4.0 Response to Agency Submissions

4.1 Overview

A total of 11 submissions were received from State and Local Government agencies including:

- Submission 1 NSW Office of Water (NOW);
- Submission 17 Transgrid;
- Submission 21 Hunter-Central Rivers Catchment Management Authority (CMA);
- Submission 23 Dungog Shire Council;
- Submission 24 Department of Environment, Climate Change and Water (DECCW);
- Submission 62 Gloucester Shire Council;
- Submission 95 Maitland Shire Council;
- Submission 114 NSW Roads and Traffic Authority (RTA);
- Submission 123 Port Stephens Shire Council;
- Submission 124 Great Lakes Shire Council; and
- Submission 147 Department of Industry and Investment (DII).

Responses to issues raised in each of these submissions are provided in the following section.

4.2 Response to Submissions

Issue #	Category	Issue	Response
Submission 1 **NSW Office of Water (NOW)**			
1	Licensing	NOW requests a condition which conveys statutory licensing requirements under NSW water legislation for licensing of water, including operating rules of relevant water sharing plans.	AGL would comply with statutory licensing requirements stipulated by the conditions of approval.
2		NOW requires the applicant to verify that all test and other wells are metered and licensed, and accounting for water extraction from all water sources is reported to NOW on an annual basis	Appropriate groundwater/bore licences would be sought for each well through NOW prior to drilling. Metering would occur via the SCADA system and reporting would be as per licence requirements.
3	Water Supply	The proponent shall ensure it has sufficient water for all stages of the project, and, if necessary, adjust the project scale to match its approved water supply.	Noted.
4	Rehabilitation of Pipeline Corridor	NOW requests more specific rehabilitation measures for pipeline crossing locations than those nominated in Section 22.2.4 of the EA. NOW does not support the use of sand bags or gabion baskets.	Site specific rehabilitation plans would be prepared depending upon site conditions (e.g. erosion, presence of acid sulphate soils, significant habitat) as part of the CEMP. Appropriate stabilisation measures would be required on both the banks and bed of watercourses. Such measures shall be determined on a site specific basis following consideration of
5		On watercourses of 3rd order or greater, the applicant must devise stabilisation measures which will effectively accommodate scour energies above the 1:100 year storm event. NOW recommends a minimum of 1 m depth of	

Issue #	Category	Issue	Response
		excavation below the maximum predicted scour activation depth for all trenching crossings.	local influencing factors such as stream hydrology, soil type, rainfall, vegetation regeneration potential, and land use. Measures may include restoring riverbanks to their original profiles, respreading topsoil over the area from which it was removed and seeding of disturbed areas, or introducing a surface layer of cobbles, coarse gravel or rock over disturbed areas as rip-rap.
6		NOW recommends stabilisation of all watercourses as quickly as possible using local flora.	Agreed. This would be incorporated into the CEMP and site specific rehabilitation plans for watercourse crossings. .
7		The applicant should provide DoP with as-executed reports to crossing installation, stabilisation and rehabilitation along the pipeline corridor.	As-executed reports for watercourse crossings can be provided to DOP as required by the conditions of approval.
Submission 17 **Transgrid**			
1	Consultation	Transgrid has identified potential concerns to AGL regarding the proximity of the pipeline to the existing 132kv powerline easement due to possible impacts on Transgrid's ability to upgrade the existing transmission line, as well general concerns regarding construction and maintenance of the pipeline in proximity to a high voltage transmission line. Transgrid would hope these concerns form the basis of ongoing consultation. Staging of works for the pipeline and Transgrid transmission powerline upgrade should be part of ongoing consultation with Transgrid.	Agreed. AGL would consult directly with Transgrid in respect of Transgrid's easement and future upgrades to ensure construction and maintenance is in accordance with Transgrid's requirements.
2	Pipeline Corridor Access and Maintenance	Where Transgrid access crosses over the pipeline, access must be provided that is suitable for heavy construction and maintenance vehicles (weights up to 35 tonnes GVM). Any services placed within Transgrid's easement must have protection for vehicles and plant up to this weight.	Noted. Refer to Issue 1 above.
3		A continuous unobstructed access way must be maintained along the length of the easement at all times. Consultation should be undertaken with Transgrid regarding possible access restrictions to Transgrid's access to the electricity easement during pipeline construction. Transgrid should be consulted regarding maintenance of shared access tracks.	Noted. Refer to Issue 1 above.

Issue #	Category	Issue	Response
4		No obstructions shall be placed in the easement within 15 m of any part of a transmission structure. Area around the base of transmission line structures shall have easy vehicle access from all sides, and be available at all times as a clear working area for Transgrid maintenance crews and plant.	Noted. Refer to Issue 1 above.
5	Electrical induction	Transgrid requests a copy of the Electrical Induction Report to be provided as part of ongoing consultation.	Noted. AGL would provide a copy of the report to Transgrid once finalised.
6	Electrical safety	All low voltage installations (electricity, gas, telephones, communications, water, sewerage) are not to be within 15m of a structure, or within 15m of the centre of the easement without adequate protection for ground currents, earth potential rise and induction.	Noted. AGL has undertaken an assessment of the risks associated with electrical induction. AGL will comply with the mitigation measures detailed in the Electrical Induction Report and undertake ongoing consultation with TransGrid.
7		In all cases where the proposed pipeline impacts on Transgrid's high voltage easements and Cathodic Protection AC mitigation report shall be provided by AGL.	Noted. Refer to Issue 5 above.
8		All work within the easement is subject to safe working distances once electricity transmissions line is operational. All work within the easement shall comply with the WorkCover Code of Practice 2006 for Work Near Overhead Powerlines, Cat No. 1394. This code requires that plant with the potential to impinge on the "Accredited Person Zone" must be operated by an "Accredited Person" as per Appendix 4 of the Code. Vehicles, plant and equipment exceeding 4.6m in height are not permitted in the easement except when operating in accordance with the Code (appendix 4).	Noted. Refer to Issue 1 above.
9		The erection of any structure greater than 4.6 m in height within the easement is prohibited.	Noted. AGL would consult directly with Transgrid in respect of Transgrid's easement and to ensure design and construction is in accordance with Transgrid's safety requirements.
10		Infringement of the WorkCover Code of Practice by any plant may result in dangerous induced voltages causing injury or death.	
11		Transgrid considers that an arc incident caused by AGL's equipment would jeopardise Transgrid's capacity to exercise its function and discharge it responsibilities under the Energy Services Corporations Act.	

Issue #	Category	Issue	Response
12	Pipeline construction	Electricity easement shall not be used during pipeline construction by construction vehicles or for materials laydown without prior consultation with Transgrid.	Noted. AGL would consult directly with Transgrid in respect of Transgrid's easement and future upgrades to ensure construction and maintenance is in accordance with Transgrid's requirements. Transgrid's requirements would be incorporated into the CEMP for pipeline construction. Noted. AGL would consult directly with Transgrid in respect of Transgrid's easement and future upgrades to ensure construction and maintenance is in accordance with Transgrid's requirements. Transgrid's requirements would be incorporated into the CEMP for pipeline construction.
13		No hazardous substances to be placed within Transgrid's easement.	
14		All earthworks disturbances within easement to be reinstated to original surface level and compacted 95% standard compaction, and stabilised with suitable ground cover.	
15		Blasting near the Transgrid easement shall have a max charge of 2kg/delay with max peak velocity of 25mm/second. No blasting to occur within 30m of a transmissions line structure.	
16		No drainage or surface stormwater shall wash over the easement within 15m of any transmission line structure.	
17		Dust to be controlled to prevent impact on insulators.	
18		No vegetation with a mature height above 4 m shall be planted in the electricity easement.	
19		Electricity easement to be left free of waste following completion of construction.	
Submission 21 **Hunter Central Rivers Catchment Management Authority (CMA)**			
1	Conservation agreements	At least 2 known Property Vegetation Plans (PVP) on or adjacent to the pipeline corridor. These are legally binding between the CMA and the Landowner. AGL should ensure the project including access and construction do not impact the ability of the landowners to achieve the outcomes in the PVPs.	Lot 895 DP262981 lies approximately 1.5 km north-west of Glen Martin. The proposed pipeline corridor transects the property at KP 57 but does not pass through remnant vegetation. Under the current alignment there would be no need to clear remnant vegetation on the property. There may be some small, short-term impacts as a result of construction, such as trench fall of wildlife, noise and disturbance. These impacts would be minimised by the mitigation measures listed in Section 5.0 of Appendix G of the EA. This should not affect the ability of the landholder to achieve the outcomes of the PVP. Therefore, it is unlikely that the proposed development would have a significant impact on the conservation agreements of these properties.
		Lots in question are Lot 895 DP 262981 - pipeline does not seem to cross area under the PVP. Lot 68 DP 753176 - property noted in EA as having a Voluntary Conservation Agreement over this land. The type of conservation agreement should be clarified. If any clearing of land within an area affected by a PVP this should be discussed with the CMA as clearing is not permitted.	

