

Checklist

Environmental Protection Act 1994

Amendment application - assessment level decision and public notice

This checklist is to be used to decide whether a proposed amendment to an environmental authority is a major amendment or minor amendment (threshold) (the assessment level decision) as required under section 228 of the Environmental Protection Act 1994. If a major amendment, this checklist is also used to determine whether public notice is required under sections 230, 233 or 152 of that Act (Note, this checklist is not relevant for condition conversion applications as these applications are automatically treated as minor amendments and do not require an assessment level decision).

1. APPLICATION DETAILS

EA NO:	EPPG03515915	PROJECT NO:	433650
APPLICANT:	Santos CSG Pty Ltd PAPL (Upstream II) Pty Limited Total E&P Australia Total E&P Australia II KGLNG E&P Pty Ltd	FILE NO:	101/0021244-001
TENURE:	Petroleum lease (PL) 176	RECEIVED DATE:	19 December 2016
PROJECT NAME:	Scotia Project Area	CHECKLIST DUE:	18 January 2017
AMENDMENT APPLICATION DESCRIPTION:	<p>On 16 December 2016, Santos CGS Pty Ltd (Santos), on behalf of all the environmental authority (EA) holders, submitted an EA amendment application for the Scotia Project Area on EA EPPG03515915 to include the Coordinator General's (CGs) stated conditions and obtain the relevant authorisations for the Santos Gas Field Development project. The CG released its report on the Santos Gas Field Development (GFD) EIS which included imposed and stated conditions on 4 December 2015. The CG's stated conditions include various site-specific conditions which would require site-specific information (such as locations of disturbances etc.) and schedules for an EA for the GFD development project. These include:</p> <ul style="list-style-type: none"> - Condition A1 – Scoping table - Schedule D, Table 2 – Authorised disturbances - Condition D13 – Maximum disturbance to ecological receptors - Schedule E – Brine and salt management - Schedule G – Air - Schedule H – Regulated structures - Schedule J – Rehabilitation 		

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	The amendment application provided an assessment of potential impacts of activities on relevant environmental values. Santos is also seeking authorisation for environmentally relevant activity (ERA) 8(1)(c) required for temporary fuel storage, ancillary to construction activities.
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2. ASSESSMENT CONSIDERATIONS

An assessment level decision must be made within 10 business days from receipt of the amendment application (section 228). This decision determines whether the proposed amendment is low risk and involves straightforward changes to the environmental authority (EA) or whether the activities proposed are likely to lead to a significant increase in the scale, intensity, level of environmental harm or impact. When completing the assessments considerations table in part two of this checklist, please refer to guideline 'major and minor amendments' EM959 for guidance on minor and major assessment considerations.

Note: where an application is made to amend the condition that requires the relevant activity to comply with the relevant eligibility criteria, written refusal can be given without further assessment or assessment level decision (see EM1320). Under section 227A a site specific application can be required if the eligibility criteria can no longer be met and where it is reasonable to require a site-specific application. Alternatively, the application can proceed in the same way as a major amendment if requiring a site specific application is not reasonable (i.e. the application is not refused, but proceeds as a major amendment). For example: where the eligibility criteria require that the activity is not within 1km of the nearest sensitive receptor and a new sensitive receptor is subsequently established close to the existing activity.

Consideration The amendment application:	Yes / No	Justification (if required)
(a) is not a change to a condition identified in the EA as a standard condition?	Yes	There are no conditions identified as standard conditions in EA EPPG03515915.
(b) does not significantly increase the level of environmental harm caused by the relevant activity?	No	<p>This amendment application is seeking authorisation for the GFD project on the Scotia Project Area through adoption of the CG's stated conditions. The commencement of the GFD project is triggered on the Scotia Project Area when construction begins on the proposed upgrade to the Scotia compression facility, which will have a total disturbance area of 60 hectares. Further, Santos is also seeking an increase in the number of wells authorised on the project area and the authorisation of the ERA for chemical storage. This project area is currently authorised for 152 wells and the GFD authorisation will increase the authorisation by 350 wells to a total of 502 wells, which is a total disturbance area of 753ha.</p> <p>In Section 3.3 of the supporting information, Santos has detailed the relevant environmental values within the Scotia Project Area are limited and that, in accordance with Section 4.4 of the supporting information, management measures would be</p>

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		<p>implemented to avoid, minimise and manage potential impacts on environmental values.</p> <p>However, in accordance with the principles provided in section 3.3 of EHP's Guideline: Major and minor amendments (ESR/2015/1684) (the guideline), EHP has determined that, as the proposed amendment cannot be approved without the need to authorise a significantly greater level of disturbance than the existing EA authorises, there is a significant increase in the level of environmental harm caused by the relevant activity.</p>
(c) does not change any rehabilitation objectives stated in the EA in a way likely to result in significantly different impacts on environmental values than the impacts previously permitted under the EA?	Yes	<p>While the current conditions on EA EPPG03515915 are being wholly replaced with the CG's stated conditions, EHP does not consider that adopting the CG's stated conditions for rehabilitation will result in a change to the rehabilitation objectives that will result in a significantly different impact on environmental values than the impacts previously permitted under the current conditions.</p>
(d) does not significantly increase the scale or intensity of the relevant activity?	No	<p>This amendment application is seeking authorisation for the GFD project on the Scotia Project Area through adoption of the CG's stated conditions. The commencement of the GFD project is when construction begins on the proposed upgrade to the Scotia compression facility. The current Scotia facility has three compressors and the upgrade of the facility will increase the size of the facility to nine compressors, resulting in a total disturbance area of 60 hectares.</p> <p>Further, Santos is seeking an increase in the number of wells authorised on the project area. This project area is currently authorised for 152 wells and the GFD authorisation will increase the authorisation by 350 wells to a total of 502 wells, which is a total disturbance area of 753ha.</p> <p>As such, EHP considers that there has been a significant increase in the scale or intensity of the relevant activity.</p>
<p>(e) does not relate to a new relevant resource tenure for the authority that is</p> <p>(i) a new mining lease? or</p> <p>(ii) a new petroleum lease? or</p> <p>(iii) a new geothermal lease under the Geothermal Energy Act? or</p>	Yes	<p>This amendment application does not relate to a new relevant resource tenure.</p>

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(iv) a new GHG injection and storage lease under the GHG storage Act?		
(f) involves an addition to the surface area for the relevant activity of no more than 10% of the existing area?	No	<p>This amendment application is seeking authorisation for the GFD project on the Scotia Project Area through adoption of the CG's stated conditions. The commencement of the GFD project is when construction begins on the proposed upgrade to the Scotia compression facility, which will have a total disturbance area of 60 hectares.</p> <p>Further, Santos is seeking an increase in the number of wells authorised on the project area. This project area is currently authorised for 152 wells and the GFD project will increase the number of authorised wells by 350 wells to a total of 502 wells, which is a total disturbance area of 753ha. This equates to 1.5ha per well. Using the 1.5ha, Santos is currently authorised for 228ha of disturbance for 152 well pads. Authorising the GFD project will increase the disturbance by 525ha for 502 well pads. This is an approximate 230% increase in the surface area of the relevant activity.</p> <p>As such, EHP is satisfied that there is an addition to the surface area of the relevant activity of more than 10%.</p>
(g) for an environmental authority for a petroleum activity, involves (i) constructing a new pipeline—the new pipeline does not exceed 150km? or (ii) extending an existing pipeline—the extension does not exceed 10% of the existing length of the pipeline?	Yes	The application does not relate to the construction of a new pipeline that exceeds 150km or the extension of an existing pipeline by more than 10%.
(h) relates to a new relevant resource tenure for the authority that is an exploration permit or GHG permit—and the amendment application under section 224 seeks an amended environmental authority that is subject to the standard conditions for the relevant activity or authority, to the extent it relates to the permit?	Yes	The application does not relate to a new resource tenure that is an exploration permit or a GHG permit.

Recommendation – major or minor amendment

Complete part (a) or (b) and check the Minor or Major check box.

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(a)	If all the 'Yes' boxes are marked, the application is a minor amendment. Complete the following:	
	<ul style="list-style-type: none"> Has the application been entered as a minor amendment in Ecotrack? If no, please email a copy of this signed checklist to Permit and Licence Management on palm@ehp.qld.gov.au to ensure Ecotrack is updated. Send ALD Notice to applicant in accordance with s229 within 10 business days Proceed to decide whether to grant or refuse the application 	MINOR ☐
(b)	If any of the 'No' boxes are marked, the application is a major amendment with issues likely to lead to a significant increase in the scale, intensity, level of environmental harm or impact. Completed the following:	
	<ul style="list-style-type: none"> Has the application been entered as a major amendment in Ecotrack? If no, please email a copy of this signed checklist to Permit and Licence Management on palm@ehp.qld.gov.au to ensure Ecotrack is updated and they are aware the assessment fee is required to be paid. Insert the below paragraph into the assessment level decision notice (EM841) if the assessment level decision is 'major' and the assessment fee has not already been paid. <p>1. Assessment fee</p> <p>The administering authority has determined that the proposed amendment to the environmental authority is a major amendment therefore further fees for the assessment of this application are required to be paid to the administering authority.</p> <p>The assessment fee for a major amendment is 30% of the annual fee for the authority that is the subject of the application prescribed under schedule 10, part 2, item 7A of the Environmental Protection Regulation 2008.</p> <p>The assessment fee to be paid is \$24,230.25.</p> <p>Please call Permit and Licence Management on 1300 130 372 (option 4) and quote your reference number to pay your outstanding fee. Under section 229(2)(b) of the <i>Environmental Protection Act 1994</i>, the assessment of the amendment application will not proceed until the assessment fee is paid.</p>	MAJOR ☒
	<ul style="list-style-type: none"> Proceed to the public notification consideration (Section 3) 	

3. PUBLIC NOTIFICATION CONSIDERATION – MAJOR AMENDMENTS

There are a number of different public notification processes that apply for a major amendment under the *Environmental Protection Act 1994*. Mark the relevant box and complete the relevant section:

- i) Public notice of a major amendment for a resources activity, other than a mining activity. ☒ **Complete section 3A**
- ii) Public notice of a major amendment for a mining activity, authorised under a mining lease, and there is no certificate of ☐ **Complete section 3B**

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public notice under the *Mineral Resources Act 1989* (Section 252A).

- iii) Public notice of a major amendment for a mining activity, authorised under a mining lease, and there is a certificate of public notice under the *Mineral Resources Act 1989* (Section 252A).
- iv) None of the above

☐ **Complete section 3B**

☐ **Public notification not required. Sign and date checklist and proceed to information stage if required.**

3A. PUBLIC NOTIFICATION CONSIDERATION – RESOURCE ACTIVITY MAJOR AMENDMENTS ONLY (s230)

Where an amendment application has been decided to be a **major amendment**, public notification requirements may be triggered. Resource activities other than a mining activity may trigger public notification requirements where an activity is determined to involve a substantial increase in the risk of environmental harm and a substantial change in the quantity or quality or the results of the release of a quantity or quality of contaminant permitted to be released into the environment.

Consideration	Yes/ No / N/A	Justification (If Required)
There is likely to be a substantial increase in the risk of environmental harm under the amended EA (s230(2)(a)) <u>and</u> the risk is the result of a substantial change in the quantity or quality of contaminant permitted to be released into the environment (s230(2)(b)(i)).	No	The commencement of the GFD project is triggered by the expansion of the compressor station on the Scotia Project Area, which is likely to cause a substantial increase in the risk of environmental harm under the amended EA due to the increase in quantity of contaminants permitted to be released to the environment. Prior to the introduction of the <i>Environment Protection and Other Legislation Amendment Act 2014</i> , it is likely that public notification would have been required. However, through this legislative amendment, if an application meets the requirements of s150 of the EP Act, public notification will not apply. Section 150 states: <i>This section applies if-</i> <ul style="list-style-type: none"> - Section 150(1)(b) - The EIS was notified under s33 of the SDPWO Act before the application was made; and - Section 150(1)(c) - The environmental risks of the activity have not changed since the EIS was notified; and - Section 150(1)(d)- If the application proposes a change to the way the relevant activity is to be carried out – the change would not attract a submission objecting to the change." <u>Section 150(1)(b)</u>
There is likely to be a substantial increase in the risk of environmental harm under the amended EA (s230(2)(a)) <u>and</u> the risk is the result of a substantial change in the results of the release of a quantity or quality of contaminant permitted to be released into the environment (s230(2)(b)(ii)).	No	

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Consideration	Yes/ No / N/A	Justification (If Required)
		<p>The EIS was notified under s33 of the SDPWO Act. Therefore, the application meets the requirement of s150(b) of the EP Act.</p> <p><u>Section 150(1)(c)</u> The air modelling, submitted with the EIS and the EA amendment application, demonstrated a substantial difference between the carbon monoxide (CO) concentrations. Air modelling for the EIS predicted cumulative concentrations of CO to be a maximum of 200µg/m³ 1km from the compressor station, however the site specific modelling in the EA amendment application predicted the concentration of CO at 665m to be 2200µg/m³. The EPP Air limit for CO is 11,000 µg/m³ and both modelled values are substantially lower than the EPP Air limit. The concentrations for nitric oxide (NO₂) were only slightly higher for the site specific modelling and were well within the EPP Air limits.</p> <p>To determine if the environmental risk had changed since the EIS was notified and whether s150(1)(c) of the EP Act has been met, technical advice was sought by EHP (see eDOCs reference: 5205981) which stated that, although there is a sizable increase in the predicted 8-hour average CO ground-level concentration at the nearest sensitive receptor, the predicted ground-level concentration of CO is only 20% of the relevant Environmental Protection (Air) Policy 2008 objective, which represents a low likelihood of any adverse impact at the sensitive receptor site. Therefore, due to the low risk from the change between the two modelling results for CO concentrations, EHP is satisfied that the environmental risks of the activity have not changed since the EIS was notified. As such, the application meets the requirement under s150(1)(c) of the EP Act.</p> <p><u>Section 150(1)(d)</u> The application does not propose a change to how the activity is to be carried out as it is the same activity on a larger scale. As such, EHP has determined that the relevant activity has not changed since the EIS was notified, and the application is not likely to attract a submission objecting to the change. As such, s150(1)(d) of the EP Act has been satisfied.</p> <p>Therefore, public notification is not required for this application.</p>

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Consideration	Yes/ No / N/A	Justification (If Required)
<p><i>Without limiting the above items, the following is taken to be a substantial change:</i></p> <ul style="list-style-type: none"> - An increase of 10% or more in the quantity of a contaminant to be released into the environment - If the amendment application is for an environmental authority for a resource project, an amendment to add an ineligible ERA for the authority 		

Recommendation – public notification under s230

- ☒ If both considerations above are marked 'No' or "N/A", the application does not require public notification.
- ☐ If either of the considerations above are marked 'Yes', the application may require public notification.

Public Notification is not required ☒

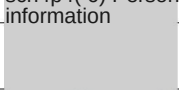
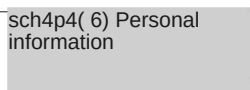
- Send ALD Notice to applicant in accordance with s229 within 10 business days, stating the decision (i.e. a major amendment) and the reasons for the decision
- Proceed to information stage.

Public Notification is required ☐

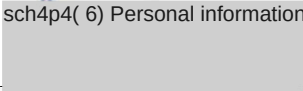
- Send ALD Notice to applicant in accordance with s229 including public notification requirement (s230) and the reasons for the decision (s230(4)) within 10 business days after the ALD is made.
- Proceed to information and notification stages.

3B. PUBLIC NOTIFICATION – MINING ACTIVITY MAJOR AMENDMENTS ONLY (s233 OR s152)**Recommendation – Public Notification under s233 or s152****Public notification is required under s152 ☐****Public notification is required under s233 ☐**

- Send ALD Notice to applicant in accordance with s229 within 10 business days, stating the decision (i.e. a major amendment) and the reasons for the decision.
- Proceed to information and notification stages.

