancillary 63 – Sewage Treatment 1: Operating sewage treatment works, other than no release works, with a total daily peak design capacity of (b-ii) more than 100 but not more than 1,500EP otherwise	

SCHEDULE A - GENERAL

Authorised Petroleum Activities

(A1) This environmental authority authorises the carrying out of the following resource activities:

(a) the petroleum activities and specified relevant activities listed in *Schedule A: Table 1 – Authorised Petroleum Activities* to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable); and

(b) incidental activities that are not otherwise specified relevant activities.

(A2) The authorised resource activities are authorised subject to the conditions of this environmental authority.

(A3) This environmental authority does not authorise a relevant act to occur in carrying out an authorised resource activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Schedule A: Table 1 – Authorised Petroleum Activities

Authorised Petroleum Activity	Scale		Intensity
	Maximum size	Location	
Petroleum activities			
Coal seam gas production and exploration	2530 ha (wells only)	Within project area	2530 wells
Specified relevant activities			
Stimulation activities	N/A	Within project area	N/A
Extracting material, other than by dredging	N/A	Within project area	N/A
Electricity generation by using gas (permanent, in isolation or combined in operation, or interconnected) at a rated capacity of 10 megawatt (MW) electrical or more	N/A	Within project area	150MW for project area
Operating fuel burning equipment (permanent, in isolation or combined in operation, or interconnected) that is capable of burning more than 500kg of fuel in an hour	N/A	Within project area	N/A
Chemical storage (permanent) that meets any of the thresholds described in Schedule 2, Part 2, section 8 of the *Environmental Protection Regulation 2008*	>50t of chemicals of DG class 1 or 2, division 2.3 >500m^3 of chemicals of class C1 or C2 combustible liquids under AS 1940 or DG Class 3	Within project area	2530 storages at well leases; N/A at other permanent facilities

Authorised Petroleum Activity	Scale		Intensity
	Maximum size	Location	
	>200m^3 of chemicals that are liquids		
Sewage treatment works, other than no-release works, where treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme; or otherwise discharged	1,500 EP per facility	Within project area	8800 EP for project area
Waste disposal onsite—operating a facility for disposing of greater than 50t of non-regulated waste in a year (including residual drilling material and drilling by-products disposal to land where the drill muds do not have any substances that would make it a regulated waste)	N/A	Within project area	2532 facilities
Waste disposal onsite—operating a facility for disposing of regulated waste (including evaporation dams, salt encapsulation)	>200 000 t/ year	Within project area	7 regulated dams
Waste disposal—Injection of treated water or wastewater	N/A	Within project area	21 wells
Regulated waste storage—Any structure, including regulated, low consequence dams, and other dams containing regulated waste.	N/A	Within project area	280 ha across 20 dams
Water treatment activities – treating 10ML or more of raw water in a day in a way that allows waste, whether treated or untreated, to be released into the environment	40 ML / day	Yuleba Creek Release Structure located on PL404	1 water treatment facility 1 release point
Storing waste that is not regulated waste (including coal seam gas water) in a regulated dam	N/A	Within project area	30 regulated dams
Storing coal seam gas water that is not regulated waste in a low consequence dam	N/A	Within project area	1850 low consequence dams

Prevent or Minimise Likelihood of Environmental Harm

(A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of Measures, Plant and Equipment

(A5) 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.

(A6) 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).

(A7) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated and operated and maintained effectively in accordance with the manufacturer's specifications.

(A8) The holder of this authority must ensure that daily operation and maintenance of all plant and equipment relating to the authorised petroleum activities are carried out by suitably qualified, competent and experienced person(s).

(A9) All laboratory analyses and tests required to be conducted under this 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.

Contingency Plan for Emergency Events and Environmental Incidents

(A10) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity;

(b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity;

(c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring;

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

(e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land;

(f) training of staff to enable them to effectively respond; and

(g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Documentation and Records Management

(A11) A record of all documents required by this environmental authority must be:

(a) kept for a minimum of five years; and

(b) be made available to an authorised person upon request.

Infrastructure

(A12) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

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

Monitoring Program

(A13) All monitoring under this environmental authority must be undertaken by a suitably qualified person.

(A14) All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

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 Plan

(B2) For activities involving significant disturbance to land, control measures that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:

(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).

Maintenance and Cleaning

(B3) The maintenance and cleaning of vehicles and any other equipment or plant must be carried out in areas from where the resultant contaminants cannot be released into any waters.

Stormwater Management

(B4) There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.

Works in watercourses, wetlands, lakes and springs

(B5) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

(B6) Petroleum activities must not occur in or within 200m of a:

(a) wetland of high ecological significance

(b) Great Artesian Basin Spring

(c) subterranean cave GDE.

(B7) Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.

(B8) 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.

(B9) 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.

(B10) 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

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

(B11) The construction or maintenance of linear infrastructure authorised under condition (B7) must comply with the water quality limits as specified in **Protecting water values, Schedule B: Table 1— Release limits for construction or maintenance of linear infrastructure**

Protecting water values, Schedule B: Table 1— Release limits for construction or maintenance of linear infrastructure

Water Quality Parameters	Units	Water Quality Limits
Turbidity	NTU	For a wetland of other environmental value, if the background water turbidity is above 45 NTU, no greater than 10% above background water turbidity measured within 20 metres downstream of the construction and/or maintenance activity.
		For a wetland of other environmental value, if the background water turbidity is equal to or below 45 NTU, a turbidity limit of 50NTU applies, measured within 20 metres downstream of the construction and/or maintenance activity.
		For a watercourse, a turbidity limit of no greater than 10% above background water turbidity measured within 20 metres downstream of the construction and/or maintenance activity.
Hydrocarbons	-	For a wetland of other environmental value, or watercourse, no visible sheen or slick.

(B12) Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (B11).

(B13) 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 (B12).

(B14) Measures must be taken to minimise negative impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.

(B15) 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; or

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

(c) increase the local duration of floods; or

(d) increase the risk of detaining flood flows.

Pipeline Waste water

(B17) Pipeline waste water, may be released to land provided that it:

(a) can be demonstrated it meets the acceptable standards for release to land; and

(b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off

(B18) Any release of pipeline waste water authorised by Condition (B17) must be located at least 100 meters from the nearest watercourse.

(B19) The holder of this authority must undertake hydro-testing of pipe sections crossing water bodies prior to commissioning of these pipe sections.

Seepage Monitoring Program

(B20) 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 31 May 2015.

(B21) The seepage monitoring program required by condition (B20) 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 background and seepage monitoring bores for the trigger parameters identified in condition (B21)(b) at a frequency, determined by a suitably qualified person and:

i. at least once every two years where baseline data has been established; or

ii. at least quarterly for two years to establish baseline data for any impact to groundwaters, after which monitoring may continue at the frequency according to condition (B21)(f)(i).

(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (B21(b)) and (B21(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.

(B22) All groundwater monitoring bores must be maintained in an operative condition and be accessible at all times to any authorised person.

(B23) The method of water sampling required by this environmental authority must comply with that set out in the most recent version of the Department of Environment and Heritage Protection Monitoring and Sampling Manual 2009 – Environmental Protection (Water) Policy 2009, Version 2, September 2010 as amended from time to time.

Coal Seam Gas Water Management

(B24) The holder of this environmental authority must ensure that coal seam gas water is contained, is not released to land or waters and is only used for purposes specifically authorised:

(a) under this environmental authority; or

(b) under section 186 of the *Petroleum and Gas (Production and Safety) Act 2004*; or

(c) under section 86 of the *Petroleum Act 1923*; or

(d) under an approval of resource for beneficial use as provided for under the *Environmental Protection Act 1994*.

Produced Water Use

(B25A) Produced water may be re-used in:

(a) drilling and well hole activities; or

(b) stimulation activities.

(B25B) Produced water from the authorised petroleum activity(ies) may be used for irrigation, dust suppression, construction, operational and incidental land management purposes for the petroleum activity(ies) authorised by this environmental authority. The use of produced water must not cause:

(a) on-site ponding;
(b) runoff from the site where the resource is applied;
(c) vegetation die-off;
(d) visible salting; or
(e) serious or material environmental harm.

(B25C) Produced water from the authorised petroleum activity(ies) which is used for:

(a) domestic, stock or stock intensive purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time;

(b) irrigation purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for irrigation purposes, as amended from time to time.

Transfer of Assets

(B25D) Despite condition (Common Conditions Schedule (R8)), the holder of the environmental authority is authorised to transfer produced water to a low consequence dam left in-situ for beneficial use, in accordance with the following:

(a) The landholder must agree in writing to the transfer ownership of the low consequence dam;

(b) The landholder must agree in writing to the beneficial re-use of produced water;

(c) The dam must be assessed as being a low consequence dam 12 months prior to the transfer of water;

(d) suitably qualified person must identify that the dam is adequate for the intended on-going use by the landholder within three months prior to transfer the transfer of the dam;

(e) a suitably qualified person must identify that the low consequence dam and the land on which it is located, must be safe, stable, non-polluting and able to support the post-activity land use within three months prior to the transfer of the dam;

(f) On cessation of the transfer of water, low consequence dams must be decommissioned to no longer accept inflow from the petroleum activity(ies);

(g) Produced water transferred to the landholder must meet the relevant quality guidelines for the intended purpose prior to the water being given;

Produced Water – Third Party Use Off Tenure

(B25E) Produced water may be transferred to a third party to be used off tenure for the following purposes:

(a) Dust suppression, construction, operational and incidental land management purposes;
(b) livestock watering purposes; and
(c) irrigation purposes.

(B25F) If the responsibility of produced water is given or transferred to a third party for use off tenure, the holder of environmental authority must ensure that:

(a) the water meets the relevant quality guidelines for the intended purpose prior to the water being given;
(b) the responsibility of the produced water is given or transferred in accordance with a written agreement (the third-party agreement) signed by both parties to the agreement; and
(c) the third party is made aware of the General Environmental Duty (GED) under s. 319 of the *Environmental Protection Act 1994,* environmental sustainability of the water disposal and protection of environmental values of waters.

Produced water – Third Party Use Generally

(B25G) The holder of the environmental authority must ensure that the water meets the relevant quality guidelines for the intended purpose prior to the water being given on:

(a) initial transfer of the water; and
(b) thereafter monthly.

(B25H) Written agreement for the use of produced water by a third party must include the following in writing:

(a) the intended use of the water;
(b) confirmation that the water meets ANZECC and ARMCANZ Water Quality Guidelines for the approved use;
(c) confirmation that the produced water being provided is compliant with the environmental authority conditions; and

(d) a current and complete laboratory certificate of analysis that outlines the quality of the produced water as per the ANZECC and ARMCANZ Water Quality Guidelines

(B25I) The holder of this environmental authority must cease using, selling or giving away produced water immediately upon becoming aware that:

(a) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at or before the point of supply; or

(b) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at the point in which it is used by a third party.

(B25J) When the produced water is transferred to a third party, the holder of the environmental authority must retain the following records of the resource:

(a) origin of the produced water;
(b) intent of the water;
(c) date of dispatch of the produced water;
(d) location of delivery of the produced water to the third-party user by real property description;
(e) date of delivery of the produced water to the third party;
(f) contact details for the person responsible for the use of the produced water at the site of use;
(g) quantity (volume) of the produced water supplied;
(h) relating to sampling and monitoring including: laboratory results, field data and monitoring report; and
(i) any written procedures developed to manage the produced water.

(B25K) Upon written agreement, the administering authority must be notified with the following details:

(a) the person responsible for the use of the produced water;
(b) the location of use of the produced water; and
(c) the intended use of the produced water.

Coal Seam Gas Water Management Criteria

(B26) Prior to the commencement of each petroleum activity authorised by this environmental authority, Coal Seam Gas Water Management Criteria need to be developed and implemented which must:

(a) be developed in accordance with section 126(1)(e) of the *Environmental Protection Act 1994*;

(b) be consistent with the requirements of this environmental authority.

CSG Water Injection

(B27) Injection of fluids is only authorised into the target formation(s) through the identified well locations for the injection fluid type(s) within the specified impact zones listed in **Schedule B: Table 2 – Details of Authorised Fluid Injection**.

Schedule B: Table 2 – Details of Authorised Fluid Injection

Well Location (Easting & Northing) GDA94 Zone 55	Well Number/ Reference	Target Formation	Injection Fluid Type	Water Quality Impact Zone	Hydraulic Impact Zone
E 740398 N 7090987	Combabula 257 INJ-P	Precipice Sandstone	Treated CSG Water	As defined in the Australia Pacific LNG Upstream Phase 1 – Reedy Creek Aquifer Injection Management Plan – Precipice Sandstone (ref.Q-4255-95-MP-004)	As defined in the Australia Pacific LNG Upstream Phase 1 – Reedy Creek Aquifer Injection Management Plan – Precipice Sandstone (ref.Q-4255-95-MP-004)
E 740437 N 7088939	Combabula 300 INJ-P				
E 740788 N 7087344	Reedy Creek 030 INJ-P				
E 743184 N 7088080	Combabula 330 INJ-P				
E 742423 N 7086618	Combabula 373 INJ-P				
E 742603 N 7085185	Combabula 416 INJ-P				
E 743326 N 7084426	Reedy Creek 067 INJ-P				
E 740364 N 7086455	Reedy Creek 047 INJ-P				
E 741000 N 7085541	Reedy Creek 050 INJ-P				
E 739714 N 7085140	Reedy Creek 059 INJ-P				
E 741046 N 7084822	Reedy Creek 066 INJ-P				
E 741470 N 7082170	Reedy Creek 007 INJ-P				
E 740556 N 7083409	Reedy Creek 125 INJ-P				
E 737975 N 7083169	Reedy Creek 121 INJ-P				
E 739189 N 7084062	Reedy Creek 088 INJ-P				
E 743081 N 7081942	Reedy Creek 185 INJ-P				
E 739519 N 7082685	Reedy Creek 156 INJ-P				
E 737975 N 7081937	Reedy Creek 180 INJ-P				
E 736388 N 7085056	Reedy Creek 053 INJ-P				
E 742301 N 7083428	Reedy Creek 127 INJ-P				
E 738354 N 7084380	Reedy Creek INJ2-P				

(B28) If environmental harm has been caused or is threatened to be caused as a result of the fluid injection activity(ies), fluid injection must cease immediately.

Fluid Injection Well Integrity

(B29) The construction of fluid injection wells must be carried out in accordance with well construction requirements in the most recent version of the Department of Environment and Heritage Protection *CSG Water Injection Well Construction Requirements*, as amended from time to time.

(B30) Despite condition (B29), the surface casing must be sheathed with cement grout having a minimum annular thickness of 15 millimetres (mm) above the maximum dimension of the casing (for example coupling or shoe).

(B31) Fluid injection well(s) authorised by this environmental authority must have appropriate records and documents which support and indicate mechanical integrity and which hold a certificate of mechanical integrity prepared and certified by a suitably qualified person, available for inspection such that:

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

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

(B32) For fluid injection, the injection pressure must not exceed 90% of the formation fracture pressure.

Fluid Injection Quality

(B33) Fluid used in the well injection must comply with the contaminant limits prescribed in **Schedule B: Table 3 – Specific Contaminant Limits for Injection Fluid**.

Schedule B: Table 3 – Specific Contaminant Limits for Injection Fluid

Contaminants	Contaminant limits in injection fluids (Measured as daily average)*
Dissolved oxygen	Maximum 500ppb
Electrical Conductivity	Maximum 1000µS/cm
Total dissolved solids (TDS)	Maximum 600 mg/L
pH units	Minimum 6.5 Maximum 9.4

** measured at the Reedy Creek Permeate Treatment Facility export analyser skid, following all treatment processes*

Injection Management Plan

(B34) The holder of this environmental authority must conduct fluid injection in accordance with the Australia Pacific LNG Upstream Phase 1 – Reedy Creek Aquifer Injection Management Plan - Precipice Sandstone (ref.Q-4255-95-MP-004).

(B35) The Australia Pacific LNG Upstream Phase 1 – Reedy Creek Aquifer Injection Management Plan – Precipice Sandstone (ref.Q-4255-95-MP-004) must include but not necessarily be limited to:

(a) estimated volumes and rates of water to be injected;

(b) description of the physical, chemical and biological components and their concentrations of the water to be injected;

(c) details of how and where the injection fluid will be produced, aggregated, stored, treated and injected;

(d) details of where the fluid is proposed to be treated including a description of the treatment process;

(e) a water quality compatibility assessment which demonstrates that the injection fluid has inconsequential reactivity with the target formation and native groundwater it will come into contact with;

(f) the regional characteristics of the receiving environment;

(g) identification of the water quality impact zone and the hydraulic impact zone;

(h) identification of any fluid injection well, all existing bores, springs, lakes, wetlands, environmental assets and watercourses connected to groundwater, faults and other geologic features that occur within the water quality impact zone and the hydraulic impact zone;

(i) identification of the environmental values and water quality objectives of the potential water quality impact zone of the target formation in accordance with the Environmental Protection (Water) Policy 2009 and the Queensland Water Quality Guidelines 2009;

(j) an assessment of the potential for migration of injection fluid or native groundwater out of the target formation through wells, bores, springs, connected watercourses, faults or other geologic features likely to impact on other aquifers;

(k) a risk assessment identifying potential hazards, their inherent risk, preventative measures for the management of potential hazards and details on sampling and analysis methods to verify preventative measures of potential hazards, including frequency and locations and quality assurance and control;

(l) methods to assess performance of the injection activities;

(m) control measures that will be implemented for fluid storage, treatment and injection to prevent or control the release of a contaminant or waste to the environment;

(n) the indicators or other criteria against which the performance of fluid injection will be assessed;

(o) procedures that will be adopted to regularly review the monitoring program;

(p) reporting procedures to management and the administering authority should unforeseen or non-compliant monitoring results be recorded;

(q) procedures that will be implemented to prevent unauthorised environmental harm from unforeseen or non-compliant monitoring results; and

(r) procedures for dealing with accidents, spills, failure of containment structures, and other incidents that may arise in the course of fluid injection.

Fluid Injection Monitoring Program

(B36) The holder of this environmental authority must implement a Fluid Injection Monitoring Program in accordance with the Australia Pacific LNG Upstream Phase 1 – Reedy Creek Aquifer Injection Management Plan - Precipice Sandstone (ref.Q-4255-95-MP-004).

Reporting Requirements for Operational Fluid Injection

(B37) An operational fluid injection report which has been certified by a suitably qualified person must be submitted to the administering authority with each annual return.

(B38) The operational fluid injection report must summarize the results of the Fluid Injection Monitoring Program required by condition (B36) and provide interpretation and analysis of those results including but not necessarily being limited to:

(a) the results of the monitoring program as required by condition (B36);

(b) monthly summaries of injection conditions;

(c) commentary on changes to injection fluid characteristics or sources;

(d) mechanical integrity tests;

(e) pressure of the target formation;

(f) integrity of overlying formation;

(g) an updated risk assessment providing details on potential hazards including their inherent risk, preventative measures & monitoring and the residual risk;

(h) quantity of fluid injected;

(i) quality parameters of fluid injected; and

(j) any fluid injection well closure plan required by condition (B39).

Fluid Injection Well Closure

(B39) A Fluid Injection Well Closure Plan must be submitted to the administering authority within six months prior to the cessation of fluid injection at a well.

(B40) The Fluid Injection Well Closure Plan must include, but not necessarily be limited to the following:

(a) details of when and under what circumstances the fluid injection well will be decommissioned;

(b) sealing details including the method, type of material to be used and the planned location and depth (metres) of the bottom of the seal from ground surface; and

(c) any proposed test or measure to be made.

(B41) Actions outlined in the well closure plan must be completed within three months of the cessation of fluid injection at the fluid injection well.

(B42) Upon completion of injection activities at a fluid injection well, a well closure report demonstrating compliance with the fluid injection well closure plan as required by condition (B39) for that well must be prepared by a suitably qualified person and submitted to the administering authority with the next annual return.

Fluid Injection Cessation Report

(B43) A fluid injection cessation report which has been certified by a suitably qualified person must be submitted to the administering authority within two months of completion of fluid injection activities.

(B44) The fluid injection cessation report must include, but not necessarily be limited to:

(a) volumes of fluid injected at each well;

(b) a risk assessment statement providing details on identified hazards including their inherent risk, summary of the results from the monitoring, preventative measures and the residual risk; and

(c) a monitoring report outlining the methods and results of monitoring undertaken to assess the performance of the injection activities and preventative measures for identified hazards.

Release of Treated CSG Water to Waters

(B45) The release of treated CSG water to waters must only occur from the release points specified in **Schedule B: Table 4 – Treated CSG Water Release Points, Sources and Receiving Waters** until 1 May 2016.

Schedule B: Table 4 – Treated CSG Water Release Points, Sources and Receiving Waters

Release Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Treated CSG Water Source and Location and Description of Release Point	Receiving Waters Description
YCRP	-26.34091	149.39592	Reedy Creek Water Treatment Facility – Yuleba Creek Release Structure located on PL404	Unnamed tributary of Yuleba Creek

(B46) The total volume of treated CSG water authorised to be released in accordance with condition (B45) must not exceed 2,700 ML.

(B47) The release of treated CSG water to waters in accordance with condition (B45) must not exceed the release limits for each quality characteristic stated in **Schedule B: Table 5 – Release Contaminant Limits (Environmental Protection)**, when measured at the monitoring points and at the frequency specified in **Schedule B: Table 5– Release Contaminant Limits (Environmental Protection)**.

Note: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition (B47) is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

Schedule B: Table 5 – Release Contaminant Limits (Environmental Protection)

Monitoring Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality Characteristic	Release Limit	Limit Type	Monitoring Frequency
Yuleba Creek Export Line	-26.347825	149.386844	Dissolved Oxygen	4 mg/L	Minimum	Daily during release
			Electrical Conductivity	500 µS/cm	Maximum	
			pH	6.5 – 8.5 units	Range	
Yuleba Creek Upstream Point (YCUS2)	-26.329164	149.398047	Temperature	+/- 4 °C	Range	
Yuleba Creek Downstream Point (YCDS1i)	-26.339006	149.398892				
Yuleba Creek Export Line	-26.347825	149.386844	Calcium	5 mg/L	Minimum	Weekly during release
			Magnesium	2 mg/L	Minimum	
			Boron	1 mg/L	Maximum	

Note: Monitoring of temperature only required when there is natural flow in Yuleba Creek.

(B48) If the monitoring required by condition (B47) indicates that any of the release limits specified in **Schedule B: Table 5 – Release Contaminant Limits (Environmental Protection),** have been exceeded at any time during any release of treated CSG water, the holder of this environmental authority must:

(a) complete an investigation in accordance with the assessment methodology outlined in ANZECC and ARMCANZ (2000) into the potential for environmental harm resulting from the exceedance; and

(b) provide a written report to the administering authority on completion of the investigation that includes:
   i. details of the investigation carried out; and
   ii. any actions taken to prevent and /or minimise environmental harm.

Note: Where an exceedance of a release limit specified in *Schedule B: Table 5 – Release Contaminant Limits (Environmental Protection)* has occurred and is being investigated in accordance with condition (B48) above, no further investigation and reporting is required for subsequent limit exceedance events for that quality characteristic.

(B49) The release of treated CSG water to waters in accordance with condition (B45) must not exceed the release limits for each quality characteristic stated in **Schedule B: Table 6 – Release Contaminant Limits (Public Health)**, when measured at the monitoring points and at the frequency specified in **Schedule B: Table 6 – Release Contaminant Limits (Public Health).**

Note: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition (B49) is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

Schedule B: Table 6 – Release Contaminant Limits (Public Health)

Monitoring Point	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Quality Characteristic	Release Limit	Limit Type	Monitoring Frequency
Yuleba Creek Export Line	-26.347825	149.386844	N-Nitosodimethylamine (NDMA)	0.0001 mg/L	Maximum	On first release day of each calendar year
			Alpha Activity	0.5 Bq/L	Maximum	
			Beta Activity	0.5 Bq/L	Maximum	
			Aluminium	0.2 mg/L	Maximum	
			Ammonia	0.5 mg/L	Maximum	
			Arsenic	0.01 mg/L	Maximum	
			Barium	0.7 mg/L	Maximum	
			Bisphenol A	0.2 mg/L	Maximum	
			Boron	4 mg/L	Maximum	
			Bromide	7 mg/L	Maximum	
			Bromoform	0.1 mg/L	Maximum	
			BTEX			
			Benzene	0.001 mg/L	Maximum	
			Toluene	0.8 mg/L		
			Ethylbenzene	0.3 mg/L		
			Xylene (m & p)	0.6 mg/L		
			Cadmium	0.002 mg/L	Maximum	
			Chlorine	5 mg/L	Maximum	
			Chloroform	0.2 mg/L	Maximum	
			Chromium	0.05 mg/L	Maximum	

			Copper	2 mg/L	Maximum	
			Cyanide	0.08 mg/L	Maximum	
			Fluoride	1.5 mg/L	Maximum	
			Iodide	0.1 mg/L	Maximum	
			Iron	0.3 mg/L	Maximum	
			Lead	0.01 mg/L	Maximum	
			Manganese	0.5 mg/L	Maximum	
			Mercury	0.001 mg/L	Maximum	
			Molybdenum	0.05 mg/L	Maximum	
			Nickel	0.02 mg/L	Maximum	
			PAH (as B(a)P TEF)			
			Species TEF benz[a]anthracene 0.1 benzo[b+j]fluoranthene 0.1 benzo[k]fluoranthene 0.1 benzo[a]pyrene 1.0 chrysene 0.01 dibenz[a,h]anthracene 5.0 indeno[1,2,3-cd]pyrene 0.1	0.01 µg/L	Maximum	
			Selenium	0.01 mg/L	Maximum	
			Sulphate	500 mg/L	Maximum	
			Strontium	4 mg/L	Maximum	
			Total Petroleum Hydrocarbons (TPH)	0.2 mg/L	Maximum	
			Vanadium	0.05 mg/L	Maximum	
			Zinc	3 mg/L	Maximum	

(B50) If the monitoring required by condition (B49) indicates that any of the limits specified in **Schedule B: Table 6 – Release Contaminant Limits (Public Health)** have been exceeded at any time during any release of treated CSG water, the holder of environmental authority must:

(a) complete an investigation into the potential for impacts to drinking water resulting from the exceedance, which includes an analysis of the potential and actual causes for the exceedance; and

(b) provide a written report to the administering authority and the Darling Downs Public Health Unit on completion of the investigation that includes:

i. details of the investigation carried out;
ii. any actions taken to prevent impacts to drinking water;
iv. the cause for the exceedance;
v. all water quality monitoring results pertaining to the investigation;
vi. any general observations;
vii. methodology(ies) and any relevant calculations used; and
viii. corrective actions to rectify the cause of the exceedance.

Note: Where an exceedance of a release limit specified in **Schedule B: Table 6 – Release Contaminant Limits (Public Health)** has occurred and is being investigated in accordance with condition (B50) above, no further investigation and reporting is required for subsequent limit exceedance events for that quality characteristic.

(B51) The release of treated CSG water is only authorised under the following circumstances:

(a) when there is flow in the receiving waters; and/or

(b) in the event that the top operating water level (TOWL) of the Reedy Creek Water Treatment Facility Feed Pond (as identified in the Register of Regulated Dams) has been reached.

(B52) If a release event has been triggered under condition (B53) the release is authorised to continue until the volume of water contained in the Reedy Creek Water Treatment Facility Feed Pond (as identified in the Register of Regulated Dams) has been reduced to the minimum inventory level (100 ML).

Flow Monitoring

(B53) The daily quantity of treated CSG water released from the release point specified in **Schedule B: Table 4 – Treated CSG Water Release Points, Sources and Receiving Waters** must be measured and recorded.

(B54) The release of treated CSG water to waters in accordance with condition (B45) must not exceed the maximum release rate of 40 ML/d when measured at the release point specified in **Schedule B: Table 4 – Treated CSG Water Release Points, Sources and Receiving Waters**.

(B55) A stream flow gauging station must be utilised to determine and record stream flows of the receiving waters at the location and frequency specified in **Schedule B: Table 7 – Stream Flow Gauging Station**.

Schedule B: Table 7 – Stream Flow Gauging Station

Gauging Station Description	Latitude (Decimal degrees GDA94)	Longitude (Decimal degrees GDA94)	Flow record frequency
Yuleba Creek at Forestry Station (422219A)	-26.84750	149.47278	Continuous

(B56) Releases to waters must not cause erosion of the bed and banks of the receiving waters or cause a material build-up of sediment in such waters.

Recording of Release Events

(B57) The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours prior to commencing the first release of treated CSG water to the receiving environment in accordance with condition (B45).

(B58) Records of all releases must include the following information:

(a) release commencement date and time;

(b) release cessation date and time;

(c) estimated release volume and actual volume of treated CSG water released;

(d) the flow rate of the receiving waters (recorded at the location specified in **Schedule B: Table 7 – Stream Flow Gauging Station**);

(e) all in-situ water quality monitoring results;

(f) any other matters pertinent to the water release event; and

(g) any details including available data regarding likely impacts on the receiving waters.

Receiving Environment Monitoring Program

(B59) The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised release. This must include monitoring the effects of the petroleum activities on the receiving environment periodically (under natural flow conditions) and while treated CSG water is being released from the site.

(B60) The REMP must encompass any sensitive receiving waters or environmental values downstream of the authorised petroleum activities that will potentially be directly affected by an authorised release of treated CSG water including but not limited to Yuleba Creek downstream to the confluence with the Balonne River.

(B61) A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the administrating authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current release limits to protect downstream environmental values.

SCHEDULE D: LAND

General

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

Disturbance to Land – General

(D2) 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.

(D3) A suitably qualified person must develop and certify a methodology so that condition (D2) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.

