NSW EPA

Our reference: LIC06/638-11:DOC12/46209
Contact: Paul Wearne 02 42244131

Mr Clay Preshaw
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Preshaw

STATE SIGIFICANT DEVELOPMENT
CAMDEN GAS PROJECT – NORTHERN EXPANSION (STAGE 3) DA NO. 09_0048
RESPONSE TO SUBMISSIONS AND AMENDED DEVELOPMENT APPLICATION

I refer to your email dated 2 November 2012 advising of the exhibition of the Submissions Report for the above development proposal. You also sought any comments, including recommended conditions of approval, regarding the project.

The Office of Environment and Heritage (OEH) and the Environment Protection Authority (EPA) have undertaken a joint review of the Camden Gas Project Northern Expansion Submissions Report (2012) and have provided detailed comments on the following in the attachment to this letter (**Attachment 1**):

- Environment Protection Licence
- Consolidated Development Consent
- Protection of Surface and Groundwater
- Fracture Stimulation Management Plan
- Surface Water
- Groundwater
- Emissions to Air
- Noise Impact Assessment
- Threatened Species and Biodiversity
- Land Use Impacts and Growth Centres Planning
- Aboriginal Cultural Heritage.

The attached comments include a number of recommendations for the Department of Planning and Infrastructure (DP&I) and the NSW Planning Assessment Commission consideration in the assessment and determination of the application. These recommendations address a range of issues including the need for further information to inform the Environmental Assessment and additional Statements of Commitment and/or Approval Conditions.

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EPA and OEH are able to meet with DP&I at a mutually convenient time to discuss any of our comments and advice. Should you require any further information or clarification on the above matters, please contact Mr Paul Wearne on (02) 4224 4100 at the EPA's Wollongong Office.

Yours sincerely

G Howard 11/1/13

GISELLE HOWARD
Director Metropolitan
Environment Protection Authority

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ATTACHMENT 1

OFFICE OF ENVIRONMENT AND HERITAGE & ENVIRONMENT PROTECTION AUTHORITY COMMENTS ON THE PROPOSED CAMDEN GAS NORTHERN EXPANSION (STAGE 3) SUBMISSION REPORT 2012: STATE SIGNIFICANT DEVELOPMENT PART 4

1. Environment Protection Licence

The Camden Gas Project holds an Environment Protection Licence (EPL No 12003). The premises description for this EPL includes the gas wells, reticulation system and the Rosalind Park Gas Treatment Plant.

If the project is approved, the proponent will need to seek a separate variation to the EPL for the proposed expanded operations. The EPL will need to be varied prior to the commencement of activities approved by DP&I.

Recommendation 1: That DP&I considers the current EPL conditions when developing conditions of approval to prevent any inconsistencies with the EPL.

Since the original submission on the exhibited Environment Assessment (EA) in 2010, the EPA has been working with the proponent in relation to several Pollution Reduction Programs attached to the EPL. This includes the development of groundwater monitoring programs; drilling, fracking and chemical usage; and the detection and management of Volatile Organic Compound emissions (predominantly methane). However the Submissions Report states in section 3.4.1 that:

> *'A Groundwater Management Plan (AGL, 2012) has recently been completed and endorsed by the NSW Office of Water and the Environment Protection Authority, for the whole CGP (including areas to the north of existing operations) to be affected by the Amended project*

While the EPA has received this plan to satisfy the PRP, the EPA advises that it has not endorsed this plan. The EPA has required the plan as part of good environmental practice but it is the EPA's standard practice to not endorse management plans.

Recommendation 2: That DP&I requires AGL to amend the statement in section 3.4.1 of the Submissions Report by removing reference to the EPA endorsing the Groundwater Management Plan.

2. Consolidated Development Consent

The EPA's and OEH's review of the EA and Submissions Report has highlighted the difficulty in understanding how this project fits with current planning consents and approvals for the Camden Gas operations. There have been numerous modifications that have been approved since the original Camden Gas consent.

It would benefit the community, Government and industry if these consents and approvals were consolidated under a single instrument. This would provide a clearer understanding of the extent of the approved project, its existing conditions of approval, and any conditions that would need to be modified or added for this development (if approved). It would also benefit EPA regulation of the premises by ensuring greater clarity between approval and licensing requirements. This includes, for example, operational, monitoring and reporting requirements.

Recommendation 3: That DP&I requires all development consents and approvals to be consolidated into a single planning instrument as part of this project.

3. Protection of Surface and Groundwater

One of the environmental outcomes for this project must be to prevent or minimise water pollution. The proponent must ensure that placing anything in waters (including groundwater) does not cause or permit material harm to the environment. Water pollution and the meaning of material harm to the environment is defined in the *Protection of the Environment Operations Act 1997* (POEO Act).