Assessing Officer	Reviewing Officer
Sign:  Date: <u>17/11/17</u> Name: Emma Page	Sign:  Date: <u>17/11/2017</u> Name: Lucy Follent

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Position: Senior Environmental Officer	Position: Team Leader
Delegate	
<p>Recommendation/s: APPROVED / NOT APPROVED</p> <p>Sign:  Date: 17.01.2017</p> <p>Name: Kylie Breaker</p> <p>Position: Manager</p>	

Notice

Environmental Protection Act 1994

Assessment level decision

This notice is issued by the administering authority pursuant to section 229 of the Environmental Protection Act 1994 to advise whether a proposed amendment to an environmental authority is a major or minor amendment.

To: Santos CSG Pty Ltd, PAPL
(Upstream II) Pty Limited, Total E&P
Australia, Total E&P Australia II and
KGLNG E&P Pty Ltd
C/- Santos CSG Pty Ltd
Ground floor
60 Flinders Street
ADELAIDE SA 5000

ATTN s.73 Irrelevant information

Our reference: EPPG03515915

Assessment level decision for an application to amend an environmental authority

1. Application details

The application to amend the environmental authority (EA) EPPG03515915 was received by the administering authority on 16 December 2016.

The application reference number is AR096349.

Land description: Petroleum Lease (PL) 176 for the Scotia Project Area

2. Decision

The assessment level decision for this application is that the proposed amendment to the environmental authority is a **major** amendment.

3. Reasons for the decision

Section 223 of the *Environmental Protection Act 1994* stipulates that:

- A minor amendment does not significantly increase the level of environmental harm caused by the relevant activity
- A minor amendment does not significantly increase the scale or intensity of the relevant activity

- A minor amendment involves an addition to the surface area for the relevant activity of no more than 10% of the existing area
- A major amendment is an amendment that is not a minor amendment.

Pursuant to section 223 of the *Environmental Protection Act 1994*, the administering is satisfied that:

- The proposed amendment will significantly increase the level of environmental harm caused by the relevant activity as the EA currently authorises 152 wells and the application proposes 350 new wells to be authorised on the EA, which will significantly increase the level of environmental harm caused by the relevant activity; and
- The proposed amendment will significantly increase the scale and intensity of the relevant activity, as the application proposes 350 new wells to be authorised on the EA and an upgrade to the existing compressor station from three compressors to nine compressors; and
- The proposed amendment involves an addition to the surface area for the relevant activity of more than 10%. The EA currently authorises 152 wells and the application proposes 350 new wells to be authorised on the EA. This is a 230% increase in the surface area of the relevant activity from what is currently authorised on the EA.

4. Assessment fee

The application was accompanied by the prescribed fee which included the application fee plus an additional fee of 30% of the annual fee which is required for a major amendment. The receipt number from the payment of the prescribed fee is #1400005294.

5. Review and appeal rights

You may apply to the administering authority for a review of this decision within 10 business days after receiving this notice. You may also appeal against this decision to the relevant court. Information about your review and appeal rights is attached to this notice. This information is guidance only and you may have other legal rights and obligations.

Should you have any questions in relation to this notice, please contact the department using the contact details provided below.

sch4p4(6) Personal information

Signature

17 January 2017

Date

Kylie Breaker

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

Enquiries:

Petroleum and Gas (Assessment)
GPO Box 2454
BRISBANE QLD 4001
Phone: (07) 3330 5715
Fax: (07) 3330 5634
Email: emma.page@ehp.qld.gov.au

Attachments

Information sheet: Internal review and appeals (ESR/2015/1742)

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Environmental Protection Act 1994

Validating an amendment application

This checklist is to be used to assess whether an application to amend an environmental authority contains the information required under section 226 of the Environmental Protection Act 1994 and the requirements for amendment applications for coal seam gas activities under section 227.

EA NO:	EPPG03515915	PROJECT NO:	433650
APPLICANT:	Santos CSG Pty Ltd PAPL (Upstream II) Pty Limited Total E&P Australia Total E&P Australia II KGLNG E&P Pty Ltd	FILE NO:	101/0021244-001
TENURE:	Petroleum lease (PL) 176	RECEIVED DATE:	19 December 2016
PROJECT NAME:	Scotia Project Area	CHECKLIST DUE:	18 January 2017
AMENDMENT APPLICATION DESCRIPTION:	<p>On 16 December 2016, Santos CGS Pty Ltd (Santos), on behalf of all the environmental authority (EA) holders, submitted an EA amendment application for the Scotia Project Area on EA EPPG03515915 to include the Coordinator General's (CGs) stated conditions and obtain the relevant authorisations for the Santos Gas Field Development project. The CG released its report on the Santos Gas Field Development (GFD) EIS which included imposed and stated conditions on 4 December 2015. The CG's stated conditions include various site-specific conditions which would require site-specific information (such as locations of disturbances etc.) and schedules for an EA for the GFD development project. These include:</p> <ul style="list-style-type: none"> - Condition A1 – Scoping table - Schedule D, Table 2 – Authorised disturbances - Condition D13 – Maximum disturbance to ecological receptors - Schedule E – Brine and salt management - Schedule G – Air - Schedule H – Regulated structures - Schedule J – Rehabilitation <p>The amendment application provided an assessment of potential impacts of activities on relevant environmental values. Santos is also seeking authorisation for environmentally relevant activity (ERA) 8(1)(c) required for temporary fuel storage, ancillary to construction activities.</p>		

For an environmental authority (EA) amendment application to meet the content requirements of the *Environmental Protection Act 1994* (EP Act) it must include all of the information required for amendment

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applications generally (section 226) and particular requirements for coal seam gas (CSG) activities (section 227).

The amendment application only needs to include the points below to the extent of the proposed amendment. Indicate by marking the 'Yes' / 'No' / 'N/A' below whether the information in the checklist has been provided in the amendment application. Where appropriate, include a justification to this determination.

*Note: This checklist is **solely** for the purpose of identifying the presence or absence of mandatory information, **not**, the quality of the information.*

Amendment application content information requirements for applications generally (s. 226) An amendment application must:	YES / NO / N/A	Justification (if required)
(a) be made to the administering authority	Yes	The amendment application was lodged with the administering authority on 16 December 2016.
(b) be in the approved form	Yes	The current version of the application form (ESR/2015/1733, Version 9) was used.
(c) be accompanied by the fee prescribed under regulation	Yes	The amendment application fee was paid on 16 December 2016, receipt number 1400005294.
<i>Requirements in sections 226(d) – (f) do not apply for an application for a condition conversion.</i> (d) describe the proposed amendment	Yes	Section 1 and Section 2 of the supporting information describes the proposed amendment, which is to authorised the GFD project, include the CG's stated conditions and authorise ERA 8(1)(c) for temporary fuel storage.
(e) describe the land that will be affected by the proposed amendment	Yes	Section 3 of the supporting information describes the land that will be affected by the proposed amendment.
(f) describe any development permits in effect under the Planning Act for the carrying out of the relevant activity for the authority	Yes	Table 8: General Requirements EA Amendment Application of the supporting information states that there are no development permits in effect under the Planning Act for the carrying out of a relevant activity.
(g) state whether each relevant activity will, if the amendment is made, comply with any eligibility criteria for the activity	Yes	Table 8: General Requirements EA Amendment Application of the supporting information states that as EA EPPG03515915 is a site specific EA there is no relevant eligibility criteria.
(h) if the application states that each relevant activity will, if the amendment is made, comply with any eligibility criteria for the activity – include a declaration that the statement is correct	NA	As above.
<i>Requirements in sections 226(i) – (n) do not apply for an application for a condition conversion.</i> (i) state whether the applicant seeks to change a condition identified in the authority as a standard condition	Yes	Table 8: General Requirements EA Amendment Application of the supporting information states that the amendment does not seek to change a condition identified in the EA as a standard condition. EA

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		EPPG03515915 is a site specific EA and does not contain standard conditions.
(j) if the application related to a new relevant resource tenure for the authority that is an exploration permit or GHG permit – state whether the applicant seeks an amended environmental authority that is subject to the standard conditions for the relevant activity or authority, to the extent it related to the permit.	NA	Table 8: General Requirements EA Amendment Application of the supporting information states that the application does not relate to a new resource tenure that is an exploration permit or GHG permit.
<i>Requirements in sections 226(1)(k)(i) – (v) do not apply for applications where an EIS process for each relevant activity the subject of the application has been completed and an assessment of the environmental risk of each activity would be the same as the assessment in the EIS</i> (k)(i) include an assessment of the likely impact of the proposed amendment on the environmental values, including a description of the environmental values likely to be affected by the proposed amendment.	Yes	Section 3.3 of the supporting information describes the environmental values likely to be affected by the proposed amendment. These include air, noise, land, flora and fauna and water. As the GFD EIS relates to this amendment application, EHP will consider the detailed descriptions of the environmental values that are included in the EIS.
(k)(ii) include an assessment of the likely impact of the proposed amendment on the environmental values, including details of any emissions or releases likely to be generated by the proposed amendment .	Yes	Section 4 – Impact Assessment and Proposed Mitigation Measures and Attachment A – Air Quality Impact Assessment of the supporting information details the emissions and releases likely to be generated by the proposed amendment. As the GFD EIS relates to this amendment application, EHP will consider the details of emissions and releases that are included in the EIS.
(k)(iii) include an assessment of the likely impact of the proposed amendment on the environmental values, including a description of the risk and likely magnitude of impacts on the environmental values.	Yes	Section 4 – Impact Assessment and Proposed Mitigation Measures and Attachment A – Air Quality Impact Assessment of the supporting information describes the risk and likely magnitude of impacts on the environmental values. As the GFD EIS relates to this amendment application, EHP will consider the descriptions of the risk and likely magnitude of impacts that are included in the EIS.
(k)(iv) include an assessment of the likely impact of the proposed amendment on the environmental values, including details of the management practices proposed to be implemented to prevent or minimise adverse impacts.	Yes	Section 4 – Impact Assessment and Proposed Mitigation Measures of the supporting information details the management practices proposed to be implemented to prevent or minimise adverse impacts. As the GFD EIS relates to this amendment application, EHP will consider the management practices that are outlined in the EIS.
(k)(v) include an assessment of the likely impact of the proposed amendment on the environmental values,	Yes	Table 8: General Requirements EA Amendment Application of the supporting information states that all

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	including details of how the land the subject of the application will be rehabilitated after each relevant activity ceases.		rehabilitation activities will be undertaken in accordance with <i>Schedule J – Rehabilitation</i> of the CG's stated conditions. As the GFD EIS relates to this amendment application, EHP will consider the rehabilitation practices that are outlined in the EIS.
(l)	include a description of the proposed measures for minimising and managing waste generated by any amendments to the relevant activity	Yes	Section 4 – Impact Assessment and Proposed Mitigation Measures of the supporting information includes a description of the measures for minimising and managing waste generated by the proposed amendments. As the GFD EIS relates to this amendment application, EHP will consider the waste management practices that are outlined in the EIS.
(m)	include details of any site management plan or environmental protection order that relates to the land the subject of the application	Yes	Table 8: General Requirements EA Amendment Application of the supporting information states that there are no site management plans or environmental protection orders that relate to the project area.
(n)	include any other document relating to the application prescribed under a regulation	Yes	Section 24AA of the Environmental Protection Regulation 2008 describes the prescribed documents for an application for EA for a CSG activity. This amendment involves the management of CSG water. Please see below.

Amendment Application Content Information Additional requirements for CSG activities (s. 227)		YES / NO / N/A	Justification (if required)
This section applies if: <ul style="list-style-type: none"> • The amendment application relates to an environmental authority for a CSG activity; and • The proposed amendment would result in changes to the management of CSG water; and • The CSG activity is an ineligible ERA. Refer to s126(1) and s126(2) of the EP Act.			
(1)(a)	The quantity of CSG water the applicant reasonably expects will be generated in connection with carrying out each relevant CSG activity.	Yes	Santos estimates that up to 39.5GL over the life of the Scotia Project Area.
(1)(b)	The flow rate at which the applicant reasonably expects the water will be generated.	Yes	Santos estimates that the flowrate of CSG water produced will be up to 10ML/day.
(1)(c)	The quality of the water, including changes in the water quality that the applicant reasonably expects will happen while each relevant CSG activity is carried out.	Yes	Santos has stated that Table 17-2, Appendix Y of the GFD EIS provides detailed coal seam water quality results for the Scotia Project Area including management options for potential changes in water quality. Mean coal seam water quality results for the Scotia Project Area include:

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Validating an amendment application

		<ul style="list-style-type: none"> - EC = 6,365 μS/cm - TDS = 3,688 mg/L - pH = 8.1
(1)(d) The proposed management of the water including the use, treatment, storage or disposal of the CSG water.	Yes	<p>Santos has stated that the CSG water will be used for beneficial uses such as dust suppression, construction, operational use and irrigation.</p> <p>Treatment to achieve appropriate water quality to facilitate irrigation in accordance with the <i>ANZECC and ARMCANZ Water Quality Guidelines 2000</i>.</p> <p>The water will be temporarily stored in above-ground tanks (non-regulated dams) prior to beneficial use.</p> <p>There is no disposal of CSG water on the Scotia Project Area as it is all used beneficially.</p>
(1)(e)(i) The measurable criteria (the management criteria) against which the applicant will monitor and assess the effectiveness of the management of the water including criteria for the quantity and quality of the water used, treated, stored or disposed of.	Yes	<p>All of the coal seam water, up to 39.5 GL over the life of the Scotia Project Area will be used, treated and temporarily stored as described above. The quality of the water is also described above.</p>
(1)(e)(ii) The measurable criteria (the management criteria) against which the applicant will monitor and assess the effectiveness of the management of the water including criteria for protection of the environmental values affected by each relevant CSG activity.	Yes	<p>The relevant environmental value for the proposed beneficial use is land. Santos has stated that, to protect this environmental value, it will ensure that CSG water is managed to meet the <i>ANZECC and ARMCANZ Water Quality Guidelines 2000</i> for each relevant beneficial use.</p>
(1)(e)(iii) The measurable criteria (the management criteria) against which the applicant will monitor and assess the effectiveness of the management of the water including criteria for the disposal of waste, including, for example, salt generated from the management of the water.	Yes	<p>Santos has stated that, in accordance with condition H6 of the Scotia Project Area EA, all residual salt/brine will be disposed of off-site at a licenced facility that can lawfully reuse, recycle, or dispose of the waste under the EP Act.</p>
(1)(f) The action proposed to be taken if any of the management criteria are not complied with, to ensure the criteria will be able to be complied with in the future.	Yes	<p>Santos has stated that Table 17-5, Appendix Y of the GFD EIS provides the monitoring and management tasks for the proposed beneficial uses, including performance indicators in accordance with BUA approval (e.g. relevant water quality performance indicators using water quality limits from <i>ANZECC and ARMCANZ Water Quality Guidelines 2000</i>).</p>
(2)(a)(i) Must not provide for using a CSG evaporation dam in connection with carrying out a relevant CSG activity unless the	No	<p>Santos is not proposing a CSG evaporation dam.</p>

Checklist
Validating an amendment application

application includes an evaluation of best practice environmental management for managing the CSG water.		
(2)(a)(ii) Must not provide for using a CSG evaporation dam in connection with carrying out a relevant CSG activity unless the application includes an evaluation of alternative ways for managing the CSG water.	No	Santos is not proposing a CSG evaporation dam.
(2)(b) Must not provide for using a CSG evaporation dam in connection with carrying out a relevant CSG activity unless the application includes an evaluation that shows there is no feasible alternative to a CSG evaporation dam for managing the CSG water.	No	Santos is not proposing a CSG evaporation dam.

Amendment Application Content Information Additional requirements for exercising underground water rights (s. 227AA)	YES / NO / N/A	Justification (if required)
<p>This section applies if:</p> <ul style="list-style-type: none"> - the application relates to a site-specific environmental authority for <ul style="list-style-type: none"> o a resource project that includes a resource tenure that is a mineral development licence, mining lease or petroleum lease; or o a resource activity for which the relevant tenure is a mineral development licence, mining lease or petroleum lease <p>Refer to s126A(1) and s126A(2) of the EP Act.</p>		
(2)(a) Any proposed exercise of underground water rights during the period in which resource activities will be carried out under the relevant tenures	Yes	In the additional information, received on 16 January 2017 (eDOCs number: 5214708), Santos states that it proposes to extract produced water from the Bandanna Formation (or its equivalent) from PL176 for the purpose of producing coal seam gas.
(2)(b) The areas in which underground water rights are proposed to be exercised	Yes	In the additional information, received on 16 January 2017, Santos states that the areas that may be developed comprise the full extent of PL176, notwithstanding specific land access constraints that may influence development of certain petroleum and gas activities in specific areas.
(2)(c) For each aquifer to be affected, or likely to be affected, by the exercise of underground water rights: (2)(c)(i) A description of the aquifer	Yes	In the additional information, received on 16 January 2017, Santos states that the target aquifer comprises the Bandanna Formation of the Bowen Basin. This is uniformly overlain by the Rewan Formation, a regionally pervasive aquitard that varies in thickness across the tenement between 50 and 350 metres.