Issue #	Category	Issue	Response
			Lot 68 DP 753176 is transected by the proposed pipeline route at KP 54.1 to KP 54.9. As noted in the EA, the pipeline follows an existing powerline easement of approximately 40 m in width. Construction would be restricted to the existing ROW and no clearing or remnant vegetation would be undertaken within the Nature Refuge area. Therefore it is unlikely that the proposed pipeline route would have a significant impact on vegetation and wildlife above that already posed by the existing powerline corridor. There may be some small, short-term impacts as a result of construction, such as trench fall of wildlife, noise and disturbance. These impacts would be minimised by the mitigation measures listed in Section 5.0 of Appendix G of the EA. Access along the existing easement may be restricted temporarily during construction, but ample notice would be provided to the landholder during negotiations for property entry. This should not affect the ability of the landholder to achieve the outcomes of a VCA or PVP. Therefore, it is unlikely that the proposed development would have a significant impact on the conservation agreements of these properties.
2	Ecology - Offsets	CMA supports the offsetting of native vegetation removal and recommends this is determined using either the Environmental Outcomes Assessment Methodology (EOAM) or BioBanking methodology. CMA acknowledges that under the EOAM, EECs are unable to be offset. CMA supports this principle, however when determining offsets where the Native Vegetation Act does not apply, CMA would support the application of either methodology with "red lights" for EECs removed where they cannot be avoided.	Noted. Biodiversity offsets are discussed in **Section 3.3.5** of the Submission Report.
3	Ecology - connectivity	Two CMA corridors have not been considered: corridor between Chichester State Forest and The Glenn Nature Reserve through Craven	The proposed pipeline route crosses a minor, highly fragmented vegetation corridor between Chichester State Forest and Glenn Haven Nature Reserve at

Issue #	Category	Issue	Response
		alternate corridor between Chichester State Forest, Wallaroo State Forest and Myall River State Forest CMA acknowledges the relatively minor nature of these corridors but encourages the project to address these corridors - any retention or improvement in landscape connectivity would be beneficial such as retention of strips of understorey, canopy or mid storey.	approximately KP 10. The alignment avoids most remnant vegetation in the corridor but does cross small remnants along Bull and Coal Creeks. Only very narrow strips (less than 30m) would be cleared through this vegetation and this may reduce connectivity slightly in the short term. Detailed mitigation measures are provided in Volume 1 Section 5.0 of Appendix G of the EA to minimise disturbance to native vegetation. In addition, understorey vegetation would be allowed to regrow over the corridor. As a consequence, the potential for a barrier effect caused by the pipeline would be very minor and very temporary. It is therefore unlikely that the development would have significant long-term impact on the connectivity of the corridor, or obstruct wildlife movement in the area. The proposed pipeline alignment also crosses vegetation corridors between Chichester State Forest and Wallaroo State Forest and between Wallaroo State Forest and Myall River State Forest (between KP 59 and KP63). The current alignment proposes to use existing cleared corridors throughout this area. Consequently, there would be no requirement to clear remnant vegetation within the area, so it is unlikely that there would be a significant decrease in connectivity. There would be some short-term impacts on wildlife and habitats, such as trench fall of terrestrial species, disturbance and noise. These would be reduced by the mitigation measures listed in Volume 1 Section 5.0 of Appendix G of the EA.
4	Endemic species	A number of rare and/or endemic species not well documented in the study area and rare species not yet listed, which have not been included in the assessment. Without ecological surveys during flowering seasons these species may be impact. Further work recommended for the following species: *Diuris pedunculata*	The pipeline and GFDA traverse extensive areas, so targeted surveys for the numerous threatened and endemic species in suitable habitats at multiple periods throughout the year was not considered to be practicable with available resources. It is considered to be more precautionary, practical and economically feasible to

Issue #	Category	Issue	Response
		Genoplesium acuminatum, *Genoplesium ruppii*, *Phaius tankarvileiae*, *Pterostylis chaetophora* *Thelymitra sp. 'adorata'* *Dodonaea megazyga* *Goodenia fordiana* *Sonchus hydrophilus*	assume their presence where potential habitat occurs and to consider appropriate offsets for these species where potential habitat is disturbed. An analysis of habitat requirements for these endemic species is provided in **Appendix B** of the Submissions Report. *Diuris pedunculata* was assessed in the EA (refer Volume 2, Table T6 of Appendix G). Based on the species' preferred habitat it was determined that there was no potential habitat for this species within the proposed alignment route. As such further assessment of this species is not required. Endemic species including the orchid species *Genoplesium acuminatum*, *Genoplesium ruppii*, *Phaius tankarvileiae*, *Pterostylis chaetophora* and *Thelymitra sp. 'adorata'* have the potential to occur along the proposed pipeline route based on their preferred habitat. Targeted surveys for each of these species along the length of the pipeline alignment route, even during flowering seasons, would not ensure their identification. Surveys in October or November could target at least four species but not *Genoplesium acuminatum.* The flowering periods of *Genoplesium ruppii* and *Thelymitra* sp*. 'adorata'* do not seem to be known. Whilst surveys in the flowering period would increase the probability of detecting these cryptic species, there would still be a low likelihood of detection. Impacts would likely be similar to that for *Cryptostylis hunteriana* assessed in Volume 2 Appendix G of the EA. *Dodonaea megazyga* is a shrub to small tree that usually grows in dry sclerophyll forest or on margins of rainforest, usually on sandstone. *Goodenia fordiana* is a prostrate herb that grows in sclerophyll forest on the lower escarpment ranges, from Coffs Harbour area to Bulahdelah. *Sonchus hydrophilus* is an erect herb that grows in

Issue #	Category	Issue	Response
			temporarily wet ground, edges of lakes and streams. Suitable habitats for all three species may occur within sections of the alignment. While targeted surveys at appropriate seasons may detect these species, detection rates of these uncommon species are relatively low and may also vary from year to year. The assessment has therefore taken the precautionary approach of assuming the presence of a species if suitable habitat for that species occurs, and concluded that no significant impact would result from the Project.
5	Wetlands	Heatherbrae crossing of Hunter River is a concern. Objection to disturbance of Hunter Estuary Wetlands, estuary and associated vegetation. Potential to fragment/disturb highly valuable wetland systems. Careful consideration required.	The Hunter Estuary Wetlands would not be directly disturbed as construction environmental management would be designed to avoid downstream impacts associated with watercourse crossings. Refer to **Section 3.1.1** of the Submission Report.
6	Waterway Crossings	Recommended that AGL obtain Riverstyles data (form, sensitivity, recovery potential) from CMA which would be beneficial in works design for each river crossing.	AGL would obtain Riverstyles data where available for consideration during watercourse crossing design and relevant information would be utilised within the CEMP.
7	Groundwater	Groundwater Management Plan (GWMP) should include monitoring of terrestrial vegetation for adverse reactions to groundwater extraction, including mitigation measures. The GWMP should assess potential impacts of irrigation of saline water, in particular impacts associated with the Avon River which has high salinity levels and increased surface salinity or dryland salinity.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. An assessment will be undertaken of terrestrial vegetation and stream baseflows to determine whether there is any groundwater dependence and whether any special monitoring requirements need to be included in the GWMP. A groundwater monitoring network would be established in the Project Area and surrounds to monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers). The Groundwater Management Plan would be implemented for the duration of the Project and would

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			include ongoing monitoring of water levels and water quality prior to, and during construction, to identify impacts to shallow alluvial aquifers, shallow bedrock aquifers, and deep bedrock aquifers. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
Submission 23 **Dungog Shire Council**			
1	Environmental management	Limited detail on impacts and mitigation in many areas of the project. Reliant on future management plans, with no opportunity for comment on drafting or monitoring of plans. Development and compliance should be carried out in consultation with local government authorities and adoption of monitoring should a condition of approval.	Noted. The management plans detailed in Chapter 25 of the EA would be submitted to the Director-General for review and approval.
2	Infrastructure	No commitment to provide adequate compensation for impacts to local infrastructure (roads and bridges). Traffic management and road maintenance agreements and contributions should be paid by AGL to compensate for reduced life of road pavement and infrastructure.	As discussed in Volume 1 Section 16.9 of the EA, a detailed Traffic Management Plan would be prepared for the Project which would incorporate dilapidation assessments prior to and following construction of the Project to assess road networks to be used during the construction period. Impacts attributable to the Project would be made good by AGL. AGL intends to meet with all relevant road authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period. Given the operation of the Project would not result in a demand for infrastructure and impacts attributable to the Project during construction would be made good by AGL, compensation is not considered to be warranted.