In 2012, the NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS), with input from the EPA, OEH and NSW Office of Water (NOW), developed two new coal seam gas codes of practice. These are the *Coal Seam Gas Code of Practice for Well Integrity* (CoPWI) and the *Coal Seam Gas Code of Practice for Hydraulic Fracturing Stimulation* (CoPHFS). These Codes have been subject to independent expert review coordinated by the NSW Chief Scientist and Engineer, Professor Mary O'Kane. Coal seam gas titleholders are now required to comply with these Codes as part of conditions of title under the *Petroleum (Onshore) Act 1991*.

The EPA advises that water pollution from well construction and hydraulic fracturing may be prevented or minimised if it is carried out in accordance with best management practices to protect the environment. At the present time, the above codes of practice provide a basis for reducing the risk of water pollution from these activities. The EPA requires these activities to be undertaken in accordance with these codes of practice. The EPA understands that these codes of practice will be regularly reviewed. If new information arises that indicates that these codes of practice are inadequate to prevent or minimise water pollution, the EPA may modify EPL conditions accordingly.

Compliance with the NSW Coal Seam Gas Codes of Practice does not negate the proponent's obligation to comply with the legislative requirements of the POEO Act and conditions of the proponent's environment protection licence (EPL 12003).

Recommendation 4: That DP&I includes a condition of consent that states: any hydraulic fracture stimulation must be conducted in accordance with the *Coal Seam Gas Code of Practice for Hydraulic Fracturing Stimulation*" and any well construction and operation be undertaken in accordance with the *Coal Seam Gas Code of Practice for Well Integrity.*

4. Fracture Stimulation Management Plan

The Submissions Report states that the proponent cannot determine the number of wells that require hydraulic fracture stimulation prior to well construction. In addition, the Submissions Report states that while it is estimated that approximately 10-20 per cent of the wells may require fracking, it is also possible that it may be greater than 20 per cent.

The proponent has indicated that the CoPHFS will be met, in particular the preparation and implementation of a Fracture Stimulation Management Plan (FSMP). In the absence of this FSMP, the proponent cannot fully identify the potential risk of environmental harm posed by site-specific hydraulic fracturing activity and demonstrate that there are effective measures in place to reduce this risk.

Coal seam gas titleholders are required to comply with these Codes as part of conditions of title under the *Petroleum (Onshore) Act 1991*. The CoPHFS requires the preparation of a Fracture Stimulation Management Plan (FSMP) prior to commencement of any fracture stimulation activity.

When developing the FSMP the proponent must demonstrate:

> *".. that all risks to the environment, existing land uses, community and workforce, as a result of fracture stimulation activity, are managed through an effective risk management process that includes identification of hazards, assessment of risks, implementation of control measures and monitoring of the integrity and effectiveness of control measures."*

The FSMP must also include an inventory and characterisation of the chemicals to be used, an environmental risk assessment, mitigation and control measures and monitoring regime. The EPA notes that the Code requires the risk assessment to comply with *AS/NZS ISO 31000:2009 Risk management – Principles and Guidelines* and supports this risk management approach to assessing potential environmental harm.

It is also recommended that this environmental risk assessment process include information on the source and chemical composition of any proppant (material injected to hold open the fractures in the coal seam) prior to its use. In addition, the records of the source and chemical composition of the proppant should be made available in the FSMP and be maintained for a period of four years.

Recommendation 5: That the FSMP includes information on any proppants to be used in the fracture stimulation process and undertake an appropriate environmental risk assessment in accordance with the CoPHFS.

Recommendation 6: That the FSMP must require the keeping of records regarding the source of the proppant and its associated risk assessment. These records should be kept for four years at the registered location of the business.

The Submissions Report states that bactericides will be used in the fracture fluids. Chemicals with active ingredients for the purpose of killing bacteria are required to be registered by the Australian Pesticides and Veterinary Medicines Authority (APVMA) for use as a pesticide. The chemicals must also be used in accordance with any APVMA labelling instructions to comply with the NSW *Pesticides Act 1999.*

Recommendation 7: All bactericides listed in the Fracture Stimulation Management Plan must be registered with the Australian Pesticides and Veterinary Medicines Authority (APVMA).

5. Surface water

5.1 Erosion and Sediment Control

The Submission Report states that creek crossings undertaken during the installation of infrastructure will be undertaken in accordance with NOW's *Guidelines for watercourse crossings, Guidelines for laying pipes and cables in watercourses* and *Managing Urban Stormwater – Soils and Construction.*

The erosion and sediment controls for all infrastructure, including creek crossings, should also be designed, installed and operated in accordance with the relevant EPA Managing Urban Stormwater series publications.