Checklist
Validating an amendment application

		<p>The Precipice Sandstone aquifer is the basal unit of the Surat Basin that overlies the Rewan Formation on PL176 where it ranges in thickness between 70 and 130 metres. The Evergreen Formation is an aquitard that overlies the Precipice Formation and varies in thickness from 140 to 180 metres across PL176. The Hutton Sandstone aquifer overlies the Evergreen Formation. The Injune Creek Group overlies the Hutton Sandstone. The Injune Creek Group contains the Walloon Coal Measures, however these are separated from the Hutton Sandstone by intervening aquitards.</p> <p>Santos states that a more detailed description is included in section 4 of the Surat Cumulative Management Area Underground Water Impact Report (herein 2016 UWIR) (eDOCs number: 5214701).</p>
(2)(c)(ii) An analysis of the movement of underground water to and from the aquifer, including how the aquifer interacts with other aquifers and surface water	Yes	<p>In the additional information, received on 16 January 2017, Santos provides an analysis of the movement of underground water to and from the affected or potentially affected aquifers, which included information on the inputs and recharges for the aquifers, information on the connectivity of aquifers, information on the risk of vertical preferential flow paths and information on any springs in PL176.</p> <p>See Appendix B of the GFD EIS Groundwater Assessment (included as a weblink in the additional information) and section 9.2 of the 2016 UWIR for further information.</p>
(2)(c)(iii) A description of the area of the aquifer where the water level is predicted to decline because of the exercise of underground water rights	Yes	<p>In the additional information, received on 16 January 2017, Santos states through modelling, it has determined the water level decline for the relevant aquifers would be between 2m and 5m. However, Santos states that it does not predict any impacts to groundwater quality from this decline.</p> <p>Further information is included in Section 7.2 and 7.3 of the GFD EIS Groundwater Assessment and Section 7.1 of the 2016 UWIR.</p>
(2)(c)(iv) The predicted quantities of water to be taken or interfered with because of the exercise of underground water rights during the period in which resource activities are carried out	Yes	<p>In the additional information, received on 16 January 2017, Santos states that up to 350 additional CSG wells will be constructed on PL176. It is estimated a peak in water production is around 0.5ML/d in 2020. When considering total cumulative water production to 2044, the nominal life of the project is estimated to be around 1750 ML.</p>
(2)(d) The environmental values that will, or may, be affected by the exercise of underground water rights and the nature and extent	Yes	<p>In the additional information, received on 16 January 2017, Santos provided information on the environmental values that will, or may, be affected by the exercise of underground water rights. This included information on the impacts to water bores, information on the impacts to springs,</p>

Checklist Validating an amendment application

of the impacts on the environmental values		<p>information on the impacts to other surface waters and information on the impact to formation integrity and surface subsidence.</p> <p>Further information is included in section 7.3.1 of the GFD EIS Groundwater Assessment and section 7.3.2 of the 2016 UWIR.</p>
(2)(e) Any impacts on the quality of groundwater that will, or may, happen because of the exercise of underground water rights during or after the period in which resource activities are carried out	Yes	<p>In the additional information, received on 16 January 2017, Santos provided information on any impacts to the quality of groundwater that will or may happen because of the exercise of underground water rights. This included information on changes in groundwater quality due to CSG depressurisation, information on any increase in concentrations of dissolved gas due to CSG depressurisation and information on the risk to groundwater quality from other planned activities.</p> <p>Further information is included in Appendix F of the 2016 UWIR.</p>
(2)(f) Strategies for avoiding, mitigating or managing the predicted impacts on the environmental values stated for paragraph (d) or the impacts on the quality of groundwater in paragraph (e)	Yes	<p>In the additional information, received on 16 January 2017, Santos states that there are no predicted impacts to groundwater due to the proposed development of PL176 and therefore, there is no assessment required on the nature and extent of the environmental values. However, Section 8 of the GFD EIS Groundwater Assessment outlines management measures for project activities that may impact groundwater.</p>

Comments / Notes

Insert any relevant information to support the decision

Recommendation

After completing the list/s above, mark which of the following applies:

- (a) The content of the amendment application is complete and valid.
A condition conversion is automatically treated as a minor amendment and applicant just needs to declare they can comply with the relevant eligibility criteria and standard conditions.

VALID ☒

For other applications the content of the application must be assessed to decide whether the proposed amendment is a major or minor amendment. This decision is known as an assessment level decision.

- (b) The content of the amendment application is incomplete.
The application is invalid and must be returned to the applicant without assessment.

INVALID ☐

Checklist
Validating an amendment application

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Assessing Officer	Reviewing Officer
Sign: sch4p4(6) Personal information Date: <u>17 / 1 / 17</u> Name: Emma Page Position: Senior Environmental Officer	Sign: sch4p4(6) Personal information Date: <u>17 / 1 / 2017</u> Name: Lucy Follent Position: Team Leader
Delegate	
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> <p>Recommendation: sch4p4(6) Personal information</p> <p>Sign: </p> <p>Name: Kylie Breaker</p> <p>Position: Manager</p> </div> <div style="width: 35%; text-align: center;"> <p>APPROVED / NOT APPROVED</p> <p>Date: <u>17.01.2017</u></p> </div> </div>	

From: RIESE Ralph [Ralph.Riese@ehp.qld.gov.au]
Sent: Friday, 13 January 2017 2:06 PM
To: PAGE Emma
Subject: RE: Question about air modelling - Santos

Correct. It is common to express the result as a percentage of the EPP (Air) objective as a way of showing the relationship. E.g. "In this case the predicted ground-level concentration is only 20% of the relevant EPP (Air) objective. This represents a low likelihood of any adverse impacts at the sensitive receptor site."



Ralph Riese
A/Compliance Delivery Manager
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Department of Environment and Heritage Protection

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PO Box 5065 Gladstone 4680

From: PAGE Emma
Sent: Friday, 13 January 2017 2:02 PM
To: RIESE Ralph <Ralph.Riese@ehp.qld.gov.au>
Subject: RE: Question about air modelling - Santos

Thanks, Ralph!

One more question, from my understanding from our chat, the main reason that the risk is so low to sensitive receptors despite the substantial difference in values of the CO concentrations, is because the value is so far below the EPP Air value for CO of 11,000ug/m3?

Just need to make sure that all my justifications in the report are thorough

Thanks



Emma Page
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From: RIESE Ralph
Sent: Friday, 13 January 2017 2:00 PM
To: PAGE Emma <Emma.Page@ehp.qld.gov.au>
Subject: RE: Question about air modelling - Santos

“At your service!”



Oops. “ground-level concentration”.



Ralph Riese
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From: PAGE Emma
Sent: Friday, 13 January 2017 11:42 AM
To: RIESE Ralph <Ralph.Riese@ehp.qld.gov.au>
Subject: RE: Question about air modelling - Santos

Hi Ralph,

Thank you for responding so fast! Just one question, what does GLCs mean?

Thanks



Emma Page
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From: RIESE Ralph
Sent: Friday, 13 January 2017 10:00 AM
To: PAGE Emma <Emma.Page@ehp.qld.gov.au>
Subject: RE: Question about air modelling - Santos

Emma: although there is a sizable increase in the predicted 8-hour average CO ground-level concentration at the nearest sensitive receptor, the likelihood of any adverse impact would be very low.

Determining the probable cause of the increased CO GLCs would take a little digging (the adopted background CO concentration remains the same for both reports, so I suspect it relates to an overall increase in CO emissions from the new equipment, and perhaps some differences in modelling tool setup). Happy to dig if needs be.

Cheers, Ralph.



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From: PAGE Emma
Sent: Friday, 13 January 2017 9:22 AM
To: RIESE Ralph <Ralph.Riese@ehp.qld.gov.au>
Cc: FOLLENT Lucy <Lucy.Follent@ehp.qld.gov.au>
Subject: Question about air modelling - Santos

Hey Ralph,

I am currently working on an EA amendment application for Santos and I have a quick question to do with air modelling in an EIS (which was more generic) vs site specific air modelling. The application is seeking to increase its compressor station from 3 to 9 compressors, which will substantially increase the emissions.

Santos modelled generic air compressor stations in its EIS. In Section 6.2.1 and Section 6.2.2 of Appendix P – Air Quality of the EIS, Santos provided data for the highest predicted cumulative concentrations at 1km from the compressor, which are as follows:

- NO₂ – approximately 125 µg/m³ (1 hour average), which is well below the EPP Air value of 250 µg/m³
- NO₂ – approximately 10.5 µg/m³ (annual average), which is well below the EPP Air value of 33 µg/m³

- CO – **200 µg/m³** (8 hour average), which is significantly less than the EPP Air value of 11,000 µg/m³

In its supporting information for the amendment, Santos provided the following information for the highest predicted cumulative concentrations at the closest sensitive receptor (665 m) to the proposed CF1 plant. Santos has provided comparison to the Environmental Protection (Air) Policy 2008 (EPP Air). They were as follows:

- NO₂ - 153.6 µg/m³ (1 hour average) which is well below the EPP Air value of 250 µg/m³
- NO₂ – less than 11.3 µg/m³ (annual average) which is well below the EPP Air value of 33 µg/m³
- CO – **2,200 µg/m³** (8-hour average) which is significantly less than 11,000 µg/m³ EPP Air value.

My main question is what is the risk of the CO concentration going from 200 µg/m³ at 1km from the compressor station to 2,200 µg/m³ at 665m from the compressor station. Both values are well under the EPP Air limit of 11,000µg/m³ . P&G consider that due to the fact it is still far below the EPP Air limits, the risk is minimal, but it is a large change to the values.

P&G need to determine if the site specific information shows a substantial change in the risk to the closest sensitive receptors when compared to the EIS modelling. I have also attached the relevant sections of the EIS and the amendment application and the EA.

Please let me know when you are available for a chat.

Thanks

Emma Page

Senior Environmental Officer (Assessment)

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Provide the purpose and scope of the document and any relevant detail to be included. Also provide the reasons the document is needed.	
For all enquiries, except document amendment/development requests, please complete the sections below:	
1. If the enquiry relates to a specific environmental authority, site or application please provide the relevant details below:	
Client/Applicant name:	Santos
Environmental authority number:	EA EPPG03515915
Site name and/or tenure number(s):	Scotia Project Area (PL176)
Application type: <i>For example: environmental authority amendment, plan of operations, FA decision.</i>	EA amendment (major)
2. Other information required:	
Background information about the issue: <i>Please provide specific information/context around the issue, for example:</i> <ul style="list-style-type: none"> - Define the issue. - Explain the history of the issue, how the issue came about, what was done to address the issue by the client and the Business Centre. - Provide references to the sections of the legislation, policy, guideline, standard etc. which are relevant to the issue. - Previous advice provided to client about the issue. - The client's expectations in terms of scope of the advice that is to be provided. - Previous advice provided by RSRS. - Potential solutions considered. 	<p><u>Background to the Gas Fields Development EIS</u></p> <p>The Santos Gas Fields Development Project (GFD) was declared a coordinated project under section 26(1)(a) of the <i>State Development and Public Works Organisation Act 1971</i> (SDPWO Act) on 16 November 2012. On 4 December 2015, the Coordinator General released the 'Coordinator-General's evaluation report on the environmental impact statement for the GFD Project' (CG Report). The Coordinator General approved the GFD Project, subject to imposed and stated conditions included in the CG Report, designed to assist in the minimisation and management of project impacts. Appendix 1 of the CG Report includes the stated conditions for inclusion in any Environmental Authority governing the GFD Project.</p> <p><u>GFD Commencement</u></p> <p>Santos is planning to commence the GFD on the Scotia Project Area (PL176) (under EA EPPG03515915) in the first quarter of 2017. Commencement of the GFD Project has been confirmed by the Office of the Coordinator General as being when construction begins on the proposed upgrade of the Scotia compression facility (Scotia Plant). Activities currently authorised by EA EPPG03515915 were confirmed to not constitute GFD activities.</p> <p><u>Proposed amendment</u></p> <p>On 5 December 2016, Santos provided a draft EA amendment application for the Scotia project area to amend the EA to include the CG's stated conditions and obtain the relevant authorisations for the GFD project. However, the CG's stated conditions include various site-specific conditions and schedules for which the draft amendment application provided an assessment of potential impacts on relevant environmental values. EHP did not consider the draft amendment application to be valid and provided advice to Santos on 13 December 2016 (please see attached email). In this advice, P&G advised Santos that, while it notes that Santos considers that s139 and s150 of the EP Act do apply, due to the site-specific nature of proposed amendment, P&G is still in the process of determining if the sections apply.</p> <p>On 16 December 2016, Santos lodged the formal application (please see Santos' supporting information attached).</p> <p>The possible trigger for public notification is the expansion of the compressors on the Scotia Project Area and the subsequent increase in contaminants. Under the s150 of the EP Act, if an EIS has been undertaken under the SDPWO Act and the EIS for each relevant activity was notified under that Act before the application was made, then the notification stage does not apply to the application. P&G considers that if this section were not included in the EP Act, then public notification would apply due to the increase in the risk of environmental harm from a substantial change (more than 10%) in contaminants, due to the increase in the compressor stations on the Scotia Project Area. Please see the attached word document for further details on the proposed amendment to the compressors</p>

	<p>and P&G's comparison between the information included in the EIS and the proposed amendment.</p> <p><u>Linking to s150 of the EP Act</u></p> <p>The concentrations detailed in P&G's word document demonstrates that there is a significant difference in the concentrations that were modelled for the EIS versus the site specific modelling for the Scotia Project Area. Air modelling for the EIS predicted cumulative concentration of CO to be a maximum of 200µg/m³ 1km from the compressor and the site specific modelling has predicted the concentration of CO at 665m to be 2200µg/m³. The concentrations for NO₂ were also higher for the site specific modelling, however, not by such a large margin. However, it should be noted that all of the modelling including the site specific modelling is within the limits of the EPP Air values.</p> <p>Santos makes it clear in its application that it considers that it will not be required to publically notify this EA amendment. In Section 4.5 of the supporting information, Santos states <i>"Impacts from air emissions resulting from combustion activities associated with the GFD Project were modelled and assessed as part of the EIS (refer to Chapter 15 and Appendix P – Air Quality of the EIS). Given the progressive nature of GFD development across the entire upstream area over the next 20 or so years, it was impractical (and impossible) for the CG to have provided authorisations for emissions from specific fuel burning equipment across the GFD Project as part of the CG Stated conditions. The conditions proposed in Section 5 for the Scotia Plant expansion are consistent with the air schedule of the existing Scotia EA and conditioning for this type of impact across the broader GLNG gas fields."</i></p> <p>P&G understands that the intent of s150 of the EP Act is to streamline the process. However, in RSRS' information sheet on these new sections, it states:</p> <p><i>"The notification stage for an EA application will not apply if-</i></p> <ul style="list-style-type: none"> <i>- The EIS was notified under s33 of the SDPWO Act before the application was made - s150(1)(b); and</i> <i>- The environmental risks of the activity have not changed since the EIS was notified – s150(1)(c); and</i> <i>- If the application proposes a change to the way the relevant activity is to be carried out – the change would not attract a submission objecting to the change – s150(1)(d)."</i>
<p>Details of the enquiry: Please provide the following information:</p> <ul style="list-style-type: none"> - Explain clearly what advice/assistance is required from RSRS to address the identified issue? - How the advice is intended to be used (i.e. assist in making a decision about an application or the amount and form of financial assurance, to provide advice to the client, assist with legislative interpretation, ministerial brief, assessment report etc.)? - Identify, if known, the implications/risks associated with the issue (positive and 	<p>P&G's specific query is related to the information provided by Santos on the expansion of the Scotia Plant.</p> <p>Based on the information outlined in this request, there is clearly a change in what the modelling in the EIS predicted versus the site specific modelling. However, P&G is seeking clarity on how to determine the significance of that change as it relates to public notification.</p> <p>Regarding s150(1)(c) of the EP Act:</p> <ul style="list-style-type: none"> - Are there any criteria to help the delegate determine what a "change" to the environmental risk is, as it is likely there will always be differences due to the differing specificity of the modelling? - As Santos has outlined, it was impossible for it to provide site specific modelling in its EIS. As such, how much discretion does the delegate have to decide that the difference between the generic modelling information in the EIS and the site specific modelling in the

negative).	application will not trigger a “change”, especially when noting that the site specific modelled emissions are still within the EPP Air values?
Attachments: Please list and attach documentation and correspondence relevant to the enquiry.	<ul style="list-style-type: none"> - EHP’s comments on Scotia EA Amendment to include CG Conditions - Santos’ EA Amendment application - Santos GFD – Appendix P – Air Quality - Santos GFD – Chapter 15 – Air Quality - EA EPPG03515915 - P&G Comparison on EIS modelled emissions and site specific modelled emissions
RSRS USE ONLY	
Enquiry reference number:	
<div style="border: 1px solid black; height: 100px; width: 100%;"></div>	
<p><i>If you need any clarification please send a reply email to ResourceSector@ehp.qld.gov.au quoting the enquiry reference number provided above.</i></p>	
Response endorsed by (name(s) and position(s)): For complex or contentious enquiries, seek endorsement for your response from a Team Leader or Manager. Cc the Team Leader/Manager to the response.	
Further action required:	
Has legal advice been sought? If it has, attach the legal advice to the enquiry response.	
<p>Note: This information has been provided to assist in resolving the questions presented herein and should not be circulated externally in its current form. It does not constitute formal legal advice.</p>	