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3	Pipeline construction camp	Location, potential impacts and benefits should be assessed separately by the local planning authority. If within Dungog LGA, a Development Application should be lodged and include a detailed social and economic assessment.	The construction workforce camp was included within the Project Application. If Project Approval is granted, there would be no requirement for additional approvals.
4	Quarries	Source of material proposed for road base/backfill should be identified and transport considered as part of a road maintenance agreement with relevant local authority. If a new quarry is proposed a separate Development Application should be lodged with Council.	Preliminary discussions have been held with Gloucester Coal regarding supply of gravel for roads and wells within land owned by Gloucester Coal. Where possible, existing quarries would be utilised to source gravel. Condition assessments would be undertaken for all transport routes prior to construction to assist with determining road repair contributions occasioned by construction traffic. Further investigations would be undertaken in consultation with council to obtain approval for new quarries / borrow pits, should these be required. Road maintenance agreements are not considered to be required - refer to Issue 2 above.
5	Traffic and transport	Dilapidation assessment to be carried out on all roads used as part of the project. AGL should develop management plans and agreements with each local authority to maintain roads during life of the project and on completion.	Refer to Issue 2 above.
6	Infrastructure - road crossings	No detail provided regarding pavement repairs for unsealed and minor sealed roads.	During detailed design, AGL would consult with all councils requesting design requirements for road crossings. Design crossing drawings would be prepared for Council for its information prior to works commencing.
7		All unsealed roads to be repaired via placement and compaction of 40mm minus crushed gravel with min CBR of 50 to 300mm depth.	
8		All sealed roads repaired by placement and compaction of 200mm DGS40 or equivalent subase and 150mm DGB20 base with 40mm AC14 seal.	
9		Trenches should be square to the road alignment. Bitumen surfaces should be saw-cut prior to excavation. Pavement repairs minimum width 2m to allow adequate compaction	
10		Council to be notified to allow inspection of rehabilitated trenches.	

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11		Bond and/or 12 month maintenance period to be applied to road crossings.	As part of the construction contract, the construction contractor would have a 12 month defects liability period in which they would need to rectify restoration defects for the length of the pipeline alignment. This would form part of consultation with Councils during detailed design.
12	Infrastructure - bridges	All bridges, especially timber structures, utilised by heavy vehicles during pipeline construction to be inspected for structural capacity and condition. Noted that 2 bridge crossings on Black Camp Road are currently inadequate for heavy vehicle movements. Both crossings are simple longitudinal timber sections covered in granular material. One has failed completely.	Refer to Issue 2 above. Prior to construction, an early works infrastructure inspection would be undertaken by the contractor to identify bridge limitations along transport routes. The bridges along Black Camp Road have previously been noted and discussions would be held with Council in this regard.
13	Cumulative impacts	Concurrent existing and potential new development in the region not considered, which may impact on community and local infrastructure. These include proposed Tillegra Dam, Transgrid renewal of 132kv line between Stroud Road and Thornton, construction of Clearwater Tanks by Hunter Water Corporation (HWC) in Dungog area, ongoing infrastructure upgrades by Country Energy and ARTC.	Consultation with Transgrid is ongoing. The staging of works and implementation of the CEMP would minimise cumulative impacts on the renewal of 132kv line between Stroud Road and Thornton. During preparation of the CEMP, consideration would be given to construction of Clearwater Tanks by HWC, Country Energy, and ARTC. Where the project has the potential to cumulatively impact community and local infrastructure, consultation with relevant parties would be undertaken prior to commencement of pipeline construction. AGL would stage works to minimise cumulative impacts.
14	Environmental Management and Monitoring	Management and monitoring of plans to be clearly outlined. Single contact to be nominated by the major contractor to manage compliance, respond to complaints and liaise with community.	Management, compliance monitoring, and auditing requirements for Project EMPs would be detailed in the CEMP, to be prepared prior to construction. These plans would be submitted to relevant Statutory Agencies as required by the Project Approval for review and approval.
15		General monitoring and compliance to the Project's EMPs and approval conditions should be undertaken by DECCW.	
16		Compliance audits on regular basis by an independent assessor with audits available to stakeholders.	
17	Section 94 Contributions	Extent of potential impacts on local road infrastructure and demand on community services not identified in EA. Section 94 contributions should be payable so	The operation of the Project would not result in a demand for infrastructure or community services. Impacts to community

Issue #	Category	Issue	Response
		ratepayers do not subsidise commercial projects.	infrastructure and services is assessed in Volume 1 Section 20.3.1 of the EA. Temporary impacts to road infrastructure attributable to the Project during construction would be made good by AGL,
Submission 24 **Department of Environment, Climate Change and Water (DECCW)**			
1	Ecology	Ecological Assessment does not address previously raised concerns from letter dated 29/1/09.	All issues provided to AGL by the Department of Planning during adequacy review were addressed.
2	Offsets / Compensatory Habitat	DECCW requires AGL to clarify the exact amount of clearing resulting from the project. If greater than stated in the EA mitigation measures should be provided.	The quantity of clearing required is approximately 19 ha for the entire project as stated in Volume 1 Section 10.6 of the EA. Refer to **Section 3.3.5** of the Submissions Report.
3		DECCW does not concur with the conclusions in the TSC Act Section 5A Assessment which concluded that significant impacts on species life-cycle and/or habitat were unlikely.	Noted. The application of the Section 5A assessment of significance is discussed in **Section 3.3.3** of the Submission Report.
4		DECCW does not support concept of pre-clearance surveys after an approval as an adequate measure to minimise the significance of the clearing impact. Targeted surveys should have been conducted prior to seeking approval. Pre-clearance surveys provide no mechanism to ensure conservation or avoidance of significant threatened species or populations.	Noted. Further discussion on the flora and fauna survey methodology and preclearance surveys is provided in **Section 3.3.4** and **3.4.4** of the Submission Report. Given that flora and fauna surveys have been undertaken, the use of pre-clearance surveys is considered adequate prior to clearing.
5		The clearing of 15-35 ha of vegetation may be significant, coupled with the lack of knowledge whether or not these areas support predicted threatened species. Loss may be significant to such species. DECCW supports a precautionary approach and considers that all suitable habitat be considered to support viable populations - as such DECCW would consider this to represent a significant impact to threatened species and their habitats. Given the proposal cannot mitigate/avoid clearing threatened species habitat, offsets are required to compensate impacts.	The Project would result in clearing of 18.17 ha as described in Volume 1 Chapter 10 and Volume 2 Appendix G of the EA. Some habitat would be impacted as result, however the EA concluded that provided the detailed mitigation measures proposed were implemented, impacts would not be significant. Mitigation detailed in Chapter 10 of the EA included the preparation of a Habitat/Biodiversity Offset Strategy. This is discussed further in **Section 3.3.5** of the Submissions Report.