Recommendation 8: That DP&I includes a condition of consent that states *"The Proponent must develop an erosion and sediment control plan in accordance with:*

- *for unsealed roads be designed and undertaken in accordance with Managing Urban Stormwater: Soils and Construction Volume 2c: Unsealed Roads, and*
- *for gas lines be designed and undertaken in accordance with Managing Urban Stormwater: Soils and Construction, Volume 2A: Installation of Services".*

5.2 Surface Chemical Management

The Submissions Report does not include any information regarding the storage and handling of chemicals such as hydraulic fracturing fluids and well work-over chemicals. This includes, in particular, potentially hazardous chemicals such as bactericides and acids. The proponent needs to document how these chemicals will be managed at the surface. For example, details of where and how these chemicals will be stored, handled and used at the well sites, proximity to water courses and spill mitigation and management measures.

The EPA's *Environmental Compliance Report: Liquid Chemical, Handling and Spill Management, Part B: Review of Best Practice and Regulation (2005)* lists a suite of measures for reducing risks of water pollution and soil contamination from chemical handling and storage.

Recommendation 9: That DP&I requires the proponent to provide detailed information about handling and storage of chemicals at surface sites in the project area that demonstrates adequate measures to prevent water pollution and land pollution.

5.3 Surface Produced Water Management

Water produced from the coal seam can be saline and can cause surface water pollution if not properly managed to prevent leaks or overtopping of storage dams or tanks. The Submission Report states that produced water would be stored in lined dams at each well pad (page 8, Appendix A), but then later states extracted water would be transferred to storage tanks with a 300 mm freeboard maintained at all times (page 30, Appendix A).

All produced water must be managed and stored in a way to comply with 'Section 120 'Prohibition of Pollution of Waters' of the POEO Act (1997).

Recommendation 10: That DP&I requires the proponent to provide clarification on:

- produce water storage arrangements
- whether the proposed freeboard is intended to be applied to storage dams also;
- the predicted frequency (using a water balance calculation) of overtopping due to wet weather if open storage is used.

6. Groundwater

The EPA considers that until the proponent has demonstrated that the above codes of practice have been met, it is unclear how a groundwater management plan can be developed to demonstrate that water pollution can be prevented or minimised.

The NSW Office of Water (NOW) has the appropriate expertise and licensing information in relation to groundwater monitoring programs. In this regard, DP&I should seek advice from NOW regarding any potential impacts on groundwater from the proposal and adequacy of the proposed groundwater monitoring programs detailed in the Submissions Report.

At the present time, EPA provides the following comments on the Groundwater Management Plan for DP&I's consideration.

6.1 Monitoring Locations

The purpose of the groundwater monitoring program is to assess the potential impact of coal seam gas operations on shallower aquifers with beneficial uses (Submission Report - Appendix D, page 29). Given this, the locations of the nested monitoring bores needs to be related to the geometry and groundwater gradients of the shallower aquifers in the region and to the nature of private bores that may potentially be affected by the proposed coal seam gas activities (such as location, depth and bore use).

6.2 Monitored Parameters

For the purpose of detecting potential pathways for chemical pollutants used in coal seam gas operations to move from the coal seam to other aquifers, the monitoring parameters presented in Table 7 (Submission Report - Appendix D) should be expanded for both gas well monitoring and nest bores (ambient groundwater monitoring in the Northern expansion area) to include:

- identification of appropriate tracers to enable movement of a pollutant from one aquifer to another to be assessed
- active constituents of bactericides used in hydraulic fracturing activities, given both the potential mobility of bactericides in water and the potential impact of bactericides on other beneficial uses of groundwater in the region, should they be transmitted between aquifers; and

- the inclusion of antimony and cyanide as additional monitoring parameters as these pollutants can potentially be found in coal seams across NSW.

Recommendation 11: That DP&I includes a condition of consent that states:
"the groundwater quality monitoring:
- *at coal seam gas wells and nested bores, must includes sampling and analysis of:*
  - *the parameters listed in Table 7 (Submission Report - Appendix D)*
  - *antinomy and cyanide; and*
  - *appropriate tracers found in each aquifer type.*
- *at nested bores, additional sampling and analysis of active constituents of any bactericides used in hydraulic fracturing.*

6.3 Monitoring Frequency

The submission report states that basic water quality monitoring in the nested bores will be undertaken once every two years (Submission Report - Appendix D, page 35), and the coal seam gas wells will be sampled once every quarter with a comprehensive suite of parameters analysed once a year (Submission Report - Appendix D, Table 8, page 36).