Emma Page

Senior Environmental Officer (Assessment)

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Information on modelled emissions

Attachment A of Santos' supporting information outlines that the existing Scotia Gas Plant is being expanded to include the Scotia Central and Flank 1 (CF1) Plant, adjacent to the existing Scotia Gas Plant. The existing plant is currently 30 terajoules per day (TJ/day) and 30 million standard cubic feet per day (MMSCFD). The expansion will nominally be to 87 TJ/day and 84 MMSCFD (this includes both the existing plant and the CF1 plant). However, Santos has stated that the maximum capacity of the new CF1 plant will have is up to 60 million standard cubic feet per day and up to 133 TJ/day.

Information from the EIS

The relevant sections of the GFD EIS are Chapter 15 – Air Quality and Appendix P – Air Quality (please see the relevant attachments).

Chapter 15 – Air Quality outlines the environmental values likely to be affected by the activities, the potential impacts from these activities and the mitigation measures for these activities. Appendix P – Air Quality provides air emissions modelling and assessment of the impact of the modelled air emissions. However, all of the information that has been used for the modelling is based on the following scenarios:

- A nominal large integrated hub gas compression facility (240 TJ/day) – normal operations
- A nominal large integrated hub gas compression facility (240 TJ/day) – major flaring event
- A typical nodal gas compression facility (80 TJ/day) – normal operations.

Santos has stated that for the purposes of the EIS, a scenario based on the maximum development case was developed at the approval of the Terms of Reference.

In Section 6.2.1 and Section 6.2.2 of Appendix P – Air Quality of the EIS, data was provided for different distances. The highest predicted cumulative concentrations at 1km from the compressor are as follows:

- NO₂ – approximately 125 µg/m³ (1 hour average), which is well below the EPP Air value of 250 µg/m³
- NO₂ – approximately 10.5 µg/m³ (annual average), which is well below the EPP Air value of 33 µg/m³
- CO – 200 µg/m³ (8 hour average), which is significantly less than the EPP Air value of 11,000 µg/m³

Information from the amendment application

In its supporting information for the amendment, Santos provided the following information for the highest predicted cumulative concentrations at the closest sensitive receptor (665 m) to the proposed CF1 plant. Santos has provided comparison to the Environmental Protection (Air) Policy 2008 (EPP Air). They were as follows:

- NO₂ - 153.6 µg/m³ (1 hour average) which is well below the EPP Air value of 250 µg/m³
- NO₂ – less than 11.3 µg/m³ (annual average) which is well below the EPP Air value of 33 µg/m³
- CO – 2,200 µg/m³ (8-hour average) which is significantly less than 11,000 µg/m³ EPP Air value.

Department of Environment and Heritage Protection

Permit¹

Environmental Protection Act 1994

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

Permit¹ number: EPPG03515915

Project Name: Scotia Project Area

Environmental authority takes effect: 27 October 2016

The anniversary date of this environmental **authority** is **3 March**.

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

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

Environmental authority holder(s)	Registered address
Santos CSG Pty Ltd ACN: 121 188 654	Ground Floor, Santos Centre 60 Flinders Street ADELAIDE SA 5000
Total E&P Australia ARBN: 112 608 880	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
Total E&P Australia II ARBN: 149 617 167	BGC Centre Level 13, 28 The Esplanade PERTH WA 6000
PAPL (Upstream II) Pty Limited ACN: 146 203 901	Level 36, Santos Place 32 Turbot Street BRISBANE QLD 4000
KGLNG E&P Pty Ltd ACN: 146 143 339	Level 27 32 Turbot Street Brisbane QLD 4000

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



Environmentally Relevant Activity(ies)	Relevant Tenure
<p>Resource activity that is a petroleum activity and which includes the following:</p> <p>Item 3, Schedule 2A of the Environmental Protection Regulation 2008 - a petroleum activity that is likely to have a significant impact on category A or B environmentally sensitive area.</p> <p>Item 6, Schedule 2A of the Environmental Protection Regulation 2008 - a petroleum activity carried out on a site containing a high hazard dam or a significant hazard dam;</p> <p>Item 8, Schedule 2A of the Environmental Protection Regulation 2008 - a petroleum activity or GHG storage activity, other than an activity mentioned in items 1 to 7, that includes 1 or more activities mentioned in schedule 2 for which an aggregate environmental score is stated</p>	Petroleum Lease (PL): PL176

sch4p4(6) Personal information

Signature

Andrew Langford

Delegate of the administering authority
Environmental Protection Act 1994

27 October 2016

Date

Enquiries:

Petroleum and Gas
Department of Environment and Heritage Protection
Level 7, 400 George Street
BRISBANE QLD 4000
GPO Box 2454, BRISBANE QLD 4001
Phone: (07) 3330 5715
Fax: (07) 3330 5634

Additional Information for Applicants

Environmentally relevant activities

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

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

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

Contaminated land and notifiable activities

It is a requirement of the EP Act that if an owner or occupier of land becomes aware a notifiable activity (as defined in Schedule 3) is being carried out on the land, or that the land has been, or is being, contaminated by a hazardous contaminant, the owner or occupier must, within 20 business days after becoming so aware, give written notice to the chief executive.

Responsibilities under the *Environmental Protection Act 1994*

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

General environmental duty

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

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

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

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

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

Duty to notify

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

The duty to notify arises where:

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

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

Some Relevant Offences under the *Environmental Protection Act 1994*

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

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

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

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

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

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

Causing environmental nuisance (section 440)

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

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

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

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

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

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

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

Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette

butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

Illegal dumping of waste (section 104)

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

Responsibilities under Other Legislation

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

- *Aboriginal Cultural Heritage Act 2003*
- contaminated land provisions of the *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Forestry Act 1959*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004 / Petroleum Act 1923*
- *Queensland Heritage Act 1992*
- *Sustainable Planning Act 2009*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Act 2000*

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

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

Environmental Authority Conditions

This environmental authority consists of the following Schedules and Appendix:

Schedule A	General Conditions
Schedule B	Water
Schedule BB	Groundwater
Schedule C	Regulated Structures
Schedule D	Land
Schedule E	Disturbance to Land
Schedule F	Environmental Nuisance
Schedule G	Air
Schedule H	Waste
Schedule I	Rehabilitation
Schedule J	Well Construction, Maintenance and Stimulation Activities
Schedule K	Community Issues
Schedule L	Notification Procedures
Schedule M	Definitions

SCHEDULE A — GENERAL CONDITIONS

- (A1) This environmental authority authorises the carrying out of the following **resource activity(ies)**:
- (a) the following petroleum activities:
 - (i) Petroleum exploration, appraisal and development wells;
 - (ii) Compressor station;
 - (iii) Water treatment facilities;
 - (iv) Regulated dams;
 - (v) Non-regulated dams;
 - (b) the following **specified relevant activities**:
 - (i) Fuel Burning – using fuel burning equipment that is capable of burning at least 500 kg of fuel in an hour;
 - (ii) Waste Disposal – operating a facility for disposing of, in a year, 50,000 t to 100,000 t of regulated waste and any, or any of the combination of general waste, limited regulated waste and no more than 5t of untreated clinical waste (if the facility is in a scheduled area);
 - (iii) Sewage Treatment – Operating sewage treatment works, other than no release works;
 - (iv) Another activity where, for the **specified relevant activities** listed in (i) – (iii) above, Schedule 2 of the Environmental Protection Regulation 2008 (the Regulation) provides exemption for the activity, but only to the extent of the circumstances stated in Schedule 2 of the Regulation;
 - (v) **Stimulation** activities; and
 - (c) **incidental activities** that are not otherwise **specified relevant activities**.
- (A2) The resource activities in condition (A1) are authorised subject to the conditions of this environmental authority.
- (A3) This environmental authority does not authorise a relevant act¹ to occur in carrying out an authorised resource activity unless a condition expressly authorises the relevant act to occur². Where there is no condition, the lack of a condition must not be construed as authorising the relevant act.

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.

¹ See section 493A of the Act.

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

- (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 activities.

Financial Assurance

- (A7) 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.
- (A8) 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.

Third Party Audit

- (A9) A **third party auditor**, nominated by the holder of this environmental authority and accepted by the administering authority, must audit compliance with the conditions of this environmental authority at a minimum frequency of every three (3) years.
- (A10) Notwithstanding condition (A9), and prior to undertaking the third party audit, the scope and content of the third party audit can be negotiated with the administering authority.
- (A11) An audit report must be prepared and **certified** by the **third party auditor** presenting the findings of each audit carried out.
- (A12) Any recommendations arising from the audit report must be acted upon by:
- (a) investigating any non-compliance issues identified; and
 - (b) as soon as reasonably practicable, implementing measures or taking necessary action to ensure compliance with the requirements of this environmental authority.
- (A13) A written response must be attached to the audit report detailing the actions taken or to be taken on stated dates:
- (a) to ensure compliance with this environmental authority; and
 - (b) to prevent a recurrence of any non-compliance issues identified.

Contingency Procedures for Emergency Environmental Incidents

- (A14) By 31 December 2016, the holder of this environmental authority must develop 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.

Infrastructure

- (A15) By 27 October 2017, 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) water treatment plants;
 - (d) sewage treatment facilities;
 - (e) authorised discharge points to air and **waters**;
 - (f) any chemical storage facility associated with the environmentally relevant activity of chemical storage; and
 - (g) compressor stations.

Monitoring

- (A16) All monitoring must be undertaken by a **suitably qualified person**.
- (A17) All laboratory analyses and tests required to be conducted under this environmental authority must be carried out by a laboratory that has **NATA accreditation** for such analyses and tests, unless NATA accredited tests are not available.
- (A18) Any management or monitoring plans, systems, programs or procedures required to be developed and implemented by a condition of this environmental authority must be reviewed for performance and amended as required but not less than once every three (3) years in accordance with the requirements for the particular plans, systems, programs and procedures in the conditions of this environmental authority.
- (A19) An annual report must be prepared each year and submitted to the administering authority in the form requested by the administering authority. This report must include but not necessarily be limited to:
- (a) the results of the Seepage Monitoring Program that is required by the conditions of this environmental authority;
 - (b) a summary of:
 - (i) any investigations required for the Seepage Monitoring Program prescribed under this environmental authority;
 - (ii) the **regulated dam** register in the approved format that is required by the conditions of this environmental authority;
 - (iii) the results of annual **regulated dam** water quality monitoring that is required by the conditions of this environmental authority;
 - (iv) the results of vibration and blast monitoring required by the conditions of this environmental authority;
 - (v) any well closure reports that are required by the conditions of this environmental authority, where applicable;
 - (vi) the results of any baseline or **stimulation** impact monitoring program that is required by this environmental authority, where applicable;
 - (vii) non **NATA accredited** laboratory testing methods, where applicable;
 - (c) the management criteria report required by section 316A of the *Environmental Protection Act 1994*;
 - (d) if prepared for the subject annual return period, any third party audit report and written response to said report that is required by this environmental authority;
 - (e) a comparison of the previous 12 **months** monitoring results to both the limits set in this environmental authority and to relevant prior results including data analyses and interpretation

- to assess the nature and extent of any contamination and the level of environmental harm caused as a result of the contamination and the environmentally relevant activity(ies);
- (f) details of any exceedances with the conditions of this environmental authority and the dates and times these exceedances were reported to the administering authority; and
 - (g) an outline of actions taken to minimise the risk of environmental harm from any circumstance, condition or elevated contaminant level identified by the monitoring or recording programs as required by condition (A18).

Surface Water Sampling Methodology

- (A20) The methods of water sampling required by this environmental authority must comply with that set out in the latest edition of the *Queensland Monitoring and Sampling Manual* as amended from time to time.

Groundwater Sampling Methodology

- (A21) The methods of groundwater sampling required by this environmental authority must comply with the latest edition of the *Queensland Monitoring and Sampling Manual*, *AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on sampling groundwater*, and the Australian Government's *Groundwater Sampling and Analysis – A Field Guide* (2009:27 GeoCat #6890.1) as relevant and as amended from time to time.

Noise Sampling Methodology

- (A22) Noise must be measured in accordance with the prescribed standards in the Environmental Protection Regulation 2008.

Documentation and Records Management

- (A23) A record of all documents required by this environmental authority must be kept for a minimum of five (5) years.
- (A24) All plans and monitoring programs required by this environmental authority must be **certified by a suitably qualified person**.
- (A25) All plans and monitoring programs under this environmental authority must be 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

- (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) preferentially divert stormwater around **significantly disturbed** land, or 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).

Works in Watercourses, Wetlands and Lakes

- (B3) Only construction or maintenance of **linear infrastructure** is permitted in or within a **general ecologically significant wetland** or in a **watercourse**.
- (B4) The construction and/or maintenance of **linear infrastructure** that will result in **significant disturbance** in or on the **bed and banks** of a **watercourse** or within a **general ecologically significant wetland** must be conducted in accordance with the following order of preference:
- (a) conducting works in times when there is no water present;
 - (b) conducting works in times of no flow;
 - (c) conducting works in times of flow but in a way that does not impede low flow.
- (B5) The construction and maintenance of **linear infrastructure** authorised under condition (B3) must comply with the water quality limits specified in *Schedule B, Table 1 – Release Limits for Construction or Maintenance of Linear Infrastructure*.

Schedule B, Table 1 – Release Limits for Construction or Maintenance of Linear Infrastructure

Water Quality Parameters	Units	Water Quality Limits
Turbidity	Nephelometric Turbidity Units (NTU)	For a general ecologically significant wetland , if background water turbidity is above 45 NTU, no greater than 25% above background water turbidity measured within a 50 m 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 50 m downstream of the construction or maintenance activity.
		For a general ecologically significant 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 50 m downstream of the construction or maintenance activity.

Water Quality Parameters	Units	Water Quality Limits
Hydrocarbons	-	For a general ecologically significant wetland , or watercourse , no visible sheen or slick

- (B6) Monitoring must be undertaken at a reasonable frequency that is appropriate to demonstrate compliance with condition (B5).
- (B7) Written notification detailing the location (GPS coordinates) of any **significant disturbance** to be undertaken in or on the **bed and banks** of a **watercourse**, or **general ecologically significant wetland**, must be provided to the administering authority at least 24 hours prior to the commencement of the significant disturbance.
- (B8) Petroleum activities must occur outside a **wetland of high ecological significance**.
- (B9) Petroleum activities must not negatively impact a **wetland of high ecological significance**.
- (B10) **Linear infrastructure** activities, other than **linear infrastructure** construction and/or maintenance activities, must not change the existing surface water hydrological regime of any **general ecologically significant wetland**.
- (B11) The construction and/or maintenance of **linear infrastructure** in any **general ecologically significant wetland** must not:
- (a) prohibit the flow of surface water in or out of the **wetland**;
 - (b) impact surface water quality in the **wetland** unless specifically authorised by this environmental authority;
 - (c) drain the **wetland**;
 - (d) fill the **wetland**;
 - (e) impact bank stability; or
 - (f) result in the **clearing** of riparian vegetation outside of the required footprint.