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6		Offsets should be secured prior to granting of approval. For any offset plan, DECCW needs to assess the adequacy and suitability and whether they accord with DECCWs offsetting principles.	AGL is currently investigating biodiversity offsets for the Project. Availability of offsets would be demonstrated with the preparation of a Habitat Offset Strategy, with offsets would be secured prior to construction. This is discussed further in **Section 3.3.5** of the Submissions Report.
7		One of two methods should be used for offsetting - DECC Offsetting principles, or a voluntary biobanking assessment using BioBanking Assessment Methodology under Biodiversity Banking and Offsets Scheme. DECCW considers the later would provide a transparent framework and quantitative, principles based approach, although not a requirement under Part 3A.	Offsetting would be in accordance with DECCW's offsetting principles as described in Volume 1 Section 25.2.4 of the EA. Biodiversity offsets are discussed in **Section 3.3.5** of the Submission Report..
8	Translocation	Offsetting of Grevillea parviflora subsp. Parviflora via translocation or propagation is not supported as a suitable offset. Biodiversity offsets containing the affected species should instead be secured.	Biodiversity offsets are discussed in **Section 3.3.5** of the Submission report.
8		DECCW recognises the good intention of translocation and requests the location of relocation, appraisal of potential impacts of translocation, and mitigation to minimise detrimental effects to other populations. Translocation should be in accordance with best practice and may require a licence under the NPW Act.	Noted. Should translocation be incorporated into the final Habitat Offset Strategy, appropriate licences would be obtained from DECCW and translocation would be undertaken in accordance with best practice.
9	Offsets / Compensatory Habitat	Details of how offsets will be conserved in perpetuity are not provided. DECCW would consider suitable measures to be a Conservation Agreement, biobanking agreement, and reservation of land under Part 4 of the NPW Act or covenant under the Conveyancing Act.	Biodiversity offsets, including mechanisms for conservation are discussed in **Section 3.3.5** of the Submissions Report.
10		An appropriate habitat offset management plan should be developed as a key amelioration measure prior to consent being issued for the project. DECCW does not support development of such a plan after development approval. A plan should be underpinned by monitoring and adaptive management regime to ensure success. The plan should document how the offset area, retained vegetation and proposed habitat management will be managed and implemented with respect to long-term conservation and viability, including funding details.	Offsetting would be in accordance with DECCW's offsetting principles as described in Volume 1 Section 25.2.4 of the EA. A Habitat Offset Strategy would be prepared and is further described in **Section 3.3.5** of the Submissions Report.

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11	Flora / Fauna Surveys	Lack of adequate surveying (only collected information on dominant features; done over a short period of time when not all species were detectable; few details on survey methodologies provided (ie call back surveys etc); must be in accordance with DECCW guidelines.	Given the rural agricultural nature of the majority of the pipeline corridor, large area covered, and mitigation measures proposed in the EA, the survey methodology is considered adequate. Further discussion on the flora and fauna survey methodology is provided in **Section 3.3.2** of the Submissions Report, including justification for the level of survey undertaken and details of timing and effort involved in the surveys.
12		DECCW recommends appropriate surveying is undertaken in accordance with DECCWs guidelines. Alternatively the proponent should assume affected vegetation is suitable for all predicted threatened species with viable populations. If the latter approach is used, DECCW would expect a significant impact, and as such, appropriate mitigation / offset measures applied.	Offsets would be provided only where affected vegetation provides suitable habitat for protected species. A Habitat Offset Strategy would be prepared and is further discussed in **Section 3.3.5** of the Submissions Report.
13		DECCW considers that the targeted surveys undertaken for some predicted threatened species are inadequate, in particular cryptic species. DECCW does not agree that there would be no significant impact on the basis that were not detected in the flora survey, and considers that additional targeted survey is required, or assumption that viable populations are present.	It is not practical or economically feasible to undertake flora and fauna surveys in all seasons in the hope of finding cryptic species within suitable habitats across the extensive areas traversed by the proposed pipeline and GFDA. Additionally, year to year variations may render approximate seasons as being non-representative. For this reason a combination of desktop assessments, field survey focussed on habitat assessments, and Threatened Species Assessments of Significance was used to identify and assess potential impacts and develop effective mitigation strategies. This is discussed further in **Section 3.3.2**. It is acknowledged that extensive targeted surveys were not conducted for most species. Therefore no assumptions of absence were made for any of the 71 threatened species and communities that received Assessments of Significance. The consistent conclusions that impacts could be mitigated effectively did not eventuate from incorrect conclusions.

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14		No specific details have been provided regarding targeted flora searches such as dates, timing and duration. General dates provided are in winter and generally outside flowering/fruiting periods for predicted species. DECCW recommends surveying of 11 predicted threatened plants (refer to submission). DECCW also believes *Galium australe* requires further assessment due habitat detected or local records.	Overall, the field survey comprised approximately 10 hours per day for 9 days by four ecologists plus two days more for two ecologists in November 2008 (about 376 person hours). The 11 threatened plant species listed in DECCW's submission for further assessment are considered in Appendix B of this submissions report. Further assessment of *Galium australe* is not considered warranted as no species have been recorded within 10 km of the Project Area.
15		DECCW recommends an appropriately qualified ecologist is engaged to provide advice and assist with pre-clearing surveys and be present during tree felling.	Noted. An appropriately qualified ecologist would be engaged to provide advice, assist with pre-clearing surveys and be present during tree felling.
16	Revegetation	Revegetation strategies are supported but are not considered an appropriate offset to compensate the loss of intact native vegetation. Any revegetation must be in accordance with Flora Bank Guidelines. Seed collection from an EEC outside the project development footprint would require a licence under the TSC Act.	Noted. If revegetation is proposed as part of the Habitat Offset Strategy, it would be undertaken in accordance with the Flora Bank Guidelines and relevant permits would be obtained as required.
17	OEMP	How will the 6m wide strip above the pipeline be kept clear of vegetation during operation?	The 6 m strip over the pipeline would be periodically slashed to ensure visibility between pipeline markers is maintained. The frequency of maintenance activities would be managed in accordance with the OEMP and in consultation with landowners.
18	CEMP	Is it possible to reduce the size of earthmoving equipment used in construction to reduce the amount of clearing?	Typically a 30 m corridor is required for pipeline construction to create a sufficient workspace and a safe working environment. The 30m clearing corridor would be reduce 15m to 20m in sensitive areas along the corridor. If a 30m corridor was cleared for the entire length of the pipeline then approximately 39.0 ha would be cleared . By implementing reduced clearing widths in vegetated area, the amount of vegetation requiring clearing has been reduced to approximately 19 ha.

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19	Rehabilitation	How will the appropriate mix of plant species for rehab and revegetation be determined?	This would be included as part of the Rehabilitation Management Plan.
20	CEMP	Does the hollow bearing tree management strategy include surveying and mapping location of hollow-bearing and dead trees?	Appendix G (Section 5.2 of AECOM 2009) states that mapping of hollow bearing tress impacted during construction would be identified and mapped prior to construction.
21	Air Quality	CPF dispersion modelling needs revision to incorporate realistic emission rates for power generation facility. Should be completed and approved prior to consent being granted.	A revised Air Quality Impact Assessment Addendum Report is included as **Appendix A** to this report.
22		Condition of approval could be a revised air quality impact assessment for CPF before construction is applied.	A revised Air Quality Impact Assessment Addendum Report is included as **Appendix A** to this report.
23	Air Quality	Suggested condition of approval - water bath heater to meet NO_x emission standard of 350mg/m3 and post commissioning stack testing be undertaken to demonstrate water bath heater complies with POEO (Clean Air) Regulation 2002.	Noted.
24	Air Quality	Recommendation that minimum spacing of 4km between concurrently flaring clusters is included in CAQMP.	Noted. This would be incorporated into the CEMP and Air Quality Management Plan.
25	Heritage	Cultural significance of Aboriginal sites identified from field surveys within project area. Cultural significance of site can only be determined by Aboriginal community. Recommendation that additional information is provided confirming significance of ACH values within project area.	This is agreed. The EA did not presume to provide a cultural significance assessment on behalf of the Aboriginal community. The Aboriginal community was consulted in accordance with the Interim Community Consultation Requirements (ICCRs) as required by DOP and DECCW. The community was requested to provide specific information on cultural significance. However, no comments relating to social or cultural significance were provided by the community representatives. All correspondence with Aboriginal representatives is provided in Appendix B of the Heritage Assessment (located in Appendix K of the EA). Refer to **Section 3.9** of the Submissions Report and Appendix K of the EA.