The monitoring of the nested bores will be a critical component of confirming whether groundwater resources in the shallower (beneficial use) aquifers have been protected by the proposed management and mitigation measures included in the proposal. The timely detection of any impacts would be critical for protecting other water users. Consequently, it is suggested that the frequency of monitoring in these nested bores should be the same as those in the coal seam gas aquifer (that is, same as in Submission Report - Appendix D Table 8) so that there is a basic suite of parameters analysed quarterly and the comprehensive suite of parameters is monitored annually.

Recommendation 12: That DP&I includes a condition of consent that states: *"the groundwater quality sampling and analysis for both gas wells and nested bores be set at the frequencies specified in Submission Report - Appendix D Table 8".*

6.4 Groundwater Quality Response Triggers and Response Options

The submission report states that response triggers for shallow aquifers (that is, nested bores) will be defined after more monitoring data is available to enable identification of natural variability. The specified response triggers are salinity and volume of water.

While salinity is likely to be an indicator of water quality change, groundwater values may also be affected by other changes including but not limited to coal seam gas extraction activities, including drilling and hydraulic fracturing fluids and well work-over chemicals. Changes may also be related to aquifer interference activities assessed and regulated by NOW. For example, salinity may change but remain within the specified beneficial use range while other parameters may exceed relevant beneficial use thresholds

The response triggers should be agreed prior to commencement of any production activities, so that there are clear trigger, action and response arrangements. These response triggers should include changes to water quality that may indicate impact on an aquifer due to migration of hydraulic fracturing or other chemicals.

Recommendation 13: That DP&I includes a condition of consent that states *"prior to commencement of activities, the proponent must prepare a monitoring program that includes a trigger, action and response plan to protect groundwater from water pollution. This plan must be developed in consultation with NOW and the EPA".*

7. Emissions to Air

As a requirement of a Pollution Reduction Program (PRP) under the EPL, the proponent, in collaboration with the EPA, has investigated and prepared a report on leading management practices and monitoring techniques for the detection and quantification of Volatile Organic Compounds (VOC) emissions (predominantly methane) from the premises. The PRP addresses issues such as:

- Identification of the main sources of VOC emissions at the premises.
- A description of the monitoring used for the detection and quantification of leaks at the premises in accordance with US EPA Method 21 – Determination of Volatile Organic Compound Leaks.
- A description of the methodology used to repair identified leaks including repair priorities and timeframes and any consideration for the use of leak-less components in repairing or replacing leaks.
- A description of any recommendations to improve the current Leak Detection and Repair Program (LDAR Program).
- A review of reasonable and feasible scanning techniques for scanning fugitive emissions in the field including continuous sampling of ambient air combined with on-site detection and open path optical remote sensing.
- Identification of a preferred scanning technique that could be applied to the premises and used as a component of the existing leak detection and repair program, considering the regulatory framework provided in USEPA Method 21, EUB Directive 060, and CAPP Best Management Practice for Fugitive Emissions Management.

The EPA review of the PRP report has revealed that the overall focus of the current AGL LDAR Program is for Occupation Health and Safety (OH&S) using the Queensland *Code of Practice for Coal Seam Gas well head emission detection and reporting* (DEEDI 2011).

The EPA is currently discussing these findings with the proponent and will be attaching a LDAR condition to the EPL that address a range of issues including annual monitoring of components, reporting of leaks and the adoption of the US EPA Method 21 protocols.

Recommendation 14: That DP&I includes a condition of consent that states; *"The proponent must implement all environmental management and mitigation measures for air emissions specified in the EPL or otherwise agreed in writing with the EPA."*

8. Noise Impact Assessment

8.1 Noise Land Use Conflict

The project area contains land that is within the South West Growth Centre and Camden Council development areas. Careful consideration should be given to the appropriateness of the location of the proposed wells given that land in the project area has been released for urban development and there is potential for future land use conflict regarding noise.

Recommendation 15: That DP&I considers potential impacts from this project on future development within the project area as part of the strategic land use planning process.

Recommendation 16: The *Locational Guidelines: Development in the Vicinity of Operating Coal Seam Methane Wells* (DoP, 2004) should be applied to any new development undertaken in these or any other future development areas.

Recommendation 17: That the proponent undertakes consultation with the relevant planning authorities during development of the Noise and Vibration Management Plan (see recommendation 21) to ensure that land use conflict is addressed and minimised.

To address potential land use conflict, the EPA also recommends that the additional mitigation set out in the original EA, as well as the Addendum Noise and Vibration Assessment and the Submissions Report (October 2012) should be implemented.