Floodplains

- (B12) Where the petroleum activity(ies) is carried out on **floodplains** petroleum activity(ies) must be carried out in a way that does not:
- (a) concentrate flood flows in a way that will or may cause or threaten an adverse environmental impact; or
 - (b) divert flood flows from natural drainage paths and alter flow distribution; or
 - (c) increase the local duration of floods; or
 - (d) increase the risk of detaining flood flows; or
 - (e) pose an **unacceptable risk** to the safety of persons from flooding; or
 - (f) pose an **unacceptable risk** of damage to property from flooding.

Well Testing

- (B13) Subject to conditions (B14) and (B15) the injection of CSG water or better quality groundwater is authorised in wells that are not exploration, appraisal or development wells, for the purposes of **hydraulic testing**, where such hydraulic tests are undertaken for no more than two (2) consecutive days.
- (B14) The maximum volume of CSG water or better quality groundwater injected for the purposes of **hydraulic testing** identified in condition (B13) must not exceed 1 ML per hydraulic test.

- (B15) Written notification detailing the type and location (GPS coordinates) of any **hydraulic testing** undertaken in accordance with condition (B13) must be provided to the administering authority at least 10 business days prior to the commencement of the hydraulic test.

SCHEDULE BB — GROUNDWATER

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

Seepage Monitoring Program

- (BB2) A Seepage Monitoring Program must be developed to detect any seepage to groundwater as a result of storing contaminants in a **regulated structure(s)** (e.g. surface dams, monocells).
- (BB3) The Seepage Monitoring Program, must include, but not necessarily be limited to:
- (a) procedures to detect any seepage to groundwater and surrounding soils from **regulated structure(s)** and its possible effect on groundwater and soils;
 - (b) identification of seepage monitoring bores and their locations including:
 - (i) baseline / hydraulically up-gradient seepage monitoring bores (i.e. bores where groundwater quality will not have been affected by petroleum activities;
 - (ii) seepage monitoring bores that are within aquifers potentially affected by the **regulated structure(s)** authorised under this environmental authority;
 - (iii) a geodetic survey of all seepage monitoring bores; a geodetic survey showing groundwater potentiometric surface;
 - (c) the Seepage Monitoring Program has been designed consistent with relevant Guidelines and Standards such that the Program design has:
 - (i) a sufficient number seepage monitoring points and / or wells to obtain representative groundwater samples from the uppermost aquifer up-gradient and down-gradient of the potential influence;
 - (ii) if a salt monocell is authorised under this environmental authority, a sufficient number of seepage monitoring bores located not more than 150 m from the monocell or the boundary of the monocell facility, whichever is the closer;
 - (iii) sufficient regularity and spatial and temporal replication to make statistically valid conclusions about the presence or absence of contaminants;
 - (iv) procedures to determine the quality of groundwater down gradient of any potential sources of contaminants including groundwater passing the relevant seepage monitoring bore(s);
 - (v) procedures to allow an assessment of whether there has been any statistically significant adverse change in groundwater quality at locations hydraulically down gradient of the containment activity(ies).
 - (d) procedures to determine groundwater flow direction, groundwater flow rate and hydraulic conductivity beneath the relevant **regulated structure(s)**;
 - (e) sampling of all baseline or hydraulically up-gradient monitoring bores for the minimum groundwater parameters levels listed below quarterly over the 12 month period immediately prior to the commencement of any new containment activities:
 - (f) identification of the trigger parameter(s) associated with the potential contaminants of concern identified in (e);
 - (g) a sampling program of all seepage monitoring bores:
 - (i) to measure and record standing groundwater levels in metres accurate to 0.01 metres to be plotted as function of time (hydrograph) to identify seasonal patterns;
 - (ii) quarterly monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) whilst activities are being carried out;
 - (iii) annual monitoring of seepage monitoring bores for the respective trigger parameter(s) identified in (f) for a minimum of three (3) years after the containment activity(ies) ceases;

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

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

Schedule BB, Table 1 – Seepage Monitoring Trigger Parameters

Parameter	Units	Untreated Coal Seam Water	Permeate	Brine
Static Water Level	m	monitor	monitor	monitor
pH	pH unit	monitor	monitor	monitor
EC	µS/cm	monitor	monitor	monitor
Major Anions (sulphate, chloride)	mg/L	monitor	-	-
Major Cations (calcium, magnesium, sodium and potassium)	mg/L	monitor	-	-

Monitoring Bores

- (BB5) The following information concerning each newly constructed groundwater monitoring bore must be submitted to the administering authority with each annual return:
- (a) bore ID and location presented on a plan;
 - (b) design of the monitoring bores installed;
 - (c) specific construction information including but not limited to geographical coordinate (including the geophysical coordinate system utilised) depth of bore, depth and length of casing, depth and length of screening, presence of any measuring probe;
 - (d) identification of any aquifers intercepted by the monitoring bores;
 - (e) standing groundwater level and water quality parameters including physical parameter and results of laboratory analysis for the possible contaminants of concern; and
 - (f) a lithological log and preferably a stratigraphic interpretation to identify the important features.

SCHEDULE C — REGULATED STRUCTURES

Assessment of Hazard Category

- (C1) The **hazard category** of any structure must be assessed by a **suitably qualified and experienced person** in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, as amended from time to time.
- (C2) The **hazard assessment** required under condition (C1) must occur in any of the following situations:
- (a) prior to the design and **construction** of the structure;
 - (b) prior to any change in its purpose or its stored contents;
 - (c) for a structure assessed and **certified** as a high or significant hazard structure, at least biennially after its **construction**;
 - (d) for an **existing low hazard dam**, by 27 October 2017.
- (C3) A hazard assessment report and **certification** must be prepared by a **suitably qualified and experienced person** for any **structure** assessed

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

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

Construction of Low Hazard Dam to Contain Wetting Front

- (C5) Where a dam is assessed as low hazard, it must be:
- (a) constructed, operated and maintained in accordance with **accepted engineering standards** currently appropriate for the purpose for which the dam is intended to be used; and
 - (b) designed with a floor and sides made of material that will contain the wetting front and any entrained contaminants within the bounds of the containment system during both its operational life and including any period of decommissioning and **rehabilitation**.
- (C6) In the event of early signs of loss of structural or hydrological integrity of a **low hazard dam**:
- (a) immediate action to prevent or minimise any actual or potential environmental harm must be taken; and
 - (b) any findings and actions taken must be reported in writing to the administering authority within 20 business days of that event.

Monitoring of Low Hazard Dams

- (C7) The condition of all low hazard dams must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.

Design and Construction of a Regulated Structure

- (C8) **Construction** of any dam determined to be a **regulated structure** is prohibited until:
- (a) a **hazard category** assessment report and **certification** has been submitted to the administering authority;
 - (b) a **design plan** for the **regulated structure** has been prepared by a **suitably qualified and experienced person**; and

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

Operation of a Regulated Structure

- (C14) Operation of a **regulated structure** is prohibited unless:
 - (a) one paper copy and one electronic copy of the **design plan** and **certification**, and a set of 'as constructed' drawings and specifications has been submitted to the administering authority, together with **certification** that the structure:
 - (i) has been constructed in accordance with the **design plan**;
 - (ii) is capable of delivering the performance stated in the **design plan**; and
 - (iii) is compliant with the relevant conditions of this environmental authority;
 - (b) the conditions of this environmental authority relating to the **construction** of the structure have been met; and
 - (c) for regulated dams, the details required under this environmental authority have been entered into a Register of Regulated Dams.

Regulated Dam Register

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

Mandatory Reporting Level

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

Design Storage Allowance

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

Monitoring

- (C21) The condition of all containment structures must be monitored for early signs of loss of structural or hydraulic integrity, based on the advice of a **suitably qualified and experienced person**. The methods of monitoring and frequency of monitoring shall be as assessed by the person who conducts the hazard assessment based on the particular circumstances of each dam.
- (C22) Each **regulated structure** must be monitored for the water quality characteristics and at the monitoring location and frequency specified in *Schedule C, Table 1 – Regulated Structure Contaminant Monitoring* as follows:

Schedule C, Table 1 – Regulated Structure Contaminant Monitoring

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

Quality Characteristic (units)	Monitoring Location	Frequency of Monitoring
Nickel (µg/L)	At least three (3) different structure profile depths for each sampling event and be taken as far as practicable from the edge of the regulated structure	During the month of October every year
Selenium (µg/L)		
Silver (µg/L)		
Strontium (µg/L)		
Tin (µg/L)		
Zinc (µg/L)		
Total phosphorus (mg/L)		
Total Nitrogen (mg/L)		
Total petroleum hydrocarbons (µg/L)		
BTEX (µg/L)		
Polycyclic aromatic hydrocarbons (µg/L)		
Gross alpha + gross beta or radionuclides by gamma spectroscopy (Bq/L)		

Annual Inspection and Report

(C23) Each **regulated structure** must:

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

(C24) A **suitably qualified and experienced person** must:

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

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

(C26) Within 20 days of receipt of the annual inspection report, the administering authority must be notified in writing of the recommendations of the inspection report and the actions to be or that are being taken to ensure the integrity of each **regulated structure**.

SCHEDULE D — LAND

General

- (D1) Contaminants must not be directly or indirectly released to land except as permitted under this environmental authority.
- (D2) The release of contaminants to land must be carried out in a manner such that:
- (a) vegetation is not damaged;
 - (b) soil quality is not adversely impacted;
 - (c) there is no surface ponding or runoff to **waters**;
 - (d) there is no aerosols or odours;
 - (e) deep drainage below the root zone of any vegetation is minimised;
 - (f) the quality of shallow aquifers is not adversely affected.

Chemical Storage

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

Hydrostatic Test Water and Low Point Drains

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

Use of Coal Seam Gas Water

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

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

Sewage Treatment Works

- (D10) Treated sewage effluent or greywater from a treatment system located on PL176 with a daily peak design capacity of equal to or less than 1500 equivalent persons (EP) may be released to land provided it:
- (a) is to a fenced and signed contaminant release area(s);
 - (b) does not contain any properties nor contain any organisms or other **contaminants** in concentrations that are capable of causing environmental harm;
 - (c) does not result in pooling or run-off or aerosols or spray drift or vegetation die-off;
 - (d) minimises deep drainage below the root zone of any vegetation;
 - (e) does not adversely affect the quality of shallow aquifers;
 - (f) does not adversely impact soil quality; and
 - (g) is to a contaminant release area(s) that is kept vegetated with groundcover, that is:
 - i) not a declared pest species; and
 - ii) kept in a viable state for transpiration and nutrient uptake.

Sewage Treatment Works greater than 100EP

- (D11) For sewage treatment works with a daily peak design capacity of greater than 100 EP on PL176, when circumstances prevent the irrigation of treated sewage effluent to land, the **contaminants** must be directed to on-site storage or lawfully disposed of off-site.
- (D12) For sewage treatment works with a daily peak design capacity of greater than 100 EP on PL176, a buffer distance of 50 metres must be applied from the location of the effluent irrigation area to any watercourse, wetland or protected area and 100 metres from any potable water supply or stock drinking water supply.
- (D13) Prior to construction of a sewage treatment works with a daily peak design capacity of greater than 100 EP located on PL176, the minimum area of land and location to be utilised for irrigation of treated sewage effluent, excluding any necessary buffer zones, must be nominated.
- (D14) All nominated locations and minimum areas of land determined in condition (D13) for sewage treatment works located on PL176 with a daily peak design capacity of greater than 100 EP must be determined using the Model for Effluent Disposal using Land Irrigation (MEDLI) program or recognised equivalent and use model inputs representative of the activity and release location including but not limited to effluent quality, soil and vegetation types, and climatic conditions.
- (D15) Treated sewage effluent from sewage treatment works with a daily peak design capacity of greater than 100 EP on PL176 must only be released to the nominated locations and minimum areas of land determined by the MEDLI program or recognised equivalent identified in (D14).
- (D16) Treated sewage effluent from sewage treatment works with a daily peak design capacity of greater than 100 EP released to land on PL176 must comply, at the monitoring point(s), with each of the release limits specified in *Schedule D, Table 1 – Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 100 EP* for each quality characteristic.
- (D17) Treated sewage effluent from sewage treatment works with a daily peak design capacity of greater than 100 EP released to land on PL176 must be monitored at the frequency and for the quality

characteristics specified in *Schedule D, Table 1 – Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 100 EP* for each quality characteristic.

Schedule D, Table 1 – Treated sewage effluent standards for release to land from sewage treatment works with a daily peak design capacity of greater than 100EP

Quality Characteristic	Monitoring Point Location	Limit Type	Release Limit	Frequency
5-day Biochemical oxygen demand (BOD)	Release pipe from sewage treatment works	Maximum	20 mg/L	Quarterly
E. coli		80 th percentile based on at least 5 samples with not less than 30 minutes between samples	1000 cfu per 100 mL	
		Maximum	10,000 cfu per 100 mL	
pH		Range	6.0–8.5	Monthly
Dissolved Oxygen		Minimum	2 mg/L	
Electrical Conductivity		Monitor only		

SCHEDULE E — DISTURBANCE TO LAND

Soil Management Plan

- (E1) By 27 April 2017, the identification of management of soil must be undertaken in accordance with the Soils Management Plan as amended from time to time.
- (E2) A copy of the Soil Management Plan must be made available by 27 April 2017 to any potentially affected landholder upon request by that landholder.

Fauna Management

- (E3) Measures must be employed to prevent fauna entrapment:
 - (a) during the construction of pipelines in pipe sections and pipeline trenches; or
 - (b) during the construction and operation of **well infrastructure** and dams.

Confirming Environmentally Sensitive Areas and Wetlands

- (E4) Prior to undertaking petroleum activities that result in **significant disturbance** to land in areas of native vegetation, confirmation of on-the-ground environmentally sensitive areas and wetlands at that location must be undertaken by a **suitably qualified person**.
- (E5) Where areas mapped as environmentally sensitive areas and wetlands differ from those confirmed under condition (E4), petroleum activities may proceed in accordance with the conditions of the environmental authority based on the confirmed on-the-ground values.
- (E6) All documentation survey information photographs, field data or any material associated with the field validation requirements in (E4) must be maintained for the life of the environmental authority to demonstrate to the administering authority that surveys were conducted.

Planning for Land Disturbance

- (E7) The location of the petroleum activity(ies) must be selected in accordance with the following **site** planning principles:
 - (a) maximise the use of areas of pre-existing disturbance;
 - (b) in order of preference, avoid, minimise or mitigate any impacts, including cumulative; impacts, on areas of native vegetation or other areas of ecological value;
 - (c) minimise disturbance to land that may otherwise result in **land degradation**;
 - (d) minimise isolation, fragmentation or dissection of tracts of native vegetation; and
 - (e) minimise **clearing** of native mature trees.

Disturbance to Land – Environmentally Sensitive Areas

- (E8) Petroleum activities must be carried out in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas*, *Schedule E, Table 2 – Authorised Disturbance* and any other relevant conditions of this environmental authority.

Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas

ESA Category	Within the ESA	Primary Protection Zone of the ESA	Secondary Protection Zone of the ESA
Category A ESAs	No petroleum activities permitted	Only low impact petroleum activities permitted.	<p>Limited petroleum activities permitted subject to condition (E11)</p> <p>Limited impact camps permitted subject to condition (E11)</p> <p>Limited impact petroleum activities subject to condition (E11)</p>
Category B ESAs excluding 'Endangered' Regional Ecosystems	Only low impact petroleum activities permitted	<p>Limited petroleum activities permitted subject to condition (E11)</p> <p>Limited impact camps permitted subject to condition (E11)</p> <p>Limited impact petroleum activities subject to condition (E11)</p>	N/A
Category C ESAs that are Nature Refuges, Koala Habitat and/or Declared Catchment Areas	Only low impact petroleum activities permitted	<p>Limited petroleum activities permitted subject to condition (E11)</p> <p>Limited impact camps permitted subject to conditions (E9) and (E11)</p> <p>Limited impact petroleum activities subject to condition (E11)</p>	N/A
Category B ESAs that are 'Endangered' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	<p>Limited petroleum activities permitted subject to condition (E11)</p> <p>Limited impact camps permitted subject to condition (E11)</p> <p>Limited impact petroleum activities subject to condition (E11)</p>	N/A

ESA Category	Within the ESA	Primary Protection Zone of the ESA	Secondary Protection Zone of the ESA
Category C ESAs that are Essential Habitat and/or 'Of Concern' Regional Ecosystems	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to conditions (E9) and (E11) Limited impact petroleum activities subject to condition (E11)	N/A
Category C ESAs that are Regional Parks (Resource Use Area)	Only limited petroleum activities permitted subject to condition (E12)	Limited petroleum activities permitted subject to condition (E11) Limited impact camps permitted subject to condition (E11) Limited impact petroleum activities subject to condition (E11)	N/A
Category C ESAs that are State Forests and/or Timber Reserves	Only limited petroleum activities permitted subject to condition (E12) Limited impact camps permitted Limited impact petroleum activities subject to condition (E10) and (E12)	N/A	N/A

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

Schedule E, Table 2 – Authorised Petroleum Activities and Disturbances

Authorised Activity	Development Name	Location of Development (GDA94)		Size of Disturbance (ha)	ESA Affected
		Latitude	Longitude		
Multiple Well Pad	Scotia 38 39 Well Pad	-25.973932	150.036166	1.332	Category B (Endangered RE) Primary Protection Zone

Authorised Activity	Development Name	Location of Development (GDA94)		Size of Disturbance (ha)	ESA Affected
		Latitude	Longitude		
Multi Well Pad	Daldowie 9 10 Well Pad	-25.954416	150.052777	1.4	Category B (Endangered RE) Primary Protection Zone
Accommodation Camp	Scotia CF1 Camp	-25.935281	150.050921	0.014	Category B (Endangered RE) Primary Protection Zone
Accommodation Camp	Scotia Avalon Camp	-25.931914	150.080687	0.329	Category B (Endangered RE) Primary Protection Zone
Single Well Pad and Manifold	Scotia 6 Well Pad	-25.929136	150.080371	1.197	Category B (Endangered RE) Primary Protection Zone
Camp Pad	Scotia 45 Camp	-25.844107	150.074773	1.025	Category C (Of Concern RE) Primary Protection Zone

(E9) **Limited impact camps** must not be located within a **primary protection zone** of Category C ESA (Essential Habitat) or Category C ESA (Nature Refuges).

(E10) **Limited impact petroleum activities** must not be located within areas that contain **commercial species**.

(E11) **Limited petroleum activities, limited impact camps and limited impact petroleum activities** located within a **primary protection zone** or **secondary protection zone** of an environmentally sensitive area in accordance with *Schedule E, Table 1 – Petroleum Activities in Environmentally Sensitive Areas* must not negatively affect the adjacent environmentally sensitive area.

(E12) Prior to carrying out **limited petroleum activities** or **limited impact 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 limited petroleum activities within the environmentally sensitive area;
2. the limited petroleum activities are preferentially located in pre-existing areas of **clearing** or **significant disturbance**;
3. clearance widths for **linear infrastructure** is minimised to the maximum extent possible, taking into account the following matters:
 - (a) safe vehicle movement;

- (b) drainage devices installed are of a type that is appropriate for the track type and location;
 - (c) erosion and sediment control measures installed are in accordance with the Erosion and Sediment Control Plan required by conditions (B2) and (B3); and
 - (d) power line stays have been preferentially located within the pipeline right of way where possible.
4. the maximum clearance widths specified in *Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure* are not exceeded.

Schedule E, Table 3 – Authorised Disturbance for Linear Infrastructure

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

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

SCHEDULE F — ENVIRONMENTAL NUISANCE

Odour, Dust and Other Airborne Contaminants

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

Nuisance Monitoring

- (F2) When the administering authority advises of a complaint alleging nuisance, the complaint must be investigated as soon as practicable. The investigation is to include monitoring of environmental nuisance at any **sensitive place** within a reasonable and practical timeframe as specified by the administering authority.
- (F3) The administering authority must be advised in writing of the results of the investigation (including an analysis and interpretation of the monitoring results) and actions proposed or undertaken to resolve the complaint within five (5) business days of completing the complaint investigation, unless a longer time is agreed to in writing by the administering authority.
- (F4) If the investigation or monitoring in accordance with condition (F2) indicates that emissions exceed the limits set in this environmental authority or are causing environmental nuisance, then:
- (a) the complaint must be addressed including the use of alternative dispute resolution services if required; and / or
 - (b) abatement or attenuation measures must be implemented so that the authorised petroleum activity(ies) does not result in further environmental nuisance.
- (F5) Noise monitoring and recording required under this environmental authority must include, but not necessarily be limited to:
- (a) LAN,T (where N equals the statistical levels of 1, 10 and 90 and T=15 mins);
 - (b) LAeq adj, 15 mins;
 - (c) **background noise level** as LA 90, 15 mins;
 - (d) Max LpA, 15 mins ;
 - (e) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to measured noise levels levels;
 - (f) atmospheric conditions including temperature, relative humidity and wind speed and directions;
 - (g) effects due to any extraneous factors such as traffic noise;
 - (h) location, date and time of monitoring;
 - (i) if the complaint concerns low frequency noise, Max LpZ, 15 mins; and
 - (j) if the complaint concerns low frequency noise, one third octave band measurements in dB(LIN) for centre frequencies in the 10–200 Hz range for both the noise source and the background noise in the absence of the noise source.

Noise

- (F6) By 31 December 2016, noise planning must be undertaken in accordance with the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area* dated 29 June 2011 or any subsequent version.
- (F7) Any subsequent revision of the *Noise Management Plan – Fairview Project Area, Roma Shallow Gas Project Area, Arcadia Valley Project Area*, must include, but not necessarily be limited to:
- (a) a commitment by the Chief Executive Officer for the holder of this environmental authority, or their delegate, to ensure adequate allocation of staff and resources to the establishment and operation of the Noise Management Plan;

- (b) definition of roles, responsibilities and authorities within the staffing of the Noise Management Plan;
 - (c) delivery of training to staff and contractors and maintenance of competencies;
 - (d) risk / constraint analysis methods to be undertaken prior to any new operation (e.g. drill site) or installation of new equipment that has the potential to create noise nuisance;
 - (e) procedures and methods to undertake assessments to determine compliance with the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** being received and when there are no **alternative arrangements** in place, taking in to account any tonal or **impulsive noise** impacts;
 - (f) procedures for handling noise complaints;
 - (g) community liaison and consultation procedures including but not limited to consultation for when night time petroleum activities are likely to exceed the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (h) procedures for managing records associated with all aspects of the Noise Management Plan including standardised forms for recording monitoring results and complaints;
 - (i) details of petroleum activities and measured and / or predicted noise levels of noise sources associated with those activities;
 - (j) reasonable and practicable control or abatement measures (including relocating the activity, altering the hours of operation, or having an alternate arrangement in place with any potentially affected person) that can be undertaken to ensure compliance with the noise limits in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*;
 - (k) the level of noise at **sensitive receptors** that would be achieved from implementing the measures detailed under condition (F7)(j); and
 - (l) mediation processes to be used in the event that noise complaints are not able to be resolved.
- (F8) Prior to undertaking petroleum activities that will result in **short-term, medium-term or long term noise events** that are likely to impact on a **sensitive receptor**, and where there are no alternative arrangements in place, any potential noise emissions from the relevant petroleum activity(ies) must be modelled or calculated to demonstrate that noise emissions will not exceed the noise levels specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors*.
- (F9) The emission of noise from the petroleum activities authorised under this environmental authority must not result in levels greater than those specified in *Schedule F, Table 1 – Noise Limits at Sensitive Receptors* in the event of a **valid complaint** about noise being made to the administering authority.

Schedule F, Table 1 – Noise Limits at Sensitive Receptors

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

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

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

- (F10) If the noise subject to a complaint is tonal or impulsive, the adjustments detailed in *Schedule F, Table 2 – Adjustments to be Added to Noise Levels at Sensitive Receptors* are to be added to the measured noise level(s) to derive L_{Aeq, adj, 15 min}.

SCHEDULE G — AIR

(G1) The environmental **authority** holder will comply with the minimum efflux velocity in *Schedule G, Table 1*.

Schedule G, Table 1

Release Point Number	Release Point	Source Description	Minimum Release Height (metres)	Minimum Efflux Velocity (metres/second)
A8	Scotia Field	Cold Vent	-	5

Fuel Burning or Combustion Equipment

(G2) Contaminants emitted from fuel burning and combustion equipment point sources that are capable of burning at least 500 kg in an hour must be directed vertically upwards.

Release of Contaminants to the Atmosphere

(G3) Fuel burning or combustion equipment must:

- (a) not be operated unless it is listed in *Schedule G, Table 2 – Authorised Releases of Contaminants to Air from Point Sources*;
- (b) not exceed the release limits specified in *Schedule G, Table 2 – Authorised Releases of Contaminants to Air from Point Sources*;
- (c) be monitored for the release limits at the release point locations and at the monitoring frequency specified in *Schedule G, Table 2 – Authorised Releases of Contaminants to Air from Point Sources*; and
- (d) be monitored when emissions are expected to be at maximum rates.

Schedule G, Table 2 – Authorised Release of Contaminants to Air from Point Sources

Facility	Release Point Locations	Contaminant Release	Release Limits			Monitoring Frequency
			Min Release Height (m)	Min Efflux Velocity (m/sec)	Max Release Limit (g/s)	
Scotia Plant	Compressor 1 (K201)	Oxides of Nitrogen	7	27	2	At least one release point must be monitored per year on a rotational basis, with all release points monitored at least once in a 3 year period.
	Compressor 2 (K202)	Oxides of Nitrogen	7	28	2	
	Compressor 3 (K203)	Oxides of Nitrogen	7	28	2	

Note 1: The above NOx release limits are applicable during all timings except start-up, shut-down and calibration of emission monitoring devices. The start-up duration is allowed up to 30 minutes.

- (G4) 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 (G4)(a) and (G4)(b) and (G4)(c) or with (G4)(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 is 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**.

SCHEDULE H — WASTE

General

- (H1) All general and regulated waste must only be removed from the **site** and sent to a facility licensed to accept the waste under the *Environmental Protection Act 1994* except as permitted under another condition of this environmental authority.
- (H2) All regulated waste must only be removed from the **site** by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994*.
- (H3) Waste must not be burned unless it is vegetation and is authorised in writing under the *Forestry Act 1959*.

Coal Seam Gas Water Management Plan

- (H4) Amendments to a Coal Seam Gas Water Management Plan must be submitted to the administering authority prior to its implementation.
- (H5) If, within 20 business days following the submission of the amended Coal Seam Gas Water Management Plan, the administering authority provides comments on the amended Coal Seam Gas Water Management Plan:
 - (a) due regard must be given to that comment in the finalisation of the amended Coal Seam Gas Water Management Plan; and
 - (b) the finalised amended Coal Seam Gas Water Management Plan must be submitted within 40 business days after the administering authority provided comments.

Brine and Salt Management

- (H6) 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*.
- (H9) The Salt and Brine Management Plan must be developed by December 2019 that has investigated the following:
 - (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 and does or could supply water for potable or agricultural purposes;
 - (c) the outcomes of the investigations and proposed actions forward, and identified methods for the **beneficial use** and of **brine** and salt; and
 - (d) procedures for identifying and implementing opportunities to improve the CSG water management practices.

Residual Drilling Materials

- (H10) If sumps are used to store **residual drilling material** or drilling fluids, they must only be used for the duration of drilling activities.

- (H11) **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.
- (H12) Records must be kept to demonstrate compliance with conditions (H10) and (H11).

SCHEDULE I — REHABILITATION

Existing Petroleum Activities

- (I1) Condition (I3) only applies to petroleum activities which commenced before 27 October 2016.
- (I2) Condition (I1) applies subject to:
- (a) the holder of this environmental authority keeping an **inventory** of all existing petroleum activities which commenced before 27 October 2016; and
 - (b) the holder of this environmental authority providing the inventory to the administering authority upon written request within the requested timeframe.
- (I3) **Rehabilitation** of disturbed areas must take place progressively as works are staged and new areas are disturbed.

Remaining Dams

- (I4) 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.

Rehabilitation Planning

- (I5) Conditions (I6) - (I14) relating to rehabilitation only apply to petroleum activities which commenced after 27 October 2016.
- (I6) 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 (I7 to I11), inclusive; and
 - (ii) provide for appropriate monitoring and maintenance.

Transitional Rehabilitation

- (I7) **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:
 - non-polluting;
 - (i) a **stable** landform;
 - (ii) re-profiled to contours consistent with the surrounding landform
 - (c) surface drainage lines are re-established;
 - (d) top soil is reinstated; and
 - (e) either:
 - (i) groundcover, that is not a **declared pest species**, is **growing**; or
 - (ii) an alternative soil stabilisation methodology that achieves effective stabilisation is implemented and maintained.

Final Rehabilitation Acceptance Criteria

- (I8) All **significantly disturbed** areas caused by petroleum activities which are not **being or intended to be utilised by the landholder or overlapping tenure holder**, must be **rehabilitated** to meet the following final acceptance criteria measured either against the highest ecological value **adjacent land use** or the **pre-disturbed land use**:

- (a) greater than or equal to 70 per cent of native ground cover **species richness**
- (b) greater than or equal to the total per cent ground cover
- (c) less than or equal to the per cent **species richness of declared plant pest species**
- (d) where the **adjacent land use** contains, or the pre-clearing land use contained, one or more **regional ecosystem(s)**, then:
 - (i) at least one **regional ecosystem(s)** from the same broad vegetation group, as demonstrated by the **predominant species** in the ecologically dominant layer, must be present; and,
 - (ii) the regional ecosystem present in (18)(d)(i) must possess an equivalent or higher conservation value (biodiversity status) than the **regional ecosystem(s)** in either the adjacent land or pre-disturbed land.

Final Rehabilitation Acceptance Criteria in Environmentally Sensitive Areas

- (I9) Where **significant disturbance to land** has occurred in an environmentally sensitive area, the following final **rehabilitation** criteria as measured against the pre-disturbance biodiversity values assessment (required by conditions (E) and (E5)) must be met:
- (a) greater than or equal to 70 per cent of native ground cover **species richness**
 - (b) greater than or equal to the total per cent ground cover
 - (c) less than or equal to the per cent **species richness of declared plant pest species**
 - (d) greater than or equal to 50 per cent of organic litter cover
 - (e) greater than or equal to 50 per cent of **total density of coarse woody material**; and
 - (f) all **predominant species** in the **ecologically dominant layer**, that define the pre-disturbance **regional ecosystem(s)** are present.

Continuing Conditions

- (I10) Conditions (I7), (I8) and (I9) continue to apply after this environmental authority has ended or ceased to have effect.

Pipeline Activities

- (I11) Pipeline trenches must be backfilled and topsoils **reinstated** within three **months** after pipe laying.
- (I12) **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.
- (I13) 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**.
- (I14) Land that has been **significantly disturbed** by the pipeline activities must be managed to ensure that gully erosion or subsidence do not occur on that land.

SCHEDULE J — WELL CONSTRUCTION, MAINTENANCE AND STIMULATION ACTIVITIES

Drilling Activities

- (J1) **Oil based or synthetic based drilling muds** must not be used in the carrying out of the petroleum activity(ies).
- (J2) Drilling activities must not result in the connection of the target gas producing formation and another aquifer.
- (J3) Practices and procedures must be in place to detect, as soon as practicable, any fractures that have or may result in the connection of a target formation and another aquifer as a result of drilling activities.