Issue #	Category	Issue	Response
26	Heritage	Sites identified as part of field assessments undertaken by proponent could not be identified on DECCW's AHIMS database. Proponent has legal obligation to notify DECCW regarding discovery of any unrecorded sites. Recommendation that proponent accurately complete NPWS site recording forms for each unregistered site and submit to for AHIMS registration.	Site cards have since been submitted to DECCW.
27	Surface Water	EA lacks sufficient detail on potential for proposal to impact on surface water quality. Concern regarding potential for proposal to impact on surface water quality during construction and operational phases.	Potential impacts to surface water are assessed in Volume 1 Chapter 12 of the EA. **Section 3.1** of the Submissions Report provides further discussion on the management of impacts to surface waters through the preparation of construction and operational environmental management plans.
28	Surface Water	DECCW's conditions of approval do not propose any licensed point for discharge to waters. Proposal will need to be designed, constructed, operated and maintained to ensure there is no pollution of waters within receiving environment, in compliance with Section 120 of PEOA Act.	Project Approval for discharge to waters is sought, subject to conditions of approval to submit relevant management plans and identify a formal discharge point. At the appropriate time, AGL would apply for this discharge point to be added to the Environmental Protection Licence (EPL) for the Project. The project would be designed, constructed, operated and maintained to ensure there is no pollution of waters within receiving environment, in compliance with Section 120 of POEO Act. Discussion on discharge of treated water to waters is provided in **Section 3.1.4** of the Submission Report.
29	Surface Water - CSG Well Construction	EA does not detail volume, quality or specific management (i.e. discharge to environment) from dewatering of CSG wells. Activities will need to be designed and undertaken to ensure no pollution of waters within receiving environment in compliance with Section 120 of PEOA Act.	See Issue 28 above and **Section 3.1** and **3.2** of the Submissions Report.
30	Surface Water - Pipeline Construction:	Greatest risk to surface water exists during construction of gas transmission pipeline.	Noted. Construction environmental management in relation to management of watercourse crossings during pipeline construction is provided in **Section 3.1.1** of the Submission Report.

Issue #	Category	Issue	Response
31		Staging of Works - Works undertaken along pipeline route need to be staged and timed to minimise exposure of cleared land to erosion from initial clearing, through to rehabilitation. Program needs to be planned and implemented to ensure erosion and sediment controls are maintained and inspected until rehabilitation is complete.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA).
32		Development of Erosion and Sediment Control Plan must be carefully planned and consider differing soil type, gradient, likely rainfall, flow conditions, erosive potential, sensitivity of receiving environment. This is not a situation where one type of control can be applied in every location over length of pipeline route. Prevent pollution of waters.	Refer to Issue 31 above.
33		Need to minimise footprint and method of trenching through creek banks and creeks; ensure appropriate erosion and sediment controls; re-establish and rehabilitate creek beds and banks. Works need to comply with Section 120 of POEO Act.	Refer to Issue 31 above.
34		HDD needs to be carefully planned and based on sound geotechnical information to avoid 'frac outs' and impacts on sensitive ecological environments and waters. Activities need to be carried out under rigorous inspection program aimed at early detection of leaks/spills of drilling fluids (e.g. bentonite). Contingency plans must be in place for containment and clean up of incidents.	Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submission Report.
35		Development of Acid Sulfate Soils Management Plan as pipeline route will encounter acid sulfate soils. Plan should ensure areas are inspected for some time post completion to ensure no liberation of acidic material and waters.	Noted. Management of acid sulphate soils is described in Section 17.5.4 and 17.6 of the EA. The Acid Sulfate Soils Management Plan would include inspection schedules post completion to ensure no liberation of acidic material and waters.

Issue #	Category	Issue	Response
36		Dewatering of trenches may be required prior to laying of pipes. No information is provided on management of this activity. Dewatering must comply with Section 120 of PEOA Act.	Dewatering of trenches would usually only be required after heavy rainfall. The water would be pumped out to the land adjacent the pipeline corridor and not directly into watercourses. In low lying areas, groundwater may be encountered during trenching. The groundwater would be pumped out the trench onto the land adjacent to the pipeline corridor (and controlled by silt fencing or similar control mechanisms). At no time would groundwater be directly pumped into nearby watercourses. Further detail on the management of this activity would be included as part of the CEMP.
37		No information provided on management of test waters. Proponent should aim to capture and recycle test waters where possible. Actions for discharge of test waters need to be identified such that there is no pollution of land/water. Test waters are often deoxygenated, contain range of pollutants.	Water used during hydro testing of the pipeline would typically be sourced from local storages or imported where suitable quality water is not available. Depending on the location of the water source, one or more temporary holding ponds may be required for water storage and transfer. The hydrotest water is recycled until all sections of the pipeline are tested. Typical testing section lengths are up to 25 km. Following hydro testing the water is captured in a lined evaporation pond to allow settlement. The treatment of water used during hydro testing is dependent on the quality of the source water. Solids are filtered and removed and treatments are added to the water. The additives used typically control pH and oxygen levels of the hydrotest water. Biocides are also used to prevent bacteria growth. The water quality is monitored to ensure breakdown of the treatment additives prior to discharge. Discharge of hydro test water would be managed through the CEMP, and would include measures for monitoring and control of discharge, avoiding discharge to watercourses and drainage lines, and mitigation measures to avoid erosion and sedimentation.

Issue #	Category	Issue	Response
38	Construction Camp Sewage Management	EA provides little detail regarding location of construction work camps. No information provided regarding sewage treatment systems proposed, volume and quality of effluent generated, proposed disposal options and EA of proposed disposal option. DECCW unlikely to be supportive of discharge to water from sewage treatment systems from proposed camps. Effluent reuse options should be fully explored.	An approved envirocycle sewerage system would be utilised for the duration of the camp.
39	CPF Sewage Management	EA does not provide information regarding management of sewage from operational CPF. Require further information for consideration and assessment. DECCW unlikely to be supportive of discharge - effluent reuse should be fully explored.	An approved envirocycle system would be installed at the CPF for the office facilities.
40	Discharges from CPF	EA does not detail management of collected coal fines. Fines must be assessed, classified and lawfully managed and disposed.	Coal fines would be collected and disposed at a licensed waste management facility.
41	Discharges from CPF	Activities involving treatment and reuse of treated water will need to be designed and undertaken to ensure no pollution of waters within receiving environment in compliance with PEOA Act. EA provides no details of quality of permeate to be discharged, proposed discharge location and assessment of potential environmental impact of such discharge, nor agreements for discharge. DECCW requested these details in letter of 23/1/09. No further details have been provided in EA, therefore the assumed management option is treatment and agricultural reuse. DECCW is not in position to allow river or groundwater discharge without development consent permitting this. Environmentally sustainable option for use/disposal of permeate from CPF facility must be found.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Irrigation and discharge and of treated water would be subject to preparation of an Irrigation and Drainage Management Plan in accordance with relevant statutory guidelines. Water Management is discussed further in **Section 3.1** of the Submissions Report. In reference to DECCW's letter dated 23/1/09, all issues provided to AGL by the Department of Planning during Adequacy Review were addressed to the satisfaction of the Department of Planning.
Submission 62 **Gloucester Shire Council**			
1	Project Site	Of the 2 sites that have been selected for the CPF site (Site 1 at Tiedmans Lane and Site 7 adjacent to Bucketts Way on the Stratford Coal site) Site 7 is the preferred site. Site 7 is in line with the Draft LEP 2009 and would not impact on residential issues and access as Site 1 would.	Noted.

Issue #	Category	Issue	Response
2	Construction Camp	The camp should be located close to the township to allow the use of community facilities. The camps will require separate approvals.	The construction workforce camp was included within the Project Application. If Project Approval is granted, there would be no requirement for additional approvals.
3	Health / Social Impacts	In the Construction Workforce Management Plan, Council would like an assessment to be made by NSW Health as to the social impacts on health provision, drug and alcohol support services, family support services, NSW Police and Ambulance Services, consultation with the Department of Community Services and consultation with the relevant Council.	Volume 1 Chapter 20 of the EA included an assessment of the social and economic impacts of the project. The project may result in a short term temporary increase in the demand on public health facilities and medical services during construction, however given the temporary nature of the construction period, and that construction workforce camps would only provide temporary accommodation, no medium or long term social impacts are expected. As such further social impact assessment on provision of the services suggested is considered to be warranted.
4		The Construction Workforce Management Plan should address the cumulative social impacts, how these will be dealt with and mitigation measures.	Noted.
5	Traffic / Construction	No indication is made of the location of gravel material required to supply drilling pads, road upgrades or maintenance. As the source material location will dictate road damage from transportation it is important for the company to consult directly with Councils to ensure that adequate provision is made to address road maintenance.	Preliminary discussions have been held with Gloucester Coal regarding supply of gravel for roads and well site locations within Gloucester Coal land. Existing quarries would be utilised to source gravel where possible. Condition assessments would be undertaken for transport routes prior to construction to assist with determining road contributions. AGL intends to meet with all relevant road authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period. Given the operation of the Project would not result in a demand for infrastructure and impacts attributable to the Project during construction would be made good by AGL, compensation is not considered to be warranted.