Recommendation 18: That DP&I includes a condition of consent that states:

"All feasible and reasonable noise mitigation measures for the construction and operation of the project identified in Section 5.3, Appendix A (the Addendum noise report) and Appendix F of the Camden Gas Project Northern Expansion Submissions Report (October 2012) must be implemented."

8.2 Recommended Operational Noise Limits (Camden Gas Project – Northern Expansion)

The proponent submitted an Addendum to Noise Assessment (Appendix F) prepared by SLR Consulting Australia Pty Ltd (previously Heggies Pty Ltd). The EPA recommends noise limits from the operation of the nominated wells and associated infrastructure at each relevant receiver location from the original 2010 Noise and Vibration Impact Assessment be consolidated with the 2012 Addendum Report by the proponent.

As an example, the following could be consolidated: data presented in the 'summary of existing ambient noise levels', and the 'operational project specific noise criteria' in Table 9 and Table13 respectively of the Heggies Noise and Vibration Impact Assessment report (30-2131-R1, Revision 2, 1 July 2010); along with any relevant amendments identified in the Addendum to Noise and Vibration Assessment Report (SLR Consulting, 19 October 2012).

An example of the EPA preferred format is provided in Box 1 below for information only.

Box 1: Example of noise limits table

L6.1 Noise generated by the operation of the nominated wells and associated infrastructure must not exceed the noise limits presented in the tables below. (Note that the noise limits apply to the noise contribution from of the Camden Gas Project –Northern expansion).

Noise limits dB(A): Gas Well Operation

Well ID Number	Receiver Location	Day $LA_{eq(15\ minute)}$	Evening $LA_{eq(15\ minute)}$	Night $LA_{eq(15\ minute)}$
CU06	St Gregory's College Blairmount	40	40	40
CU26 CU29	Frontignan St Eschol Park	38	38	38

Recommendation 19: That DP&I seeks from the proponent a consolidated set of noise limits for the operation of the nominated wells and associated infrastructure at each relevant receiver location. These limits should be secured as a condition of approval.

Recommendation 20: That DP&I includes the following requirements to support the above limits:

Noise *limit conditions*

1. *For the purpose of this Condition,*
   - *day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays*
   - *evening is defined as the period from 6pm to 10pm; and*
   - *night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.*

2. *The noise limits set shall apply under all meteorological conditions except for the following:*
   - *During rain and wind speeds (at 10 metres height) greater than three metres/second.*

3. *To determine compliance with the conditions:*

   a) *with the $L_{eq(15\ minute)}$ noise limits condition, the noise monitoring equipment must be located:*
   - *within 30 metres of a dwelling façade where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises*
   - *approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises*
   - *within approximately 50 metres of the boundary of a National Park or a Nature Reserve.*

   b) *the noise monitoring equipment must be located in a position that is:*
   - *at the most affected point at a location where there is dwelling at the location; or*
   - *at the most affected point within an area at a location prescribed by conditions 3 (a).*

4. *A breach of the conditions will still occur where noise generated from the identified wells in excess of the appropriate limit specified in the condition is detected:*
   - *in an area at a location other than an area prescribed by condition 3(a); and/or*
   - *at a point other than the most affected point at a location.*

5. *For the purposes of determining the noise generated at the premises, the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.*

8.3 Construction Noise

Recommendation 21: That DP&I includes a condition of consent that states:

"The proponent shall prepare a Noise and Vibration Construction Noise Management Plan which take account of all feasible and reasonable noise mitigation measures for the construction of the project identified in Section 5.3, Appendix A (the Addendum noise report) and Appendix F of the Camden Gas Project Northern Expansion Submissions Report (October 2012). This shall include, but is not limited to, the following provisions.

Noise and Vibration Management Plan
Prior to commencement of works, the Proponent shall prepare a Noise and Vibration Management Plan covering all activities consistent with the guidelines contained in the Interim Construction Noise Guidelines (DECCW 2009) to detail how noise and vibration impacts would be minimised and effectively managed. The Plan shall include but not necessarily be limited to:

- *the appropriate noise and vibration objectives for each identified noise sensitive receiver*
- *details of activities and a schedule of works*
- *identification of activities that have the potential to generate noise and/or vibration impacts on surrounding sensitive receivers, particularly residential receivers*
- *assessment of potential noise impacts from the proposed work methods including noise from vehicles and noise impacts from required traffic diversions*