(D4) Where mapped biodiversity values differ from those confirmed under conditions (D2) and (D3), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.

(D5) The holder of this environmental authority, when carrying out the petroleum activity(ies) must:

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

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

(c) manage topsoil in a manner that will preserve its biological and chemical properties;

(d) utilise stockpiled soils for rehabilitation purposes;

(e) avoid clearing mature trees; and

(f) prior to carrying out field based petroleum activities, make all relevant staff, contractors or agents carrying out those petroleum activities, aware of the location of any Category A, B or C Environmentally Sensitive Areas, wetlands and presence of species classed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992* and the requirements of this environmental authority.

(D6) Despite condition (D5), significant disturbance to land caused by the carrying out of the petroleum activities must not involve clearing vegetation or placing fill:

(a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e. stepping stone or contiguous bioregional / local corridor networks) and / or results in an increase in threatening processes (e.g. potential impacts associated with edge effects or introduced species); or

(b) in discharge areas.

Disturbance to Land – Environmentally Sensitive Areas

(D7) Petroleum activities must be carried out in accordance with **Schedule D: Table 1 – Petroleum Activities in Environmentally Sensitive Areas**.

Schedule D: Table 1 – Petroleum Activities in Environmentally Sensitive Areas

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. Subject to condition (D12) and (D13).
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to condition (D11), (D12) and (D13).	Petroleum activities permitted.
Category C ESAs that are Nature Refuges Koala Habitat, Declared Catchment Areas	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to condition (D11), (D12) and (D13).	Petroleum activities permitted.
Category B ESAs that are 'Endangered' Regional Ecosystems Category C ESAs that are Essential Habitat, Essential Regrowth Habitat, Critically Limited or Threshold or 'Of Concern' Regional Ecosystems	Only essential petroleum activities permitted. Subject to condition (D10) and (D11).	Only essential petroleum activities permitted. Subject to condition (D11), (D12) and (D13).	Petroleum activities permitted.
Category C ESAs that are Resource Reserves	Only essential petroleum activities permitted. Subject to condition (D10) and (D11).	Only essential petroleum activities permitted. Subject to condition (D11), (D12) and (D13).	Petroleum activities permitted.
Category C ESAs that are State Forests, Timber Reserves.	Only essential petroleum activities permitted. Subject to condition (D10) and (D11).	Petroleum activities permitted.	Petroleum activities permitted.

(D8A) Despite condition (D7) of this environmental authority, the infrastructure (and associated activities necessary for construction, operational and maintenance purposes) specified **in Schedule D: Table 2 – Authorised Petroleum Activity(ies) Disturbance**, are permitted in the location specified in **Schedule D: Table 2 – Authorised Petroleum Activity(ies) Disturbance** and shown in Schedule M Figures 1 - 8.

Schedule D: Table 2 – Authorised Petroleum Activity(ies) Disturbance

Tenure	Description of Infrastructure	Number	Location
ATP606	Pine Hills Repeater Power Access	1	Lot 44 Plan WV614 and Lot 46 Plan WV615.
	Monitoring Bore	2	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA.
PL297	Combabula Central Compressor Station	1	Within previously disturbed land with approximately 3.667 hectares of clearing required within the Category B 'Endangered Regional Ecosystem' and within existing cleared land within the primary protection zone of this ESA. Within already cleared disturbed land within the primary protection zone of Category C 'Of Concern Regional Ecosystem.
	Combabula laydown areas and stockpile	1	Existing cleared land within the primary protection zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern Regional Ecosystem'.
	Helipad	1	
	Combabula sediment pond	1	Existing cleared land within the primary protection zone of Category B 'Endangered Regional Ecosystem'.
	Combabula access road (including a low voltage power cable to a communications tower)	1	Existing cleared land within the Primary Protection Zone of Category B 'Endangered Regional Ecosystem'.
	30m wide Combabula Dual carriage way along an existing access track	1	Within previously disturbed land within the Category B 'Endangered Regional Ecosystem' (3 ha of clearing required) and existing cleared land in the primary protection zone of this ESA.
	Injection well	3	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA and Primary Protection Zone of Category C 'Of Concern Regional Ecosystem' ESA
	Injection flowlines	3	Within Category B 'Endangered Regional Ecosystem' ESA and its Primary Protection Zone
	Injection flowlines	1	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA
	Drill Camp (CA04)	1	Within pre-existing cleared land of Primary Protection Zone of Category C (OCRE) and Category B (ERE) ESA on Lot 11 SP184726 required up to 1.2ha of disturbance.
	Combabula (Griffin – Sydeva) Borrow Pits	2	Within the primary protection zone of Category B 'Endangered Regional Ecosystem' with 3.2 ha of clearing required for Pit 1 and 4.1 ha of clearing required for Pit 2 within this area.
	Camp Area (CA01)	1	Within pre-existing cleared land of Primary Protection Zone of Category B (ERE) ESA on Lot 4AB78 requiring an area of 1.1ha.
	Drill Camp (CA02)	1	Lot Plan 7AB176 Within existing cleared land within the Primary Protection Zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern Regional Ecosystem' ESA

Tenure	Description of Infrastructure	Number	Location
PL297/ PL404	Injection flowlines	6	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA
PL404	Temporary Construction Camp - to be decommissioned by 30 June 2016	1	Within the primary protection zone of Category B 'Endangered' Regional Ecosystem ESA, requiring up to 11ha of clearing.
	Irrigation Area (Temporary Camp STP)	1	Within the primary protection zone of Category B 'Endangered' Regional Ecosystem ESA. Within the primary protection zone of Category B 'Endangered Regional Ecosystem' with 3.2 ha of clearing required for Pit 1 and 4.1ha of clearing required for Pit 2 within this area.
	Borrow Pit	1	Within the primary protection zone of Category B 'Endangered Regional Ecosystem' within existing cleared land.
	30 m wide Reedy Creek Dual carriageway	1	Within the Category C 'Of Concern' Regional Ecosystem ESA requiring, 1.1 hectares of clearing within this area and within existing cleared land within the primary protection zone.
	Permanent camp / accommodation and IOC	1	Within existing cleared land in the primary protection zone of Category C 'Of Concern' Regional Ecosystem.
	Reedy Creek access track to the gathering accommodation facility and laydown area (including a treated sewage effluent pipeline to the irrigation area).	1	Within Category C 'Of Concern' Regional Ecosystem with 2.1 hectares of clearing required in this area and within existing cleared land in the primary protection zone of this ESA.
	Borrow Pit	1	Within the primary protection zone of Category B 'Endangered Regional Ecosystem' within existing cleared land.
	Laydown and stockpile area	1	Existing cleared land in the primary protection zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern' Regional Ecosystem.
	Sewage irrigation area	1	Existing cleared land in the primary protection zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern' Regional Ecosystem.
	Construction water pond (low consequence)	1	Existing cleared land in the primary protection zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern' Regional Ecosystem. Within the primary protection zone of Category B 'Special Forestry Area' Endangered Regional Ecosystem' requiring 1.1 hectares of clearing.
	Helipad	1	
	Regulated dam	1	
	Accommodation facility (temporary)	1	
	Reedy Creek (Pilot) Accommodation Camp	1	
	Gathering Infrastructure (1 well and flow lines) Lot34WV774	1	

Tenure	Description of Infrastructure	Number	Location
	Longitude / **Latitude**: 149.4346 / -26.3442; 149.4356 / -26.3439; 149.436 / -26.3449; 149.4355 / -26.3451; 149.4347 / -26.3444		
	Irrigation area (Reedy Creek permanent camp STP)	1	Within primary protection zone of Category C 'Of Concern Regional Ecosystem' ESA.
	Release pipeline and discharge structure	1	Within Category C 'Of Concern Regional Ecosystem' ESA and its primary protection zone requiring clearing of up to 1.1 hectares.
	Injection well	1	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA
	Injection well	1	Primary Protection Zone of Category B 'Special Forestry Area' ESA
	Injection well	4	Primary Protection Zone of Category C 'Of Concern Regional Ecosystem' ESA
	Extension of well pad associated with reinjection well on RCK-059 to accommodate one groundwater monitoring bore	1	0.3 ha within Category C 'Of Concern Regional Ecosystem' ESA
	Injection flowlines	4	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA
	Injection flowlines	16	Primary Protection Zone of Category C 'Of Concern Regional Ecosystem' ESA
	Injection flowlines	3	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA and Primary Protection Zone of Category C 'Of Concern Regional Ecosystem' ESA
	Injection flowlines	1	Primary Protection Zone of Category B 'Special Forestry Area' ESA and Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA
	Injection flowlines	2	Within Category C 'Of Concern Regional Ecosystem' ESA and its Primary Protection Zone
	Injection flowlines	1	Within Category B 'Endangered Regional Ecosystem' ESA and Primary Protection Zone of Category C 'Of Concern Regional Ecosystem' ESA
	EWS001	1	Within the primary protection zone of Category B 'Endangered' Regional Ecosystem ESA and primary protection zone of Category C 'Of Concern' Regional Ecosystem ESA on Lot 5AB27.
PL403	WBP001-1	1	Within the primary protection zone of Category B 'Endangered' Regional Ecosystem ESA and primary protection zone of Category C 'Of

Tenure	Description of Infrastructure	Number	Location
			Concern' Regional Ecosystem ESA on Lots 9AB112 and 5AB27.
	Temporary Camp - to be decommissioned by 30 June 2016	1	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA.
PL407	Drill Camp (CA01)	1	Lot Plan 7AB176 Within existing cleared land within the Primary Protection Zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern Regional Ecosystem' ESA
	Laydown (LD101)	1	Lot Plan 7AB176 Within existing cleared land within the Primary Protection Zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern Regional Ecosystem' ESA
	Laydown (LD04)	1	Lot Plan 7AB176 Within existing cleared land within the Primary Protection Zone of Category B 'Endangered Regional Ecosystem' and Category C 'Of Concern Regional Ecosystem' ESA
PL408	Injection well	2	Primary Protection Zone of Category B 'Endangered Regional Ecosystem' ESA
	Temporary Construction Camp	1	Within the primary protection zone of Category B 'Endangered' Regional Ecosystem ESA on Lot 9AB112 requiring up to 6ha of clearing.
	Extra work space (EWS 1 & EWS 2)	2	Existing pre-disturbed land within Category C (Dinoun State Forest) ESA Lot 25 FTY532
	Rig access turn (RAT033)	1	Existing pre-disturbed land within Category C (Dinoun State Forest) ESA Lot 25 FTY532
	Access track (AT03)	1	

(D8B) Despite condition (D7) of this environmental authority, electrical distribution equipment are authorised within ESAs and associated Primary Protection Zones when:

(a) located within the well site; and

(b) used to provide electric power to a wellhead(s).

(D9) Prior to carrying out essential petroleum activities undertaken within environmentally sensitive areas in accordance with **Schedule D: Table 1 - Petroleum Activities in Environmentally Sensitive Areas**, it must be demonstrated, in the following order of preference that:

1. no reasonable or practicable alternative exists for carrying out the essential petroleum activities within the environmentally sensitive area;
2. the essential petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance;

(D10) Linear infrastructure construction corridors must, for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area or its primary protection zone, be no greater than 40m in total width.

(D11) Prior to carrying out essential petroleum activities subject to Condition (D7) within the primary and secondary protection zones of an environmentally sensitive area, the holder of the environmental authority must demonstrate, in the following order of preference:

(a) The essential petroleum activities are preferentially located in areas of pre-existing disturbance.

(b) Significant disturbance to land from the carrying out of the essential petroleum activities is minimised to the greatest extent practicable.

(D12) If petroleum or essential petroleum activity(ies) are located within a primary protection zone or secondary protection zone of an environmentally sensitive area, that the activity(ies) must not impact the adjacent environmentally sensitive area.

(D13) The record of the assessment required by conditions (D2) to (D3) and the extent of significant disturbance to land in the following areas must be prepared for each annual return period and made available to the administering authority upon request:

(a) The primary protection zone of, or within a Category B or C Environmentally Sensitive Area; and

(b) in the secondary protection zone of ESAs; and

(c) other remnant vegetation areas; and

(d) wetlands.

Offsets

(D14) Prior to construction of significant construction work, the environmental authority holder must submit to the administering authority for approval an Environmental Offsets Strategy.

(D15) The Environmental Offset Strategy must address the Queensland Government Environmental Offset Policy 2008 and associated specific issue policies and includes requirements for listed/scheduled species under the *Nature Conservation Act 1992*. The strategy must address impacts on biodiversity, vegetation, wetlands, and coastal and marine areas arising from:

(a) exploration, development and operation of the coal seam gas fields; and

(b) other activities (e.g. construction camps, port works for the project, ancillary works).

(D16) The Environmental Offset Strategy must be supported by a program detailing the following:

(a) principles adopted for the environmental offsets strategy; and

(b) procedures to identify the requirements for environmental offsets for specific components of the project over the life of the project; and

(c) relevance to any legislative requirements for offsets; and

(d) mechanisms to secure and manage the environmental offset for long term protection of values; and

(e) location, size and values that must be offset; and

(f) location, size and values of the offsets proposed; and

(g) management measures, including funding, required to maintain or enhance values for the life of the offset, and

(h) a system for reporting to the CG on offset arrangements; their management; how offset values are met and maintained; and the reconciliation process.

(D17) The environmental authority holder must enter into an environmental offset agreement with the administering authority.

Top soil management

(D18) Top soil must be managed in a manner that preserves its biological and chemical properties.

Fauna Management Procedures

(D19) 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

(D20) Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Spill Kit Training

(D21) Anyone operating under this approval must be trained in the use of the spill kit where it is relevant to their day-to-day tasks.

Pipelines

(D22) Pipelines must be preferentially located alongside existing linear infrastructure such as roads, tracks and powerlines.

(D23) Pipeline trenches must only be left open for the minimum time practicable.

(D24) The length of pipeline trench open at any one time must be minimised as far as practicable.

(D25) Measures must be employed to prevent fauna entrapment in pipe sections or within the pipeline trench.

(D26) Open trenches and pipes must be checked for fauna prior to backfill and any trapped animals removed.

Access Tracks in Environmentally Sensitive Areas

(D27) New access tracks are not permitted within Category B or C Environmentally Sensitive Areas unless they are co-located with gas collection or CSG associated water pipelines, unless otherwise authorised by the administering authority.

Pad Drilling

(D28) The environmental authority holder must assess the use of pad drilling wherever medium or high environmental values, including strategic cropping lands are impacted by the petroleum activities. The environmental authority holder must demonstrate that where pad drilling is shown not to be feasible, alternative ways of siting drilling rigs and other petroleum facilities are proposed to protect environmental values.

Gas Trunkline Easements

(D29) The construction of co-located trunklines must be undertaken in a manner to minimise width and total disturbance required for the right of way.

Sewage Treatment Plant

(D30) Sewage pump stations must be fitted with a stand-by pump and a visible or audible high-level alarm. All alarms must be able to operate without mains power.

Sewage Treatment Plants > 150 EP

(D31) Treated effluent may only be released to land within the petroleum tenure at a designated, fenced and delineated contaminant release area(s).

(D32) Prior to construction of a sewage treatment facility, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated by the holder of the environmental authority.

(D33) All nominated locations and minimum areas of land must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent.

(D34) A copy of the MEDLI program results required in condition (D33) must be submitted to the administering authority.

(D35) All treated effluent released to land must be in accordance with the contaminant release limits and monitored at the frequency stated in Schedule D: Table 3 – Treated Sewage Effluent Release Limits to Land and the conditions of this environmental authority.

Treated Sewage Effluent Dust Suppression or Construction Activities

(D36) Notwithstanding condition (D31), treated sewage effluent that meets or exceeds the standards specified in **Schedule D, Table 3 – Treated Sewage Effluent Release Limits to Land** may be used for dust suppression or construction activities, provided the use meets the criteria in conditions (D38), as relevant to the use.

(D37) The release of treated sewage effluent under condition (D36) must:

(a) not exceed the amount required to effectively supress dust; and

(b) not cause on-site ponding or runoff; and

(c) be directly applied to the area being dust supressed; and

(d) not harm vegetation surrounding the area the subject of condition *(new conditions inserted above).*

Schedule D: Table 3 – Treated Sewage Effluent Release Limits to Land

Discharge Type	Quality Characteristic / Contaminant	Sampling and *in situ* measurement point location	Limit Type	Release Limit	Frequency
Irrigation at delineated contaminant release areas	5-day Biochemical oxygen demand (BOD)	e.g. release pipe from sewage treatment plant	maximum	20 mg/L	Quarterly
	E.coli		80th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100mL	
			maximum	10,000 cfu per 100mL	
	pH		range	6.0 – 8.5	Monthly
	Electrical Conductivity		monitor only		
Use for dust suppression or construction activities	5-day Biochemical oxygen demand (inhibited)	e.g. Release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
	pH		range	6.0 to 8.5	
	e-coli (use for dust suppression or construction		80th percentile based on at least 5 samples with not less than 30 minutes between samples	100 cfu per 100 mL	
				1000 cfu per 100 mL	

(D38) Notwithstanding the quality characteristic limits specified in **Schedule D: Table 3 – Treated Sewage Effluent Release Limits to Land**, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.

(D39) The daily volume of contaminants released to land must be determined or estimated by an appropriate method, for example a flow meter, and records kept of such determinations and estimates.

(D40) Notices must be prominently displayed on areas undergoing effluent irrigation, warning the employees and the general public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.

(D41) When circumstances prevent the irrigation of treated sewage effluent to land, such as during or following rain events, waters must be directed to wet weather storage or alternative measures must be taken to store or lawfully dispose of effluent.

(D42) The wet weather storage capacity outlined in condition (D41) must have a capacity to hold effluent for a minimum of three days.

(D43) Pipelines and fittings associated with the effluent irrigation system must be clearly identified.

(D44) Lockable valves or removable handles must be fitted to all release pipes situated in public access areas.

Sewage Treatment Plants between >21 EP and <150 EP

(D45) Treated sewage effluent or greywater can be released to land provided it:

(a) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of between 21 and 150EP.

(D46) The release of treated sewage effluent or greywater authorised in condition (D45) must:

(a) be to a fenced and signed contaminant release area(s);

(b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off;

(c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is:

i. not a declared pest species;

ii. kept in a viable state for transpiration and nutrient uptake; and

iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.

Sewage treatment plants <21 EP

(D47) Treated sewage effluent may only be released to land by irrigation at designated, fenced contaminant release area(s).

(D48) The release of contaminants to land authorised under this environmental authority must be carried out in a manner such that:

(a) vegetation is not damaged;

(b) soil quality is not adversely impacted;

(c) there is no surface ponding or runoff to waters;

(d) there are no aerosols or odours;

(e) deep drainage below the root zone of any vegetation is minimised; and

(f) the quality of shallow aquifers is not adversely affected.

SCHEDULE G: WASTE

General

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

(G2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.

(G3) Waste must not be burned on the site unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

(G4) All waste fluids and muds resulting from drilling and exploration petroleum activities must be contained in a properly lined dam or containment structure for disposal, remediation or reuse where applicable.

(G5) Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised to be disposed of or used on site under this environmental authority.

Waste Management

(G6) A Waste Management Program in accordance with Part 5 of the Environmental Protection (Waste Management) Policy 2000 must be developed and implemented within three months from the date of this authority and maintained for the site. The waste management program must include:

(a) a description of the activities that may generate waste;

(b) the types and amounts of wastes generated by the activities;

(c) a program for reusing, recycling or disposing of all wastes;

(d) how the waste will be dealt with in accordance with the waste management hierarchy, including a description of the types and amounts of waste that will be dealt with under each of the waste management practices in the waste management hierarchy (i.e. avoidance, reuse, recycling, energy recover, disposal);

(e) procedures for identifying and implementing opportunities to minimise the amount of waste generated, promote efficiency in the use of resources and improve the waste management practices employed;

(f) procedures for dealing with accidents, spills and other incidents;

(g) details of any accredited management system employed, or planned to be employed, to deal with waste;

(h) how often the performance of the waste management program will be assessed;

(i) the indicators or other criteria on which the performance of the waste management program will be assessed; and

(j) staff training and induction to the waste management program.

Brine and Salt Management

(G7) The holder of this environmental authority must develop and implement a Brine and Salt Management Plan.

(G8) The Brine and Salt Management Plan required by condition (G7) must address, but not be limited to:

(a) the Queensland Government policy on Coal Seam Gas Water Management;

(b) the Administrating Authority's guideline *Preparing an environmental management plan (EM Plan) for Coal Seam Gas (CSG) activities*;

(c) a plan for the containment, use and disposal of salt brought to the surface through CSG production, and produced through the treatment of CSG water;

(d) any plan for reinjection of brine or untreated water;

(e) any long-term plan for the utilisation of salts extracted from CSG water;

(f) an assessment of the potential impacts of options considered and appropriate mitigation measures for the preferred option having regard to the decision hierarchy identified in government policy and guidelines;

(g) a risk assessment methodology which will identify the potential for secondary salinity due to the company's activities. This must include an investigation into wind-borne salt from brine ponds and aggregation dams;

(h) a list of identified management tools and mitigations that will be used in those locations to minimise and manage the risk of secondary salinity;

(i) a commitment to assess and report to the administering authority disturbance and rehabilitation activities which affect salinity risk for each 12-month period of the environmental authority.

(G9) 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*.

(G10) The holder of the environmental authority must investigate:

(a) the viability of waste reuse or recycling through chemically processing or treating brine or salt residues to create useable or saleable products;

(b) the viability of the injection of brine into a natural underground structure that is geologically isolated and does not contain groundwater that does or could supply water for potable or agricultural purposes;

(c) report the outcomes of the investigations in each annual return until the information required by Condition (G11) has been provided to the administering authority.

(G11) By 31 December 2015, the holder of this environmental authority must submit to the administering authority the following:

(a) updated Brine and Salt Management Plan documenting information required by Condition (G7); and

(b) report on the results of investigations required by Condition (G9); and

(c) a summary and ranking from most to least preferred of all brine management options investigated; and

(d) the preferred management option for the beneficial use of brine and salt.

Residual drilling material and drilling by-products disposal to land

(G12) Residual drilling material may be disposed of on-site by the mix-bury-cover method if the residual drilling material meets the approved quality criteria.

(G13) Residual drilling material or drilling by-products may be disposed of on-site if the method 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.

SCHEDULE I: STIMULATION ACTIVITIES

Well Drilling, Completion and Stimulation

(I1) Restricted stimulation fluids must not be used in stimulation.

(I2) The holder of this environmental authority must ensure that polycyclic aromatic hydrocarbons are not added by design to stimulation fluids to be injected into the target gas producing formation.

(I3) Oil based drilling muds must not be used in the carrying out of the petroleum activity(ies).

(I4) Synthetic based drilling muds must not be used in the carrying out of the petroleum activity other than with the written approval of the administering authority.

(I5) Treated coal seam gas water may be used in the stimulation process providing that the coal seam gas water is not of a lower quality than the water in the formation to be stimulated. The water quality of the well to be stimulated is to be assessed by monitoring and parameters required by Conditions (I15)–(I17).

(I6) Accurate and current material safety data sheets for all fluids used in stimulation activities must be published on the environmental authority holder's website.

(I7) Prior to undertaking well stimulation activities, the holder of this environmental authority must develop a risk assessment to ensure that stimulation activities are managed to prevent environmental harm.

(I8) The stimulation risk assessment 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 landholder bores in the area where stimulation activities are to be carried out;

(i) the environmental values of groundwater in the area;

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

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

(l) a description of the well mechanical integrity testing program;

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

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

(o) locations of landholders' active groundwater bores;

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

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

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

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

  i. toxicological and ecotoxicological information of chemicals used;

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

  iii. identification of the stimulation fluid chemicals of potential concern derived from the risk assessment;

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

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

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

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

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

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

(z) 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.

(I9) The stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation activities being carried out at that well.

(I10) Stimulation activities must not result in a change in water quality other than that within the stimulation impact zone of the target gas producing formation.

(I11) Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.

(I12) The holder of this authority must ensure the internal and external mechanical integrity of the well system prior to and during stimulation such that there is:

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

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

(I13) 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.

(I14) Rectification measures must be taken immediately if the holder of this environmental authority either becomes aware that stimulation activities have resulted in a change in water quality other than that within the stimulation impact zone of the target gas producing formation or that stimulation activities have caused the connection of the target gas producing formation and another aquifer.

Stimulation Baseline Monitoring

(I15) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the water quality of:

(a) all active landholders' groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two kilometre horizontal radius from the location of the stimulation initiation point within the target gas producing formation; and

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

(c) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the risk assessment required by conditions (I7) and (I8).

(I16) Prior to undertaking stimulation activities at a well, the holder of this environmental authority must have sufficient water quality data to accurately represent the water quality in the well to be stimulated. The data must include as a minimum the results of analyses for the parameters in condition (I17).

(I17) 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 [ºC];

(f) dissolved oxygen [mg/L];

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

(h) alkalinity (bicarbonate, carbonate, hydroxide and total as CaCO3) [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

(I18) A Stimulation Impact Monitoring Program which has been certified by a suitably qualified person must be developed prior to the carrying out of stimulation activities.

(I19) The Stimulation Impact Monitoring Program 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 (I7) and (I8) 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 (I15).

(I20) 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 (I17); 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.

(I21) The Stimulation Impact Monitoring Program must provide for monitoring of the bores in condition (I15) at the following minimum frequency:

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

(b) annually for the first five years subsequent to the stimulation activities being undertaken or until analytes and physico-chemical parameters listed in condition (I17)(b), (I17)(m)-(t) are not detected in concentrations above baseline bore monitoring data on two consecutive monitoring occasions.

(I22) The holder of this environmental authority must implement the Stimulation Impact Monitoring Program.

(I23) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE L: DEFINITIONS

Refer to Appendix A for definitions for this Part.