Issue #	Category	Issue	Response
6	Traffic / Construction	A separate development application should be made for the use of all gravel sources including existing small rural quarries due to the volumes to be extracted.	Development applications would not be sought where extraction is proposed from existing approved quarries.
7	Noise / Air Impacts	Instead of generators being used at each well head which produce noise and exhaust gas, underground electricity lines are preferred.	Noted, however as described in Volume 1 Section 5.4.10 initial electricity supply would be via the use of small power generators.
8	Air Quality	Concern regarding exhaust gas emissions in the PM1 and PM2 range. Generators at each well head would only add to this.	Heavy vehicle and construction emissions were discussed in Section 9.4.1 and 9.4.2 of Volume 1 Chapter 9 of the EA, and in the Air Quality Impact Assessment in Volume 2 Appendix F of the EA. Current ambient air quality criteria for particulate matter in NSW are set for PM_{10}. The only criteria relevant in NSW relating to $PM_{2.5}$ is the National Environment Protection Council criteria. A comparative assessment for PM_{10} and $PM_{2.5}$ is provided in **Section 3.5.3** of the Submissions Report and concludes that $PM_{2.5}$ would likely be below relevant guideline criteria under worst case assumptions.
9	Waste	The landfill cannot accept the salt waste as it does not have a liner to stop salt leaching. Council's Economic Development Officer will work with AGL to find a buyer for salt and hopefully have a business located in the industrial estate to reduce the transport needs.	Noted. AGL accepts Gloucester Shire Council's offer of assistance in this regard.
10	Waste	Oil waste is not accepted at the Gloucester Landfill.	Noted. An appropriately licensed landfill would be identified for disposal of oil waste.
11	Air Quality	Request that a PM2 monitor be installed between the CPF site and Stratford Village, and Stratford Village and Fairbairns Road locality. The monitor should be installed well before the project commencement to gain an existing background recording. The monitor should be for community recording and health related purposes only.	AGL would undertake monitoring in accordance with the conditions of approval and in accordance with the requirements of the Environment Protection Licence.
12	Ground Water	Need a monitoring programme for aquifers. Council would like to establish a water table level at both the surface and at deeper levels to identify any changes in aquifer water levels prior to any drilling or water or gas extraction.	Refer to Submissions 21, Issue 7.

Issue #	Category	Issue	Response
13	Visual Impact	Important to reduce visual impacts through the use of sympathetic colours and vegetation at critical locations. Landscaping Plan should be submitted.	The preparation of a Landscape and Rehabilitation Plan was a commitment of the EA (refer Volume 1 Section 18.6 of the EA).
14	Traffic	The project will result in a huge increase in heavy vehicle traffic on council roads, which will disadvantage the local community. A detailed Traffic Management Plan (TMP) and Pavement Management Plan (PMP) should be prepared for Council to allow a review of probable impacts.	As discussed in Volume 1 Section 16.9 of the EA, a detailed Traffic Management Plan would be prepared for the Project and submitted to the Director-General for approval, which would incorporate dilapidation assessments prior to and following construction of the Project to assess road networks to be used during the construction period. Impacts attributable to the Project would be made good by AGL. AGL intends to meet with all relevant road authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period.
15	Traffic	Construction of the delivery pipeline from Stratford to Hexham also presents a major impact upon the local road network. Little attention is given to the likely impacts of this part of the project on the Bucketts Way (MR90), other local roads and other affected LGAs.	Refer to Issue 14 above.
16	Traffic	Detailed TMP and PMP should be prepared for approval by the Bucketts Way Task Force to allow a review of probable impacts on the Bucketts Way pavement and bridges and an appropriate funding stream established from the applicant to ensure safety and serviceability of the road during construction, and restoration to at least pre-development condition at completion of the project.	As discussed in Volume 1 Section 16.9 of the EA, a detailed Traffic Management Plan would be prepared for the Project and submitted to the Director-General for approval, which would incorporate dilapidation assessments prior to and following construction of the Project to assess road networks to be used during the construction period. Impacts attributable to the Project would be made good by AGL. AGL intends to meet with all relevant road authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period. Given the operation of the Project

Issue #	Category	Issue	Response
			would not result in a demand for infrastructure and impacts attributable to the Project during construction would be made good by AGL, compensation is not considered to be warranted.
17	Traffic	The Australian Rail Track Corporation (ARTC) should be consulted regarding the impact of the increased traffic conflicts on any rail crossings and their specific upgrade requirements in each case.	Rail crossings would form part of the Traffic Management Plan and ARTC would be consulted in this respect.
18	Traffic	A site specific impact assessment should be undertaken for Jacks Road, McKinley Lane and Tiedmans Lane to determine the method of protection of the threatened grey crowned babbler species.	The grey crowned babbler species awareness and identification already forms part of AGL's safety and environmental inductions for employees and contractors. A site specific workplan would form part of the Flora and Fauna Management Plan for the protection of the Babbler, in particular for known habitat areas, and a general workplan across the Project Area.
19	Contributions	There will be a general need to assist in community development projects and these should be based over the period of the life of the project rather than as a large up front contribution.	The Project would not result in a significant demand for infrastructure and community services, however AGL would consult with affected Council's directly in this regard.
20	Environmental management	The proposed management plans should be developed as listed in Section 25 Environmental Management of the Environmental Assessment are submitted to all local government bodies to make an assessment of impacts. The proponent should consult with local government agencies to ensure the legislation and local knowledge is included in the management plans.	Management plans would be provided to relevant authorities as required by the project approval. The EA considered and assessed environmental, social and economic impacts of the project, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.

Issue #	Category	Issue	Response
Submission 95 **Maitland City Council**			
1	Heritage	Condition should be included that in the event that a potential artefact or site is uncovered, all works shall cease and the item is properly investigated and necessary approval obtained if the item is to be removed or destroyed.	The Heritage Assessment includes the recommendation for an Aboriginal Heritage Management Plan to be prepared which would provide management measures for an object or site encountered during construction (refer Section 10.1 of Appendix K of the EA). Should historical or Aboriginal archaeological sites be encountered during construction of the Project, works would cease at that location and relevant stakeholders, including DECCW, notified.
2	Infrastructure - road crossings	RTA should be consulted in relation to pipeline crossings of Raymond Terrace Road just south of KP86 which carries significant traffic volumes. Consultation required in relation to pavement rehabilitation and traffic management during construction.	Refer to Submission 62 Issue 16.
3		Consultation should be undertaken with Council where road crossings or pavement disturbance is proposed on Duckenfield Road, Turners Road and Woodberry Road	Refer to Issue 2.
4	Acid sulfate soils	Impact may arise from disturbance to potential ASS in Maitland LGA. EA recommends appropriate ASS management strategies.	Noted. The acid sulphate soil management strategies detailed in the EA would be implemented.
5	Land use - agriculture	Agricultural value of land traversed by pipeline not adequately considered, however noted that pipeline route will be in close proximity to land affected by existing utilities which have previously been disturbed and does not necessarily affect agricultural viability.	Noted. Refer **Section 3.7.1** of the Submissions Report.
Submission 114 **NSW Roads and Traffic Authority (RTA)**			
1	Traffic	Where possible the proposed pipeline should remain outside of the road reserve and the number of crossings under State Roads should be minimised.	The proposed alignment largely follows existing powerline easements and is not longitudinally within road reserves under State control.
2	Traffic	Any crossing of state roads shall be at right angles (or as near as possible) to the road centreline to minimise the impact of pipe sensitivity.	If crossings are required under State roads these would be perpendicular and thrust bored.