- *include noise and vibration from ancillary activities such as site yards, plant compounds, batch plants and crushing plants*
- *works timetabling, in particular works outside standard hours, to minimise noise impacts*
- *justification for any activities outside standard construction hours*
- *examination of all feasible and reasonable noise mitigation measures including the use of alternative methods where potential noise impacts exceeds the relevant objectives*
- *reiteration of the commitments made in Section 5.3, Appendix A (the Addendum noise report) and Appendix F of the Camden Gas Project Northern Expansion Submissions Report (October 2012*
- *a detailed description of those actions and mitigation measures that would be implemented to ensure that these works would comply with the relevant noise and vibration criteria/ guidelines*
- *a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often monitoring would be conducted, how the results of the monitoring would be recorded, and, if any non-compliance is detected*
- *procedures to notify residents of activities that are likely to affect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints*
- *site contact person and appropriate telephone number; and*
- *description and commitment to work practices which minimise noise; and management and mitigation measures which minimise impact.*

8.4 Requirement to Monitor Noise

To determine compliance with the relevant noise conditions, it is recommended that an appropriate monitoring regime shall be developed and implemented to ensure adequate management of noise.

Recommendation 22: That DP&I includes a condition of consent that states:

> "T*he Proponent must develop and implement a noise monitoring program to validate any noise limits and measures identified in the Noise and Vibration Management Plan. The program must be developed in consultation with the EPA."*

9. Threatened Species and Biodiversity

9.1 Clearing of vegetation and biodiversity impacts

The amended development proposal has removed Wells VV07 and VV11 which were to be located within a stand of critically endangered ecological community Cumberland Plain Woodland (CPW). However, Figures 6A – 6Q of Appendix E *Amended Project Flora and Fauna Report* (F&F Report) only identifies CPW where there are overstorey trees.

Section 3.3 of the Flora and Fauna Report describes two additional communities – Shrubland and Closed Grassland although Figures 6A-6Q do not map the Closed Grassland. Impacts on Closed Grassland are not detailed in Table 10 either.

The 2009 Scientific Committee determination for CPW expressly included derived native grasslands in the community description and also noted that "*Either or both of the upper-storey and mid-storey may be absent from the community.*"

The Flora and Fauna Report has not separately identified native and non-native Shrubland and Closed Grasslands, but notes that both exist.

OEH considers it is likely that some of the areas of Shrubland and Closed Grassland, when dominated by native species, would be correctly classified as CPW under the terms of the current determination. The Flora and Fauna Report estimates ~ 24.77 ha of Closed Grasslands will be affected by the proposal (11.5 ha by well sites and 13.27 ha by pipelines and access tracks). 0.48 ha of Shrubland will also be affected by the pipeline and access track network.

Recommendation 23: That DP&I requires the Proponent to review the information available and determine which areas of Shrubland and Closed Grassland should be identified as CPW. These areas should be marked as such on a revised set of Figures 6A-6Q and tabulated on a revised Table 10 (and other tables and figures, as appropriate). Should it be determined that there will be residual impacts on critically endangered or endangered ecological communities, then the applicant should consider preparation of an offsets strategy.

9.2 Protection of *Pimalea spicata*

The Flora and Fauna Report acknowledges that this species is "*known from highly disturbed areas including road verges, table drains, road embankments and ploughed paddocks*" (as well as intact vegetation), but then concludes that impacts are unlikely as the project "*will not result in the removal of suitable habitat*" This is presumably because the project has been assessed as not impacting on intact vegetation, just shrubland.

OEH survey recommendations for *Pimelea spicata* are one person hour of survey per hectare of suitable habitat when the species is in flower. There has been a total of 144 person hours of survey (all surveys, not just targeted threatened flora survey).

As noted above, ~24.77 ha of Closed Grasslands will be affected by the proposal. Much of this area may be dominated by exotic species.

Recommendation 24: That DP&I ensures that the Proponent has undertaken one person hour of targeted flora survey within suitable *Pimelea spicata* habitat (not just areas of intact vegetation) that will be affected by the project, when the species is flowering. This will first require identifying where suitable habitat based on the habitat types that *Pimelea spicata* is known to occur in. The recommended survey method to detect this species can be found in the Environmental Impact Assessment Guidelines in the National Recovery Plan for *Pimelea spicata*. The Recovery Plan is at:
http://www.environment.gov.au/biodiversity/threatened/publications/pubs/p-spicata.pdf

Recommendation 25: If this survey effort cannot be demonstrated to have been achieved, then it is recommended that pre-development surveys be conducted. Should any *Pimelea spicata* be detected, a record should be submitted into the Atlas of NSW Wildlife at: www.bionet.nsw.gov.au/. This should occur as soon as possible following detection of the species and include a population count and accurate GPS co-ordinates.

9.3 Biodiversity Offset Package

In the event that impacts on CPW cannot be avoided or mitigated, any residual impact must be offset by the development of a suitable biodiversity offset package.