SCHEDULE M: FIGURES

Figure 1 – PL297 Infrastructure within ESA buffers

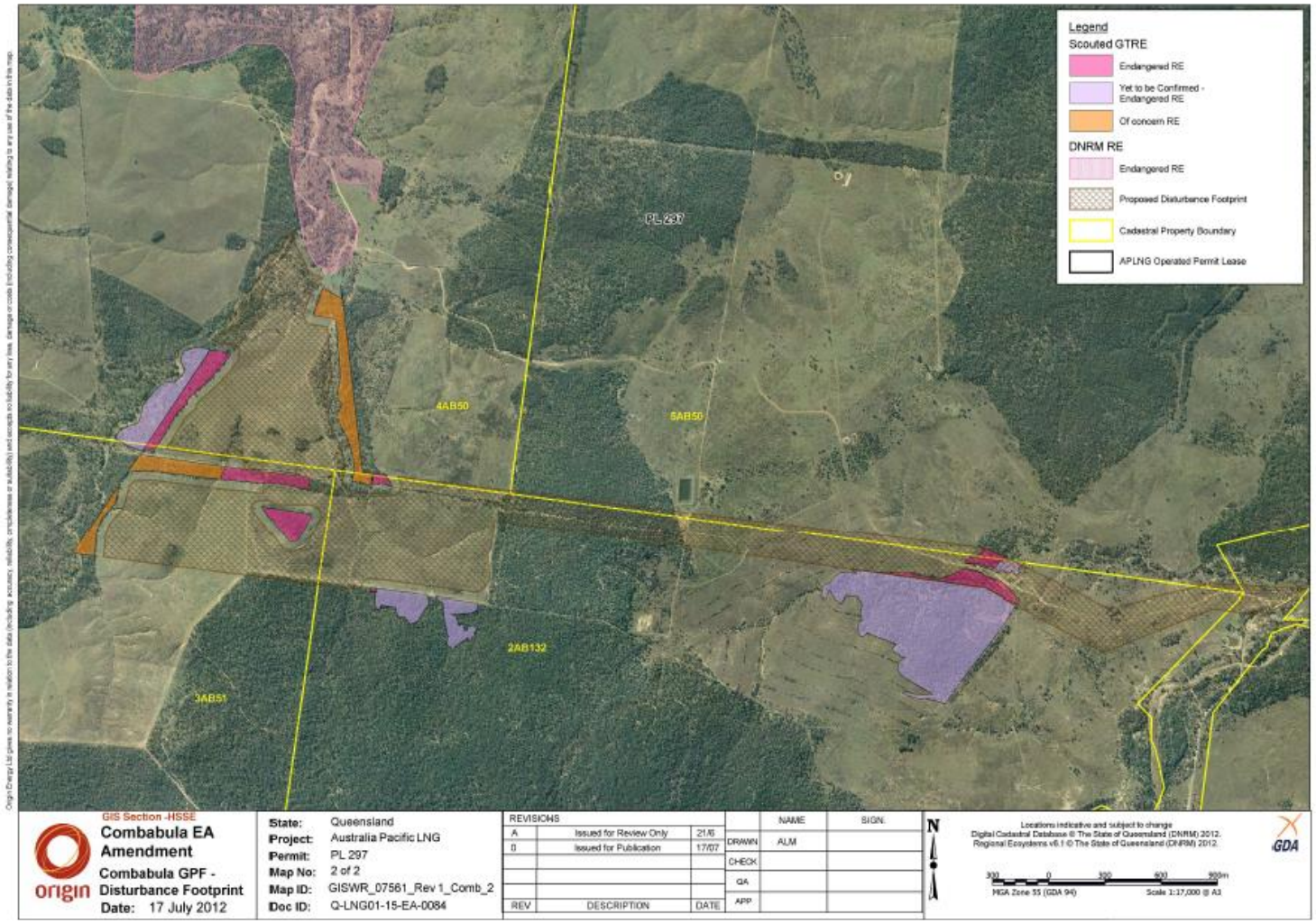


Figure 2 – PLA404 Disturbance within ESA buffers

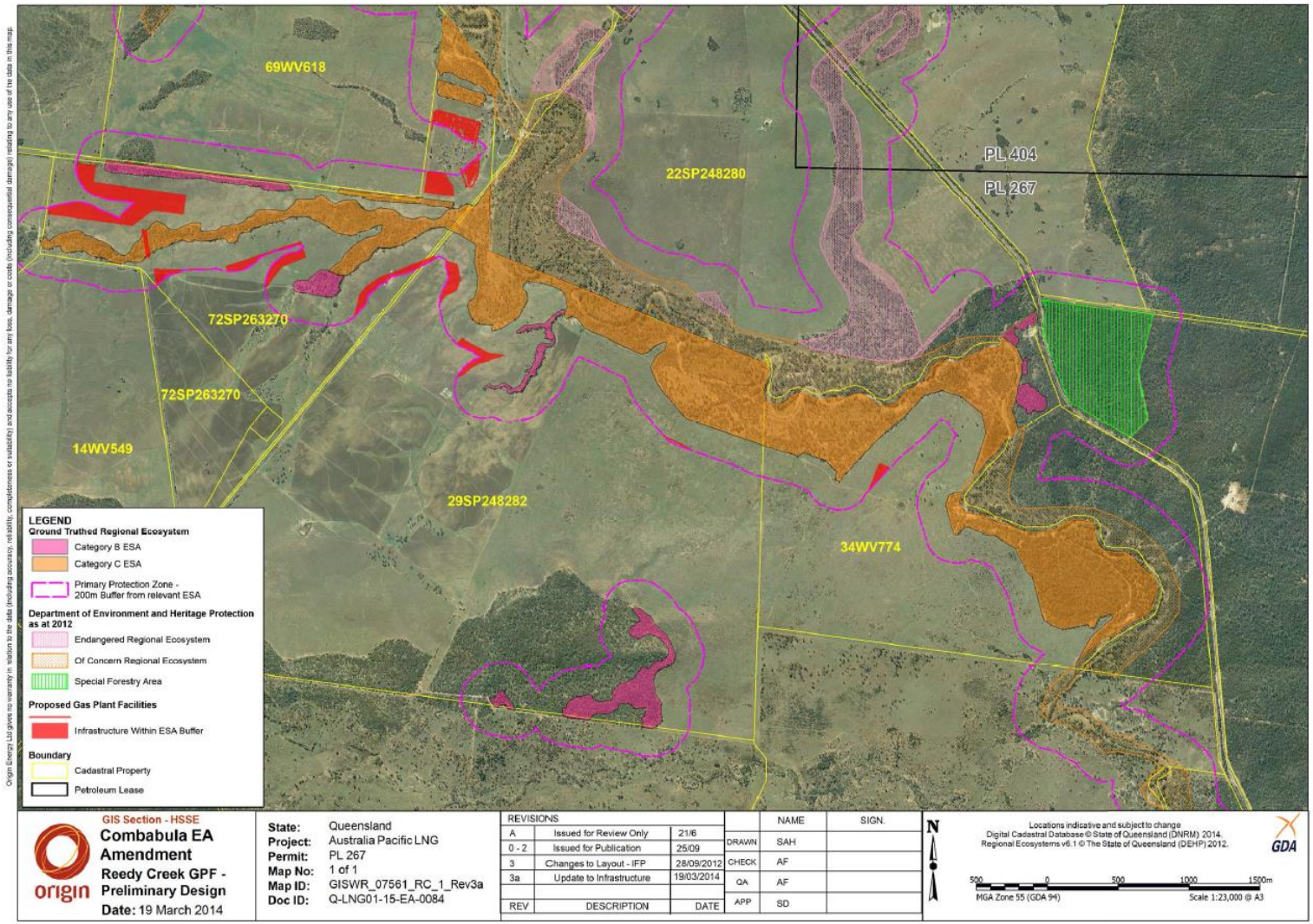


Figure 3 - PL404 – Disturbance within ESA buffers

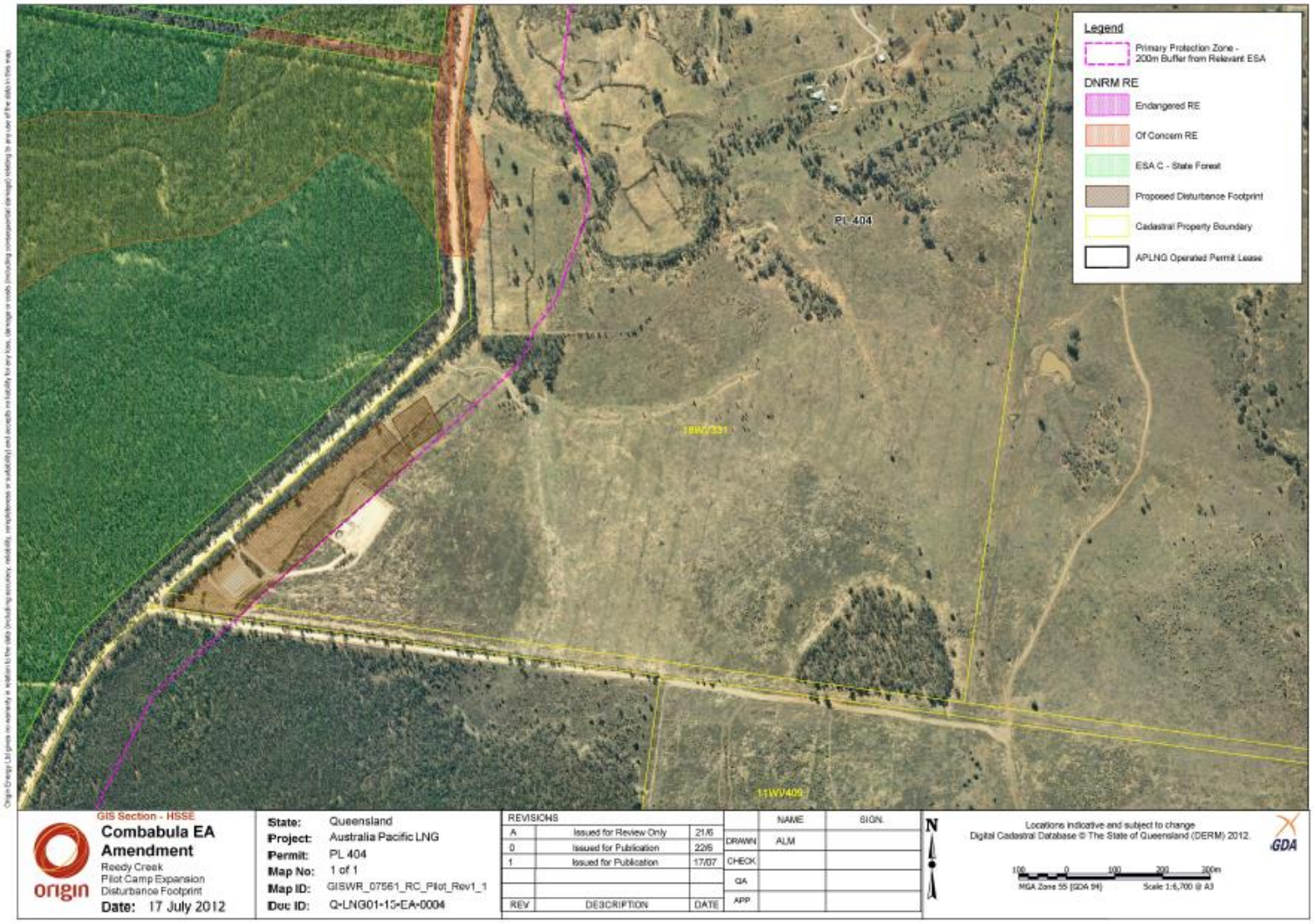


Figure 4 - PL297 – Disturbance within ESA buffers

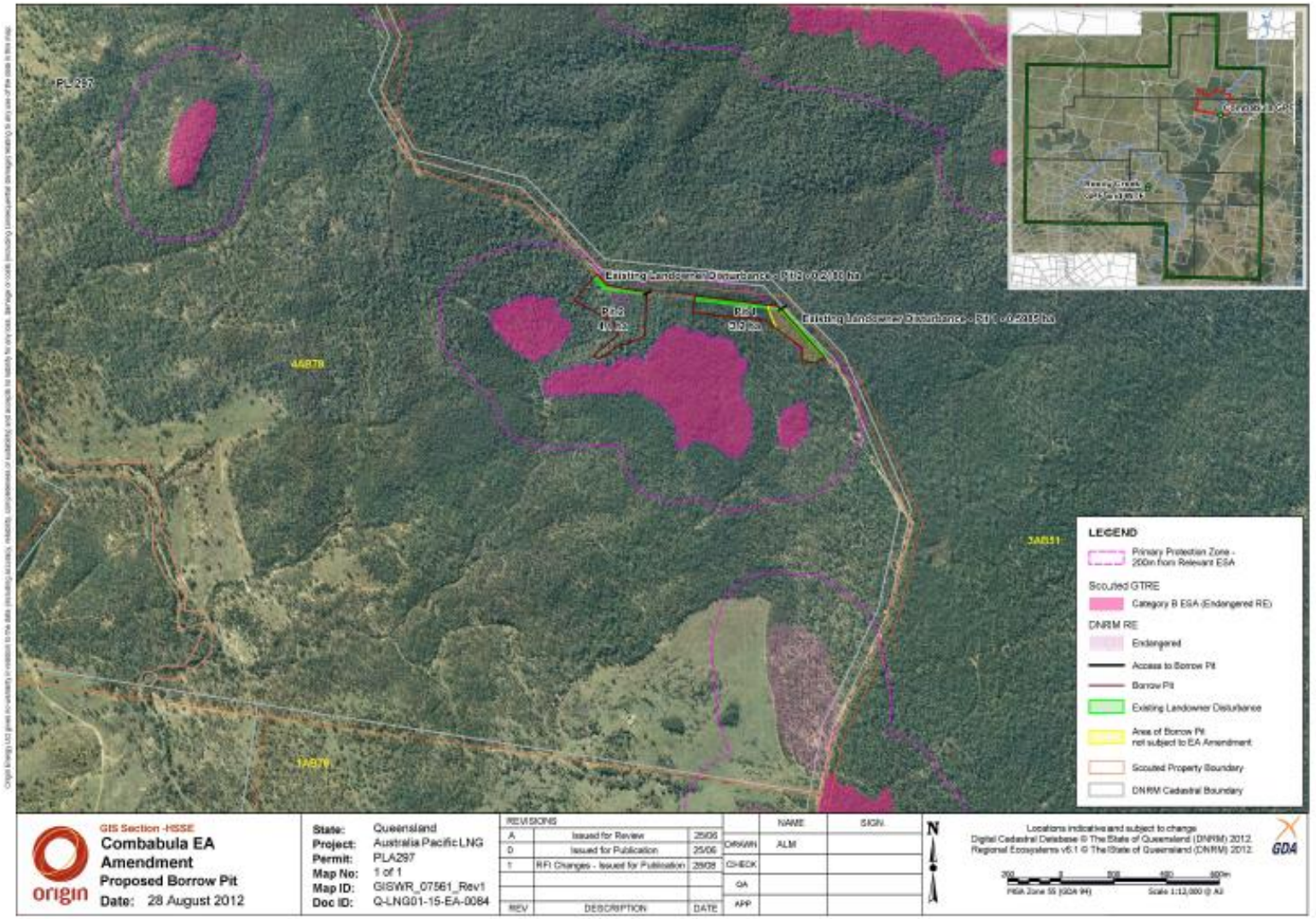


Figure 5 – PL406 – Disturbance within ESA buffers

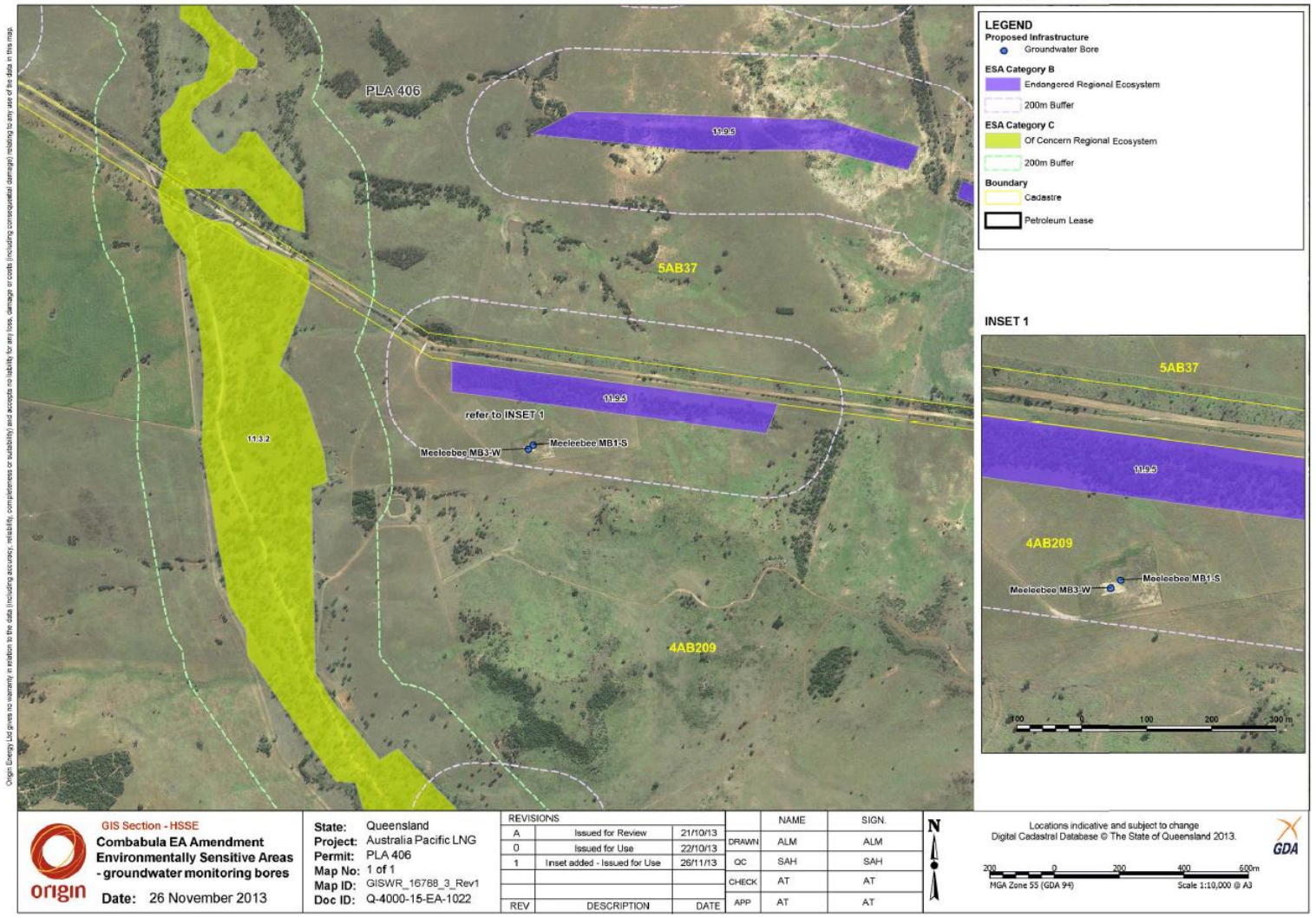


Figure 6 – PL408 – Disturbance within ESA buffers

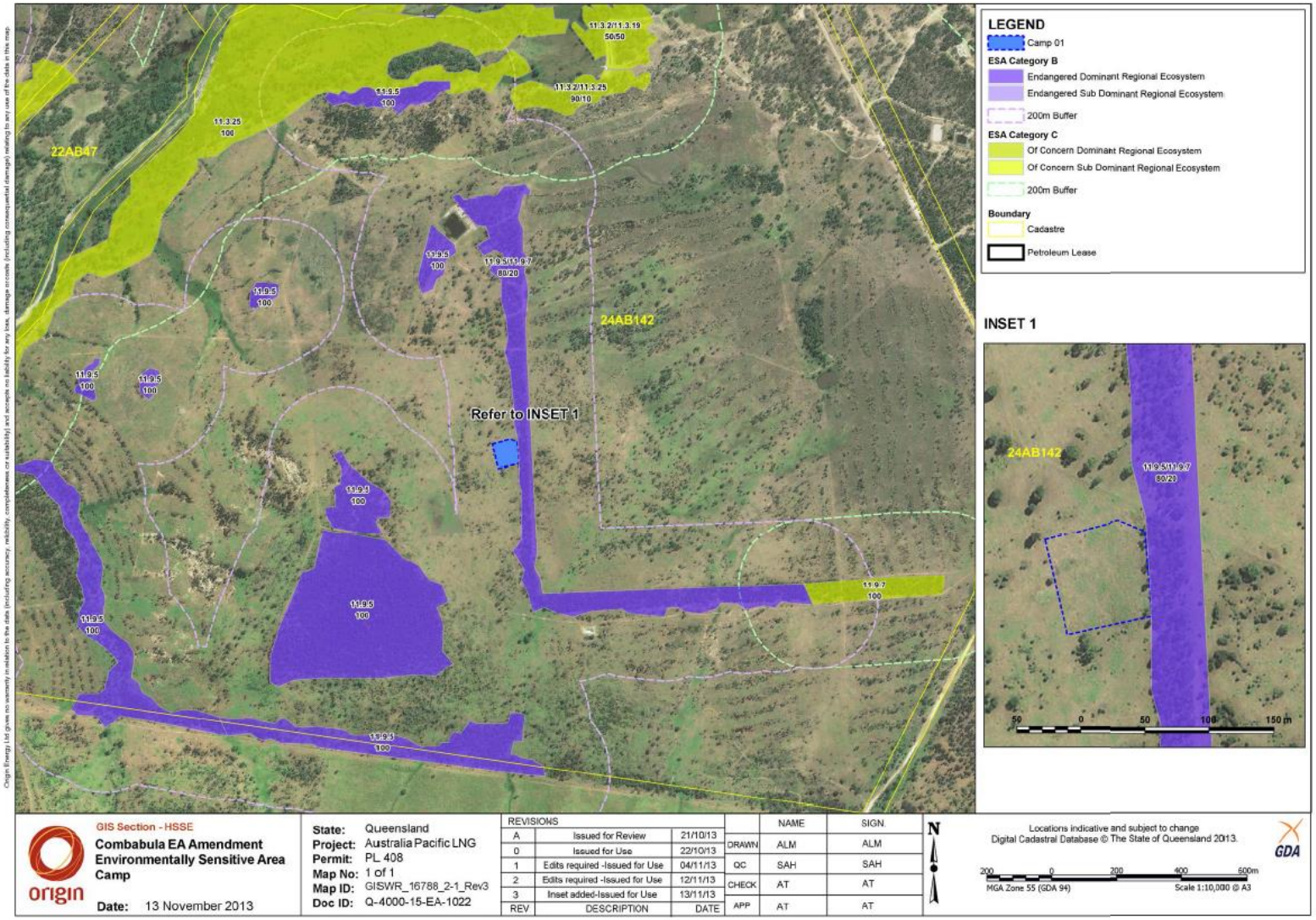


Figure 7 – PL 297 – Disturbance within ESA buffers

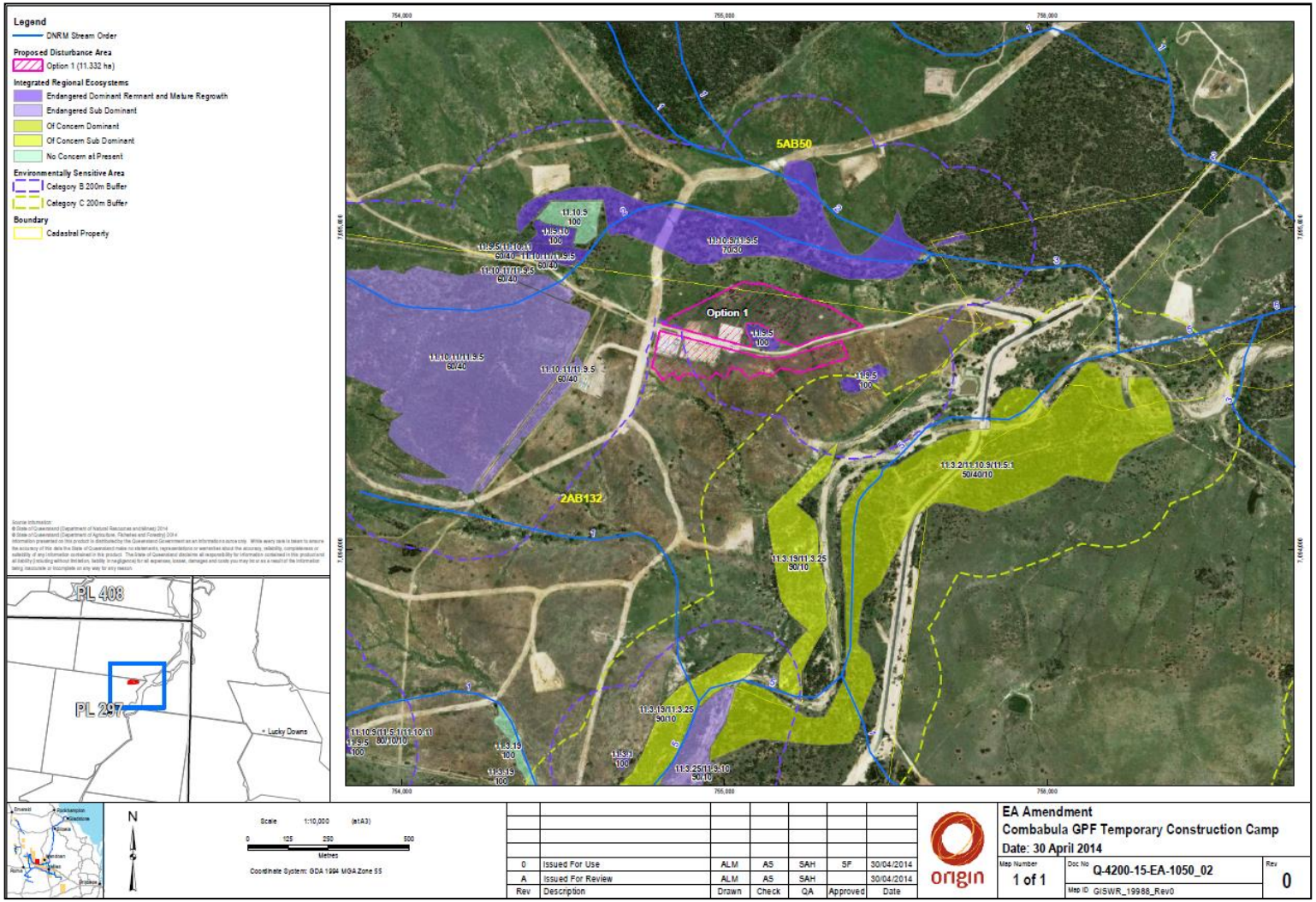
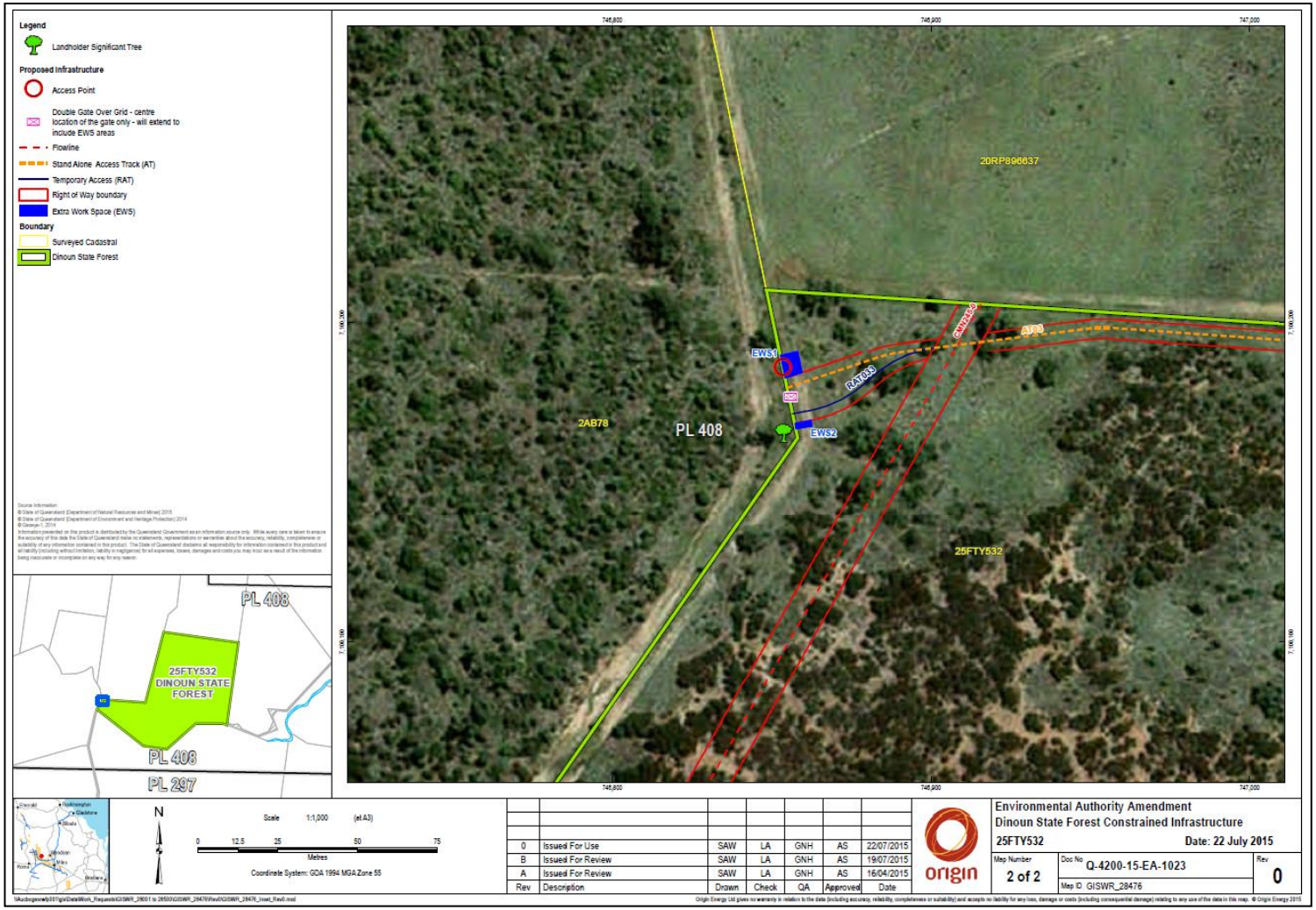


Figure 8 – PL 408 – Disturbance within ESA buffers



End of Part 3 – Combabula Development Area

PART 4 – Ramyard Development Area

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Resource Activity, Schedule 3, 06: A petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam	ATP606 ATP972 PL469 PL470 PL471 PL444
Resource Activity, Schedule 3, 08: A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	
Resource Activity, Ancillary 15 - Fuel burning, Using fuel burning equipment that is capable of burning at least 500kg of fuel in an hour	
Resource Activity, Ancillary 60 - Waste disposal, 2: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1)(b), (b) more than 2000t but not more than 5000t	
Resource Activity, Ancillary 63 - Sewage Treatment, 1: Operating sewage treatment works, other than no release works, with a total daily peak design capacity of, (a-ii) 21 to 100EP otherwise	

SCHEDULE A – GENERAL CONDITIONS

Authorised Petroleum Activities

(A1) This environmental authority authorises the carrying out of the following resource activities:

(a) the petroleum activities and specified relevant activities listed in *Schedule A, Table 1 - Authorised petroleum activities and specified relevant activities* to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable); and

(b) incidental activities that are not otherwise specified relevant activities.

(A2) The authorised resource activities are authorised subject to the conditions of this environmental authority.

(A3) This environmental authority does not authorise a relevant act to occur in carrying out an authorised resource activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Schedule A: Table 1 – Authorised Petroleum Activities

Authorised Petroleum Activity	Scale		Intensity
	Maximum size	Location	
Petroleum activities			
Coal seam gas production and exploration wells	100 wells	Within project area	100 wells
Specified relevant activities			
Stimulation activities	-	Within project area	100 wells
Regulated Dams <400megalitres	9ha	Within project area	1
Sewage Treatment plants (for each plant)	200 EP (total)	Within project area	2

Prevent or minimise likelihood of environmental harm

(A4) This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.

Maintenance of measures, plant and equipment

(A5) 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.

(A6) 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).

(A7) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this environmental authority must be calibrated and operated and maintained effectively in accordance with the manufacturer's specifications.

(A8) The holder of this authority must ensure that daily operation and maintenance of all plant and equipment relating to the authorised petroleum activities are carried out by suitably qualified, competent and experienced person(s).

(A9) All laboratory analyses and tests required to be conducted under this 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.

Contingency procedures for emergency environmental incidents

(A10) Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:

(a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.

(b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.

(c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.

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

(e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.

(f) training of staff to enable them to effectively respond.

(g) procedures to notify the administering authority, local government and any potentially impacted landholder.

Documentation and records management

(A11) A record of all documents required by this environmental authority must be:

(a) kept for a minimum of five years; and

(b) be made available to an authorised person upon request.

Infrastructure

(A15) The following infrastructure must be clearly and permanently marked for the life of the petroleum activity(ies) with a unique reference name / number in such a way that it is clearly observable:

a. regulated dams;

b. exploration, appraisal and development wells;

c. gas processing facilities;

d. water treatment facilities;

e. brine encapsulation facilities;

f. sewage treatment facilities;

g. authorised discharge points to air, land and waters;

h. any chemical storage facility associated with the environmentally relevant activity of chemical storage;

i. field compressor stations; and

j. central compressor stations.