Issue #	Category	Issue	Response
3	Traffic	Crossings shall avoid being in close proximity to any existing road intersection as there is an increased likelihood that maintenance works will be undertaken at these locations in the future.	Noted.
4	Traffic	The pipeline shall have a minimum cover of 1500mm under the road formation and 900mm to any other point on the existing surface within the road reserve, including from the bottom of any drain.	AGL would consult with the RTA in respect of crossings of roads under State control. Detailed design drawings of road crossings could be provided to the RTA prior to construction.
5	Traffic	The pipeline should be at such a depth that still allows future road maintenance to occur without interfering with the pipeline.	Noted.
6	Traffic	Pipes installed under the road shall be sleeved and grouted.	Noted.
7		Crossings shall be carried out using mechanical underboring construction rather than hydraulic means. Only boring under the road will be permitted in this region.	If crossings are required under roads these would be perpendicular and thrust bored.
8	Traffic	In rural areas there should be readily visible location markers on either side of the road, located outside the clear zone (10m from edge line). In urban areas the location of the bore (or conduit) should be demarcated on the kerb directly above the bore casing to enable its exact location to be determined should future road works be necessary.	Noted. Pipeline markers would be installed as per the Australian Standard AS2885 code requirements.
9	Traffic	Permanent markers shall be provided at the entry and exit points of the road reserves. Where steel casings are not used then a trace wire shall be provided to assist with the future location of the line.	Noted.
10	Traffic	Any access points and valves shall be located outside of the road reserve in adjacent local streets or properties.	Valves would only be located on private property.
11	Traffic	Requirements for crossing of F3 to Raymond Terrace Bypass Route: The pipeline shall be placed within a culvert (large enough for maintenance access) across the full width of the road reserve. The culvert shall be designed and constructed such that it does not prevent any future RTA maintenance.	Crossing of the F3 would be completed by directional drilling which would be at least 5 m below the road surface. Detailed design drawings of the road crossing could be provided to the RTA prior to construction.
12		No access to the pipeline will be permitted from the road carriageway. Access to the pipeline shall be via the culvert and adjoining properties.	Noted.

Issue #	Category	Issue	Response
13	Traffic	The developer will be required to enter into a Works Authorisation Deed (WAD) with the RTA. The WAD shall be executed prior to the issuance of a construction certificate.	Noted.
14	Traffic	All road works must be completed prior to occupation of the new development.	Road works on roads under State control are not anticipated.
Submission 123 **Port Stephens Council**			
1	Community consultation	It is recommended that conditions of consent requiring on-going community consultation be imposed, to ensure community is informed of construction works prior to commencement.	AGL would continue to consult with the community, including ongoing meetings with the Community Consultative Committee established for the project. Prior to works commencing on the main pipeline, a notice would be sent to landowners within 1 km either side of the proposed alignment to notify them of the proposed activities and their anticipated duration. The notice would contain contact phone numbers to make enquires or complaints if required.
2	Environmental Management	It is recommended that a 50 m buffer be employed for the drilling platform from all SEPP 14 wetlands	Noted.
3		Weed management has not been given due consideration in the EA. The preparation of the weed management strategy (appendix G) should be a condition of consent.	Noted. Section 25.2.9 of the EA details the preparation of a Weed Management Plan as part of the CEMP.
4		ASS management plan should be a condition of consent	Noted. Section 25.2.3 of the EA details the preparation of an Acid Sulfate Soils Management Plan which would be prepared in consultation with relevant authorities to mitigate potential impacts from the disturbance of potential acid sulfate soils.
5		Flora and Fauna Management Plan should be a condition of consent. This should include management of *Phytophthera cinnamomi*.	Noted. Section 25.2.4 of the EA details the preparation of a Flora and Fauna Management Plan, including management of *Phytophthera cinnamomi*.
6		It is unclear whether an offset strategy will be implemented or not. This should be a condition of consent.	A Habitat Offset Strategy would be prepared and implemented for the project to offset impacts which cannot be adequately mitigated or avoided. Refer to **Section 3.3.5** of the Submissions Report.

Issue #	Category	Issue	Response
7	Engineering/ Traffic and Transport	No open road trenching is allowed on Port Stephens Council roads without approval, all road crossings should be thrust bored. Appropriate approval should be sought well in advance of the works.	AGL would consult with Council prior to construction in this regard. Detailed design drawings of road crossings would be provided to Council prior to construction.
8		The upgrade of the Buckets Way will need engineering designs as part of the Roads Act approval from Councils Civil Assets Engineer.	If upgrade of the Bucketts Way is required as a direct result of the project, AGL would approach relevant authorities for approval prior to commencing works.
Submission 124 **Great Lakes Council**			
1	Engineering/ Traffic and Transport	It is in Council and AGLs best interest to undertake negotiations as to a strategy for road construction and cost sharing within this section of road (pipeline route generally contained within the 4km Black Camp Road reserve) as the Proponent would need to undertake significant road construction/upgrading in order to lay and maintain the pipeline.	Noted. AGL would consult with Council in this regard.
2	Ecology	Conditions of consent should be inclusive of all measures and recommendations in Chapter 25 of the EA and Chapter 5.0 of Appendix G.	Noted. The project would be undertaken in accordance with the mitigation measures contained with the EA and as modified by the conditions of Project Approval.
3		Suggested re-analysis of the possible use of nearby power line easement rather than Black Camp Road for gas pipeline installation between km points 30 and 39.5.	Extensive analysis of the pipeline alignment has been undertaken and the proposed route along Black Camp Road presents the most feasible option due to the terrain constraints which the powerline follows
4		Offsets of biodiversity related impacts should be confined to the LGA associated with the impact that is to be offset.	Noted, however offsets would be determined taking into consideration biodiversity values from a regional perspective, which does not necessarily align with jurisdictional LGA boundaries. The priority of the Biodiversity Offset Strategy would be to obtain a neutral or beneficial impact for biodiversity in the region as a whole. Refer to **Section 3.3.5** of the Submissions Report for further discussion regarding biodiversity offsets.

Issue #	Category	Issue	Response
5		It would have been preferred that after the pipeline route was scoped that ecological consultants determine core wildlife habitat areas along the proposed alignment.	As described in Section 4.3.1 of the EA, the pipeline route was determined based on an initial study area, consisting of a 10 km wide corridor from Stratford to Hexham. This was refined utilising GIS and multi criteria analysis methods. Significant consideration was given to protected areas such as RAMSAR wetlands, National Parks and State Forests, and other protected areas, as well as a range of other constraints. This included realignment of the pipeline where necessary during and following ecological surveys being undertaken as part of the EA for the project.
6		There is no further specific detail on proposed offsets have been provided, including offset ratio, offset strategy, ongoing management, locality. Strong conditions of consent are recommended in this regard.	Refer to **Section 3.3.5** of the Submissions Report for further discussion regarding biodiversity offsets.
7	Heritage	A Statement of Heritage Impact (SOHI) should be prepared for the Former Weismantels Inn. Construction of the pipeline corridor should be undertaken in a manner that minimises any potential impact.	The Former Inn was identified as LEH1 Cobb and Co Hut. The site is located 180m east of the pipeline, outside the pipeline corridor. The site would therefore not be affected and there would be no impact. The preparation of a SOHI is therefore not warranted.
8	General	The Council is in support of the Project provided the recommended safeguards contained in the EA are implemented, the draft conditions recommended by Councils Engineering Development Officer and Senior Ecologist, and the SOHI.	Noted.
Submission 147 **Department of Industry and Investment (DII)**			
1	PPL	A PPL would be required for the proposed wells and gas gathering system. The CPF and Pipeline would not be included in any PPL granted for this Project. A PPL can only coexist over the same area as a Mining Lease where the holders of both titles have an agreement to the satisfaction of the Minister.	Noted.