Stimulation Activities

- (J4) Polycyclic aromatic hydrocarbons or products that contain polycyclic aromatic hydrocarbons must not be used in **stimulation fluids** in concentrations above the **reporting limit**.
- (J5) **Stimulation** activities must not negatively affect water quality, other than that within the **stimulation impact zone** of the target gas producing formation.
- (J6) **Stimulation** activities must not cause the connection of the target gas producing formation and another aquifer.
- (J7) The internal and external mechanical integrity of the well system prior to and during **stimulation** must be ensured such that there is:
 - (a) no significant leakage in the casing, tubing, or packer; and
 - (b) there is no significant fluid movement into another aquifer through vertical channels adjacent to the well bore hole.
- (J8) Practices and procedures must be in place to detect, as soon as practicable, any fractures that cause the connection of a target gas producing formation and another aquifer.

Stimulation Risk Assessment

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

- (i) the environmental values of groundwater in the area;
- (j) an assessment of the appropriate limits of reporting for all water quality indicators relevant to **stimulation** monitoring in order to accurately assess the risks to environmental values of groundwater;
- (k) description of overlying and underlying formations in respect of porosity, permeability, hydraulic conductivity, faulting and fracture propensity;
- (l) consideration of barriers or known direct connections between the target gas producing formation and the overlying and underlying aquifers;
- (m) a description of the well mechanical integrity testing program;
- (n) process control and assessment techniques to be applied for determining extent of **stimulation** activities (e.g. microseismic measurements, modelling etc.);
- (o) practices and procedures to ensure that the **stimulation** activities are designed to be contained within the target gas producing formation;
- (p) groundwater **transmissivity**, flow rate, hydraulic conductivity and direction(s) of flow;
- (q) a description of the 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;
 - (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) if used, 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) the determination of the likelihood of causing interconnectivity and/or negative water quality as a result of **stimulation** activities undertaken in close proximity or each other; and
- (aa) potential environmental or health impacts which may result from **stimulation** activities including but not limited to water quality, air quality (including suppression of dust and other airborne contaminants), noise and vibration.

Water Quality Baseline Monitoring

- (J11) Prior to undertaking any **stimulation** activity, a baseline bore assessment must be undertaken of the water quality of:
- (a) all **landholders' active groundwater bores** (subject to access being permitted by the landholder) that are spatially located within a two (2) kilometre horizontal radius from the location of the 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 200 metres above or below the target gas producing formation and is spatially located with a two (2) kilometre radius from the location of the stimulation initiation point; and
 - (c) any other bore that could potentially be adversely impacted by the **stimulation** activity(ies) in accordance with the findings of the risk assessment required by conditions (J9) and (J10).
- (J12) Prior to undertaking **stimulation** activities at a well, there must be sufficient water quality data to accurately represent the water quality in the well to be stimulated. The data must include as a minimum the results of analyses for the parameters in condition (J13).
- (J13) Stimulation baseline bore assessments required in condition (J11) must include the minimum water quality **analytes** and physico-chemical parameters identified in the *Baseline Assessment Guideline* (EHP) and any restricted **stimulation fluids** as defined in the *Environmental Protection Act 1994*, as amended from time to time, in order to establish baseline water quality.

Stimulation Impact Monitoring Program

- (J14) A Stimulation Impact Monitoring Program must be developed prior to the carrying out of **stimulation** activities which must be able to detect adverse impacts to water quality from **stimulation** activities and must consider the findings of the risk assessment required by conditions (J9) and (J10) that relate to **hydraulic fracturing** activities and must include, as a minimum, monitoring of:
- (a) the **stimulation fluid(s)** 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 water(s) from **stimulation** activities at sufficient frequency and which sufficiently represents the quality of that flow back water; and
 - (c) flow-back water(s) from **stimulation** activities at sufficient frequency and accuracy to demonstrate that 150 per cent of the volume used in **stimulation** activities has been extracted from the stimulated well; and
 - (d) all bores identified in condition (J11) at the following minimum frequency:
 - (i) monthly for the first six (6) months subsequent to **stimulation** activities being undertaken; and
 - (ii) annually for the first five (5) years subsequent to **stimulation** activities being undertaken or until **analytes** and physico-chemical parameters identified in condition (J13) are not detected in concentrations above baseline bore monitoring data on two (2) consecutive monitoring occasions, whichever is shorter.
- (J15) The Stimulation Impact Monitoring Program must provide for monitoring of:
- (a) **analytes** and physico-chemical parameters relevant to baseline bore and well assessments to enable data referencing and comparison including, but not necessarily being limited to the **analytes** and physico-chemical parameters in condition (J13); and
 - (b) any other analyte or physico-chemical parameters that will enable detection of adverse water quality impacts and the inter-connection with a non-target aquifer as a result of **stimulation** activities including chemical compounds, identified in the respective Stimulation Risk Assessment, that are actually or potentially formed by chemical reactions with each other or coal seam materials during **stimulation** activities.
- (J16) The results of the Stimulation Impact Monitoring Program must be made available to any potentially affected landholder upon request by that landholder.

SCHEDULE K — COMMUNITY ISSUES

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

SCHEDULE L — NOTIFICATION PROCEDURES

- (L1) The Department of Environment and Heritage Protection Pollution Hotline must be notified as soon as reasonably practicable, but within 48 hours after becoming aware of:
- (a) any unauthorised **significant disturbance** to land; or
 - (b) any unauthorised release of contaminants greater than:
 - (i) 200 L of hydrocarbons; or
 - (ii) 200 L of **stimulation additives**; or
 - (iii) 500 L of **stimulation fluids**; or
 - (iv) 1 000 L of **brine**; or
 - (v) 5 000 L of **coal seam gas water**; or
 - (vi) 10 000 L of sewage effluent; or
 - (vii) 100,000 L of irrigation quality **coal seam gas water**, in accordance with condition D5(b), inside designated irrigation area.
 - (c) a potential or actual loss of structural or hydraulic integrity of a dam; or
 - (d) when the level of the contents of any **regulated dam** reaches the **mandatory reporting level**; or
 - (e) when a **regulated dam** will not have available storage to meet the **design storage allowance** on the 1 November of any year;
 - (f) any incident where there is a potential or actual loss of well integrity (e.g. when the annulus pressure during **stimulation** increases by more than 3.5 MPa from the pressure immediately preceding **stimulation**); or
 - (g) any detection of restricted **stimulation fluids** from **stimulation fluid** monitoring; or
 - (h) any analyses result from baseline bore, well or stimulation impact monitoring that exceeds a water quality objective for the protection of an environmental value of that water resource; or
 - (i) any analyses result from groundwater monitoring that exceeds trigger action investigation levels, if provided in this environmental authority.
- (L2) The notification of emergencies or incidents as required by condition (L1) must include but not be limited to the following information:
- (a) the environmental authority number and name of the holder;
 - (b) the tenure type and number where the emergency or incident occurred;
 - (c) the name and telephone number of the designated contact person;
 - (d) the location of the emergency or incident (GDA94);
 - (e) the date and time that the emergency or incident occurred;
 - (f) the date and time the holder of this environmental authority became aware of the emergency or incident;
 - (g) details of the nature of the event and the circumstances in which it occurred;
 - (h) the estimated quantity and type of any contaminants involved in the incident;
 - (i) the actual or potential suspected cause of the emergency or incident;
 - (j) a description of the land use at the site of the emergency or incident (eg. grazing, pasture, forest etc.) and/or the name of any relevant **waters** and other environmentally sensitive features;
 - (k) a description of the possible impacts from the emergency or incident;
 - (l) a description of whether stock and/or wildlife were exposed to any contaminants released and measures taken to prevent access for the duration of the emergency or incident;
 - (m) any sampling conducted or proposed, relevant to the emergency or incident;
 - (n) landholder details and details of landholder consultation;
 - (o) immediate actions taken to control the impacts of the emergency or incident and how environmental harm was mitigated at the time of the emergency or incident; and
 - (p) whether further examination/root cause analysis is required and if so, the expected date by when this examination will be completed and reported to the administering authority.
- (L3) Within 10 business days following the initial notification under conditions (L1) and (L2) unless a longer time is agreed to by the administering authority, a written report must be provided to the administering authority, including the following (where relevant to the emergency or incident):

- (a) the root cause of the emergency or incident;
- (b) the confirmed quantities and types of any contaminants involved in the incident;
- (c) results and interpretation of any analysis of samples taken at the time of the emergency or incident (including the analysis results of any impact monitoring);
- (d) a final assessment of the impacts from the emergency or incident including any actual or potential environmental harm that has occurred or may occur in the longer term as a result of the release;
- (e) the success or otherwise of actions taken at the time of the incident to prevent or minimise environmental harm;
- (f) results and current status of landholder consultation, including commitment to resolve any outstanding issues / concerns; and
- (g) actions and / or procedural changes to prevent a recurrence of the emergency or incident.

SCHEDULE H — DEFINITIONS

Words and phrases used throughout this authority are defined below.

Where a definition for a term used in this authority is sought and the term is not defined within this authority the definitions provided in the *Environmental Protection Act 1994*, its regulations, and the Environmental Protection Policies shall be used.

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

“adjacent land use” means the **ecosystem function** adjacent to an area of significant disturbance, or where there is no ecosystem function, the use of the land. An adjacent land use does not include an adjacent area that shows evidence of edge effect.

“administering authority” means:

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

“aggregation dam” means a regulated dam that receives and contains coal seam gas water or coal seam gas concentrate. The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.

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

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

“analogue site” means an area of land which contains values and characteristics representative of an area to be rehabilitated prior to disturbance. Such values must encompass land use, topographic, soil, vegetation, 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.

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

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

“annual return” means the return required by the annual notice (under section 316 of the *Environment Protection Act 1994*) for the section 86(2) licence that applied to the development approval.

“appraisal well” means a petroleum well to test the potential of one (1) or more natural underground reservoirs for producing or storing petroleum.

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

“approved quality criteria” for the purposes of residual drilling materials, means the **residual drilling material** meet the following quality standards:

Part A in all cases:

Parameter	Maximum Concentration
pH	6 – 10.5 (range)
Electrical Conductivity	20 dS/m (20,000 µS/cm)
Chloride*	8000 mg/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 (mg/kg)
Arsenic	20
Selenium	5
Boron	100
Cadmium	3
Chromium (total)	400
Copper	100
Lead	600

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 (mg/kg)
C6-C10	170
C10-C16	150
C16-C34	1300
C34-C40	5600
Total Polycyclic Aromatic Hydrocarbons (PAHs)	20
Phenols (halogenated)	1
Phenols (non-halogenated)	60
Monocyclic aromatic hydrocarbons (Total sum of benzene, toluene, ethyl benzene, xylenes (includes ortho, para and meta xylenes) and styrene)	7
Benzene	1

“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 works” in relation to a dam, means:

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

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

“Australian Standard 2187” means Australian Standard 2187.0:1998 *Explosives—Storage, transport and use, Part 0*, Australian Standard 2187.1:1998 *Explosives—Storage, transport and use Part 1* and Australian Standard 2187.2:2006 *Explosives—Storage and use, Part 2* or any updated versions that becomes available from time to time.

“Australian Standard 2885” means Australian Standard 2885.0:2008 *Pipelines – Gas and Liquid Petroleum General Requirements*, Australian Standard 2885.1:2007 *Pipelines – Gas and Liquid Petroleum Design and Construction* and Australian Standard 2885.3:2001 *Pipelines – Gas and Liquid Petroleum Operation and Maintenance*, or any updated versions that becomes available from time to time.

“Australian Standard 4323” means Australian Standard 4323.1:1995 *Stationary source emissions method 1: Selection of sampling positions*.

“Australian / New Zealand Standard 5667.11” means Australian / New Zealand Standard 5667.11: 1998 *Water Quality – Sampling – Guidance on sampling at Groundwaters*.

“Australian / New Zealand Standard 5667.12” means Australian / New Zealand Standard 5667.12:1999 *Guidance on Sampling of Bottom Sediments for permanent, semi-permanent water holes and water storages*.

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

“authorised resource activities” for this environmental authority means the resource activities authorised to be carried out under condition (A1).

“authority” means level 1 licence (without development approval), or level 1 (without development approval), or level 2 approval (without development approval) under the *Environment Protection Act 1994*.

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

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

“being or intended to be utilised by the landholder or overlapping tenure holder” for significantly disturbed land, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use of the land such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.

For dams, means there is a written agreement (e.g. land and compensation agreement) between the landholder or the overlapping tenure holder and the holder of the environmental authority identifying that the landholder or the overlapping tenure holder has a preferred use for the dam such that rehabilitation standards for revegetation by the holder of the environmental authority are not required.

“beneficial use” means

- with respect to dams, that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:
 - of benefit to that owner in that it adds real value to their business or to the general community,
 - in accordance with relevant provisions of the *Waste Reduction and Recycling Act 2011*,
 - sustainable by virtue of written undertakings given by that owner to maintain that dam, and

- the transfer and use have been approved or authorised under any relevant legislation. Or
- with respect to coal seam gas water, refer to the Department of Environment and Heritage Protection's *Guideline – Approval of Coal Seam Gas Water for Beneficial Use*.

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

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

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

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

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

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

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

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

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

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

- Nature Refuges as defined under the *Nature Conservation Act 1992*;
- Koala Habitat Areas as defined under the *Nature Conservation (Koala) Conservation Plan 2006*;
- State Forests or Timber Reserves as defined under the *Forestry Act 1959*;
- Regional parks (resource use area) under the *Nature Conservation Act 1992*;
- An area validated as “Essential Habitat” from ground-truthing surveys in accordance with the *Vegetation 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 identified in the database called ‘RE description database’ containing Regional Ecosystem numbers and descriptions.

“certification or certified by a suitably qualified and experienced person” in relation to a design plan, ‘as constructed’ drawings or an annual report regarding dams, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

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

“certify” or “certification” or “certified” in relation to any matter other than a design plan, ‘as constructed’ drawings or an annual report regarding dams in this environmental authority means a Statutory Declaration by a suitably qualified person accompanying the written document stating that:

- (a) all relevant material has been considered in the written document; and
- (b) that the content of the written document is accurate and true; and
- (c) that the written document meets the requirements of the relevant conditions of the environmental authority.

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

“coal seam gas water” means underground water brought to the surface of the earth, or otherwise interfered with, in connection with exploring for or producing coal seam gas. Coal seam gas water is a waste defined under section 13 of the *Environmental Protection Act 1994*.

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

“coal seam gas water dams” include any type of dam (storage or evaporation) used to contain groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production.

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

“commercial species” means species as listed in parts 1, 2 and 3 of Schedule 6 of the Vegetation Management Regulation 2012, which are above the diameters / sizes specified in this Schedule for each listed species.

“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.

“contaminant” can be:

- (a) a gas, liquid or solid; or
- (b) an odour; or
- (c) an organism (whether alive or dead), including a virus; or
- (d) energy including noise, heat radioactivity and electromagnetic radiation; or
- (e) a combination of contaminants.

“contaminated land” means land contaminated by a hazardous contaminant.

“control measure” has the meaning in section 47 of the Environmental Protection Regulation 2008 and means a device, equipment, structure, or management strategy used to prevent or control the release of a contaminant or waste to the environment.

“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” means a land-based structure or a void that is designed to contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does *not* mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

“dam crest volume” means the volume of material that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls without regard to flows entering or leaving (e.g. via a spillway).

“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.

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

“design storage allowance or DSA” means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, prepared by the Department of Environment and Heritage Protection, as amended from time to time, that must be provided in a dam to an annual exceedance probability specified in that Manual.

“development well” means a petroleum well which produces or stores petroleum.

For clarity, a development well does not include an appraisal well.

“discharge area” means:

- that part of the land surface where groundwater discharge produces a net movement of water out of the groundwater; and
- identified by an assessment process consistent with the document *Salinity Management Handbook* Queensland Department of Natural Resources, 1997, as amended from time to time; or
- identified by an approved salinity hazard map held by the Department of Environment and Heritage Protection.

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

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

“dwelling” means any of the following structures or vehicles that is principally used as a residence:

- a house, unit, motel, nursing home or other building or part of a building;
- a caravan, mobile home or other vehicle or structure on land;
- a water craft in a marina

“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.

“ecosystem functioning or ecosystem function” means the interactions between and within living and non-living components of an ecosystem and generally correlates with the size, shape and location of the vegetation community.