Monitoring Program

(A16) All monitoring under this environmental authority must be undertaken by a suitably qualified person.

(A17) All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

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 Plan

(B2) For activities involving significant disturbance to land, control measures that are commensurate to the site-specific risk of erosion, and risk of sediment release to waters must be implemented to:

(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).

(B3) Top soil must be managed in a manner that preserves its biological and chemical properties.

(B4) Despite condition (B6), disturbance within 200m of a lake or spring, or 100m of the high bank of a watercourse is permitted for the activities at the locations described in *Schedule B – Table 1 – Authorised Activities in a Wetland, Lake, Spring or Watercourse Buffer*.

Schedule B: Table 1 - Authorised Activities in a Wetland, Lake, Spring or Watercourse Buffer

Tenure	Description of Activity	Location	Number of Activities	Maximum Size
ATP972	Tilt meters	Lot 31 on BWR704	2	300 m^2 each

Authorised impacts to wetlands

(B5) The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

Authorised activities in waters

(B6) Petroleum activities must not occur in or within 200m of a:

(a) wetland of high ecological significance

(b) Great Artesian Basin Spring

(c) subterranean cave GDE.

(B7) Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.

(B8) 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.

(B9) 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.

(B10) 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

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

(B11) The construction or maintenance of linear infrastructure authorised under condition (B7) must comply with the water quality limits as specified in *Protecting water values, Table 2—Release limits for construction or maintenance of linear infrastructure.*

Protecting water values, Table 2—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

(B12) Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (B11).

Register of activities in wetlands and watercourses

(B13) 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 (B12).

Activities in river improvement areas

(B14) Measures must be taken to minimise negative impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.

Activities in floodplains

(B15) 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; or
(b) divert flood flows from natural drainage paths and alter flow distribution; or
(c) increase the local duration of floods; or
(d) increase the risk of detaining flood flows.

SCHEDULE BB – GROUNDWATER

Seepage Monitoring Program

(BB1) 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 31 May 2015.

(BB2) The seepage monitoring program required by condition (BB1) 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 background and seepage monitoring bores for the trigger parameters identified in condition (BB2)(b) at a frequency, determined by a suitably qualified person and:

i. at least once every two years where baseline data has been established; or

ii. at least quarterly for two years to establish baseline data for any impact to groundwaters, after which time monitoring may continue at the frequency according to condition (BB2)(f)(i),

(g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (BB2(b)) and (BB2(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.

(BB3) If groundwater monitoring results indicate any significant changes in groundwater quality caused by petroleum activities, investigations into the potential for environmental harm, including the validation and verification of the source, cause and extent of contamination, must be completed

(BB4) The findings of the investigation must be included in a written report that is submitted in the next annual return. The report must detail the investigations that were carried out and the actions that were taken to prevent environmental harm.

SCHEDULE BC – SEWAGE TREATMENT

Release of Treated Sewage Effluent Contaminants to Land

(BC1) Sewage pump stations must be fitted with a stand-by pump and a visible or audible high-level alarm

(BC2) Treated sewage effluent may only be released to land by sub-surface or spray irrigation at designated, fenced contaminant release area(s).

(BC3) When weather conditions or soil conditions preclude the release of contaminants, the contaminants must be directed to on-site storage or lawfully disposed of off-site.

Quality of Contaminants Released from the Sewage Treatment Works

(BC4) Treated effluent must comply, at the sampling and in-situ measurement point(s), with each of the release limits specified in *Schedule BC, Table 1 - Treated Sewage Effluent Standards* for each quality characteristic.

(BC5) The release of contaminants to land must be monitored at the frequency and at the sampling and in-situ measurement point specified in *Schedule BC, Table 1 - Treated Sewage Effluent Standards.*

Treated Sewage Effluent Dust Suppression or Construction Activities

(BC6) Notwithstanding condition (BC2), treated sewage effluent that meets or exceeds the standards specified in *Schedule BC, Table 1 – Treated Sewage Effluent Standards* may be used for dust suppression or construction activities, provided the use meets the criteria in condition (BC7) as relevant to the use.

(BC7) The release of treated sewage effluent under condition (BC6) must:

(a) not exceed the amount required to effectively supress dust; and
(b) not cause on-site ponding or runoff; and
(c) be directly applied to the area being dust supressed; and
(d) not harm vegetation surrounding the area the subject of condition (BC6)

Schedule BC: Table 1 - Treated Sewage Effluent Standards

Discharge Type	Quality Characteristic	Sampling and in-situ measurement Point Location	Limit Type	Release Limit	Frequency
Irrigation at designated contaminant release areas	5-day Biochemical oxygen demand (inhibited)	E.g. Release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
	pH		range	6.0 to 9.0	
	E-Coli		80th percentile based on at least 5 samples with not less than 30 minutes	1000 cfu per 100 mL	

Discharge Type	Quality Characteristic	Sampling and in-situ measurement Point Location	Limit Type	Release Limit	Frequency
			between samples.		
			maximum	10000 cfu per 100 ml	
Use for dust suppression or construction activities	5-day Biochemical oxygen demand (inhibited)	E.g. Release pipe from sewage treatment plant	maximum	20 mg/L	Monthly
	pH		range	6.0 to 8.5	
	e-coli		80th percentile based on at least 5 samples with not less than 30 minutes between samples.	100 cfu per 100 mL	
			maximum	1000 cfu per 100 mL	

SCHEDULE D – LAND

General

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

Fauna Management

(D2) Measures must be employed to prevent fauna entrapment:

(a) during the construction of pipelines in pipe sections and pipeline trenches; or

(b) during the construction and operation of well infrastructure and dams.

Chemical and Fuel Storage

(D3) Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

SCHEDULE E – DISTURBANCE TO LAND

General

(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) The holder of this environmental authority, when carrying out (a) petroleum activity(ies) must:

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

(b) minimise the risk of injury, harm, or entrapment to wildlife and stock;

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

(d) manage topsoil in a manner that will preserve its biological and chemical properties;

(e) utilise stockpiled soils for rehabilitation purposes;

(f) prior to carrying out field-based activities, make all relevant staff, contractors or agents carrying out those activities, aware of the location of any category A, B or C ESAs and the requirements of this environmental authority.

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

(E4) In accordance with Condition (E3) above, if significant disturbance to land is unavoidable, the holder of this environmental authority must not clear vegetation or place fill:

(a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e. stepping stone or contiguous bioregional/local corridor networks) and/or results in an increase in threatening processes (e.g. potential impacts associated with edge effects or introduced species);

(b) in discharge areas.

(E5) Pipelines must be preferentially located alongside existing linear infrastructure such as roads, tracks and powerlines.

Disturbance to Land – Environmentally Sensitive Areas

(E6) Petroleum activities must be carried out in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas.*

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

ESA Category	Within the ESA	Primary protection zone of the ESA (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. Subject to Condition (E10) and (E11).
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to Condition (E10) and (E11).	Petroleum activities permitted.
Category C ESAs that are Nature Refuges Koala Habitat, Declared Catchment Areas	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted. Subject to Condition (E10) and (E11).	Petroleum activities permitted.
Category B ESAs that are 'Endangered' Regional Ecosystems Category C ESAs that are Essential Habitat, Essential Regrowth Habitat, Critically Limited or Threshold or 'Of Concern' Regional Ecosystems	Only essential petroleum activities permitted. Subject to condition (E8) and (E9).	Only essential petroleum activities permitted. Subject to Condition (E10) and (E11).	Petroleum activities permitted.
Category C ESAs that are Resource Reserves	Only essential petroleum activities permitted. Subject to condition (E8) and E9.	Only essential petroleum activities permitted. Subject to Condition (E10) and (E11).	Petroleum activities permitted.
Category C ESAs that are State Forests, Timber Reserves.	Only essential petroleum activities permitted. Subject to condition (E8) and E9.	Petroleum activities permitted.	Petroleum activities permitted.

(E7) Despite condition (E6) of this environmental authority, activities specified in *Schedule E, Table 2 – Authorised Activities in ESA*s are authorised under this approval.

Schedule E: Table 2 – Authorised Activities in ESAs

Tenure	Description of Activity(ies)	Number of Activities	Location
ATP972	Pilot flares Lot 31 BWR704	2	Within pre-existing disturbance of Primary

Tenure	Description of Activity(ies)	Number of Activities	Location
			Protection Zone of Category C ESA
ATP972	Tank pads Lot 31 BWR704	3	Within pre-existing disturbance of Primary Protection Zone of Category C ESA
ATP972	Laydown/washdown area Lot 31 BWR704	1	Within pre-existing disturbance of Primary Protection Zone of Category C ESA
ATP972	Telecommunications tower Lot 9 BWR118	1	Within pre-existing cleared land within Primary Protection Zone of Category C 'Of Concern Regional Ecosystem'.

(E8) Prior to carrying out essential petroleum activities undertaken within environmentally sensitive areas in accordance with *Schedule E: Table 1 - Petroleum Activities in Environmentally Sensitive Areas*, it must be demonstrated, in the following order of preference that:

1. no reasonable or practicable alternative exists for carrying out the essential petroleum activities within the environmentally sensitive area;
2. the essential petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance;

(E9) Linear infrastructure construction corridors must, for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area, be no greater than 40m in total width

(E10) Prior to carrying out essential petroleum activities subject to Condition (E6) within the primary and secondary protection zones of an environmentally sensitive area, the holder of the environmental authority must demonstrate, in the following order of preference:

1. The essential petroleum activities are preferentially located in areas of pre-existing disturbance.
2. Significant disturbance to land from the carrying out of the essential petroleum activities is minimised to the greatest extent practicable.

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

Disturbance to Land – Endangered and Of Concern Regional Ecosystems

(E12) The record of the assessment required by conditions (E1) and (E2) and the extent of significant disturbance to land in the following areas must be prepared for each annual return period and made available to the administering authority upon request:

(a) The Primary Protection Zone of, or within a Category B or C Environmentally Sensitive Area; and

(b) In the Secondary Protection Zone of Environmentally Sensitive Areas; and

(c) Other remnant vegetation areas; and

(d) Wetlands.

(E13) 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.

(E14) When requested by the administering authority, the holder of this environmental authority must enter into an agreement with the administering authority to provide an environmental offset to counterbalance the impacts of the activity on Endangered or Of Concern regional ecosystem.

Offsets

(E15) Prior to construction of significant construction work, the environmental authority holder must submit to the administering authority for approval an Environmental Offsets Strategy.

(E16) The Environmental Offset Strategy must address the Queensland Government Environmental Offset Policy 2008 and associated specific issue policies and includes requirements for listed/scheduled species under the *Nature Conservation Act 1992*. The strategy must address impacts on biodiversity, vegetation, wetlands, and coastal and marine areas arising from:

(a) exploration, development and operation of the coal seam gas fields; and
(b) other activities (e.g. construction camps, port works for the project, ancillary works).

(E17) The Environmental Offset Strategy must be supported by a program detailing the following:

(a) principles adopted for the environmental offsets strategy; and
(b) procedures to identify the requirements for environmental offsets for specific components of the project over the life of the project; and
(c) relevance to any legislative requirements for offsets; and
(d) mechanisms to secure and manage the environmental offset for long term protection of values; and
(e) location, size and values that must be offset; and
(f) location, size and values of the offsets proposed; and
(g) management measures, including funding, required to maintain or enhance values for the life of the offset, and
(h) a system for reporting to the CG on offset arrangements; their management; how offset values are met and maintained; and the reconciliation process.

(E18) The environmental authority holder must enter into an environmental offset agreement with the administering authority.

SCHEDULE H – WASTE

General

(H1) All general waste must only be removed from the site and sent to a recycling facility or disposal facility licensed to accept the waste under the *Environmental Protection Act 1994*.

(H2) All regulated waste must only be removed from the site by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a recycling facility or disposal facility licensed to accept the waste.

(H3) Waste must not be burned on the site unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

(H4) All waste fluids and muds resulting from drilling and exploration petroleum activities, including hydraulic fracturing activities if authorised by this environmental authority, must be contained in a lined dam or containment structure for off-site disposal, remediation or reuse.

(H5) Disposal of regulated waste associated with the use of radioactive tracers must only occur in a facility which has a minimum depth of 1.0m and a minimum radius of 5m at the following locations only:

- Well – Ramyard 23 (-26.449027, 149.733473)
- Well – Ramyard 24 (-26.446892, 149.734517)

(H6) Residual drilling material may be disposed of on-site by the mix-bury-cover method if the residual drilling material meets the approved quality criteria.

(H7) Residual drilling material or drilling by-products may be disposed of on-site if the method 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.

(H8) Pipeline waste water, may be released to land provided that it:

(a) can be demonstrated it meets the acceptable standards for release to land; and

(b) is released in a way that does not result in visible scouring or erosion or pooling or run- off or vegetation die-off.

Coal Seam Gas Water Management

(H9) The holder of this environmental authority must ensure that coal seam gas water is contained, is not released to land or waters and is only used for purposes specifically authorised:

(a) under this environmental authority; or

(b) under Section 186 of the *Petroleum and Gas (Production and Safety) Act 2004*; or

(c) under Section 86 of the *Petroleum Act 1923*; or

(d) under an approval of resource for beneficial use as provided for under the *Environmental Protection Act 1994.*

Produced water use

(H10A) Produced water may be re-used in:

(a) drilling and well hole activities; or

(b) stimulation activities.

(H10B) Produced water from the authorised petroleum activity(ies) may be used for irrigation, dust suppression, construction, operational and incidental land management purposes for the petroleum activity(ies) authorised by this environmental authority. The use of produced water must not cause:

(a) on-site ponding;

(b) runoff from the site where the resource is applied;

(c) vegetation die-off;

(d) visible salting; or

(e) serious or material environmental harm.

(H10C) Produced water from the authorised petroleum activity(ies) which is used for:

(a) domestic, stock or stock intensive purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time;

(b) irrigation purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for irrigation purposes, as amended from time to time.

Transfer of Assets

(H10D) Despite condition (Common Conditions Schedule (R8)), the holder of the environmental authority is authorised to transfer produced water to a low consequence dam, left in-situ for beneficial use, in accordance with the following:

(a) The landholder must agree in writing to the transfer ownership of the low consequence dam;

(b) The landholder must agree in writing to the beneficial re-use of produced water;

(c) The dam must be assessed as being a low consequence dam 12 months prior to the transfer of water;

(d) suitably qualified person must identify that the dam is adequate for the intended on-going use by the landholder within three months prior to transfer the transfer of the dam;

(e) a suitably qualified person must identify that the low consequence dam and the land on which it is located, must be safe, stable, non-polluting and able to support the post-activity land use within three months prior to the transfer of the dam;

(f) On cessation of the transfer of water, low consequence dams must be decommissioned to no longer accept inflow from the petroleum activity(ies);

(g) Produced water transferred to the landholder must meet the relevant quality guidelines for the intended purpose prior to the water being given;

Produced Water – Third Party Use Off Tenure

(H10E) Produced water may be transferred to a third party to be used off tenure for the following purposes:

(a) Dust suppression, construction, operational and incidental land management purposes;

(b) livestock watering purposes; and

(c) irrigation purposes.

(H10F) If the responsibility of produced water is given or transferred to a third party for use off tenure, the holder of environmental authority must ensure that:

(a) the water meets the relevant quality guidelines for the intended purpose prior to the water being given;

(b) the responsibility of the produced water is given or transferred in accordance with a written agreement (the third-party agreement) signed by both parties to the agreement; and

(c) the third party is made aware of the General Environmental Duty (GED) under s. 319 of the E*nvironmental Protection Act 1994,* environmental sustainability of the water disposal and protection of environmental values of waters.

Produced Water – Third Party Use Generally

(H10G) The environmental authority must ensure that the water meets the relevant quality guidelines for the intended purpose prior to the water being given on:

(a) initial transfer of the water; and
(b) thereafter monthly.

(H10H) Written agreement for the use of produced water by a third party must include the following in writing:

(a) the intended use of the water;
(b) confirmation that the water meets ANZECC and ARMCANZ Water Quality Guidelines for the approved use;
(c) confirmation that the produced water being provided is compliant with the environmental authority conditions; and
(d) a current and complete laboratory certificate of analysis that outlines the quality of the produced water as per the ANZECC and ARMCANZ Water Quality Guidelines

(H10I) The holder of this environmental authority must cease using, selling or giving away produced water immediately upon becoming aware that:

(a) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at or before the point of supply; or
(b) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at the point in which it is used by a third party.

(H10J) When the produced water is transferred to a third party, the holder of the environmental authority must retain the following records of the resource:

(a) origin of the produced water;
(b) intent of the water;
(c) date of dispatch of the produced water;
(d) location of delivery of the produced water to the third-party user by real property description;
(e) date of delivery of the produced water to the third party;
(f) contact details for the person responsible for the use of the produced water at the site of use;
(g) quantity (volume) of the produced water supplied;
(h) relating to sampling and monitoring including: laboratory results, field data and monitoring report; and
(i) any written procedures developed to manage the produced water.

(H10K) Upon written agreement, the administering authority must be notified with the following details:

(a) the person responsible for the use of the produced water;
(b) the location of use of the produced water; and
(c) the intended use of the produced water.

Coal Seam Gas Water Management Criteria

(H11) Prior to the commencement of each petroleum activity authorised by this environmental authority, Coal Seam Gas Water Management Criteria need to be developed and implemented which must:

(a) be developed in accordance with section 126(1)(e) of the *Environmental Protection Act 1994*;
(b) be consistent with the requirements of this environmental authority.

Brine and Salt Management

(H12) Following the completion of the petroleum activity(ies), any residual brine and/or solid salt present in any dam must be removed and transported to a facility that can lawfully reuse, recycle or dispose of such waste under the *Environmental Protection Act 1994*.

SCHEDULE J – WELL CONSTRUCTION, MAINTAINANCE AND HYDRAULIC FRACTURING ACTIVITIES

Stimulation Risk Assessment

(J1) Prior to undertaking hydraulic fracturing activities, a risk assessment must be developed to ensure that hydraulic fracturing activities are managed to prevent environmental harm.

(J2) The stimulation risk assessment must assessment must 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 hydraulic fracturing activity to be applied, including equipment and a comparison to best international practice;

(b) provide details of where, when and how often hydraulic fracturing 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 hydraulic fracturing 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 hydraulic fracturing 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 hydraulic fracturing activities (e.g. microseismic measurements, modelling etc.);

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

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

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

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

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

(i) toxicological and ecotoxicological information of chemicals used;

(ii) information on the persistence and bioaccumulation potential of the chemicals used;

(iii) identification of the hydraulic fracturing fluid chemicals of potential concern derived from the risk assessment;

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

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

(v) an environmental hazard assessment of leaving chemicals used in stimulation fluids in the target gas producing formation for extended periods subsequent to hydraulic fracturing;

(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 hydraulic fracturing activities;

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

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

(J3) The stimulation risk assessment must be carried out for every well to be stimulated prior to hydraulic fracturing activities being carried out at that well.

(J4) The hydraulic stimulation risk assessment required by Conditions (J1) and (J2) must be reviewed at least annually and when new or additional toxicological information becomes available for the chemicals used.

(J5) The updated hydraulic stimulation risk assessment required by Condition (J4) must be provided to the administering authority upon request.

Stimulation Activities

(J6) The holder of this environmental authority must take all reasonable and practicable measures to ensure the stimulation activities must not:

(a) cause the connection of a target gas producing formation and another aquifer; and

(b) result in a change of water quality other than that within the stimulation impact zone of the target gas producing formation.

(J7) The holder of this environmental authority must have procedures in place capable of as soon as practicable detecting any fractures that are not contained within the target coal seam formation that results in the condition described in (J6).

(J8) Rectification measures must be taken immediately if the holder of this environmental authority either becomes aware that stimulation activities have resulted in a change in water quality other than that within the stimulation impact zone of the target gas producing formation or that stimulation activities have caused the connection of the target gas producing formation and another aquifer.

(J9) If the holder of this environmental authority becomes aware of a fracture that has not been contained within the target coal seam formation steps to remedy the lack of containment must be taken immediately, much may include but not be limited to plugging and abandoning the well.

(J10) Oil based drilling muds must not be used in the carrying out of the petroleum activity(ies).

(J11) Synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).

(J12) Restricted stimulation fluids must not be used in stimulation.

Stimulation Monitoring

(J13) Prior to undertaking any stimulation activity, the holder of this environmental authority must undertake a baseline bore assessment of the quality of:

(e) all active landholders' groundwater bores (subject to access being permitted by the landholder) that are:
   i. located within a one kilometre horizontal radius of a well subject to stimulation activity(ies); and
   ii. within 200 metres vertically of the target location for the stimulation activity(ies); and

(f) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings of the hydraulic stimulation risk assessment required by Conditions (J1) and (J2).

(J14) Prior to undertaking any stimulation activity(ies), the holder of this environmental authority must undertake a baseline well assessment of the quality of water in each well to be stimulated provided the formation has sufficient yield to produce a representative sample.

(J15) The baseline bore and well assessments must include relevant parameters to be monitored in order to establish baseline water quality and must include, but not necessarily be limited to:

(a) pH;
(b) electrical conductivity [μS/m];
(c) turbidity [NTU];
(d) total dissolved solids [mg/L];
(e) temperature [ºC];
(f) dissolved oxygen [mg/L];
(g) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L];
(h) alkalinity (bicarbonate, carbonate, hydroxide and total as $CaCO_3$) [mg/L];
(i) residual alkali [mg/L];
(j) sodium adsorption ratio (SAR);
(k) anions (bicarbonate, carbonate, hydroxide, chloride, fluoride, sulphate) [mg/L];
(l) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L];
(m) dissolved and total metals (including but not necessarily being limited to: aluminium, arsenic III, cadmium, copper, iron, lead, manganese, mercury, nickel and zinc) [μg/L];
(n) total petroleum hydrocarbons [μg/L];
(o) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene) [μg/L];
(p) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [μg/L];
(q) sodium hypochlorite [mg/L];
(r) sodium hydroxide [mg/L];
(s) formaldehyde [mg/L];
(t) ethanol [mg/L]; and
(u) gross alpha radiation[Bq/L].

(J16) A Stimulation Impact Monitoring Program which has been certified by a suitably qualified person must be developed prior to the carrying out of stimulation activities.

(J17) The Stimulation Impact Monitoring Program must be able to detect adverse impacts to water quality from stimulation activities and must include, but not necessarily be limited to:

(a) consideration of the findings of the risk assessment required by Conditions (J1) and (J2) that relate to stimulation activities; and

(b) provision of monitoring for relevant analytes that will enable detection of adverse impacts from the stimulation activity(ies) including chemical compounds that are actually or potentially formed by chemical reactions with each other or coal seam materials during the stimulation activity(ies); and

(c) provision of monitoring of the quality of stimulation fluids, coal seam gas water produced from every stimulated well and landholders' bores for parameters relevant to baseline bore and well assessments to enable data referencing and comparison which is to include, but not necessarily be limited to the parameters in Condition (J16)(a) – (J16)(t).

(J18) The Stimulation Impact Monitoring Program must provide for the analysis of the quality and quantity of stimulation fluids to be used for the stimulation event at least once prior to undertaking the stimulation activity. Quality monitoring must include, but not be necessarily limited to, the parameters in Condition (J16)(a) – (J16)(t).

(J19) The Stimulation Impact Monitoring Program must provide for monitoring of the quantity and quality of coal seam gas water produced from every stimulated well after stimulation but prior to its containment for the parameters including, but not necessarily limited to, those in Condition (J16)(a) – (J16)(t) at a minimum frequency of:

(a) daily or in 15% increments of produced fluid until a volume of coal seam gas water equivalent to 150% of the stimulation fluid volume used in the stimulation activity has been pumped out of the stimulated well; and

(b) monthly thereafter for six months or until parameters listed in Condition (J16)(b), (J16)(n) – (J16)(t) and where applicable to stimulation activities, Condition (J16)(u), are not detected in concentrations above baseline well monitoring data on two consecutive monitoring occasions.

(J20) The Stimulation Impact Monitoring Program must provide for impact monitoring of the quality of water, for the for the parameters including, but not necessarily limited to, those in Condition (J16)(a) – (J16)(t), in:

(a) all active landholders' groundwater bores (subject to access being permitted by the landholder that are located:

(i) within a one kilometre horizontal radius of a well subject to stimulation activity(ies); and

(ii) within 200 metres vertically of the target location for the stimulation activity(ies); and

(b) any other bore that could potentially be adversely impacted by the stimulation activity(ies) in accordance with the findings risk assessment required by Conditions (J1) and (J2).

(J21) The monitoring of bores required by Condition (J21) must be carried out at least:

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

(b) annually for the first five years subsequent to the stimulation activity(ies) being undertaken or until analytes listed in Condition (J16)(b), (J16)(n) – (J16)(t) and where applicable to stimulation activities, Condition (J16)(u), are not detected in concentrations above baseline bore monitoring data on two consecutive monitoring occasions.

Note: Monthly monitoring required by condition (J22)(a) may extend beyond six (6) months depending on the outcomes of the risk assessment and the transmissivity of groundwater in the area.

(J22) Notwithstanding Conditions (J18) – (J21), the Stimulation Impact Monitoring Program must provide for monitoring of gross alpha radiation in stimulation fluids, coal seam gas water produced from the stimulated well and in landholders' bores as per Condition (J21) when radioactive tracers are used in the stimulation activity.

(J23) The holder of this environmental authority must implement the Stimulation Impact Monitoring Program.

(J24) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE M – DEFINITIONS

Key terms and/or phrases used in this document are defined in this section. Applicants should note that where a term is not defined, the definition in the Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.*

Refer to Appendix A for definitions for this Part.

End of Part 4 – Ramyard Development Area

APPENDIX A – Section 1 Definitions

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td>acceptable standards for release to land</td><td>means wastewater of the following quality as determined by monitoring results or by characterisation:
a. electrical conductivity (EC) not exceeding 3000µS/cm
b. sodium adsorption ratio (SAR) not exceeding 8
c. pH between 6.0 and 9.0
d. heavy metals (measured as total) meet the respective short term trigger value in section 4.2.6, Table 4.2.10—Heavy metals and metalloids in Australian and New Zealand Guidelines for Fresh and Marine Water Quality
e. does not contain biocides.</td></tr>
<tr><td>accepted engineering standards</td><td>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.</td></tr>
<tr><td>acid sulfate soils</td><td>means soil or sediment containing highly acidic soil horizons or layers affected by the oxidation of iron sulfides (actual acid sulfate soils) and / or soil or sediment containing iron sulfides or other sulfidic material that has not been exposed to air and oxidised (potential acid sulfate soils). The term acid sulfate soil generally includes both actual and potential acid sulfate soils. Actual and potential acid sulfate soils are often found in the same soil profile, with actual acid sulfate soils generally overlying potential acid sulfate soil horizons.</td></tr>
<tr><td>active</td><td>for the purposes of landholders' groundwater bores means bores that are able to continue to provide a reasonable yield of water in terms of quantity for the bores authorised purpose or use.</td></tr>
<tr><td>administering authority</td><td>means:
• 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
• for all other matters – the Chief Executive of the Department of Environment and Science; or another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under other enacted legislation.</td></tr>
<tr><td>Aggregation dam</td><td>means a dam that is used to aggregate and contain CSG water prior to use, treatment or disposal of that water (by means other than evaporation). The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.</td></tr>
<tr><td>AHD</td><td>means Australian Height Datum and is the datum used for the determination of elevations in Australia. The determination uses a national network of benchmarks and tide gauges and sets mean sea level at zero elevation.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>analytes</td><td>means a chemical parameter determined by either physical measurement in the field or by laboratory analysis.</td></tr>
<tr><td>annual exceedance probability or AEP</td><td>is the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year.</td></tr>
<tr><td>appraisal well</td><td>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.</td></tr>
<tr><td>approved quality criteria for mix–bury-cover</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:

<u>Part A</u> In all cases:
<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>pH</td><td>6–10.5 (range)</td></tr>
<tr><td>Electrical Conductivity</td><td>20dS/m (20,000µS/cm)</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>Chloride*</td><td>8000mg/L</td></tr>
</table>

*Chloride analysis is only required if an additive containing chloride was used in the drilling process
The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing.
Part B If any of the following metals are a component of the drilling fluids, then for that metal:
<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>Arsenic</td><td>20mg/kg</td></tr>
<tr><td>Selenium</td><td>5mg/kg</td></tr>
<tr><td>Boron</td><td>100mg/kg</td></tr>
<tr><td>Cadmium</td><td>3mg/kg</td></tr>
<tr><td>Chromium (total)</td><td>400mg/kg</td></tr>
<tr><td>Copper</td><td>100mg/kg</td></tr>
<tr><td>Lead</td><td>600mg/kg</td></tr>
</table>

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:
<table>
<tr><th>TPH</th><th>Maximum concentration</th></tr>
<tr><td>C6-C10</td><td>170mg/kg</td></tr>
<tr><td>C10-C16</td><td>150mg/kg</td></tr>
<tr><td>C16-C34</td><td>1300mg/kg</td></tr>
<tr><td>C34-C40</td><td>5600mg/kg</td></tr>
<tr><td>Total Polycyclic Aromatic Hydrocarbons (PAHs)</td><td>20mg/kg</td></tr>
<tr><td>Phenols (halogenated)</td><td>1mg/kg</td></tr>
<tr><td>Phenols (non-halogenated)</td><td>60mg/kg</td></tr>
<tr><td>Monocyclic aromatic hydrocarbons
(Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)</td><td>7mg/kg</td></tr>
<tr><td>Benzene</td><td>1mg/kg</td></tr>
</table>
</td></tr>
<tr><td>associated works</td><td>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.</td></tr>
<tr><td>bed and banks</td><td>for a watercourse or wetland means land over which the water of the watercourse or wetland normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed or banks that is from time to time covered by floodwater.</td></tr>
<tr><td>beneficial use</td><td>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 and Waste Reduction and Recycling Act 2011.
o sustainable by virtue of written undertakings given by that owner to maintain that dam; and
o the transfer and use have been approved or authorised under any relevant legislation; or
o with respect to coal seam gas water, refer to the Queensland Government Operational Policy - Management of water produced in association with petroleum activities and Notice of decision to approve a resource for beneficial use – CSG water as amended from time to time.</td></tr>
<tr><td>biodiversity values</td><td>for the purposes of this environmental authority, means
(a) environmentally sensitive areas;
(b) wetlands;
(c) ecosystem functioning; and
(d) ecological connectivity (i.e. stepping stone or contiguous bioregional/local corridor networks).</td></tr>
<tr><td>bore</td><td>means a water observation bore or a water supply bore that is either sub-artesian or artesian.</td></tr>
</table>

brine	means saline water with a total dissolved solid concentration greater than 40 000 mg/l.
brine dam	means a regulated dam that is designed to receive, contain or evaporate brine.
bund or bunded	in relation to spill containment systems for fabricated or manufactured tanks or containers designed to a recognised standard means an embankment or wall of brick, stone, concrete or other impervious material which may form part or all of the perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or bunded area) is sometimes colloquially referred to within industry as the bund. The bund is designed to contain spillages and leaks from liquids used, stored or processed above ground and to facilitate clean-up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.
calendar year	means a period of 365 or 366 days beginning 1 January and ending 31 December.
clearing	For Part 1, 3 and 4, 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.
	For Part 2 means: ○ in relation to grass, scrub or bush—the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include— • the flattening or compaction of vegetation by vehicles if the vegetation remains living; or • the slashing or mowing of vegetation to facilitate access tracks; or • the clearing of noxious or introduced plant species; or • destroying standing vegetation by stock ; and ○ in relation to trees—cutting down, ringbarking, pushing over, poisoning or destroying in any way, but does not include – • lopping a tree.
consequence	in relation to a structure as defined, means the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.
consequence category	means a category, either low, significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures.
construction	in relation to a dam includes building a new dam and modifying or lifting an existing dam but does not include investigations and testing necessary for the purposes of preparing a design plan.
dam	means a land-based structure or a void that is designed to contain, divert or control flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does *not* mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.
dam crest volume	means the volume of material that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls without regard to flows entering or leaving (e.g. via a spillway).
design plan	is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.
design storage allowance or DSA	means an available volume, estimated in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, prepared by the Department of Environment and Heritage Protection, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.