Recommendation 26: That DP&I include a condition of consent that states:

"The Proponent shall develop and submit for the approval of the Director-General, a Biodiversity Offset Package (the Offset) to compensate for the loss of CPW. The Offset shall include, but not be limited to the following:

1. *The Offset shall be developed in accordance with the Principles for the Use of Biodiversity Offsets in NSW (DECCW 2009).*
2. *The Offset shall be developed in consultation with OEH.*
3. *The Biobanking Assessment Methodology and Operations Manual (DECCW 2009) could be used to calculate the amount and attributes of the Offset.*
4. *The Offset shall be directed towards 'priority conservation lands' as identified in the Recovery Plan for Cumberland Plain Woodland (DECCW 2011) where feasible.*
5. *The Offset shall be secured for long-term conservation within 12 months of any consent or approval through a means agreed to by OEH".*

9.4 Biodiversity Exclusion Zones

The Revised SOCs refers to work in areas identified as 'Avoid by Exclusion'. These include 'biodiversity constraint zone' discussed in the previous submission.

To ensure the conservation and management of the biodiversity constraint areas, OEH recommends the inclusion of the following condition of consent:

Recommendation 27: That DP&I include a condition of consent that states:

"Biodiversity Exclusion Zones

a. General

i. The boundary of the biodiversity exclusion zone, as identified in Figures 7A to 7Q in the Amended Flora and Fauna Report Appendix E of the Submissions Report, and labelled as "avoid by exclusion" shall be clearly defined in consultation with a fully qualified ecologist prior to the commencement of any construction works.

ii. Site supervisors shall be provided with aerial images, including the boundary of the defined biodiversity exclusion zone.

iii. All hollow bearing trees shall be retained and protected, with no excavation within the critical root zone (extending to 2 metres beyond the drip line) of hollow bearing trees.

b. Well Surface Locations (WSL) and Access Roads

i. All WSLs, including access and maintenance areas and initial construction compound areas, as identified in Figure 12 of the EA, shall be located wholly outside the biodiversity exclusion zone.

ii. Vehicles, heavy plant and machinery shall be restricted to designated areas located wholly outside the biodiversity exclusion zone during construction and maintenance of any WSL.

iii. Access roads for the construction and maintenance of WSL shall be located to avoid the biodiversity exclusion zone, native vegetation, derived native grasslands and Blackthorn (Bursaria spinosa) stands.

c. Gas Gathering Lines (GGL)

i. GGLs shall be located to avoid the biodiversity exclusion zone, native vegetation, derived native grasslands and Blackthorn (Bursaria spinosa) stands.

ii. GGLs shall be located in existing formed access tracks, easements or exotic closed grassland, where practicable.

iii. Access roads for the construction and maintenance of GGL shall be located in existing formed access tracks, easements or exotic closed grassland, where practicable.

iv. In locations where the biodiversity exclusion zone, native vegetation derived native grasslands or Blackthorn (Bursaria spinosa) stands may be disturbed during the construction of GGL, erosion and sediment control fencing shall be installed around vegetation that is to be retained with no access to occur in the fenced areas and signing placed on the fencing shall identify these areas as 'no access zones'.

v. In locations where the biodiversity exclusion zone, native vegetation derived native grasslands or Blackthorn (Bursaria spinosa) stands may be disturbed during the construction of GGL a fully qualified ecologies shall develop a response protocol should Cumberland Plain Land Snail (CPLS) be found, as well as undertake pre-clearing CPLS surveys prior to the commencement of any construction works.

vi. In locations where the biodiversity exclusion zone, native vegetation derived native grasslands or Blackthorn (Bursaria spinosa) stands may be disturbed during the construction of GGL, hygiene protocols shall be implemented for vehicles, heavy plant and machinery used for earthworks."

9.4 Landscape Rehabilitation Management Plan

While a SOC is included to revise and implement a Landscape and Rehabilitation Management Plan (LRMP), this does not include adequate detail. OEH recommends that specific SOCs be developed to address landscape rehabilitation management or the following condition of consent be secured.

Recommendation 28: That DP&I include a condition of consent that states:

"The Proponent shall prepare and implement a Landscape Rehabilitation Management Plan (LRMP) for the Surface Project Area, to the satisfaction of the Director-General prior to the commencement of construction. The LRMP shall include, but not be limited to the following:

a) The LRMP shall be prepared in consultation with a fully qualified ecologist prior to the commencement of any construction works.
b) The LRMP shall be consistent with the best practice standards for bushland management and restoration contained in the Recovery Plan for Cumberland Plain Woodland (DECCW, 2011) and Recovering Bushland on the Cumberland Plain: Best Practice Guidelines for the Management and Restoration of Bushland (DEC 2005).
c) The LRMP shall define the rehabilitation objectives and goals for the area, clearly set out the proposed actions required, monitoring regimes, as well as performance indicators to report on the implementation of rehabilitation.
d) The LRMP shall include an accompanying work or action plan which includes specific restoration actions, site preparation, rehabilitation techniques to be used, as well as care and maintenance following rehabilitation.
e) The LRMP shall use species and densities recommended in Appendix 7 in Appendix E of the EA during rehabilitation.
f) The LRMP shall address the management of weed and pest species, weed eradication methods, protocols for the use of herbicides, stock inclusion fencing, as well as methods to treat and re-use weed infested topsoil.
g) The LRMP shall be implemented progressively, that is, rehabilitation shall occur as soon as reasonably practicable following the disturbance.

10 Land Use Impacts and Growth Centres Planning

Previous comments provided by OEH, dated 22 December 2010 (then the Department of Environment Climate Change and Water), noted that the project area included lands within the South West Growth Centre and Camden Council development areas and that further consideration should be given to the appropriateness of the location of the proposed wells given that land in the project area had been released for urban development.

CU06, which was formerly to be located in the Turner Road Precinct, has been relocated. CU02 is still proposed to be located in the Turner Road Precinct within a part of the release area earmarked as a riparian zone.

Timing for the production and extraction project and future land use conflicts is still a potential issue. As noted in the Environmental Assessment (EA), the Turner Road Development Area was released in 2006 and development of the Gregory Hills and Central Business districts began in September 2009. Development in this area is therefore well underway with new streets and residential development already built south of Gregory Hills Drive. The EA states that there will be a production stage of nine months followed by a 15 year extraction phase. Therefore, should the project be approved, final rehabilitation of the well surface locations will not occur until at least 2029 and could be later depending on project staging.

The Submissions Report states that the assessment envelope around the well would be reduced in consultation with the landowner to ensure it will not encroach on parts of the site proposed for residential development. It is not clear if the actual well will be within the riparian area or nearby on land now zoned for Business Development. However, the location of the well and ongoing extraction of gas within the riparian

zone would not be compatible with the objectives as set out in the Turner Road Development Control Plan 2007 which are to protect, restore and enhance the environmental qualities of water courses and for low impact recreational activities such as walking and cycling.

OEH does not consider that there is adequate justification that the proposed location in the Turner Road Precinct will not result in land use conflicts. Even though consultation has occurred with land developers, current landholders and the Growth Centres Commission it is not clear how landholders have been and will be informed before purchase about the production of coal seam gas in close proximity to residential areas.

The location of CU02 within the riparian area also raises concern for OEH as these areas have been identified as important protection within the new suburbs that are intended to be rehabilitated and provide important environmental and passive recreational opportunities for future residents.

11 Aboriginal Cultural Heritage

OEH considers that the Proponent has adequately responded to the 2010 comments regarding Aboriginal Cultural Heritage (ACH) matters. However, no specific Statement of Commitments (SOC) has been included for ACH. OEH recommends that specific SOC be developed to address OEH concerns or condition of consent be secured in regard to ACH.

Recommendation 29: That DP&I include as a condition of consent that states:

"Aboriginal Cultural Heritage

- *a) The Proponent shall develop, in consultation with the Aboriginal community, a communication strategy to ensure the Aboriginal community is kept informed of developments with respect to the management of Aboriginal objects, sites and potential Aboriginal deposits.*
- *b) The Proponent shall develop management and mitigation strategies prior to the commencement of any construction works.*
- *c) The Proponent shall develop management and mitigation strategies in consultation with the Aboriginal community.*
- *d) The Proponent shall update the Aboriginal Cultural Heritage Management Sub-Plan (ACHMSP) based on the findings of the Aboriginal Archaeological Assessment, in consultation with the Aboriginal community and DoP&I. Note: OEH does not wish to be consulted in relation to the ACHMSP and considers this to be a more appropriate role for the approval body which in this case is DoP&I.*
- *e) In the unlikely event that human remains are recovered:*
  - *i. The Proponent shall cease work immediately in the vicinity of the remains and the area should be secured to avoid further harm to the remains.*
  - *ii. The Proponent shall notify the local police and OEHs' Environment Line on 131 555 as soon as practicable and provide any available details of the remains and their location.*
  - *iii. The Proponent shall not recommence work at the particular location until authorised in writing by OEH.*

Please note, under s20 (1) of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984, *'a person who discovers anything that he or she has reasonable grounds to suspect to be Aboriginal remains shall report his or her discovery to the Minister, giving particulars of the remains and of their location', there is a requirement for all Aboriginal human remains that are discovered anywhere in Australia to be reported to the relevant Commonwealth Minister. "*