“enclosed flare” means a device where the residual gas is burned in a cylindrical or rectangular enclosure that includes a burning system and a damper where air for the combustion reaction is admitted.

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

“equivalent person” or “EP” 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.

“evaporation dam” means an impoundment, enclosure or structure that is designed to be used to hold CSG water for evaporation.

“existing dam” means an existing evaporation, aggregation or brine dam and any dam that is constructed and / or whose construction had substantially commenced on 7 April 2012.

“existing low hazard dam” means a low hazard dam that was constructed and/or whose construction had substantially commenced on 7 April 2012.

“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.

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

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

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

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

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

“foliage cover” means the proportion of the ground, which would be shaded if sunshine came from directly overhead and is defined for each stratum. It includes branches and leaves and is similar to the crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown.

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

“fuel burning or combustion equipment” means a permanent fuel burning or combustion equipment which is in isolation, or combined in operation, or which are interconnected, is, or is capable of burning more than 500 kg of fuel in an hour.

“general ecologically significant wetland” otherwise known as “wetlands of other environmental value”, is a wetland that meets the definition of a wetland and that is shown as a general ecologically significant wetland or “wetlands of other environmental value” on the map of referable wetlands

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

“greywater” means wastewater generated from domestic activities such as laundry, dishwashing, and bathing. Greywater does not include sewage.

“growing” means to increase by natural development, as any living organism or part thereof by assimilation of nutriment; increase in size or substance.

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

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

“high value regrowth” vegetation means

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

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

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

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

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

“incidental activity” for this environmental authority means an activity that is not a specified relevant activity and is necessary to carry out the activities listed in *Schedule A, Table 1 – Scale and Intensity for the Activities*.

“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.

“inventory” in relation to existing petroleum activities means:

- relevant shapefiles which clearly show the location of infrastructure; and
- metadata for the relevant shapefiles which includes the infrastructure ID, latitude and longitude, and date of disturbance for the activity.

“ $L_{Aeq, adj, 15 mins}$ ” 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.

“ $L_{A90, adj, 15 mins}$ ” means the A-weighted sound pressure level, adjusted for tonal character, that is equal to or exceeded for 90 per cent of any 15 minutes sample period equal, using Fast response

“lake” means:

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

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

- 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.

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

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

“leachate” means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of onsite 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.

“limited impact camps” mean accommodation camps that:

- are temporary (no more than 6 months);
- are located within pre-existing areas of **clearing** or significant disturbance;
- are up to 2 ha or located within well sites; and
- may involve sewage treatment works that are no release works or release works that involve an irrigation release within pre-existing areas of **clearing** or significant disturbance.

“limited impact petroleum activities” means petroleum activities that are located within areas that are not a **regional ecosystem** and:

- are single **well sites** (includes observation, pilot, injection and production wells) or multi-well sites greater than 1ha; and
- may involve construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone; and
- may involve upgrading or maintenance of existing roads or tracks; and
- may include power and communication lines; and
- may include gas gathering lines from a well site to the initial compression facility; and
- may include water gathering lines from a well site to the initial water storage or **dam**.

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

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

- single well sites (includes observation, pilot, injection and production wells) up to 1 ha and associated infrastructure (water pumps and generators, sumps, flare pits or dams) located on the well site or up to 1.25 ha if the well pad includes the use of a tank (minimum 1ML) for above ground fluid storage,
- multi-well sites up to an additional (in addition to single well site above) 0.25 ha per additional well and associated infrastructure (water pumps and generators, sumps, flare pits, dams or tanks) located on the well site to a maximum of 3 ha,
- construction of new access tracks that are required as part of the construction or servicing a petroleum activity that can be lawfully carried out within an ESA or its protection zone
- upgrading or maintenance of existing roads or tracks,
- power and communication lines,
- gas gathering lines from a well site to the initial compression facility,
- water gathering lines from a well site to the initial water storage or dam,
- camps within well site that may involve sewage treatment works that are a no release works.

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

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

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

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

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

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

“low impact petroleum activities” means petroleum activities which do not result in the clearing of native vegetation, earthworks or excavation work that cause either, a significant disruption to the soil profile or permanent damage to vegetation that cannot be easily rehabilitated immediately after the activity is completed. Examples of such activities include but are not necessarily limited to:

- chipholes
- coreholes
- geophysical surveys
- seismic surveys
- soil surveys
- topographic surveys
- cadastral surveys
- ecological surveys
- installation of environmental monitoring equipment (including surface water)

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

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

“mandatory reporting level” or **“MRL”** means a warning and reporting level determined in accordance with the criteria in the “Manual for Assessing Hazard Categories and Hydraulic Performance of Dams” prepared by the Department of Environment and Heritage Protection, as amended from time to time.

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

“meter” means a device for measuring, or giving an output signal proportional to, quantities of water passed and/or the rate of flow in a pipe.”

“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 ($k_w=10-8\text{m/s}$) or subsoil with a clay content of greater than 20 per cent; 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.

“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.

- a place used as an office or for business or commercial purposes, and includes the curtilage of any such place.

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

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

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

“pest” means species:

- 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.

“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.

“prescribed storage gases” has the meaning provided in section 12 of the *Petroleum and Gas (Production and Safety) Act 2004*.

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

“prioritisation hierarchy” has the meaning provided in the *Coal Seam Gas Water Management Policy*, published by the Department of Environment and Heritage Protection, as amended from time to time.

“programmed and approved” means when the location of infrastructure has been approved by the authorised person(s) with the organisation(s).

“protected area” means any area listed in Part 4, Section 14 of the *Nature Conservation Act 1992*.

“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 geology, landform and soil. Regional ecosystems of Queensland were originally described in Sattler and Williams (1999). The Regional Ecosystems Description Database (Queensland Herbarium 2013) is maintained by Queensland Herbarium and contains the current descriptions of regional ecosystems.

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

- areas of regrowth vegetation, identified on the map as high-value regrowth vegetation, that—
 - are any of the following:
 - (i) an endangered regional ecosystem;
 - (ii) an of concern regional ecosystem;
 - (iii) a least concern regional ecosystem; and
 - have not been cleared since 31 December 1989; and
- particular watercourses in the Burdekin, Mackay Whitsunday and Wet Tropics catchments, identified on the map as regrowth watercourses; and
- areas the chief executive decides under section 20A1 of the *Vegetation Management Act 1999* to show on the map as high value regrowth vegetation.

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

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

“regulated waste” means non-domestic waste mentioned in Schedule 7 of the Environment Protection Regulation 1998 (whether or not it has been treated or immobilised), and includes:

- for any element – any chemical compound containing the element; and
- anything that has contained the waste.

“rehabilitation or rehabilitated” means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria and, where relevant, includes remediation of contaminated land. For the purposes of pipeline rehabilitation, rehabilitation includes reinstatement, revegetation and restoration.

“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 topography, 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).

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

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

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

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

“resource activity(ies)” has the meaning in section 107(d) of the *Environmental Protection Act 1994*.

“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 rehabilitations after pipeline decommissioning.

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

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

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

“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, B or C Environmentally Sensitive Area means an area within an 100 metre buffer from the boundary of a **primary protection zone**.

“sensitive place” means:

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

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

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

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

“significantly disturbed” or **“significant disturbance”** or **“significant disturbance to land or areas”** has the 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.

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

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

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

“specified relevant activities” for this environmental activity means an activity that:

- (a) but for being carried out as a resource activity, would otherwise be an activity prescribed under section 19 of the *Environmental Protection Act 1994* as an environmentally relevant activity; or
- (b) stimulation activities; or
- (c) extracting material other than by dredging.

“spillway” means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.

“stable” has the meaning in Schedule 5 of the Environmental Protection Regulation 2008 and, 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.

“stimulation” means a technique used to increase the permeability of a natural underground reservoir, including for example, hydraulic fracturing / hydrofracturing, fracture acidizing and the use of proppant treatments.

“stimulation fluid” means the fluid injected into an aquifer to increase the permeability of a natural underground reservoir. For clarity, the term stimulation fluid only applies to fluids injected down well post-perforation.

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

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

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

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

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

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

- 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.

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 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.

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

“third party auditor” means a suitably qualified person who is either a certified third party auditor or an internal auditor employed by the holder of the environmental authority and the person is independent of the day to day management and operation of the petroleum activity(ies) covered by this environmental authority.

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

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

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

“total density of coarse woody material” means the total length of logs on the ground greater than or equal to 10cm diameter per hectare and number of logs on the ground greater than or equal to 10cm diameter per hectare.

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

“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 tunneling, pipe jacking, auger boring
- microtunnelling and pipe jacking
- on-line replacement.

“unacceptable risk” means those risks identified as unacceptable through a risk assessment that substantially conforms with Australian Standard 4360:2004 *Risk Management* or any updated version that becomes available from time to time.

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

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

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

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

“watercourse” has the meaning in Schedule 4 of the Environmental Protection Act 1994 and means:

- a river, creek or stream in which water flows permanently or intermittently:
 - in a natural channel, whether artificially improved or not; or
 - in an artificial channel that has changed the course of the watercourse.
- Watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.

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

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

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

- 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 (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.

“wetland of high ecological significance” otherwise known as a “high conservation value wetland”, is a wetland that meets the definition of a wetland and that is shown as a wetland of high ecological significance or high conservation value wetland on the map of referable wetlands.

“year” means a period of 12 months.

“80th percentile” in relation to release limits means that not more than one (1) of the measured values is to exceed the stated release limit for any five (5) consecutive samples where:

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

END OF PERMIT

From: PAGE Emma [Emma.Page@ehp.qld.gov.au]

Sent: Tuesday, 13 December 2016 5:05 PM

To: s.73 Irrelevant information

CC: Kahle, Dan; BREAKER Kylie

Subject: EHP's comments on Scotia EA Amendment to include CG Stated Conditions

Attachments: 161213 - EHPs comments on draft EA amendment for Scotia - EPPG03515915.pdf

Hi s.73

Thank you for submitting the draft environmental authority (EA) amendment application for the Scotia Project Area, EA EPPG03515915, to include the Coordinator General's stated conditions (CG's conditions) on the EA, as Santos is seeking to commence the Gas Field Development Project (GFD) on petroleum lease (PL) 176.

EHP has provided comments in the attached document.

If you have any questions, please don't hesitate to contact me on the details below.

Kind regards,

Emma Page

Senior Environmental Officer (Assessment)

Petroleum and Gas | Petroleum, Gas and Compliance

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...make the move

On 5 December 2016, Santos submitted a draft environmental authority (EA) amendment application for the Scotia Project Area, EA EPPG03515915, to include the Coordinator General's stated conditions (CG's conditions) on the EA, as Santos is seeking to commence the Gas Field Development Project (GFD) on petroleum lease (PL) 176. EHP understands that the stated conditions must be imposed on the EA, as required by s205 of the *Environmental Protection Act 1994* (EP Act). EHP has reviewed the draft application and advises that further information is required to ensure the application meets the legislative requirements as per s226 of the EP Act. Further, EHP has also provided general feedback on the draft application.

Please note, under s139 and s150 of the EP Act, due to the GFD EIS having been carried out under the *State Development and Public Works Organisation Act 1971*, the information and notification stage may not apply to the application. EHP notes that Santos considers that these sections do apply to this proposed application. However, due to the site-specific nature of this amendment application, EHP is still in the process of determining if these sections apply.

Legislative requirements under s226 of the EP Act

Issue 1: Description of the proposed amendment

Section 226(d) of the EP Act requires applicants to describe the proposed amendment. In Section 2 of the supporting information, Santos stated that as the CG's conditions must be included on the EA, the application only addresses the CG's conditions which require site-specific consideration. EHP is satisfied that most of the proposed amendments have been adequately described, however, the following proposed amendment is not considered to have been adequately described.

Issue 1.1: Section 2.1.1. Condition A1 – Scoping table

In Section 2.1.1 of the supporting information, Santos has stated that the amendment application seeks to authorise GFD activities associated with the Scotia Project Area on PL176. These activities are typical of exploration, development operation and decommissioning phases of a petroleum and gas project. As Santos has detailed, the CG's condition A1 is as follows:

Scoping table conditions

A1 *[To be determined following an assessment for each EA. Condition General 1 will clearly identify the activities authorised under the environmental authority and specify the scale and intensity of the activity, where relevant.]*

EHP considers that the relevant "scale" is the number of the activities to be undertaken (and has been provided by Santos in the draft EA amendment application for both activities that are authorised under the existing EA and those that will be authorised under the GFD). However, EHP considers that the relevant "intensity" is the total maximum disturbance or size (depending on the activity) of each of the activities. The intensity of each of the activities (for the existing authorised activities and the GFD activities) needs to be provided in the draft amendment application.

Further, in Section 2.1.1 of the supporting information, Santos has stated that the project will include both temporary and permanent accommodation facilities. EHP considers that these should be included in the scoping table.

Recommendation 1.1.1

As outlined in the CG's conditions, Santos is required to include both the scale and intensity of the activities in the proposed scoping table. As such, when the application is formally lodged, please

ensure that the relevant intensity (as maximum disturbance or size) of each of the activities is included in condition A1.

Recommendation 1.1.2

When the application is formally lodged, please ensure that the scale and intensity of all accommodation camps is included in the scoping table.

Issue 1.2: Attachment A: Scotia Central Flank 1 – Air Quality Impact Assessment

Attachment A of the supporting information outlines that the existing Scotia Gas Plant is being expanded to include the Scotia Central and Flank 1 (CF1) Plant, adjacent to the existing Scotia Gas Plant.

In Section 2.1 of Attachment A of the supporting information, it states that the new CF1 Plant will have an initial nominal capacity of 40 million standard cubic feet per day (MMSCFD), however, it can reach up to 60 MMSCFD. However, there is no information on the current MMSCFD of the existing Scotia Gas Plant.

In Section 2.1.2 of Attachment A of the supporting information, it states that the proposed CF1 Plant will include one flare that has a capacity up to 133TJ/day. However, there is no information on the current TJ/day of the existing Scotia Gas Plant.

Recommendation 1.2.1

To allow the assessing officer to adequately assess the increase in capacity of the existing Scotia Gas Plant to the expansion to include the CF1 Plant, please include the following information:

- The current MMSCFD of the existing Scotia Gas Plant; and
- The current TJ/day of the Scotia Gas Plant.

General Comments on the draft EA amendment

Issue 2.1: GFD Project Background

In Section 1.1 GFD Project Background of the supporting information, Santos states that the commencement of the GFD is when construction begins on the proposed upgrade of the Scotia Plant. Santos has referenced that the upgrade to the plant is further discussed in Section 2.3.3. However, this section does not exist. Also, Attachment A (the air modelling report) of the supporting information includes a detailed description of the upgrade of the Scotia Plant and should be referenced in this section.

Recommendation 2.1.1

To allow for the assessing officer to locate the relevant information, update this section to include the correct referencing.

Issue 2.2: Environmentally relevant activity (ERA) for chemical storage

In Section 2.2 of the supporting information, Santos states that it seeks authorisation for ERA 8(1)(c) for chemical storage and that it would be undertaken in accordance with CG's condition C5. There is minimal further information provided in the application around this activity. However, in the GFD EIS, information on the mitigation measures and management practices around chemical storage are included in Chapter 9 – Land Resources and Appendix Y-F – Chemical and Fuel Management Plan.

Recommendation 2.2.1

Please confirm that ERA 8(1)(c) can be undertaken in accordance with the mitigation measures and management practices outlined in the EIS.

Issue 2.3: Referencing of figures

In the list of figures, there are two figures listed as “Figure 2”, the map showing sensitive receptors and the map showing environmentally sensitive areas.

Recommendation 2.3.1

Please update the figures with the correct figure numbers.

Issue 2.4: Referencing the incorrect EA

In Section 1 and Section 3.2 of Attachment A of the supporting information, EA EPPG00980113 has been referenced. However, due to the cancellation of EA EPPG00980113 on 25 May 2016, the applicable EA is now EA EPPG03515915, which was most recently issued on 27 October 2016. There has been a substantial change in the conditions between EA EPPG00980113 and EA EPPG03515915.

Recommendation 2.4.1

Please ensure that the correct EA number (and all relevant conditions) for the Scotia Project Area is referenced in Attachment A.