<table>
<tr><td>discharge area</td><td>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 Environment and Resource Management 5011, as amended from time to time; or
identified by an approved salinity hazard map held by the Department of Environment and Science</td></tr>
<tr><td>drilling by-product</td><td>means waste drilling materials including muds, liquids and cuttings from well holes which do not contain hydrocarbon sheen above the following hydrocarbon fractions:
<table>
<tr><th>TPH</th><th>Maximum concentration</th></tr>
<tr><td>C6-C10</td><td>170mg/kg</td></tr>
<tr><td>C10-C16</td><td>150mg/kg</td></tr>
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<tr><td>Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)</td><td>7mg/kg</td></tr>
<tr><td>Benzene</td><td>1mg/kg</td></tr>
</table></td></tr>
<tr><td>electrical distribution equipment</td><td>means infrastructure that does not exceed a capacity of 500 kilo-volt amps (kVA) and is necessary for providing electric power to wellheads for undertaking petroleum activities.</td></tr>
<tr><td>end</td><td>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.</td></tr>
<tr><td>equivalent person or EP</td><td>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.</td></tr>
<tr><td>essential petroleum activities</td><td>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 of disturbance and multi-well sites not exceeding 1.5 hectares of disturbance.
well sites with monitoring equipment (including monitoring bores) or tanks for above ground fluid storage:
for single well sites, not exceeding 1.25 hectares disturbance;
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:
for single well sites, not exceeding 1.5 hectares disturbance;
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:
water pumps and generators;
flare pits;
chemical / fuel storages;</td></tr>
</table>

	○ 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) ○ pipe laydown areas; ○ soil and vegetation stockpile areas; ○ a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works; ○ temporary administration sites and warehouses; ○ dust suppression activities using water that meets the quality and operational standards approved under the environmental authority • communication and powerlines 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).
evaporation dam	means a land based structure designed to contain coal seam gas water, the purpose of which is to contain, impound or evaporate the water.
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.
facilities	in the context of waste disposal, refers to the definition provided in Schedule 2, Part 12 (60)(4)(a) of the *Environment Protection Regulation 2019*.
feed pond	means a land-based structure used to contain untreated coal seam gas water prior to its treatment in a water treatment facility.
fill	means any kind of material in solid form (whether or not naturally occurring) capable of being deposited at a place but does not include material that forms a part of, or is associated with, a structure constructed in a watercourse, wetland or spring including a bridge, road, causeway, pipeline, rock revetment, drain outlet works, erosion prevention structure or fence.
floodplain	has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that— • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and • has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island in the watercourse.
flowable substance	means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.
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
high water production period	means any year commencing 1 January up to and including 31 December of that same year when the total rate of produced treated water under the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme is between 38 ML/d and 45 ML/d as an annual average.
high bank	means the defining terrace or bank or, if no bank is present, the point on the active floodplain, which confines the average annual peak flows in a watercourse.
hydraulic impact zone	is the area within which a pressure increase due to injection can be measured. For the practical purposes of this Guideline it is defined within a boundary where a 0.1m pressure change can be predicted through modelling.
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 consequence category *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures*, prepared by the Department of Environment and Science , as amended from time to time.
inferred lithology	means the best available description of the lithology based upon historical drilling records, interpretation of logs and any other information that the suitably qualified person may have discovered.
infrastructure	means plant or works including for example, communication systems, compressors, powerlines, pumping stations, reservoirs, roads and tracks, water storage dams, evaporation or storage ponds and tanks, equipment, buildings and other structures built for the purpose and duration of the conduct of the petroleum activity(ies) including temporary structures or structures of an industrial or technical nature, including, for example, mobile and temporary camps. Infrastructure does not include other facilities required for the long-term management of the impact of those petroleum activities or the protection of potential resources. Such other facilities include dams other than water storage dams (e.g. evaporation dams), pipelines and assets, that have been decommissioned, rehabilitated, and lawfully recognised as being subject to subsequent transfer with ownership of the land.
Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme	means the Coal Seam Gas Water Management activities authorised under Part 1 and Part 2 of EPPG00968013
irrigation demand	means the total volume of treated coal seam gas water supplied to landholders for irrigation purposes when measured at all off-take points along the Fairymeadow Road pipeline (PPL185).
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 Part 4, for the purposes of hydraulic fracturing 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, powerlines, pipelines, flowlines, roads and access tracks.

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 consequence dam	means any dam that is not a high or significant consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures.
low impact petroleum activities	For Part 1, 3, and 4, means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land. Examples of such activities include but are not necessarily limited to soil surveys, topographic surveys, cadastral surveys and ecological surveys and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.
	For Part 2, 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, permanent damage to vegetation, or negative impacts that cannot be easily rehabilitated (e.g. using hand tools) immediately after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, installation of environmental monitoring equipment and traversing land by car or foot via existing access tracks or routes.
low water production period	means any year commencing 1 January up to and including 31 December of that same year when the total rate of produced treated water under the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme is less than 38 ML/d as an annual average.
mandatory reporting level or MRL	means a warning and reporting level determined in accordance with the criteria in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures prepared by the Department of Environment and Science, as amended from time to time.
meter	means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe.
mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=10–8m/s) or subsoil with a clay content of greater than 20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and • topsoil is replaced.
Monitoring bore lease	For Part 2, means single well site monitoring bore leases not exceeding 1ha of disturbance
Monreagh Dam	means a dam located on Lot35 SP142792 used to contain treated CSG water to be used for irrigation.
	•
multi monitoring bore leases	For Part 1, means a multi-well site monitoring bore lease required to measure formation pressure and gas levels for the purposes of the Condamine River Gas Seepage Investigation and not exceeding 1.5 hectares of disturbance.
no flow conditions	means any 24-hour period when the mean river flow of the receiving waters specified in *Schedule B, Table 1 – Treated CSG water release point and receiving environment* is less than 1 ML/d.
oil-based drilling mud	means mud where the base fluid is a petroleum product such as diesel fuel.
operational period	means the period commencing immediately after the transitional period.
peak water production period	means any year commencing 1 January up to and including 31 December of that same year when the total rate of produced treated water under the Integrated Condabri-Talinga Coal Seam Gas Water Management Scheme exceeds 45 ML/d as an annual average.

permanent	means infrastructure or facilities that are lasting or intended to last for the life of the project and is not temporary or mobile.
pest	means species: • declared under the *Land Protection (Pest and Stock route Management) Act 2002*; • declared under Local Government model local laws; and • which may become invasive in the future.
petroleum activity	for this environmental authority means an authorised resource activity listed under the heading Petroleum activities in *Schedule A, Table 1 – Authorised petroleum activities*.
pipeline waste water	means hydrostatic testing water, flush water or water from low point drains.
Primary Protection Zone	means an area within a 200 metre buffer from the boundary of any Category A, B or C Environmentally Sensitive Area.
produced treated water	means the total volume of treated CSG water produced by the Talinga and Condabri water treatment facilities measured at the outlets of each water treatment facility.
project area	For Part 1, means the Walloons Development Area located within the boundaries of the Petroleum Facility Licence (PFL) 26, Petroleum Lease (PL) 215, PL 216, PL 225, PL 226, PL 272, PL 289.
	For Part 2, means the Condabri Development Area located within the boundaries of Petroleum Lease (PL) 265, PL 266, PL 267, PL 1011 and Petroleum Pipeline Licence (PPL) 186.
	For Part 3, means the Combabula Development Area located within the boundaries of Authority to Prospect (ATP)606, Petroleum Lease (PL)297, PL403, PL404, PL405, PL406, PL407, PL408, PL412, PL413, and Water Monitoring Authority (WMA)2013.
	For Part 4, means the Ramyard Development Area located within the boundaries of Authority to Prospect (ATP) 606, ATP972, Petroleum Lease (PL) 469, PL470, PL471, and PL444.
release day	For Parts 1 and 2, means the 24-hour period when treated CSG water is released from the release point specified in *Schedule B, Table 1 – Treated CSG Water release point and receiving environme*nt.
regulated dam	means any dam in the significant or high consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (ESR/2016/19339), published by the administering authority, as amended from time to time.
residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.
restricted stimulation fluids	For Part 1 and 3, 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.
	For Part 4, 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. For clarity, the term restricted stimulation fluids only applies to fluids injected down well post-perforation.
	For Part 2, means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals, unless otherwise provided for under 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.
river flow	means the mean river flow for the release day as measured by the gauge at the Chinchilla Weir, as specified *in Schedule B, Table 4 – Stream flow gauging station.*

Secondary Protection Zone	in relation to a Category A, Category B or Category C Environmentally Sensitive Area means an area within a 100 metre buffer from the boundary of the Primary Protection Zone.
Secondary treated class C standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L 5-day biochemical oxygen demand (inhibited) (e.g. Release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-Coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 10 000cfu per 100mL, maximum 100 000cfu per 100mL
severe weather event	means a potentially hazardous or dangerous weather event that is not directly related to severe thunderstorms, tropical cyclones or bushfires.
significantly disturbed land or significant disturbance to land or significant disturbance	means disturbance to land as defined in Schedule 12, section 4 of the *Environmental Protection Regulation 2008*. (1) Land is significantly disturbed if— (a) it is contaminated land; or (b) it has been disturbed and human intervention is needed to rehabilitate it— (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance. Examples of a disturbance to land— • the covering, compaction, exposure, removal or stockpiling of soil or other material • the destruction or removal of vegetation • the carrying out of a mining activity in a watercourse or wetland • the submergence of an area with a hazardous contaminant, tailings, or water (2) Without limiting subsection (1)(b), land requires human intervention to rehabilitate it if— (a) the disturbance has made the land more susceptible to erosion; or (b) the land use capability or suitability of the land is diminished; or (c) the quality of water in a watercourse downstream of the land has been significantly reduced. (3) If land is significantly disturbed land because it is contaminated land, it ceases to be significantly disturbed land if a suitability statement is issued for the land. (4) If land is significantly disturbed land under subsection (1)(b), it ceases to be significantly disturbed land if the administering authority is satisfied the land has been rehabilitated— (a) to the condition it was in immediately before the disturbance; or (b) to another condition decided by the administering authority.
spring	means the land to which water rises naturally from below the ground and the land over which the water then flows.
spillway	means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.
stage 1 – Injection Management Plan	means data gathering, well construction for hydrology and geochemistry, injection fluid characterisation, hydrological assessment, initial hydrogeological conceptual modelling.
stage 2 – Field Test Program of the CSG Water Injection Trial	means the CSG injection trial, hydrogeochemical reaction assessment, full field hydrogeological model development and injection system design.
stage 3 – Full Scale CSG Water Injection	means the construction and operation of a full-scale system for CSG water injection and hydrogeological model verification and refinement.

stimulation	means a technique used to increase the permeability of natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments. This definition is restricted from that in the *Petroleum and Gas (Production and Safety) Act 2004* in order to only capture the types of stimulation activities that pose a risk to environmental values of water quality in aquifers.
Stimulation fluid	For Part 1, and 3, means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir.
	For Part 4, means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.
stimulation impact zone	means a 100 metre maximum radial distance from the stimulation target location within a gas producing formation.
stormwater management infrastructure	means structural and engineered control devices designed to capture, manage or treat stormwater. Stormwater management infrastructure can include, but not necessarily be limited to: • levees; • culverts; and • swales.
subterranean cave GDE	For Part 1, 3, and 4 • 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.*
suitably qualified and experienced person	For Part 1, 2 and 3 in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the Professional Engineers Act 2002, and has demonstrated competency and relevant experience: • for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design. • for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments. Note: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.
suitably qualified person	means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature.
suitably qualified third party	means a person who: (a) has qualifications and experience relevant to performing the function including but not limited to: (1) a bachelor's degree in science or engineering; and (2) 3 years' experience in undertaking soil contamination assessments; and (b) is a member of at least one organisation prescribed in Schedule 14 of the Environmental Protection Regulation 2019; and not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
sump	For Part 1, 2, and 3, 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.
system design plan	means a plan that manages an integrated containment system that shares the required DSA volume across the integrated containment system.
Third party	For Part 2 and 3, person or company that does not operate under the regulation of the environmental authority.
third party auditor	means a suitably qualified person who is either a certified third-party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day-to-day management and operation of the petroleum activity(ies) covered by this environmental authority.
threatening processes	means processes, features and actions that can have a detrimental effect upon the health and viability of an area of vegetation (e.g. altered hydrology, land use practices, invasion by pest and weed species, land degradation, edge effects and fragmentation).
tolerable limits	means a range of parameters regarded as being sufficient to meet the objective of protecting relevant environmental values (e.g. a range of settlement for a tailings capping, rather than a single value, could still meet the objective of draining the cap quickly, preventing damage and limiting infiltration and percolation).
top soil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300 mm in depth from the natural surface.
transmissivity	means the rate of flow of water through a vertical strip of aquifer which is one unit wide and which extends the full saturated depth of the aquifer.
treated CSG water	For Part 1 means reverse osmosis treated coal seam gas water.
trenchless methods	means construction methods for the installation of pipelines and cables below the ground with minimal excavation. Trenchless methods can include, but not necessarily be limited to: • moling • pipe ramming method • horizontal directional drilling • utility tunnelling, pipe jacking, auger boring • micro tunnelling and pipe jacking • on-line replacement.
transitional period	means the period until the earlier of either a) when the irrigation demand reaches a maximum of 12.8 GL/annum average for a 30-day period, or b) 30 June 2015.
unacceptable risk	For Part 1, 3, and 4, means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 *Risk Management* or any updated version that becomes available from time to time.
	For Part 2, is when the results of a hazard assessment indicates that there is both a high hazard and a high likelihood of an event occurring such that the risk is classified as “high”, “very high” or “extreme”.
void	means any man-made, open excavation in the ground (includes borrow pits, drill sumps, frac pits, flare pits, cavitation pits and trenches).
waste and resource management hierarchy	has the meaning provided in section 9 of the *Waste Reduction and Recycling Act 2011* and is the following precepts, listed in the preferred order in which waste and resource management options should be considered— (a) AVOID unnecessary resource consumption (b) REDUCE waste generation and disposal (c) RE-USE waste resources without further manufacturing (d) RECYCLE waste resources to make the same or different products (e) RECOVER waste resources, including the recovery of energy (f) TREAT waste before disposal, including reducing the hazardous nature of waste (g) DISPOSE of waste only if there is no viable alternative.
waste and resource management	has the meaning provided in section 4(2)(b) of the *Waste Reduction and Recycling Act 2011* and means the: (a) polluter pays principle

principles	(b) user pays principle (c) proximity principle (d) product stewardship principle.
water quality impact zone	For Part 1 and 3, is the area within which a measurable change in water quality parameters or characteristics due to injection is apparent.
waters	For Part 1, 2 and 4, 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.
as above	For Part 3, includes all or any part of a creek, river, stream, lake, lagoon, dam, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
watercourse	has the meaning in Schedule 4 of the Environmental Protection Act 1994 and means: (1) a river, creek or stream in which water flows permanently or intermittently— (a) in a natural channel, whether artificially improved or not; or (b) in an artificial channel that has changed the course of the watercourse. (2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
watercourse, wetland, lake or spring with state significant biodiversity values	are those described in Appendix 1 of the Queensland Biodiversity Offsets Policy.
well infrastructure	For Part 3 and 4, means infrastructure required for the construction, completion and operation of a well including but not limited to cellar pits, dams and drill sumps.
Well lease infrastructure	For Part 2, means infrastructure required for the construction and completion of a well including but not limited to cellar pits, dams and drill sumps.
well site	means a maximum area of land disturbance for the purposes of constructing, installing and operating an exploration, appraisal or development well or such wells as part of a multi-well arrangement and includes well lease infrastructure.
wetlands	for the purposes of the environmental authority means: • areas shown on the Map of Referable Wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and • are wetlands as defined under the Queensland Wetlands Program as areas of permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six metres, and possess one or more of the following attributes: o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or o the substratum is not soil and is saturated with water or covered by water at some time. The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
wetland of high ecological significance	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.
wetland of other environmental value	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'general environmental significance' or wetland of 'other environmental value' on the Map of referable wetlands.
80th percentile	in relation to release limits means that not more than one of the measured values is to exceed the stated release limit for any five consecutive samples where:

	• the consecutive samples are taken over a five-month period; and • the consecutive samples are taken at approximately equal periods.

SECTION 2

Part 5 (INJUNE), PART 6 (LONESOME & MEMBRANCE) AND PART 7 (MURRUNGAMA)

Part 5 – Injune Development Area

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Petroleum activity	Authority To Prospect (ATP) 592

Condition 1 – Significant disturbance

The holder of the environmental authority must ensure that petroleum activities do not cause more than 4 ha of any land to be significantly disturbed at a petroleum works site at any one time.

Condition 2 – Work Program

The holder of the environmental authority must submit to the administering authority a copy of the original or any amended work program that has been approved by the Department of Mines and Energy for the relevant petroleum authority, 8 business days before commencing activities, or additional or varied activities covered by the program.

Condition 3 – Financial assurance

(a) 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.

(b) 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.

Environmentally sensitive areas

PESCA 3.

Only low impact petroleum activities can be undertaken within Category B Environmentally Sensitive Areas (ESAs) or Category C ESAs other than state forests or timber reserves; or within the primary protection zone of Category A ESAs.

Explanatory note: Category A ESAs are excised from DAA, WMA and ATP tenure types and therefore petroleum activities cannot occur in these areas.

PESCA 4.

Only essential petroleum activities can be undertaken in:

(a) the primary protection zone of Category B ESAs or Category C ESAs other than state forests or timber reserves

(b) the secondary protection zone of Category A ESAs or Category B ESAs

(c) Category C ESAs that are state forests or timber reserves.

PESCA 5.

Essential petroleum activities carried out in a primary protection zone must:

(a) be located in areas of pre-existing disturbance; and

(b) not negatively impact the ESA.

Condition 4.

Despite condition (PESCA 4), the infrastructure (and associated activities necessary for construction, operational and maintenance purposes) specified in *Table 1 – Authorised Petroleum Activities within Environmentally Sensitive Areas and their Projection Zones* are permitted in the locations specified the table.

Table 1 – Authorised Petroleum Activities within Environmentally Sensitive Areas and their Projection Zones

Description of Activities	Location
Telecommunication Infill Site 45 (70m x 70m)	Existing cleared land on Lot 4 Plan SP204532 within 500m of Category B 'Endangered Regional Ecosystem' Environmentally Sensitive Area
Telecommunication Infill Site 48 (70m x 70m)	Existing cleared land on Lot 11 Plan AB153 within 500m of Category B 'Endangered Regional Ecosystem' Environmentally Sensitive Area
Telecommunication Infill Site 49 Access Track (Total 2.9km @ 6m width)	Existing cleared land on Lot 8 Plan AB227 and Lot 4 Plan AB68 within 500m of Category B 'Endangered Regional Ecosystem' Environmentally Sensitive Area
Temporary disturbance for grid and gate installation (EWS399) And Temporary disturbance for a tie-in point (EWS504)	Existing cleared land on Lot 3 Plan SP204532 within 500m of Category B 'Endangered Regional Ecosystem' Environmentally Sensitive Area
Temporary disturbance for pilot testing activities (EWS515) and Temporary disturbance for grid and gate installation (EWS508)	Existing cleared land on Lot 72 Plan WT327 within 500m of Category B 'Endangered Regional Ecosystem' Environmentally Sensitive Area

Site planning

PESCB 5.

Prior to carrying out petroleum activities, the location of petroleum activities must be selected to:

(a) firstly avoid, then minimise, then mitigate any negative impacts on areas of vegetation or other areas of ecological value

(b) minimise disturbance to land that may otherwise result in land degradation

(c) minimise isolation, fragmentation or dissection of tracts of vegetation that would lead to a reduction in the current level of ecosystem functioning or ecological connectivity

(d) minimise clearing of mature or hollow bearing trees.

PESCB 6.

Records must be kept to demonstrate compliance with standard condition (PESCB 5).

PESCB 7.

Prior to any significant disturbance to land:

(a) an ecological assessment of areas with native vegetation that are to be significantly disturbed, must be conducted in accordance with the Queensland Government's Biocondition, a Condition Assessment Framework for Terrestrial Biodiversity in Queensland, Assessment Manual; and

(b) an assessment of the impacts that will occur as a result of significant disturbance to land must be undertaken.

Soil management

PESCC 14.

Measures to minimise stormwater entry onto significantly disturbed land must be implemented and maintained.

PESCC 15.

Sediment and erosion control measures to prevent soil loss and deposition beyond significantly disturbed land must be implemented and maintained.

Condition 7 – Vegetation management

The holder of the environmental authority must:

(a) prevent or minimise disturbance to vegetation by petroleum activities;

(b) manage the effects of clearing to prevent the loss of biodiversity, reduction of ecological processes and land degradation;

(c) consider whether it is feasible to avoid clearing, and where viable alternatives exist, must not clear vegetation:

i. in, or within 50 metres of, the high bank of a watercourse;
ii. in, or within 50 metres of the static high water mark of, wetlands, lakes or springs;
iii. in a way that isolates clumps or dissects corridors of vegetation;
iv. on slopes greater than 5%;
v. on dispersible soils; and
vi. in existing or potential discharge areas.

Condition 8 – Protection of riverine areas

The holder of the environmental authority must:

(a) ensure that there is no significant disturbance in riverine areas containing permanent water except where necessary for the construction and/or maintenance of roads, tracks and pipelines that are essential for carrying out the authorised petroleum activities and no reasonable alternative location is feasible; and

(b) minimise disturbance of all other riverine areas.

Condition 9 – Erosion and sedimentation control

The holder of the environmental authority must prevent or minimise:

(a) erosion of areas disturbed by petroleum activities; and

(b) sedimentation of any waters as a result of petroleum activities.

Condition 10 – Dust Management

The holder of the environmental authority (petroleum activities) must ensure that dust or particulate matter or both resulting from a petroleum activity does not cause an environmental nuisance at any sensitive or commercial place.

Condition 12 – Waste Management

The holder of the environmental authority must:

(a) ensure that petroleum activities do not result in the release or likely release of a contaminant to land or waters that results in material or serious environmental harm, unless the release is explicitly authorised under this environmental authority; and

(b) remove and dispose of all regulated waste to a licensed waste disposal facility or recycling facility.

Condition 13 - Sewage Treatment and Disposal for Temporary Camps

The holder of this environmental authority must ensure that:

(a) plant and equipment used for sewage treatment or disposal is installed, maintained and operated in a proper and efficient manner;

(b) untreated and treated sewage effluent is not released to waters;

(c) the disposal of sewage effluent does not cause the contamination of any water used for drinking or domestic purposes or manufacturing purposes or for consumption by animals;

(d) where sewage sludge is buried on land the sludge is covered with at least 250mm of soil and where practicable located above known flood levels;

(e) irrigation of sewage effluent on land must be in accordance with National Water Quality Guidelines – Use of Reclaimed Water;

(f) surface ponding of effluent on land disposal area(s) shall be minimised and managed in a way that does not cause nuisance;

(g) public access to any sewage effluent land disposal area must be denied during the release of contaminants to the land and until the irrigation/disposal area has dried.

Condition 14 – Storage of hazardous substances, fuel and oil

The holder of the environmental authority must ensure that storage facilities for all hazardous, flammable and combustible liquids:

(a) are within an on-site containment system;

(b) are controlled in a manner that prevents material or serious environmental harm;

(c) are maintained in accordance with Section 2.3 for minor storages and Section 5.9 for storages above 10 000 L of AS 1940 Storage and Handling of Flammable and Combustible Liquids; and

(d) are equipped with measures, appropriate to the risks to the surrounding environment, to minimise the risk of spills and ensure early detection of spills.

Condition 15 – Spills and clean up action

Notwithstanding the other conditions of this environmental authority, if a hazardous contaminant is released to waters or land, the holder of the environmental authority must:

(a) take immediate action to stop any further release;

(b) take immediate action to contain the hazardous contaminant to the affected area, taking particular care to protect environmentally sensitive areas;

(c) restore or rehabilitate the environment to its condition before the release occurred; and
(d) take necessary action to prevent a recurrence of the release.

Condition 16 - Associated water

(a) The holder of the environmental authority must ensure that associated water that, at the time it is produced is a hazardous waste, as determined from Table 1 of Appendix B of this environmental authority, is not released to land or waters, other than to an evaporation pond constructed and managed in accordance with Appendix B.

(b) The holder of the environmental authority must ensure that associated water that, at the time it is produced, is not a hazardous waste, is not released to land or waters other than to an appropriate evaporation pond.

(c) Despite (a) and (b) the holder of the environmental authority may apply to the administering authority to amend this environmental authority to allow associated water to be released to a containment for domestic or stock purposes managed by the landowner/occupier, provided the owner/occupier has:

i. given written permission to the holder for discharge to the containment;
ii. given written advice to the administering authority about the proposed storage and use; and
iii. given an assurance to the administering authority that the associated water will not be released to land or waters in a way that has the potential to cause material or serious environmental harm.

(d) Despite (a) and (b) the holder of the environmental authority may apply to the administering authority to amend this environmental authority to allow associated water that meets a nominated set of water quality standards (after treatment if necessary) to:

i. be released to land or waters; or
ii. be used for a specified purpose, provided the potential user has given written advice about the proposed use and environmental safeguards that will be implemented to prevent material or serious environmental harm.

(e) If the associated water complies with a *Notice of decision to approve a resource for beneficial use* under section 66L of the *Environmental Protection (Waste Management) Regulation 2000* it can be used in accordance with the Notice for the stated type of use(s).

Condition 16a - Produced water use

Produced water may be re-used in:

(a) drilling and well hole activities; or

(b) stimulation activities.

Condition 17 – Dams and evaporation ponds

The holder of the environmental authority must ensure all dams and evaporation ponds are:

(a) designed, constructed, operated, maintained and decommissioned in accordance with the criteria outlined in Appendix B; and

(b) not located within 100 m of any watercourse, waterway, wetland or lake.

Condition 18 – Dams, Ponds and other Excavations

For dams, ponds and other excavations which are constructed as part of the petroleum activities, the holder of the environmental authority must where relevant either:

(a) provide safe access for livestock and wildlife where contained water has appropriate quality; or

(b) construct and maintain bunds and/or fences sufficient to exclude livestock.

Condition 20 – Infrastructure

All infrastructure, constructed by or for the holder of the environmental authority, including water storage structures, must be removed by the holder from the site and the site rehabilitated according to condition 19, prior to surrender of the petroleum authority, except where it is to remain with the written agreement of the administering authority and post petroleum authority landowner/holder.

Condition 23 - Stimulation

Stimulation activities using stimulation fluid that contains chemical additives where polycyclic aromatic hydrocarbons are in concentrations above the reporting limit are not authorised.

Condition 24

The petroleum activities must not involve well stimulation activities at a well located within 2 kilometres laterally of a landholder's active groundwater bore and sourced from a formation within 200 metres vertically of the stimulation impact zone.

Condition 25

Prior to undertaking well stimulation activities, written stimulation management procedures must be developed.

Condition 26

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.

Definitions

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

AS 2885 Australian Standard Pipelines – Gas and Liquid Petroleum

Associated water for this environmental authority is underground water produced from a petroleum well during the course of or resulting from carrying out petroleum activities. Associated water may be potable, suitable for stock purposes, saline, high in fluoride, contaminated by hydrocarbons, and/or otherwise contaminated by a hazardous contaminant. It may be classified as a **hazardous waste** (See Appendix B).

Clearing has the meaning in the dictionary of the *Vegetation Management Act 2000*.

Commercial place means a place used as an office or for business or commercial purposes.

Development plan - Under the P & G Act holders of petroleum authorities must submit a development plan for a petroleum lease or proposed petroleum lease. The plan gives detailed information about the nature and extent of activities to be carried out under the relevant lease.

Discharge area is:
(a) that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
(b) identified by an assessment process consistent with the document: Salinity Management Handbook, Queensland Department of Natural Resources, 1997; or
(c) identified by an approved salinity hazard map held by the Department of Natural Resources and Mines.

Dissects corridors of vegetation means clearing vegetation that results in a break more than 50 metres wide across a corridor.

Dispersible soils are soils in which clay material disintegrates into particles less than 2 microns across. This can be observed within 24 hours when soil crumbs are submerged in distilled water.

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.

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End means the stopping of the particular activity that has caused a significant disturbance in a particular area. It refers to, among other things, the end of a seismic survey or the end of a drilling operation. It does not refer to the end of all related *activities such as rehabilitation*. In other words, it does not refer to: the "completion" of the particular activity, the time at which the petroleum authority ends or the time that the land in question ceases to be part of an authority. Under the *APPEA Code* "completion" refers to the point at which the particular survey, program or operation has been rehabilitated and abandoned.

Environmental nuisance is unreasonable interference or likely interference with an environmental value caused by:
(a) noise, dust, odour, light; or
(b) an unhealthy, offensive or unsightly condition because of contamination; or
(c) another way prescribed by regulation.

Essential habitat means an area identified as essential habitat for a species of wildlife listed as endangered, vulnerable, rare, or near threatened under the Nature Conservation Act 1992 on a map prepared by the chief executive officer of the Environmental Protection Agency and certified by the chief executive officer of the Department of Natural Resources and Mines for the purposes of the *Vegetation Management Act 1999*.

Essential Petroleum Activity means activities that are essential to bringing the resource to the surface and are only the following:

- low impact petroleum activities
- single well sites not exceeding 1 hectare disturbance and multi-well sites not exceeding 1.5 hectare disturbance
- associated infrastructure located on a well site necessary for the construction and operations of wells:
  - water pumps and generators
  - flare pits
  - above ground containers and chemical / fuel storages
  - sumps for residual drilling material and drilling fluids
  - dams to contain stimulation flow back waters that are not significant or high hazard dams
  - erosion and sediment and control structures
  - pipe laydown and vegetation stockpile areas
  - a temporary camp associated with a drilling rig that may involve sewage treatment works that are no release works.
- 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
- ecological surveys, geophysical surveys, topographic or cadastral surveys or geological surveys (including seismic and geotechnical petroleum activities)
- gathering / flow pipelines from a well head to the initial compression facility
- supporting access tracks

Evaporation pond means a dam or interceptor pond constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the pond.

Environmentally sensitive area (as determined from the EPA GIS data base) means a location, however large or small, that has environmental values that contribute to maintaining biological diversity and integrity, have intrinsic or attributed scientific, historical or cultural heritage value, or are important in providing amenity, harmony or sense of community.

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*.

Flow line is a small diameter pipeline through which fluids move on a petroleum lease before being sold.

Gathering line is a pipeline to convey crude oil or gas from a production facility to a processing plant, compressor station, flow line or transmission pipeline.

Hazardous contaminant means a contaminant that, if improperly treated, stored, disposed of or otherwise managed, is likely to cause serious or material environmental harm because of—
(a) its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability; or
(b) its physical, chemical or infectious characteristics.

High bank - The defining bank is the terrace or bank or, if no bank is present, the point on the active floodplain, which confines the average annual peak flows.

Land degradation includes the following:
(a) soil erosion;
(b) rising water tables;
(c) the expression of salinity;
(d) mass movement by gravity of soil or rock;
(e) stream bank instability; and
(f) a process that results in declining water quality.

Landholder's active groundwater bore 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*.

Licensed waste disposal facility is a facility approved under a development approval and operated by a holder of a registration certificate for environmentally relevant activity item number 75 under Schedule 1 of the *Environmental Protection Regulation 1998*.

Low impact petroleum activity means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.

Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads, pipelines etc), which is to be left by *agreement* with the landowner.

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

Petroleum authority includes Authority to Prospect, Petroleum Lease, Data Acquisition Authority, Water Monitoring Authority, Petroleum Facility Licence, Survey Licence and Pipeline Licence issued or granted under the *Petroleum Act 1923* or *Petroleum and Gas (Production and Safety) Act 2004.*

Petroleum project is all petroleum activities conducted on one or more petroleum authorities as a single integrated operation. To be a single integrated operation, the activities must be:
(a) carried out under the day-to-day management of a single responsible person, for example, a site or operations manager;
(b) operationally interrelated;
(c) operated in a way that leads to a lower risk of environmental harm being caused by the activities; and
(d) carried out at two or more places at or about the same time, and the places where they are carried out are separated by distances short enough to make feasible the integrated day to day management of the activities.

Petroleum works site is a separate location on the area subject to a petroleum authority where certain petroleum activities are undertaken; including a well site, production facilities, evaporation pond, compressor site and campsite. The following petroleum activities are excluded from the definition of *petroleum works site*: roads and tracks, seismic survey lines, and non-licensed gathering systems.

Potential discharge area - Low lying parts of the landscape (relative to adjacent terrain) where groundwater movements are within 2-5m of the land surface and the landscape may be subject to upward movement of groundwater in the future.

Primary Protection Zone means an area within 200 metres from the boundary of any Category A, B or C environmentally sensitive area.

Release of a contaminant into the environment, includes –
(a) to deposit, discharge, emit or disturb the contaminant; and
(b) to cause or allow the contaminant to be deposited, discharged, emitted or disturbed; and
(c) to fail to prevent the contaminant from being deposited, discharged, emitted or disturbed; and
(d) to allow the contaminant to escape; and
(e) to fail to prevent the contaminant from escaping.

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

Riverine area refers to the land confined to the flood flow channel of a watercourse.

Secondary Protection Zone in relation to a Category A or Category B environmentally sensitive area means an area within 100 metres from the boundary of the primary protection zone.

Sediment pond means a bunded or excavated structure used to contain and settle waterborne sediment running off significantly disturbed areas.

Sediment trap means a device used to filter waterborne sediment running off significantly disturbed areas. This may include silt fences, hay bales or grassed strips.

Significantly disturbed land and **significant disturbance** means land that is:
(a) contaminated land; or
(b) disturbed and human intervention is needed to rehabilitate it:
to a state required under the relevant environmental authority; or
if the environmental authority does not require the land to be rehabilitated to a particular state – to its state immediately before the disturbance.

Examples of a disturbance to land:

(a) areas where soil has been compacted, removed, covered, exposed or stockpiled;
(b) areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion;
(c) areas where land use suitability or capability has been diminished;
(d) areas within a watercourse, waterway, wetland or lake where petroleum activities occur and human intervention is necessary to restore or stabilise the disturbed area;
(e) areas submerged by hazardous waste storage and dam walls in all cases;
(f) areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after petroleum activities have ceased; or
(g) areas where land has become contaminated land and a suitability statement has not been issued.

However, for the purpose of this environmental authority the following areas **are not** significantly disturbed:
(a) areas off the petroleum authority (e.g. roads or tracks which provide access to the petroleum authority).
(b) areas previously significantly disturbed which have been rehabilitated to the administering authority's satisfaction.
(c) areas under permanent infrastructure.
(d) areas that were significantly disturbed prior to the grant of the environmental authority unless those areas are re-disturbed by the holder of the environmental authority during the term of the authority.
(e) minor disturbances such as drill sumps and minor respreading of soil on GPS located seismic lines.

State wildlife corridor means an area identified as State wildlife corridor on a map prepared by the chief executive officer of the Environmental Protection Agency and certified by the chief executive officer of the Department of Natural Resources and Mines for the purposes of the *Vegetation Management Act 1999*. The map showing areas of State wildlife corridor is available in digital form from NR&M. Areas of State wildlife corridor are also depicted on regional ecosystem maps available from NR&M or the EPA's website at http://www.epa.qld.gov.au/REMAPS.

Static high water mark means the settled ordinary water level that occurs under average meteorological conditions. It is less than extreme levels that can be caused by storm surges.

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

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

Stimulation impact zone means a 100m maximum radial distance from the stimulation target location within a gas producing formation.

Stimulation management procedures means procedures for the management of stimulation activities that include, but is not necessarily limited to information on:

- the local stratigraphy including aquifers, faults, linear features, hydraulic conductivity, porosity, seismic risk and groundwater dependent assets;
- the impacts of applied stresses including aquifer drawdown, on connectivity to aquifers above and below the fractured zone subsequent to the stimulation activity;
- the extent to which there are vertically impermeable formations between the fractured zone and other aquifers;
- methods to ensure isolation of hydrocarbon bearing formations from aquifers and internal and external mechanical integrity of well(s);
- process control techniques incorporating real-time analysis, fracture modelling and formation understanding utilising techniques such as micro-seismic measurements;
- quantity and quality monitoring of flow back water.

Top soil means the top layer of soil, alluvium or weathered rock that forms a suitable plant growth medium. Top soil should be non-crusting and low in salinity.

Turkey's nest dam - A dam constructed outside a watercourse, wetland or waterway by excavating a pit and constructing a wall around the pit with the excavated material. Natural surface flow is excluded from the dam.

Watercourse has the meaning in Schedule 4 of the *Environmental Protection Act 1994* and means:

1) a river, creek or stream in which water flows permanently or intermittently—
   (a) in a natural channel, whether artificially improved or not; or
   (b) in an artificial channel that has changed the course of the watercourse.

2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.

Waters includes river, stream, lake, wetland, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part-thereof.

Waterlogging is the saturation of soil by soil water.

Wetland for the purpose of this environmental authority, wetland means:

- areas shown on the Map of referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and

- areas defined under the Queensland Wetlands Program as permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and possess one or more of the following attributes:

  - at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
  - the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
  - the substratum is not soil and is saturated with water or covered by water at some time.

The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.

Work program - Under the P & G Act holders of petroleum authorities are required to submit a work program for an authority to prospect. The program gives detailed information about the nature and extent of activities to be carried out under the authority.

APPENDIX B Criteria for dams and evaporation ponds

The holder of a Petroleum Authority may require containment structures to be constructed within the authority for raw water storage, storage and evaporation of contaminated waters, containment of **associated water** that is saline or contains hydrocarbons, storage of process waters, or the containment of contaminated solids formed from such waters.

The assessment criteria presented in Tables 1 and 2 allow these structures to be classified as:

- High hazard dams
- Medium hazard dams containing hazardous waste; or
- Low hazard dams.

High hazard dams containing hazardous waste, or dams which could impact on life or property on collapse or failure, are not permitted under this environmental authority and will require either site-specific conditions or will be conditioned under a level 1 environmental authority.

Determination if dam contains hazardous waste.

The assessment process for the determination if a dam contains a hazardous waste is dependent on whether the dam contents, including liquor and total solids can comply with the hazardous contaminant limits listed in Table 1 below. If the content of the dam cannot comply with the limits in Table 1, then the dam contains a hazardous waste.

Table 1 – Determination if content of dam is hazardous waste

Contaminant [1]	**Liquor [2]**	**Total solids [3,4]**
Arsenic	0.5 mg/l	250 mg/kg
Boron	5.0 mg/l	15,000 mg/kg
Cadmium	10µg/l	100mg/kg
Cobalt	1.0 mg/l	500 mg/kg
Copper	1.0 mg/l	5,000 mg/kg
Lead	0.1 mg/l	300 mg/kg
Mercury	2µg/l	75 mg/kg
Nickel	1.0 mg/l	3,000 mg/kg
Zinc	20 mg/l	35,000 mg/kg
Chloride	2,500 mg/l	-
Fluoride	2.0 mg/l	-
Selenium	0.02 mg/l	
Sulphate	1,000 mg/l	-
Cyanide	10 mg/l	2,500 mg/kg
pH	Between 5.5 and 9.0	Net acid generation of pH <4
Nitrite	30 mg/l	-
Nitrate	400 mg/l	-
TDS	4000 mg/l	
Aromatic Hydrocarbons	600 µg/l	-
Polycyclic Aromatic Hydrocarbons Naphthalene Benzo (a) pyrene	 16µg/l 0.2 µg/l	-
Phenol	320 µg/l	-
Polychlorinated Biphenyls Aroclor 1242 Aro 1254	 0.3 µg /l 0.1 µg /l	-
TPH	10 mg/l (or no visible film)	
Blue green Algae (Microcystis)	11,000 cells/ml	-

1. Metals should be analysed in accordance with recognised test methods by a NATA certified laboratory.
2. Applies to the liquid contents in a dam generally available to the environment (for example, water available to birds and animals)

3. Total solids include suspended and colloidal solids.
4. Applies to the solids in the dam.

Determining other risk factors

If a proposed dam exceeds any of the size and location criteria listed in Table 2, then the dam will be a high hazard dam.

Table 2 – Determination of other risk factors

	Threshold for high hazard activity
Criterion 1 Location with respect to habitation or water infrastructure	In the event of collapse, failure or overflow, flow from the dam would have one or more of the following actions, it would or could: • impact on occupied premises to a depth of more than 300 mm; or • flow to a sensitive or commercial place; or • flow to a riverine area containing permanent water; or • contaminate a water supply for human consumption; or • contaminate a water supply used for livestock.
Criterion 2 Location in catchments	The dam is located within a: • declared catchment or sub-artesian area; or • watercourse and the containment facilities surface area of water exceeds 1ha.
Criterion 3 Size	The dam has a surface area of water greater than 4 ha; or the dam has a volume of water greater than 20 mega litres.

Determining the hazard category of dam containing hazardous waste

Table 3 summarises the process for determining the hazard category of dams on a site.

If any proposed dam cannot comply with the acceptance criteria listed in Table 1 but can comply with the size and location criteria listed in Table 2, then the dam will be a medium hazard dam containing hazardous waste. Similarly if the dam contains hazardous waste and exceeds the criteria in Table 2 then the dam will be a high hazard dam (containing hazardous waste).

Table 3 – Determination of dam hazard category

Dam liquor and total solid hazardous contaminant concentration	**Dam location and size**	**Type of dam**
Dam contents do not exceed limits in Table 1	Dam location and size do not trigger criterion 1 listed in Table 2	The dam is a low hazard dam
Dam contents exceed limits in Table 1	Dam location and size are below the criteria listed in Table 2	The dam is a medium hazard dam containing hazardous waste.
Dam contents exceed limits in Table 1	Dam location and size are above the criteria listed in Table 2	The dam is a high hazard dam (containing hazardous waste).

Design, construction, operation, maintenance and decommissioning criteria

Dams are engineering structures and must be designed by professional engineer(s) who would normally apply the criteria defined below. A professional engineer should also be consulted in the development of the decommissioning plan.

In order to comply with the conditions of this Code design, construction, operation, maintenance and decommissioning of dams containing hazardous waste must be in accordance with the following.

Criteria for the design, construction, operation, maintenance and decommissioning of dams containing hazardous waste

Design:

(a) Dams with a capacity up to 3 mega litres are best constructed as ***Turkey's Nest*** dams;

(b) Dams should be located to have the smallest practical catchment area;

(c) Dams must have a spillway capable of passing a design flood, defined as the peak discharge from a critical duration storm with an annual exceedance probability of 1% (i.e. 1 in 100 yr. event) or lower;

(d) The spillway should be located where practicable in the abutment of the dam or in the minimum height section of the dam;

(e) Any spillway discharge should be contained within stable defined channels until it enters any natural watercourse or waterway;

(f) For embankments built on stable foundations, not subject to draw down and out of uniform soil material, the batters shall be no steeper than those shown in the table below, unless otherwise shown to be stable:

Embankment Soil Classification (Universal soil classification)	**Upstream Batter**	**Downstream Batter**
GC, SC	2.5:1	2.0:1
CL, ML	3.5:1	2.5:1
CH, MH	3.5:1	2.5:1
GW, GP, GM, SW, SP, SM	Not suitable	Not suitable

Note: The codes for the Universal Soil Classification (e.g. GC) are detailed in the Australian Standard AS 1726 1993 Geotechnical Site Investigation, Appendix A.

(g) Where foundation material differs from the embankment fill material, the batters shall be chosen conservatively to be consistent with the weaker material classification.

Construction:

(a) Embankments must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures, flow velocities, material strength, stability and durability.

(b) Fine grained soils used in embankment construction should be mechanically compacted when they are near or at the optimum moisture content (i.e. slightly plastic) to improve soil strength, minimise seepage and reduce the risk of piping failure

(c) Where geo-membranes are used, ensure that they are placed, anchored and joined in accordance with the manufacturer's specification.

(d) Where geo-membranes are used ensure that they are suitable to prevent leakage of the hazardous contaminants, which are contained within the dam.

(e) Where geo-membranes are used for liners, filters or drains, ensure that the geo-membrane is in contact only with fine-grained soils to prevent punching or tearing of the membrane.

(f) Embankments built out of pervious material must be constructed in accordance with an engineering design and specification, which has considered the internal seepage pressures and flow velocities.

(g) Where foundation material differs from embankment fill material, the embankment should be constructed out of the material, which gives the flatter batter.

(h) Prior to construction of an embankment, the foundation should be cleared of all:

- vegetation (grass, shrubs and trees);
- soils containing organic matter (roots);
- cracked soils (stiff plastic soils);
- pervious soils (sand, gravel)
- pervious material in rock faults, joints or the rock foundation itself.

(i) Prior to construction of an embankment, all transverse trenches, holes and other irregularities should be plugged or backfilled to create a generally undulating foundation for placement of the embankment.

(j) Fine-grained soils used in embankment construction should have a consistent texture and be free from foreign matter such as branches, logs, gravels or boulders etc.

(k) Fine-grained soils including dispersive soils should be placed in the centre of or towards the upstream faces of embankment dams.

(l) Coarser grained soils and rock materials are to be placed towards and on the outer faces of embankment dams to minimise erosion and breaching potential.

(m) Dispersive and easily erodible soils should not be used on the outer faces of embankment dams.

(n) Provide adequate measures to control seepage through the dam wall and the transmission of contaminants through underlying soil layers or rock stratum.

(o) Embankment dams should be constructed with stable earth materials that will not decay or generate leachate or hazardous contaminants.

Operation:

(a) The dam should be operated to maintain a minimum freeboard of 0.5m below the spillway

(b) To ensure that there is no leakage of hazardous wastes from any dam or evaporation pond associated with the petroleum activity a field-based groundwater monitoring program must be established to ensure there is no contamination of any unsaturated perched systems or existing groundwater aquifers in the vicinity of the works. Three or more monitoring bores specifically designed for this purpose should be located in a cluster between the contaminant source and any environmentally sensitive place. The monitoring program should regularly record:

(a) water levels;
(b) water quality;
(c) flow rates; and
(d) direction of flow.

(c) As far as practicable minimise seepage and return any contaminated seepage to the dam.

Maintenance:

(a) Maintain the erosion resistance of the downstream face of the dam to avoid surface scour, which may lead to failure of the wall;

(b) Maintain the erosion resistance of the spillway to avoid scouring during the design flood;

(c) Prevent the establishment of trees or shrubs on water containing embankments (roots initiate seepage paths);

(d) Control of burrowing insects and animals (initiation of piping paths);

(e) Repair active erosion and piping processes; and

(f) During initial filling or commissioning, the dam should be monitored for leaks, seepages, embankment deformation or other signs of embankment distress.

Decommissioning:

(a) Removing (where possible) all remaining liquids in the dam (e.g. it is generally acceptable to evaporate the liquid if the dam is not to be left to the landowner / holder).

(b) Remove (where possible) all contaminated solids from the dam and encapsulate in a purpose-built storage facility, or

(c) Encapsulate any residual contaminated solids in situ by capping with an appropriate capillary break and with one metre of clay or similar impermeable material;

(d) Design, install and maintain adequate diversion drains or similar structures to protect or minimise the erosion of any exposed surfaces by stormwater runoff;

(e) Design, install and maintain adequate surface drainage to prevent water ponding and infiltration into any contaminated materials;

(f) Address contaminated site issues by referring to Condition 19 of this environmental authority;

(g) Establish a monitoring program to determine the success of the decommissioning plan.

(h) If required, remove the wall and rehabilitate the disturbed area in accordance with the rehabilitation conditions of this environmental authority; and

(i) Rehabilitate the disturbed areas in accordance with the rehabilitation conditions of this environmental authority.

End of Part 5 – Injune Development Area

Part 6 – Lonesome and Membrance Development Areas

Environmentally relevant activity and location details

Environmentally relevant activity(ies)	Location(s)
Schedule 3 – 3 – a petroleum activity that is likely to have a significant impact on a category A or B environmentally sensitive area Schedule 3 – 8 – a petroleum activity or GHG storage activity, other than an activity mentioned in any of items 1 to 7, that includes 1 or more activities mentioned in schedule 2 for which an AES is stated.	Petroleum Lease (PL) 220 and PL219

This environmental authority consists of the following schedules:

Streamlined Conditions—General Environmental Protection
Streamlined Conditions—Waste Management
Streamlined Conditions—Protecting Land Values
Streamlined Conditions—Protecting Biodiversity Values
Streamlined Conditions—Protecting Water Values
Conditions—Well construction, maintenance and stimulation activities
Conditions—Dams
Definitions

Streamlined Conditions—General Environmental Protection

Authorised resource activities[1]

General 1.
This environmental authority authorises the carrying out of the following resource activities:
(a) the petroleum activities and specified relevant activities listed in **Streamlined Conditions—General Environmental Protection, Table 1 – Authorised Petroleum Activities** to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable); and
(b) incidental activities that are not otherwise specified relevant activities.

General 2.
The authorised resource activities are authorised subject to the conditions of this environmental authority.

General 3.
This environmental authority does not authorise a relevant act to occur in carrying out an authorised petroleum activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition shall not be construed as authorising the relevant act.

Streamlined Conditions—General Environmental Protection, Table 1 – Authorised Petroleum Activities

Lonesome Development Area			
Authorised Petroleum Activity	**Scale**		**Intensity**
	Maximum size	**Location**	
Petroleum activities			
Coal seam gas production or exploration (PL220)	13ha	Within project area	7 wells
Specified relevant activities			
Sewage treatment works, other than no-release works, where treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme; or otherwise discharged	100 EP per facility	Within project area	300 EP for the project area
Waste disposal onsite—disposing of greater than 50t of non-regulated waste in a year	0.2ha	Within project area	7
Membrance Development Area			
Authorised Petroleum Activity	**Scale**		**Intensity**
	Maximum size	**Location**	
Petroleum Activities			
Coal seam gas production or exploration (PL219)	13ha	Within project area	9 wells

[1] Advice statements for the environmental authority:
a) It is an offence under section 426 of the Act for a person to carry out an environmentally relevant activity unless the person holds, or is acting under, an environmental authority for the activity.
b) The environmental authority does not authorise a relevant act to occur in carrying out an authorised relevant activity unless a condition of this environmental authority expressly authorises the relevant act to occur.
c) The environmental authority does not authorise environmental harm unless a condition contained within the authority explicitly authorises that harm. Where there is no condition, the absence of a condition shall not be construed as authorising harm.

Specified Relevant Activities			
Sewage treatment works, other than no-release works, where treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme; or otherwise discharged	100 EP per facility	Within project area	300 EP for the project area
Waste disposal onsite—disposing of greater than 50t of non-regulated waste in a year	0.2ha	Within project area	9

Monitoring standards

General 4.
(PESCD[1] 1.)
All monitoring must be undertaken by a suitably qualified person[2].

General 5
If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.

General 6.
All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.

General 7.
Notwithstanding condition (General 9), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.

General 8.
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 2019
(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.

[1] Conditions that include 'SC' are an existing approved and published standard condition.
[2] Words underlined are currently defined in the dictionary, schedule of an environmental authority or the *Environmental Protection Act 1994* and/or its subordinate legislation.

Financial assurance

General 10.
(PESCB 1.)
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*.

General 11.
Prior to any changes in petroleum activities which would result in an increase to the maximum significant disturbance since financial assurance was last given to the administering authority, the holder of the environmental authority must amend the financial assurance and give the administering authority the increased amount of financial assurance.

General 12.
If the amount of financial assurance held by the administering authority has been discounted and either the nominated period of financial assurance has ended, or an event or change in circumstance has resulted in the holder of the environmental authority no longer being able to meet one or more of the mandatory pre-requisites or applicable discount criteria, the holder of the environmental authority must amend the financial assurance and give the administering authority the increased amount of financial assurance as soon as practicable.

Contingency procedures for emergency environmental incidents

General 13.
Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to:
(a) A clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.
(b) Consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity.
(c) Response procedures to be implemented to prevent or minimise the risks of environmental harm occurring.
(d) The practices and procedures to be employed to restore the environment or mitigate any environmental harm caused.
(e) Procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land.
(f) Training of staff to enable them to effectively respond.
(g) Procedures to notify the administering authority, local government and any potentially impacted landholder.

Maintenance of plant and equipment

General 14.
(PESCC 4.)
All plant and equipment must be maintained and operated in their proper and effective condition.

General 15.
The following infrastructure must be signed with a unique reference name or number in such a way that it is clearly observable:
(b) regulated dams and low consequence dams
(c) exploration, appraisal and development wells
(d) water treatment facilities
(e) brine encapsulation facilities
(f) landfill cells
(g) sewage treatment facilities
(h) specifically authorised discharge points to air and waters
(i) any chemical storage facility associated with the environmentally relevant activity of chemical storage
(j) field compressor stations
(k) central compressor stations
(l) gas processing facilities; and
(m) pipeline compressor stations.

General 16.
Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.

Erosion and sediment control

General 17.
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).

Complaints
General 18.
Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.

Documentation

General 19.
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.

General 20.
All plans, procedures, programs, reports and methodologies required under this environmental authority must be written and implemented.

General 21.
All documents required to be developed under this environmental authority must be kept for five years.

General 22.
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.

Streamlined Conditions—Waste Management

General waste management

Waste 1.
(PESCC 24.)
Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.

Waste 2.
Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised by conditions Waste 4, Waste 5, Waste 6, Waste 7, Waste 8, Waste 10, Waste 11, Waste 14 and Waste 17 to be disposed of or used on site

Waste 3.
Waste fluids, other than flare precipitant stored in flare pits, or residual drilling material or drilling fluids stored in sumps, must be contained in either:
(a) an above ground container; or
(b) a structure which contains the wetting front.

Waste 4.
Green waste may be used on-site for either rehabilitation or sediment and erosion control, or both.

Pipeline wastewater

Waste 5.
Pipeline waste water, may be released to land provided that it:
(a) can be demonstrated it meets the acceptable standards for release to land; and
(b) is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.

Authorised uses of produced water for petroleum activities

Waste 6.
Produced water may be re-used in:
(a) drilling and well hole activities; or
(b) stimulation activities.

Waste 7.
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.

Waste 8.
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.

Waste 9.
If there is any indication that any of the circumstances in condition (Waste 7)(b)(i) to (Waste 7(b)(iv)) or (Waste 8)(a) to (Waste 8(d)) is occurring the use must cease immediately and the affected area must be remediated without delay.

Sewage treatment

Waste 10.
Treated sewage effluent or greywater can be released to land provided it:
(a) meets or exceeds secondary treated class B standards for a treatment system with a daily peak design capacity of between 150 EP and 1500 EP; or
(b) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of between 21 EP and 150 EP; or
(c) in undertaken in a way that achieves the following for a treatment system with a daily peak design capacity of below 21EP:
    i. vegetation is not damaged
    ii. soil quality is not adversely impacted
    iii. there is no surface ponding or runoff to waters

iv. there are no aerosols or odours
v. deep drainage below the root zone of any vegetation is minimised
vi. the quality of shallow aquifers is not adversely affected.

Waste 11.
Despite Waste 10, treated sewage effluent or greywater that does not comply with the limits required by Waste 10(a) and Waste 10(b) for the following parameters may be released to land:
(a) total nitrogen as N;
(b) total phosphorous as P;
(c) suspended solids.

Waste 12.
If treated sewage effluent or greywater is released to land in accordance with Waste 11, the releases of water quality that does not comply with the limits set in condition (Waste 11) are only authorised to the extent that they comply with the acceptable limits determined by the Modelling for Effluent Disposal Using Land Irrigation (MEDLI) method.

Waste 13.
Treated sewage effluent or greywater released to land in accordance with Waste 10, Waste 11 and Waste 12 must:
(a) be to a fenced and signed contaminant release area(s)
(b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off
(c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is:
    i. not a declared pest species
    ii. kept in a viable state for transpiration and nutrient uptake; and
    iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months or at a determined by MEDLI method required by Waste 12.

Waste 14.
Notwithstanding conditions (Waste 11) and (Waste 12), treated sewage effluent that meets or exceeds secondary treated class A standards may be used for dust suppression or construction activities, provided the use meets the criteria in condition (Waste 8) or (Waste 9), as relevant to the use.

Waste 15.
Sewage pump stations must be fitted with a:
(a) stand-by pump; and
(b) high level alarm to warn of imminent pump station overflow, that operates without mains power or with a back-up power source that starts automatically in the event of a power failure.

Residual drilling material

Waste 16.
If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.

Waste 17.
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.

Waste 18.
Records must be kept to demonstrate compliance with condition (Waste 15) and (Waste 16).

Onsite waste disposal—General waste

Waste 19.
No dedicated landfill facilities are authorised.

Streamlined Conditions—Protecting Land Values

General

Land 1.
Contaminants must not be directly or indirectly released to land except for those releases authorised by conditions Waste 4, Waste 5, Waste 6, Waste 7, Waste 8, Waste 10, Waste 11, Waste 14 and Waste 17.

Top soil management

Land 2.
Top soil must be managed in a manner that preserves its biological and chemical properties.

Land management

Land 3.
Land that has been significantly disturbed by the petroleum activities must be managed to ensure that mass movement, gully erosion, rill erosion, sheet erosion and tunnel erosion do not occur on that land.

Acid sulfate soils

Land 4.
Acid sulfate soils must be treated and managed in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.

Chemical storage

Land 5.
Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.

Pipeline operation and maintenance

Land 6.
Pipeline operation and maintenance must be in accordance, to the greatest practicable extent, with the relevant section of the APIA Code of Environmental Practice: Onshore Pipelines (2009).

Pipeline reinstatement and revegetation

Land 7.
(PPSCE 17.)
Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.

Land 8.
Reinstatement and revegetation of the pipeline right of way must commence within 6 months after cessation of petroleum activities for the purpose of pipeline construction.

Land 9.
Backfilled, reinstated and revegetated pipeline trenches and right of ways must be:
(a) a stable landform
(b) re-profiled to a level consistent with surrounding soils
(c) re-profiled to original contours and established drainage lines; and
(d) vegetated with groundcover which is not a declared pest species, and which is established and growing

Streamlined Conditions—Protecting Biodiversity Values

Confirming biodiversity values

Biodiversity 1.
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.

Biodiversity 2.
A suitably qualified person must develop and certify a methodology so that condition (Biodiversity 1) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.

Biodiversity 3.
Where mapped biodiversity values differ from those confirmed under conditions (Biodiversity 1) and (Biodiversity 2), 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

Biodiversity 4.
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

Biodiversity 5.
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

Biodiversity 6.
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 **Streamlined Conditions—Protection of Biodiversity Values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones**.

Streamlined Conditions—Protection of Biodiversity Values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones

Environmentally sensitive area	**Within the environmentally sensitive area**	**Primary protection zone of the environmentally sensitive area**	**Secondary protection zone of the environmentally sensitive area**
Category A environmentally sensitive areas	No petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.
Category B environmentally sensitive areas that are other than 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.
Category B environmentally sensitive areas that are 'endangered' regional ecosystems	Only low impact petroleum activities permitted.	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.
Category C environmentally sensitive areas that are 'nature refuges' or 'koala habitat'	Only low impact petroleum activities permitted.	Only low impact petroleum activities permitted.	
Category C environmentally sensitive areas 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 environmentally sensitive areas that are 'regional parks' (previously known as 'resources reserves')	Only essential petroleum activities permitted.	Only essential petroleum activities permitted.	
Category C environmentally sensitive areas that are 'state forests' or 'timber reserves'	Only essential petroleum activities permitted.	Petroleum activities permitted.	

Biodiversity 7.
Despite condition (Biodiversity 6), petroleum activities are not permitted within matters of state environmental significance unless an offset is provided in accordance with the *Environmental Offsets Act 2014*.

Biodiversity 8.

The record of the assessment required by conditions (Biodiversity 1) and (Biodiversity 2) and the extent of significant disturbance to land in the following areas must be prepared for each annual return period and made available to the administering authority upon request:

(a) The Primary Protection Zone of, or within a Category B or C Environmentally Sensitive Area; and

(b) In the Secondary Protection Zone of Environmentally Sensitive Areas; and

(c) Other remnant vegetation areas; and

(d) Wetlands.

Streamlined Conditions—Protecting Water Values

Authorised impacts to wetlands

Water 1.
The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.

Authorised impacts in waters

Water 2.
Only construction or maintenance of linear infrastructure is permitted in a watercourse.

Water 3.
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
(c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.

Water 4.
The construction or maintenance of linear infrastructure authorised under condition (Water 2) must comply with the water quality limits as specified in **Streamlined Conditions—Protecting Water Values, Table 1—Release limits for construction or maintenance of linear infrastructure**.

Streamlined Conditions—Protecting Water Values, 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 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 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 watercourse, no visible sheen or slick

Water 5.
Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (Water 4).

Register of activities in wetlands and watercourses

Water 6.
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 (Water 5).

Activities in Floodplains

Water 7.
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; or
(b) divert flood flows from natural drainage paths and alter flow distribution; or
(c) increase the local duration of floods; or
(d) increase the risk of detaining flood flows.

Seepage monitoring program

Water 8.
No leaks or seepage to waters from any fuel, chemical or coal seam gas water storage facilities (including containment areas) are authorised.

Conditions—Well construction, maintenance and stimulation

Drilling activities

Well activities 1.
Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).

Well activities 2.
Drilling activities must not result in the connection of the target gas producing formation and another aquifer.

Well activities 3.
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

Well activities 4.
Stimulation activities are not permitted.

Conditions—Dams

General

Dams 1.
Dams are not authorised under this authority.

Definitions

<table>
<tr><td>acceptable standards for release to land</td><td>means wastewater of the following quality as determined by monitoring results or by characterisation:
(a) electrical conductivity (EC) not exceeding 3000µS/cm
(b) sodium adsorption ratio (SAR) not exceeding 8
(c) pH between 6.0 and 9.0
(d) heavy metals (measured as total) meets the respective short term trigger value in section 4.2.6, Table 4.2.10—Heavy metals and metalloids in Australian and New Zealand Guidelines for Fresh and Marine Water Quality
(e) does not contain biocides.</td></tr>
<tr><td>acid sulfate soil(s)</td><td>means a soil or soil horizon which contains sulfides or an acid soil horizon affected by oxidation of sulfides.</td></tr>
<tr><td></td><td>(a)</td></tr>
<tr><td>alternative arrangement</td><td>means a written agreement about the way in which a particular environmental nuisance impact will be dealt with at a sensitive place and may include an agreed period of time for which the arrangement is in place. An alternative arrangement may include, but is not limited to, a range of nuisance abatement measures to be installed at the sensitive place, or provision of alternative accommodation for the duration of the relevant nuisance impact.</td></tr>
<tr><td>annual return period</td><td>means the most current 12-month period between two anniversary dates.</td></tr>
<tr><td>appraisal well</td><td>means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.</td></tr>
<tr><td>approved quality criteria</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:
Part A In all cases:
<table><tr><th>Parameter</th><th>Maximum concentration</th></tr><tr><td>pH</td><td>6–10.5 (range)</td></tr><tr><td>Electrical Conductivity</td><td>20dS/m (20,000µS/cm)</td></tr><tr><td>Chloride*</td><td>8000mg/L</td></tr></table>*Chloride analysis is only required if an additive containing chloride was used in the drilling process
The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing.
Part B If any of the following metals are a component of the drilling fluids, then for that metal:</td></tr>
</table>

	<table><tr><th>Parameter</th><th>Maximum concentration</th></tr><tr><td>Arsenic</td><td>20mg/kg</td></tr><tr><td>Selenium</td><td>5mg/kg</td></tr><tr><td>Boron</td><td>100mg/kg</td></tr><tr><td>Cadmium</td><td>3mg/kg</td></tr><tr><td>Chromium (total)</td><td>400mg/kg</td></tr><tr><td>Copper</td><td>100mg/kg</td></tr><tr><td>Lead</td><td>600mg/kg</td></tr></table> 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: <table><tr><th>TPH</th><th>Maximum concentratio</th></tr><tr><td>C6-C10</td><td>170mg/kg</td></tr><tr><td>C10-C16</td><td>150mg/kg</td></tr><tr><td>C16-C34</td><td>1300mg/kg</td></tr><tr><td>C34-C40</td><td>5600mg/kg</td></tr><tr><td>Total Polycyclic Aromatic Hydrocarbons (PAHs)</td><td>20mg/kg</td></tr><tr><td>Phenols (halogenated)</td><td>1mg/kg</td></tr><tr><td>Phenols (non-halogenated)</td><td>60mg/kg</td></tr><tr><td>Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)</td><td>7mg/kg</td></tr><tr><td>Benzene</td><td>1mg/kg</td></tr></table>
areas of pre-existing disturbance	means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless of whether the infrastructure is associated with the authorised petroleum activities). The term ‘areas of pre-disturbance’ does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.
associated water	means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised

	activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.
associated works	in relation to a dam, means: (a) operations of any kind and all things constructed, erected or installed for that dam; and (b) any land used for those operations.
Australian Standard 3580	means any of the following publications: • AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method. • AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet—Gravimetric method • AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter— PM10 low volume sampler—Gravimetric sampler.
bed	of any waters, has the meaning in Schedule 12 of the Environmental Protection Regulation 2008 and— (a) includes an area covered, permanently or intermittently, by tidal or non-tidal waters; but (b) does not include land adjoining or adjacent to the bed that is from time to time covered by floodwater.
being or intended to be utilised by the landholder or overlapping tenure holder	for significantly disturbed land, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.
biodiversity values	for the purposes of this environmental authority, means environmentally sensitive areas, areas matters of state environmental significance and wetlands.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.
clearing	has the meaning in the dictionary of the *Vegetation Management Act 2000* and for vegetation— (a) means remove, cut down, ringbark, push over, poison or destroy in any way including by burning, flooding or draining; but (b) does not include destroying standing vegetation by stock or lopping a tree.

daily peak design capacity	for sewage treatment works, has the meaning in Schedule 2, section 63(4) of the Environmental Protection Regulation 2008 as the higher equivalent person (EP) for the works calculated using each of the formulae found in the definition for EP.
dam(s)	means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works.
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.
design storage allowance or DSA	means an available volume, estimated in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), published by the administering authority, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.
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.
enclosed flare	means a device where the residual gas is burned in a cylindrical or rectilinear enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.
environmental harm	has the meaning in section 14 of the *Environmental Protection Act 1994* and means any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance. Environmental harm may be caused by an activity— (a) whether the harm is a direct or indirect result of the activity; or (b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.
environmental nuisance	has the meaning in section 15 of the *Environmental Protection Act 1994 and means* unreasonable interference or likely interference with an environmental value caused by— (a) aerosols, fumes, light, noise, odour, particles or smoke; or (b) an unhealthy, offensive or unsightly condition because of contamination; or (c) another way prescribed by regulation.
environmentally sensitive area	means Category A, B or C environmentally sensitive areas (ESAs)
equivalent person or EP	has the meaning under section 3 of the Planning Guidelines For Water Supply and Sewerage, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the Environmental Protection Regulation

	2008 where: • EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or • EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.
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 • 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 o 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).
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.
flare pit	has the meaning in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635) and means containment area where any hydrocarbon that is discovered in an over-pressured reservoir during a drilling operation is diverted to, and combusted, the flare pit is only used during the drilling and work over process on a petroleum well.
flare precipitant	means waste fluids which result from the operation of a flare.
floodplains	has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that— • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and • has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island of the watercourse.
flowable substance	means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.
fuel burning or combustion facility	means a permanent fuel burning or combustion equipment which in isolation, or combined in operation, or which are interconnected, is, or are capable of burning more than 500 kg of fuel in an hour.
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
green waste	means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature but does not include declared pest species.
greywater	means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.
groundwater dependent ecosystem (GDE)	means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services. For the purposes of the environmental authority, groundwater dependent ecosystems do not include those mapped as "unknown".
growing	means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.
hydraulic integrity	refers to the capacity of a dam to contain or safely pass flowable substances based on its design.
impacts to state significant biodiversity values	means to have a negative effect on a state significant biodiversity value as identified by the Queensland Biodiversity Offset Policy (Department of Environment and Heritage Protection, 2014). Examples may include, but are not necessarily limited to: • clearing, removal or fragmentation of vegetation • interference or disturbance of fauna habitat.
impulsive (for noise)	means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.
land degradation	has the meaning in the *Vegetation Management Act 1999* and means the following: • soil erosion • rising water tables • the expression of salinity • mass movement by gravity of soil or rock • stream bank instability • a process that results in declining water quality.
land-based offset	means direct offsets, indirect offsets, or offset transfers.
landholder's active groundwater bore	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*.
legally secured	in relation to land-based offsets means any of the following legally binding mechanisms:

	• gazettal as a protected area (e.g., a nature refuge) under the *Nature Conservation Act 1992* • declaration of an area of high nature conservation values under the *Vegetation Management Act 1999* • use of a covenant under the *Land Title Act 1994* or *Land Act 1994* • other mechanism administered and approved by the State.
linear infrastructure	means powerlines, pipelines, flowlines, roads and access tracks.
liquid	means a substance which is flowing and offers no permanent resistance to changes of shape.
low consequence dam	means any dam that is not classified as high or significant as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, published by the administering authority, as amended from time to time.
low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.
Map of referable wetlands	has the meaning in Schedule 12 of the Environmental Protection Regulation 2008 and means the 'Map of referable wetlands', a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D.
matters of state environmental significant	has the meaning in Schedule 2 of the Environmental Offsets Regulation 2014.
methodology	means the science of method, especially dealing with the logical principles underlying the organisation of the various special sciences, and the conduct of scientific inquiry.
mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=10–8m/s) or subsoil with a clay content of greater than 20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and

	• topsoil is replaced.
petroleum activity	means an authorised resource activity listed under the heading “Petroleum activities” in Streamlined Conditions—General Environmental Protection, Table 1 – Authorised Petroleum Activities
pipeline waste water	means hydrostatic testing water, flush water or water from low point drains.
predominant species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
prescribed contaminants	has the meaning in section 440ZD of the *Environmental Protection Act 1994* and means: (a) earth; or (b) a contaminant prescribed under section 440ZF.
primary protection zone	means an area within 200m from the boundary of any Category A, B or C ESA.
produced water	has the meaning in Section 15A of the *Petroleum and Gas (Production and Safety) Act 2004* and means CSG water or associated water for a petroleum tenure.
project area	means the following tenures: Petroleum Lease (PL) 220
protection zone	means the primary protection zone of any Category A, B or C ESA or the secondary protection zone of any Category A or B ESA.
regional ecosystem	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 vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.
regulated dam	means any dam in the significant or high consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), published by the administering authority, as amended from time to time.
reinstate or reinstatement	for pipelines, means the process of bulk earth works and structural replacement of pre-existing conditions of a site (i.e., soil surface typography, watercourses, culverts, fences and gates and other landscape(d) features) and is detailed in the Australian Pipeline Industry Association (APIA) Code of Environmental Practice: Onshore Pipelines (2013).

relevant offset objectives	means the relevant criteria listed under the heading 'When an offset ceases to have effect' in Criteria A2—Legally securing biodiversity offsets of the Queensland Biodiversity Offset Policy (Department of Environment and Heritage Protection, 2014).
relevant offset rules	means the relevant criteria included in the Queensland Biodiversity Offset Policy (Department of Environment and Heritage Protection, 2014) including but not necessarily limited to: • for all offsets, the relevant criteria of Criteria B1—Offset Rules; and • for land-based offsets, the relevant criteria of Criteria B1—Offset Rules as well as Criteria A1 – Obtaining Ecological Equivalence.
reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as "less than" the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L–0.02 ug/L.
residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes, and which have been left behind after the drilling fluids are pumped out.
restricted stimulation fluids	has the meaning in section 206 of the *Environmental Protection Act 1994* and means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amount prescribed under a regulation— (a) petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene (b) chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.
secondary protection zone	in relation to a Category A or Category B ESA means an area within 100 metres from the boundary of the primary protection zone.
secondary treated class A standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g., release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 100cfu per 100mL, maximum 1000cfu per 100mL.
secondary treated class B standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L

	• 5-day biochemical oxygen demand (inhibited) (e.g., release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 1000cfu per 100mL, maximum 10 000cfu per 100mL.
secondary treated class C standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g., Release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-Coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 10 000cfu per 100mL, maximum 100 000cfu per 100mL.
significantly disturbed or significant disturbance or significant disturbance to land or areas	has the meaning in Schedule 12, section 4 of the Environmental Protection Regulation 2008. Land is significantly disturbed if— (a) it is contaminated land; or (b) it has been disturbed and human intervention is needed to rehabilitate it— (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular condition—to the condition it was in immediately before the disturbance.
species richness	means the number of different species in a given area.
State significant biodiversity values	means those regional ecosystems, essential habitat, wetlands, watercourses, legally secured offset areas and connectivity areas provided in Appendix 1 of the Queensland Biodiversity Offsets Policy (Department of Environment and Heritage Protection, 2014).
statement of compliance	for a condition in an environmental authority has the meaning in section 208 of the *Environmental Protection Act 1994* and is a condition that requires the holder to give the administering authority a statement of compliance about a document or work relating to a relevant activity. The condition must also state— (a) the criteria (the compliance criteria) the document or work must comply with; and (b) that the statement of compliance must state whether the document or work complies with the compliance criteria; and (c) the information (the supporting information) that must be provided to the administering authority to demonstrate compliance with the compliance criteria; and (d) when the statement of compliance and supporting information must be given to the administering authority.

stimulation	means a technique used to increase the permeability of natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments. This definition is restricted from that in the *Petroleum and Gas (Production and Safety) Act 2004* in order to only capture the types of stimulation activities that pose a risk to environmental values of water quality in aquifers.
stimulation fluid	means the fluid injected underground to increase permeability. For clarity, the term stimulation fluid only applies to fluid injected down well post-perforation.
stimulation impact zone	means a 100m maximum radial distance from the stimulation target location within a gas producing formation.
structure	means a dam or levee.
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.*
suitably qualified person	means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.
suitably qualified third party	means a person who: (a) has qualifications and experience relevant to performing the function including but not limited to: i. a bachelor's degree in science or engineering; and ii. 3 years' experience in undertaking soil contamination assessments; and (b) is a member of at least one organisation prescribed in Schedule 8 of the Environmental Protection Regulation 2008; and (c) not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
sump	means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.

synthetic based 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.
top soil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300mm in depth from the natural surface.
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.
void	means any constructed, open excavation in the ground.
waste and resource management hierarchy	has the meaning provided in section 9 of the *Waste Reduction and Recycling Act 2011 and* is the following precepts, listed in the preferred order in which waste and resource management options should be considered— (a) AVOID unnecessary resource consumption (b) REDUCE waste generation and disposal (c) RE-USE waste resources without further manufacturing (d) RECYCLE waste resources to make the same or different products (e) RECOVER waste resources, including the recovery of energy (f) TREAT waste before disposal, including reducing the hazardous nature of waste (g) DISPOSE of waste only if there is no viable alternative.
waste and resource management principles	has the meaning provided in section 4(2)(b) of the *Waste Reduction and Recycling Act 2011* and means the: (a) polluter pays principle (b) user pays principle (c) proximity principle (d) product stewardship principle.
waste fluids	has the meaning in section 13 of the *Environmental Protection Act 1994* in conjunction with the common meaning of "fluid" which is "a substance which is capable of flowing and offers no permanent resistance to changes of shape". Accordingly, to be a waste fluid, the waste must be a substance which is capable of flowing and offers no permanent resistance to changes of shape.
watercourse	has the meaning in Schedule 4 of the *Environmental Protection Act 1994* and means: 1) a river, creek or stream in which water flows permanently or intermittently— (a) in a natural channel, whether artificially improved or not; or (b) in an artificial channel that has changed the course of the watercourse. 2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
waters	includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed

	and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
well integrity	the ability of a well to contain the substances flowing through it.
wetland	for the purpose of this environmental authority, wetland means: • areas shown on the Map of referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and • areas defined under the Queensland Wetlands Program as permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and possess one or more of the following attributes: o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or o the substratum is not soil and is saturated with water or covered by water at some time. The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
wetland of high ecological significance	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.
wetland of other environmental value	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'general environmental significance' or wetland of 'other environmental value' on the Map of referable wetlands.

End of Part 6 – Lonesome and Membrance Development Areas

PART 7 – MURRUNGAMA DEVELOPMENT AREA

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 3 08: A petroleum or GHG storage activity, other than items 1 to 7, that includes an activity from Schedule 2 with an AES	PL1084
Ancillary 63 - Sewage Treatment 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of (a-i) 21 to 100EP if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme	

General conditions

Condition number	Condition
(A1)	This environmental authority authorises the carrying out of the following resource activities: (a) the petroleum activities and specified relevant activities listed in **Schedule A, Table 1 - Authorised petroleum activities and specified relevant activities** to the extent they are carried out in accordance with the activity's corresponding scale or intensity or both (where applicable); and (b) incidental activities that are not otherwise specified relevant activities.
(A2)	The authorised resource activities are authorised subject to the conditions of this environmental authority
(A3)	This environmental authority does not authorise a relevant act to occur in carrying out an authorised resource activity unless a condition expressly authorises that relevant act to occur. Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

Schedule A, Table 1 – Authorised petroleum activities and specific relevant activities

Authorised petroleum activity	Scale		Intensity
	Maximum size	Location	
Petroleum activities			
Coal seam gas production and exploration	50 ha (wells only)	Within project area	40 wells
Specified relevant activities			
Stimulation activities	N/A	Within project area	Approved, limited by the conditions contained in this

	<table><tr><td></td><td></td><td></td><td>environmental authority</td></tr><tr><td>Sewage Treatment – Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of 21 to 100EP, if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme.</td><td>21 to 100EP per facility</td><td>Within project area</td><td>N/A</td></tr></table>
(A4)	This environmental authority does not authorise environmental harm unless a condition contained in this environmental authority explicitly authorises that harm. Where there is no condition, the lack of a condition shall not be construed as authorising harm.
(A5)	All monitoring must be undertaken by a suitably qualified person.
(A6)	If requested by the administering authority in relation to investigating a complaint, monitoring must be commenced within 10 business days.
(A7)	All laboratory analyses and tests must be undertaken by a laboratory that has NATA accreditation for such analyses and tests.
(A8)	Notwithstanding condition (A7), where there are no NATA accredited laboratories for a specific analyte or substance, then duplicate samples must be sent to at least two separate laboratories for independent testing or evaluation.
(A9)	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 2019 (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.
(A11)	Petroleum activities involving significant disturbance to land cannot commence until the development of written contingency procedures for emergency environmental incidents which include, but are not necessarily limited to: (a) a clear definition of what constitutes an environmental emergency incident or near miss for the petroleum activity.

	(b) consideration of the risks caused by the petroleum activity including the impact of flooding and other natural events on the petroleum activity. (c) response procedures to be implemented to prevent or minimise the risks of environmental harm occurring. (d) the practices and procedures to be employed to restore the environment or mitigate any environmental harm caused. (e) procedures to investigate causes and impacts including impact monitoring programs for releases to waters and/or land. (f) training of staff to enable them to effectively respond. (g) procedures to notify the administering authority, local government and any potentially impacted landholder.
(A12)	All plant and equipment must be maintained and operated in their proper and effective condition.
(A13)	The following infrastructure must be signed with a unique reference name or number in such a way that it is clearly observable: (a) regulated dams and low consequence dams (b) exploration, appraisal and development wells (c) water treatment facilities (d) brine encapsulation facilities (e) landfill cells (f) sewage treatment facilities (g) specifically authorised discharge points to air and waters (h) any chemical storage facility associated with the environmentally relevant activity of chemical storage (i) field compressor stations (j) central compressor stations **(k)** gas processing facilities; and (l) pipeline compressor stations.
(A14)	Measures to prevent fauna being harmed from entrapment must be implemented during the construction and operation of well infrastructure, dams and pipeline trenches.
(A15)	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).

(A16)	Petroleum activities must not cause environmental nuisance at a sensitive place, other than where an alternative arrangement is in place.
(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)	A record of all documents required by this environmental authority must be: (a) kept for a minimum of five years; and (b) be made available to an authorised person upon request.
Water conditions	
Condition number	**Condition**
(B1)	The extraction of groundwater as part of the petroleum activity(ies) from underground aquifers must not directly or indirectly cause environmental harm to a wetland.
(B2)	Petroleum activities must not occur in or within 200m of a: (a) wetland of high ecological significance (b) Great Artesian Basin Spring (c) subterranean cave GDE.
(B3)	Only construction or maintenance of linear infrastructure is permitted in or within any wetland of other environmental value or in a watercourse.
(B4)	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.
(B5)	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

<table>
<tr><td></td><td>(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.</td></tr>
<tr><td>(B6)</td><td>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
(c) thirdly, in times of flow, providing a bankfull situation is not expected and that flow is maintained.</td></tr>
<tr><td>(B7)</td><td>The construction or maintenance of linear infrastructure authorised under condition (B4) must comply with the water quality limits as specified in Protecting water values, Table 1—Release limits for construction or maintenance of linear infrastructure.
Protecting water values, Table 1—Release limits for construction or maintenance of linear infrastructure
<table>
<tr><th>Water quality parameters</th><th>Units</th><th>Water quality limits</th></tr>
<tr><td rowspan="2">Turbidity</td><td rowspan="2">Nephelometric Turbidity Units (NTU)</td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td>Hydrocarbons</td><td>-</td><td>For a wetland of other environmental value, or watercourse, no visible sheen or slick</td></tr>
</table></td></tr>
<tr><td>(B8)</td><td>Monitoring must be undertaken at a frequency that is appropriate to demonstrate compliance with condition (B7).</td></tr>
<tr><td>(B9)</td><td>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:</td></tr>
</table>

	(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 (B8).
(B10)	Measures must be taken to minimise negative impacts to, or reversal of, any river improvement works carried out in River Improvement Areas by Queensland's River Improvement Trusts.
(B11)	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; or (b) divert flood flows from natural drainage paths and alter flow distribution; or (c) increase the local duration of floods; or (d) increase the risk of detaining flood flows.
(B12)	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 31 March 2020.
(B13)	The seepage monitoring program required by condition (B12) 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 (B13(b)) (g) seepage trigger action response procedures for when trigger parameters and trigger levels identified in conditions (B13(b)) and (B13(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.
(B14)	A bore drill log must be completed for each seepage monitoring bore in condition (B13) 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.
Structures that are dams or levees	
Condition Number	**Condition**
(C1)	Regulated dams are not authorised under this environmental authority.
(C2)	Low consequence dams must be: (a) constructed, operated and maintained in accordance with accepted engineering standards currently appropriate for the purpose for which the dam is intended to be used; and (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and rehabilitation.
(C3)	All low consequence dams must be monitored for early signs of loss of structural or hydraulic integrity as specified in the initial consequence assessment.
Land conditions	
Condition number	**Condition**
(D1)	Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.
(D2)	Top soil must be managed in a manner that preserves its biological and chemical properties.
(D3)	Land that has been significantly disturbed by the petroleum activities must be managed to ensure that mass movement, gully erosion, rill erosion, sheet erosion and tunnel erosion do not occur on that land.
(D4)	Acid sulfate soils must be treated and managed in accordance with the latest edition of the *Queensland Acid Sulfate Soil Technical Manual*.

(D5)	Chemicals and fuels stored, must be effectively contained and where relevant, meet Australian Standards, where such a standard is applicable.
(D6)	Pipeline operation and maintenance must be in accordance, to the greatest practicable extent, with the relevant section of the APIA Code of Environmental Practice: Onshore Pipelines (2009).
(D7)	Pipeline trenches must be backfilled and topsoils reinstated within three months after pipe laying.
(D8)	Reinstatement and revegetation of the pipeline right of way must commence within 6 months after cessation of petroleum activities for the purpose of pipeline construction.
(D9)	Backfilled, reinstated and revegetated pipeline trenches and right of ways must be: (a) a stable landform (b) re-profiled to a level consistent with surrounding soils (c) re-profiled to original contours and established drainage lines; and (d) vegetated with groundcover which is not a declared pest species, and which is established and growing.
Biodiversity conditions	
Condition number	**Condition**
(D10)	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.
(D11)	A suitably qualified person must develop and certify a methodology so that condition (D10) can be complied with and which is appropriate to confirm on-the-ground biodiversity values.
(D12)	For conditions (D13) to (D16), where mapped biodiversity values differ from those confirmed under conditions (D10) and (D11), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground biodiversity value.
(D13)	The location of the petroleum activity(ies) must be selected in accordance with the following site planning principles: (g) maximise the use of areas of pre-existing disturbance (h) in order of preference, avoid, minimise or mitigate any impacts, including cumulative impacts, on areas of native vegetation or other areas of ecological value (i) minimise disturbance to land that may result in land degradation (j) in order of preference, avoid then minimise isolation, fragmentation, edge effects or dissection of tracts of native vegetation; and (k) in order of preference, avoid then minimise clearing of native mature trees.
(D14)	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.

(D15)	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**. **Protection of biodiversity values, Table 1—Authorised petroleum activities in environmentally sensitive areas and their protection zones**

	<table><tr><th>**Environmentally sensitive area**</th><th>**Within the environmentally sensitive area**</th><th>**Primary protection zone of the environmentally sensitive area**</th><th>**Secondary protection zone of the environmentally sensitive area**</th></tr><tr><td>Category A environmentally sensitive areas</td><td>No petroleum activities permitted.</td><td>Only low impact petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td></tr><tr><td>Category B environmentally sensitive areas that are other than ‘endangered' regional ecosystems</td><td>Only low impact petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td><td>Petroleum activities permitted.</td></tr><tr><td>Category B environmentally sensitive areas that are ‘endangered’ regional ecosystems</td><td>Only low impact petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td><td>Petroleum activities permitted.</td></tr><tr><td>Category C environmentally sensitive areas that are ‘nature refuges’ or ‘koala habitat’</td><td>Only low impact petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td><td></td></tr><tr><td>Category C environmentally sensitive areas that are ‘essential habitat’, ‘essential regrowth habitat’, or ‘of concern’ regional ecosystems</td><td>Only essential petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td><td></td></tr><tr><td>Category C environmentally sensitive areas that are ‘regional parks’ (previously known as ‘resources reserves’)</td><td>Only essential petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td><td></td></tr><tr><td>Category C environmentally sensitive areas that are ‘state forests’ or ‘timber reserves’</td><td>Only essential petroleum activities permitted.</td><td>Petroleum activities permitted.</td><td></td></tr><tr><td>Areas of vegetation that are ‘critically limited’</td><td>Only low impact petroleum activities permitted.</td><td>Only essential petroleum activities permitted.</td><td></td></tr></table>
(D16)	The record of the assessment required by conditions (D10) and (D11) and the extent of significant disturbance to land in the following areas must be prepared for each annual return period and made available to the administering authority upon request:

	(a) The Primary Protection Zone of, or within a Category B or C Environmentally Sensitive Area; and (b) In the Secondary Protection Zone of Environmentally Sensitive Areas; and (c) Other remnant vegetation areas; and (d) Wetlands.
(D17)	Prior to carrying out petroleum activities undertaken within Environmentally Sensitive Areas in accordance with *Protection of biodiversity values, Table 1 - Authorised petroleum activities in environmentally sensitive areas and their protection zones*, it must be demonstrated, in the following order of preference that: (a) no reasonable or practicable alternative exists for carrying out the essential petroleum activities within the Environmentally Sensitive Area; and (b) the essential petroleum activities are preferentially located in pre-existing areas of clearing or significant disturbance.
(D18)	Linear infrastructure construction corridors must, for linear infrastructure that is an essential petroleum activity authorised in an environmentally sensitive area or its primary protection zone, be no greater than 40m in total width.
(D19)	Prior to carrying out essential petroleum activities subject to condition (D15) within the primary and Secondary Protection Zones of an Environmentally Sensitive Area, the holder of the environmental authority must demonstrate, in the following order of preference: (a) the essential petroleum activities are preferentially located in areas of pre-existing disturbance; and (b) significant disturbance to land from the carrying out of the essential petroleum activities is minimised to the greatest extent practicable.
(D20)	Petroleum activities undertaken within a Primary Protection Zone or Secondary Protection Zone of an Environmentally Sensitive Area in accordance with *Protection of biodiversity values, Table 1 - Authorised petroleum activities in environmentally sensitive areas and their protection zones* must not impact the adjacent Environmentally Sensitive Area.
Waste conditions	
Condition number	**Condition**
(G1)	Measures must be implemented so that waste is managed in accordance with the waste and resource management hierarchy and the waste and resource management principles.
(G2)	Waste, including waste fluids, but excluding waste used in closed-loop systems, must be transported off-site for lawful re-use, remediation, recycling or disposal, unless the waste is specifically authorised to be disposed of or used on site under this environmental authority.
(G3)	Waste fluids, other than flare precipitant stored in flare pits, or residual drilling material or drilling fluids stored in sumps, must be contained in either: (a) an above ground container; or

	(b) a structure which contains the wetting front.
(G4)	Green waste may be used on-site for either rehabilitation or sediment and erosion control, or both.
(G5)	Produced water and stimulation flow back water may be re-used in: (a) drilling and well hole activities; or (b) stimulation activities.
(G6)	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.
(G7)	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.
(G8)	If there is any indication that any of the circumstances in condition (G6(b)(i)) to (G6(b)(iv)) or (G7)(a) to (G79(d)) is occurring the use must cease immediately and the affected area must be remediated without delay.
(G9)	Produced water from the authorised petroleum activity(ies) which is used for domestic, stock or stock intensive purposes must meet the ANZECC and ARMCANZ Water Quality Guidelines 2000 for stock and domestic purposes, as amended from time to time.
(G10)	Treated sewage effluent or greywater can be released to land provided it: (a) meets or exceeds secondary treated class B standards for a treatment system with a daily peak design capacity of between 150 EP and 1500 EP; or (b) meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of less than 150 EP.
(G11)	The release of treated sewage effluent or greywater authorised in condition (G10) must: (a) be to a fenced and signed contaminant release area(s) (b) not result in pooling or run-off or aerosols or spray drift or vegetation die-off (c) be to a contaminant release area(s) that is kept vegetated with groundcover, that is: i. not a declared pest species ii. kept in a viable state for transpiration and nutrient uptake; and iii. grazed or harvested and removed from the contaminant release area as needed, but not less than every three months.

(G12)	Sewage pump stations must be fitted with a: (a) stand-by pump; and (b) high level alarm to warn of imminent pump station overflow, that operates without mains power or with a back-up power source that starts automatically in the event of a power failure.
(G13)	If sumps are used to store residual drilling material or drilling fluids, they must only be used for the duration of drilling activities.
(G14)	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.
(G15)	Records must be kept to demonstrate compliance with condition (G13) and (G14).
(G16)	**Transfer of Assets** Despite condition (Common Conditions Schedule (R18)), the holder of the environmental authority is authorised to transfer produced water to a low consequence dam left in-situ for beneficial use, in accordance with the following: (a) The landholder must agree in writing to the transfer ownership of the low consequence dam; (b) The landholder must agree in writing to the beneficial re-use of produced water; (c) The dam must be assessed as being a low consequence dam 12 months prior to the transfer of water; (d) suitably qualified person must identify that the dam is adequate for the intended on-going use by the landholder within three months prior to transfer the transfer of the dam; (e) a suitably qualified person must identify that the low consequence dam and the land on which it is located, must be safe, stable, non-polluting and able to support the post-activity land use within three months prior to the transfer of the dam; (f) On cessation of the transfer of water, low consequence dams must be decommissioned to no longer accept inflow from the petroleum activity(ies); (g) Produced water transferred to the landholder must meet the relevant quality guidelines for the intended purpose prior to the water being given.
(G17)	**Produced Water – Third Party Use Generally** The environmental authority must ensure that the water meets the relevant quality guidelines for the intended purpose prior to the water being given on: (a) initial transfer of the water; and (b) thereafter monthly.
(G18)	Written agreement for the use of produced water by a third party must include the following in writing: (a) the intended use of the water;

	(b) confirmation that the water meets ANZECC and ARMCANZ Water Quality Guidelines for the approved use; (c) confirmation that the produced water being provided is compliant with the environmental authority conditions; and (d) a current and complete laboratory certificate of analysis that outlines the quality of the produced water as per the ANZECC and ARMCANZ Water Quality Guidelines.
(G19)	The holder of this environmental authority must cease using, selling or giving away produced water immediately upon becoming aware that: (a) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at or before the point of supply; or (b) the water does not meet the water ANZECC and ARMCANZ Water Quality Guidelines for the approved use at the point in which it is used by a third party.
(G20)	When the produced water is transferred to a third party, the holder of the environmental authority must retain the following records of the resource: (a) origin of the produced water; (b) intent of the water; (c) date of dispatch of the produced water; (d) location of delivery of the produced water to the third-party user by real property description; (e) date of delivery of the produced water to the third party; (f) contact details for the person responsible for the use of the produced water at the site of use; (g) quantity (volume) of the produced water supplied; (h) relating to sampling and monitoring including: laboratory results, field data and monitoring report; and (i) any written procedures developed to manage the produced water.
(G21)	Upon written agreement, the administering authority must be notified with the following details: (a) the person responsible for the use of the produced water; (b) the location of use of the produced water; and (c) the intended use of the produced water.
Well construction, maintenance and stimulation activities conditions	
Condition number	**Condition**
(I1)	Oil based or synthetic based drilling muds must not be used in the carrying out of the petroleum activity(ies).
(I2)	Drilling activities must not result in the connection of the target gas producing formation and another aquifer.

(I3)	Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target formation and another aquifer as a result of drilling activities.
(I4)	Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in stimulation fluids in concentrations above the reporting limit.
(I5)	Stimulation activities must not negatively affect water quality, other than that within the stimulation impact zone of the target gas producing formation.
(I6)	Stimulation activities must not cause the connection of the target gas producing formation and another aquifer.
(I7)	The internal and external mechanical integrity of the well system prior to and during stimulation must be ensured such that there is: (a) no significant leakage in the casing, tubing, or packer; and (b) there is no significant fluid movement into another aquifer through vertical channels adjacent to the well bore hole.
(I8)	Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.
(I9)	Prior to undertaking stimulation activities, a risk assessment must be developed to ensure that stimulation activities are managed to prevent environmental harm.
(I10)	The stimulation risk assessment must be carried out for every well to be stimulated prior to stimulation 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 landholder' 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: iv. toxicological and ecotoxicological information of chemical compounds used v. information on the persistence and bioaccumulation potential of the chemical compounds used; and vi. 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.
(I11)	A summary of each stimulation risk assessment must be submitted to the administering authority upon request.

(I12)	Prior to undertaking any stimulation activity, a baseline bore assessment must be undertaken of the water quality of: (a) all landholder's active groundwater bores (subject to access being permitted by the landholder) that are spatially located within a two (2) kilometre horizontal radius from the location of the 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 two (2) kilometre radius from the location of the stimulation initiation point; and (c) any other bore that could potentially be adversely impacted by the stimulation activities in accordance with the findings of the risk assessment required by conditions (I9) and (I10).
(I13)	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 (I14).
(I14)	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: (u) pH (v) electrical conductivity [μS/m] (w) turbidity [NTU] (x) total dissolved solids [mg/L] (y) temperature [ºC] (z) dissolved oxygen [mg/L] (aa) dissolved gases (methane, chlorine, carbon dioxide, hydrogen sulfide) [mg/L] (bb) alkalinity (bicarbonate, carbonate, hydroxide and total as $CaCO_3$) [mg/L] (cc) sodium adsorption ratio (SAR) (dd) anions (bicarbonate, carbonate, hydroxide, chloride, sulphate) [mg/L] (ee) cations (aluminium, calcium, magnesium, potassium, sodium) [mg/L] (ff) dissolved and total metals and metalloids (including but not necessarily being limited to: aluminium, arsenic, barium, borate (boron), cadmium, total chromium, copper, iron, fluoride, lead, manganese, mercury, nickel, selenium, silver, strontium, tin and zinc) [μg/L] (gg) total petroleum hydrocarbons [μg/L] (hh) BTEX (as benzene, toluene, ethylbenzene, ortho-xylene, para- and meta-xylene, and total xylene) [μg/L] (ii) polycyclic aromatic hydrocarbons (including but not necessarily being limited to: naphthalene, phenanthrene, benzo[a]pyrene) [μg/L] (jj) sodium hypochlorite [mg/L] (kk) sodium hydroxide [mg/L] (ll) formaldehyde [mg/L] (mm) ethanol [mg/L]; and

	(nn) gross alpha + gross beta or radionuclides by gamma spectroscopy [Bq/L].
(I15)	A stimulation impact monitoring program must be developed prior to the carrying out of stimulation activities which must be able to detect adverse impacts to water quality from stimulation activities and must consider the findings of the risk assessment required by conditions (I9) and (I10) that relate to stimulation activities and must include, as a minimum, monitoring of: (e) the stimulation fluids to be used in stimulation activities at sufficient frequency and which sufficiently represents the quantity and quality of the fluids used (f) flow back waters from stimulation activities at sufficient frequency and which sufficiently represents the quality of that flow back water (g) 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 (h) all bores in accordance with condition (I12).
(I16)	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 (Well activities 14); 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.
(I17)	The stimulation impact monitoring program must provide for monitoring of the bores in condition (I15(d)) at the following minimum frequency: (a) monthly for the first six (6) months subsequent to stimulation activities being undertaken; then (b) annually for the first five (5) years subsequent to stimulation being undertaken or until analytes and physico-chemical parameters listed in conditions (I14(a)) to (I14(t)) inclusive, are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions.
(I18)	The results of the stimulation impact monitoring program must be made available to any potentially affected landholder upon request by that landholder.

Definitions

Key terms and/or phrases underlined in this environmental authority are defined in this section. Where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

Term	Definition

<table>
<tr><td>acceptable standards for release to land</td><td>means wastewater of the following quality as determined by monitoring results or by characterisation:
(a) electrical conductivity (EC) not exceeding 3000µS/cm
(b) sodium adsorption ratio (SAR) not exceeding 8
(c) pH between 6.0 and 9.0
(d) heavy metals (measured as total) meets the respective short term trigger value in section 4.2.6, Table 4.2.10—Heavy metals and metalloids in Australian and New Zealand Guidelines for Fresh and Marine Water Quality
(e) does not contain biocides.</td></tr>
<tr><td>acid sulfate soil(s)</td><td>means a soil or soil horizon which contains sulfides or an acid soil horizon affected by oxidation of sulfides.</td></tr>
<tr><td>adjacent land use(s)</td><td>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.</td></tr>
<tr><td>administering authority</td><td>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.</td></tr>
<tr><td>annual return period</td><td>means the most current 12-month period between two anniversary dates.</td></tr>
<tr><td>appraisal well</td><td>means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum. For clarity, an appraisal well does not include an exploration well.</td></tr>
<tr><td>appropriately qualified person / suitably qualified person</td><td>means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.
<< Note: The preferred term to use for the environmental offset conditions is ‘appropriately qualified person’ as ‘suitably qualified person’ as defined under the EP Act does not relate to these conditions. However, for consistency within an existing EA, the term ‘suitably qualified person’ can be used at the discretion of the relevant assessment team. >></td></tr>
<tr><td>approved quality criteria</td><td>for the purposes of residual drilling materials, means the residual drilling material meet the following quality standards:
Part A In all cases:
<table>
<tr><th>Parameter</th><th>Maximum concentration</th></tr>
<tr><td>pH</td><td>6–10.5 (range)</td></tr>
<tr><td>Electrical Conductivity</td><td>20dS/m (20,000µS/cm)</td></tr>
</table></td></tr>
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	Chloride* | 8000mg/L *Chloride analysis is only required if an additive containing chloride was used in the drilling process The limits in Part A must be measured in the clarified filtrate of oversaturated solids prior to mixing. Part B If any of the following metals are a component of the drilling fluids, then for that metal: **Parameter** | **Maximum concentration** Arsenic | 20mg/kg Selenium | 5mg/kg Boron | 100mg/kg Cadmium | 3mg/kg Chromium (total) | 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 | 1300mg/kg C34-C40 | 5600mg/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 Benzene | 1mg/kg
areas of pre-existing disturbance	means areas where environmental values have been negatively impacted as a result of anthropogenic activity and these impacts are still evident. Areas of pre-disturbance may include areas where legal clearing, logging, timber harvesting, or grazing activities have previously occurred, where high densities of weed or pest species are present which have inhibited re-colonisation of native regrowth, or where there is existing infrastructure (regardless

	of whether the infrastructure is associated with the authorised petroleum activities). The term 'areas of pre-disturbance' does not include areas that have been impacted by wildfire/s, controlled burning, flood or natural vegetation die-back.
associated water	means underground water taken or interfered with, if the taking or interference happens during the course of, or results from, the carrying out of another authorised activity under a petroleum authority, such as a petroleum well, and includes waters also known as produced formation water. The term includes all contaminants suspended or dissolved within the water.
associated works	in relation to a dam, means: (a) operations of any kind and all things constructed, erected or installed for that dam; and (b) any land used for those operations.
Australian Standard 3580	means any of the following publications: • AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter—Gravimetric method. • AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM10 high volume sampler with size-selective inlet—Gravimetric method • AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter— PM10 low volume sampler—Gravimetric sampler.
bed	of any waters, has the meaning in Schedule 12 of the Environmental Protection Regulation 2008 and— (a) includes an area covered, permanently or intermittently, by tidal or non-tidal waters; but (b) does not include land adjoining or adjacent to the bed that is from time to time covered by floodwater.
being or intended to be utilised by the landholder or overlapping tenure holder	for significantly disturbed land, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required. For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.
biodiversity values	for the purposes of this environmental authority, means environmentally sensitive areas, prescribed environmental matters and wetlands.
BTEX	means benzene, toluene, ethylbenzene, ortho-xylene, para-xylene, meta-xylene and total xylene.
clearing	has the meaning in the dictionary of the *Vegetation Management Act 2000* and for vegetation— (a) means remove, cut down, ringbark, push over, poison or destroy in any way including by burning, flooding or draining; but (b) does not include destroying standing vegetation by stock or lopping a tree.

critically limited regional ecosystem	means the regional ecosystems defined and listed in Appendix 5 of the Queensland Biodiversity Offset Policy.
daily peak design capacity	for sewage treatment works, has the meaning in Schedule 2, section 63(4) of the Environmental Protection Regulation 2008 as the higher equivalent person (EP) for the works calculated using each of the formulae found in the definition for EP.
dam(s)	means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works.
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.
designated precinct	has the meaning in Part 5 section 15(3) of the Regional Planning Interests Regulation 2014 and means: • for a strategic environmental area mentioned in section 4(1) – the area identified as a designated precinct on the strategic environmental area map for the strategic environmental are; or • if a strategic environmental area is shown on a map in a regional plan – the area identified on the map as a designated precinct for the strategic environmental area.
design storage allowance or DSA	means an available volume, estimated in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), published by the administering authority, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.
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.
enclosed flare	means a device where the residual gas is burned in a cylindrical or rectilinear enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.
environmental harm	has the meaning in section 14 of the *Environmental Protection Act 1994* and means any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance. Environmental harm may be caused by an activity— (a) whether the harm is a direct or indirect result of the activity; or (b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

environmental nuisance	has the meaning in section 15 of the *Environmental Protection Act 1994 and means* unreasonable interference or likely interference with an environmental value caused by— (a) aerosols, fumes, light, noise, odour, particles or smoke; or (b) an unhealthy, offensive or unsightly condition because of contamination; or (c) another way prescribed by regulation.
environmentally sensitive area	means Category A, B or C environmentally sensitive areas (ESAs)
equivalent person or EP	has the meaning under section 3 of the Planning Guidelines For Water Supply and Sewerage, 2005, published by the Queensland Government. It is calculated in accordance with Schedule 2, Section 63(4) of the Environmental Protection Regulation 2008 where: • EP = V/200 where V is the volume, in litres, of the average dry weather flow of sewage that can be treated at the works in a day; or • EP = M/2.5 where M is the mass, in grams, of phosphorus in the influent that the works are designed to treat as the inlet load in a day.
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 • 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 o 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

	○ temporary administration sites and warehouses ○ 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 authority	has the meaning in section 94 of the *Environmental Offsets Act 2014*.
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.
flare pit	has the meaning in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635) and means containment area where any hydrocarbon that is discovered in an over-pressured reservoir during a drilling operation is diverted to, and combusted, the flare pit is only used during the drilling and work over process on a petroleum well.
flare precipitant	means waste fluids which result from the operation of a flare.
floodplains	has the meaning in the *Water Act 2000* and means an area of reasonably flat land adjacent to a watercourse that— • is covered from time to time by floodwater overflowing from the watercourse; and • does not, other than in an upper valley reach, confine floodwater to generally follow the path of the watercourse; and • has finer sediment deposits than the sediment deposits of any bench, bar or in-stream island of the watercourse.
flowable substance	means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.
fuel burning or combustion facility	means a permanent fuel burning or combustion equipment which in isolation, or combined in operation, or which are interconnected, is, or are capable of burning more than 500 kg of fuel in an hour.
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*
green waste	means waste that is grass cuttings, trees, bushes, shrubs, material lopped from trees, untreated timber or other waste that is similar in nature but does not include declared pest species.
greywater	means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.
groundwater dependent ecosystem (GDE)	means ecosystems which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes and ecosystem services. For the purposes of the environmental authority, groundwater dependent ecosystems do not include those mapped as "unknown".
growing	means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.
hydraulic integrity	refers to the capacity of a dam to contain or safely pass flowable substances based on its design.
impulsive (for noise)	means sound characterised by brief excursions of sound pressure (acoustic impulses) that significantly exceed the background sound pressure. The duration of a single impulsive sound is usually less than one second.
land degradation	has the meaning in the *Vegetation Management Act 1999* and means the following: • soil erosion • rising water tables • the expression of salinity • mass movement by gravity of soil or rock • stream bank instability • a process that results in declining water quality.
landholder's active groundwater bore	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*.
linear infrastructure	means powerlines, pipelines, flowlines, roads and access tracks.

liquid	means a substance which is flowing and offers no permanent resistance to changes of shape.
low consequence dam	means any dam that is not classified as high or significant as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, published by the administering authority, as amended from time to time.
low impact petroleum activities	means petroleum activities which do not result in the clearing of native vegetation, cause disruption to soil profiles through earthworks or excavation or result in significant disturbance to land which cannot be rehabilitated immediately using hand tools after the activity is completed. Examples of such activities include but are not necessarily limited to soil surveys (excluding test pits), topographic surveys, cadastral surveys and ecological surveys, may include installation of monitoring equipment provided that it is within the meaning of low impact and traversing land by car or foot via existing access tracks or routes or in such a way that does not result in permanent damage to vegetation.
Map of referable wetlands	has the meaning in Schedule 12 of the Environmental Protection Regulation 2008 and means the 'Map of referable wetlands', a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D.
maximum extent of impact	means the total, cumulative, residual extent and duration of impact to a prescribed environmental matter that will occur over a project's life after all reasonable avoidance and reasonable on-site mitigation measures have been, or will be, undertaken.
methodology	means the science of method, especially dealing with the logical principles underlying the organisation of the various special sciences, and the conduct of scientific inquiry.
mix-bury-cover method	means the stabilisation of residual drilling solids in the bottom of a sump by mixing with subsoil and which occurs in accordance with the following methodology: • the base of the subsoil and residual solid mixture must be separated from the groundwater table by at least one metre of a continuous layer of impermeable subsoil material (kw=10–8m/s) or subsoil with a clay content of greater than 20%; and • the residual solids is mixed with subsoil in the sump and cover; and • the subsoil and residual solids is mixed at least three parts subsoil to one part waste (v/v); and • a minimum of one metre of clean subsoil must be placed over the subsoil and residual solids mixture; and • topsoil is replaced.
notice of election	has the meaning in section 18(2) *Environmental Offsets Act 2014*.
petroleum activity	for this environmental authority means an authorised resource activity listed under the heading 'Petroleum Activities' in **Schedule A, Table 1 – Authorised Petroleum Activities and specific relevant activities.**
prescribed environmental matters	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.

predominant species	has the meaning in the Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Version 3.2 August 2012) and means a species that contributes most to the overall above-ground biomass of a particular stratum.
prescribed contaminants	has the meaning in section 440ZD of the *Environmental Protection Act 1994* and means:
primary protection zone	means an area within 200m from the boundary of any Category A, B or C ESA.
produced water	has the meaning in Section 15A of the *Petroleum and Gas (Production and Safety) Act 2004* and means CSG water or associated water for a petroleum tenure.
protection zone	means the primary protection zone of any Category A, B or C ESA or the secondary protection zone of any Category A or B ESA.
regional ecosystem	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 vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystem Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.
regulated dam	means any dam in the significant or high consequence category as assessed using the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), published by the administering authority, as amended from time to time.
reinstate or reinstatement	for pipelines, means the process of bulk earth works and structural replacement of pre-existing conditions of a site (i.e., soil surface typography, watercourses, culverts, fences and gates and other landscape(d) features) and is detailed in the Australian Pipeline Industry Association (APIA) Code of Environmental Practice: Onshore Pipelines (2013).
reporting limit	means the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes, the reporting limit is selected as the lowest non-zero standard in the calibration curve. Results that fall below the reporting limit will be reported as “less than” the value of the reporting limit. The reporting limit is also referred to as the practical quantitation limit or the limit of quantitation. For polycyclic aromatic hydrocarbons, the reporting limit must be based on super-ultra trace methods and, depending on the specific polycyclic aromatic hydrocarbon, will range between 0.005 ug/L–0.02 ug/L.
residual drilling material	means waste drilling materials including muds and cuttings or cement returns from well holes, and which have been left behind after the drilling fluids are pumped out.
restricted stimulation fluids	has the meaning in section 206 of the *Environmental Protection Act 1994* and means fluids used for the purpose of stimulation, including fracturing, that contain the following chemicals in more than the maximum amount prescribed under a regulation— (a) petroleum hydrocarbons containing benzene, ethylbenzene, toluene or xylene (b) chemicals that produce, or are likely to produce, benzene, ethylbenzene, toluene or xylene as the chemical breaks down in the environment.

revegetation or revegetating or revegetate	means to actively re-establish vegetation through seeding or planting techniques in accordance with site specific management plans.
secondary protection zone	in relation to a Category A or Category B ESA means an area within 100 metres from the boundary of the primary protection zone.
secondary treated class A standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g., release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 100cfu per 100mL, maximum 1000cfu per 100mL.
secondary treated class B standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g., release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 1000cfu per 100mL, maximum 10 000cfu per 100mL.
secondary treated class C standards	means treated sewage effluent or greywater which meets the following standards: • total phosphorous as P, maximum 20mg/L • total nitrogen as N, maximum 30mg/L • 5-day biochemical oxygen demand (inhibited) (e.g., Release pipe from sewage treatment plant), maximum 20mg/L • suspended solids, maximum 30mg/L • pH, range 6.0 to 8.5 • e-Coli, 80th percentile based on at least 5 samples with not less than 30 minutes between samples, 10 000cfu per 100mL, maximum 100 000cfu per 100mL.
significant residual impact	has the meaning in section 8 *Environmental Offsets Act 2014*.
significantly disturbed or significant disturbance or significant	has the meaning in Schedule 12, section 4 of the Environmental Protection Regulation 2008. Land is significantly disturbed if— (i) to a condition required under the relevant environmental authority; or (ii) if the environmental authority does not require the land to be rehabilitated to a particular

disturbance to land or areas	condition—to the condition it was in immediately before the disturbance.
species richness	means the number of different species in a given area.
statement of compliance	for a condition in an environmental authority has the meaning in section 208 of the *Environmental Protection Act 1994* and is a condition that requires the holder to give the administering authority a statement of compliance about a document or work relating to a relevant activity. The condition must also state— (a) the criteria (the compliance criteria) the document or work must comply with; and (b) that the statement of compliance must state whether the document or work complies with the compliance criteria; and (c) the information (the supporting information) that must be provided to the administering authority to demonstrate compliance with the compliance criteria; and (d) when the statement of compliance and supporting information must be given to the administering authority.
stimulation	means a technique used to increase the permeability of natural underground reservoir that is undertaken above the formation pressure and involves the addition of chemicals. It includes hydraulic fracturing / hydrofraccing, fracture acidizing and the use of proppant treatments. **Explanatory note:** This definition is restricted from that in the *Petroleum and Gas (Production and Safety) Act 2004* in order to only capture the types of stimulation activities that pose a risk to environmental values of water quality in aquifers.
stimulation fluid	means the fluid injected underground to increase permeability. For clarity, the term stimulation fluid only applies to fluid injected down well post-perforation.
stimulation impact zone	means a 100m maximum radial distance from the stimulation target location within a gas producing formation.
strategic environmental area	has the meaning in section 11(1) of the *Regional Planning Interest Act 2014.*
structure	means a dam or levee.
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.*

suitably qualified person	means a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.
suitably qualified third party	means a person who: (a) has qualifications and experience relevant to performing the function including but not limited to: i. a bachelor's degree in science or engineering; and ii. 3 years' experience in undertaking soil contamination assessments; and (b) is a member of at least one organisation prescribed in Schedule 8 of the Environmental Protection Regulation 2008; and (c) not be an employee of, nor have a financial interest or any involvement which would lead to a conflict of interest with the holder(s) of the environmental authority.
sump	means a pit in which waste residual drilling material or drilling fluids are stored only for the duration of drilling activities.
synthetic based 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.
top soil	means the surface (top) layer of a soil profile, which is more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300mm in depth from the natural surface.
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.
void	means any constructed, open excavation in the ground.
waste and resource management hierarchy	has the meaning provided in section 9 of the *Waste Reduction and Recycling Act 2011 and* is the following precepts, listed in the preferred order in which waste and resource management options should be considered— (a) AVOID unnecessary resource consumption (b) REDUCE waste generation and disposal (c) RE-USE waste resources without further manufacturing (d) RECYCLE waste resources to make the same or different products (e) RECOVER waste resources, including the recovery of energy (f) TREAT waste before disposal, including reducing the hazardous nature of waste (g) DISPOSE of waste only if there is no viable alternative.
waste and resource management principles	has the meaning provided in section 4(2)(b) of the *Waste Reduction and Recycling Act 2011* and means the: (a) polluter pays principle (b) user pays principle (c) proximity principle

	(d) product stewardship principle.
waste fluids	has the meaning in section 13 of the *Environmental Protection Act 1994* in conjunction with the common meaning of "fluid" which is "a substance which is capable of flowing and offers no permanent resistance to changes of shape". Accordingly, to be a waste fluid, the waste must be a substance which is capable of flowing and offers no permanent resistance to changes of shape.
watercourse	has the meaning in Schedule 4 of the *Environmental Protection Act 1994* and means: 1) a river, creek or stream in which water flows permanently or intermittently— (a) in a natural channel, whether artificially improved or not; or (b) in an artificial channel that has changed the course of the watercourse. 2) Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.
waters	includes all or any part of a creek, river, stream, lake, lagoon, swamp, wetland, spring, unconfined surface water, unconfined water in natural or artificial watercourses, bed and bank of any waters, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and underground water.
well integrity	the ability of a well to contain the substances flowing through it.
wetland	for the purpose of this environmental authority, wetland means: • areas shown on the Map of referable wetlands which is a document approved by the chief executive on 4 November 2011 and published by the department, as amended from time to time by the chief executive under section 144D of the Environmental Protection Regulation 2008; and • areas defined under the Queensland Wetlands Program as permanent or periodic / intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six (6) metres, and possess one or more of the following attributes: o at least periodically, the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or o the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or o the substratum is not soil and is saturated with water or covered by water at some time. The term wetland includes riverine, lacustrine, estuarine, marine and palustrine wetlands; and it does not include a Great Artesian Basin Spring or a subterranean wetland that is a cave or aquifer.
wetland of high ecological significance	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.
wetland of other environmental value	means a wetland that meets the definition of a wetland and that is shown as a wetland of 'general environmental significance' or wetland of 'other environmental value' on the Map of referable wetlands.

End of Part 7 – Murrungama Development Area

END OF ENVIRONMENTAL AUTHORITY