Issue #	Category	Issue	Response
2	Environmental Management	DII notes that the EA does not contain clear rehabilitation objectives and also lacks discussion on strategic completion criteria. DII expects to capture addition rehabilitation detail during the Petroleum Production Operations Plan (PPOP) process.	Noted.
3		If the re-use of treated water via irrigation is approved, DII recommends that conditions relating to the adoption of Best Management Practice for monitoring are also required.	Noted. AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
4	Land Use	Section 11.3.2 of the EA mentions proximity of 'extractive industry'. The Brandy Hill Quarry near Seaham (owned by Hanson) is a significant quarry operation (operated continuously) that is situated close to the corridor. The quarry was listed under Section 117 of the EP&A Act and a buffer zone applies to this quarry. Further investigation is required to consider the associated impacts.	Local planning directions issued by the Minister for Planning under section 117(2) of the *Environmental Planning and Assessment Act 1979* (19 July 2007) state that "The directions previously issued under section 117(2) of the Act that are specified in Schedule 1 are revoked". As such the buffer zone for the Brandy Hill Quarry has been lifted. Consideration of cumulative impacts of extractive industries in proximity to the Project has been discussed in **Section 3.12** of the Submissions Report.
5		Chapter 11 does not include an assessment for extractives (as suggested in Table 7.5 Matter for Consideration). The consideration to liaise with relevant stakeholders to discuss the pipeline impact has not been addressed (re potential future expansion plans of the quarry). Consideration for the current quarry operations are a condition of consent. Additional consultation is recommended.	AGL has been in consultation with the Brandy Hill quarry management team and have signed an agreement for an easement for the proposed location of the pipeline through their property.
6		Martins Pit and Bratfields Quarry (two intermittently operating quarries) have not been referenced for consideration in the EA.	DII was contacted in this respect. Simon Francis advised via email on 7/4/2010 that these two quarries were owned by Great Lakes Council, and that Great Lakes Council no longer has an interest in these quarries. As such further consideration is not required.
7		Agricultural land use has not referred to current ABS census data or specific consultation with DII or Gloucester Council. The proponent should seek to better	Landowner consultation was undertaken as part of the project and the predominant land use for each property determined. As such,

Issue #	Category	Issue	Response
		document agricultural lands for the concept area, GFDA and proposed pipeline corridor.	agricultural land use within the GDFA has been mapped and is shown in Figure 5.1 of the EA. Current ABS data for agricultural land use in the Hunter region does not provide information with respect to land used for grazing activities. Grazing is the predominant land use for affected areas and as such other statistics on cropping and horticulture (for which for the most part does not occur in Project affected areas) does not provide added value to discussions on land use within the Project Area. However, impacts on agricultural land use (specifically grazing) has been further discussed in **Section 3.7.1** of the Submissions Report
8		The EA comments on the predominately undulating rural lands but fails to note that there are also extensive alluvial flood plains or to review the significance of the agricultural resource lands.	The Avon River is the primary watercourse which passes through the Stage 1 GFDA (as shown in Figure 5.2 of the EA) and as such Gloucester and surrounding low-lying land and river flats form part of the Avon River Floodplain. The majority of the Concept Area is located in the lowlands and floodplains of the Avon and Gloucester Rivers. These floodplains provide fertile alluvial plains for agricultural and pastoral land uses such as cattle farming. The raising of beef cattle is the main industry for the area Impacts on agricultural land use and its significance (specifically grazing) has been further discussed in **Section 3.7.1** of the Submissions Report.
9		As the EA does not clearly document the timing and number of proposed well heads on each property and the specific land uses and farming operations around the indicative gas well locations within Stage 1 GFDA, the capacity to effectively consider the relative impacts on farming operations is limited.	As a worst case scenario, the maximum footprint of a well site with multiple well heads is 40 m x 15 m. This would be the maximum exclusion zone for farming activities on any particular property with a well site. However, it is unlikely that each well location would have the maximum number of well heads (due to the productivity of each site). For the purposes of the environmental assessment and envelope approach, the worst case scenario was used to consider the relative impacts on land use.

Issue #	Category	Issue	Response
10		Control over surrounding lands would enable ready access to gas processing facilities and help minimise off site impacts, however, it should be feasible for the undisturbed surrounding lands to continue to be used for extensive agricultural purposes on a leasehold or company managed basis.	Noted.
11		The extent to which agricultural business and resource impacts were considered and balanced with other factors is not clear. It is apparent over 70% of the pipeline route will dissect farming properties, however the primary focus appears to be to minimise impacts on native bushland and biodiversity rather than farming impacts.	Noted. Once established there should not be a major impact on farming activities (particularly grazing). Impacts on farming and agricultural land have been further discussed in **Section 3.7.1** of the Submissions Report.
12		To restrict adverse impacts on farming operations DII recommends the following conditions of consent: 1. Mandate ongoing consultation with landholders regarding the specific location of the gas wells and access tracks. 2. Specify a reasonable minim period of notice to landholders regarding scheduled gas well development on private lands so that they can adjust their farming operations. 3. Establish a dispute resolution process to mitigate the possible conflict in regard to the specific location of gas wells, the timing of construction works, the adequacy of rehabilitation works and lease fees if relevant for easements and restrictions on use.	1. Noted. 2. Noted. 3. Noted. AGL includes a dispute resolution process in it landowner agreements.

Issue #	Category	Issue	Response
13	Consultation	DII recommends ongoing consultation with GCL and GRL, both of which have plans for expansion which are not addressed in the EA. Correspondence between DII and GRL has stated "there have not yet been any consultative discussions between AGL and GRL - there have only been various endeavours to set a meeting, for the purpose". This degree of consultation would appear to have been overstated in the EA and DII would like to see it rectified.	Since the EA was lodged for exhibition, AGL has attended one meeting with Brian Wingett from Gloucester Resources (GRL) and a separate meeting with Keith Ross (Chairman) and Graham Holley from GRL. GRL has acknowledged that it intends to co-operate with AGL, and has recently signed access agreements to undertake 3D seismic activities over properties owned by GRL . GRL have also signed a Confidentiality Agreement and have completed a Data Sharing Agreement ready for signing by AGL. Further meeting will be held over the coming months in relation to the development of a Co-operation Agreement for areas with overlapping tenure.
14		DII recommends ongoing consultation with the Mine Subsidence Board (MSD) given that there is the possibility of underground mining occurring below the pipeline.	Agreed. AGL would continue to consult with the MSB regarding the potential for future underground mining.
15		Landowner consultation is one of the aspects used to determine the final sites of gas well locations, however this is not listed as a specific statement of commitment.	Consultation with respect to the location of final well sites would be undertaken in accordance with landowners and relevant access agreements negotiated between AGL and the respective landowner.
16	Subsidence	Within the EA there is conflicting positions between 15.7.3 - liaison with MSB will be undertaken as a mitigation measure in respect of the pipeline and that the pipeline design will make provision for subsidence impacts. However section 15.4.2 states "the detailed design of gathering lines and transmission pipeline would not include specific allowance for the impact of potential future mine subsidence".	Initial advice received from the Mine Subsidence Board stated that no particular assessment requirements were identified for the EA, as the proposed development is not located within a Mine Subsidence District. Section 15.4.2 of the EA states - At this stage, the potential for underground mining in the Gloucester Basin (giving rise to possible mine subsidence) is low, with no commercial initiatives known to be under consideration. Furthermore, if underground mining occurs, it is likely to commence in the shallow rather than the deepest parts of the basin. Accordingly, the detailed design of gathering lines and the transmission pipeline would not include specific allowance for the impact of potential future mine subsidence. While specific allowances would not be made, consultation with the MSB

Issue #	Category	Issue	Response
			would still occur, and if potential subsidence impacts are identified, specific provision for subsidence impacts would be made during detail design.
17	Land Use/Statutory Planning	It appears that the EA does not refer to the Mid North Coast Regional Strategy regarding potential for future rural residential development of agricultural lands. The EA (Section 6.2) does not include any reference to or apparent consideration of the Rural SEPP.	The Mid North Coast Regional Strategy and the Rural SEPP are addressed in **Section 3.7.2** of the Submissions Report.
18	Water	DII considers key aspects of the project from an agricultural water resource perspective to be as follows:	
		1. Impacts of water extraction (along with gas) on coal seam aquifers and any other connected groundwater sources/aquifers. DII recommends that possible consent conditions include requirements for agreement or contract to be sought with the owners of the 65 existing bores to ensure remediation or reparation of any impacts proven to arise from the projects activities.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. A groundwater monitoring network would be established in the Project Area and surrounds to monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers). The Groundwater Management Plan would be implemented for the duration of the Project and would include ongoing monitoring of water levels and water quality prior to, and during construction and operation, to identify impacts to shallow alluvial aquifers, shallow bedrock aquifers, and deep bedrock aquifers. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report. A groundwater survey of properties with existing water bores within 2km of any gas well will be undertaken in advance of well construction to determine the condition of each water bore should these works be affected by project activities. As part of the GWMP a range of monitoring, management and mitigation measures will be included.

Issue #	Category	Issue	Response
		2. Potential for surface water/groundwater connectivity and contamination. No data from pilot wells was included in the EA or its appendices. There is the assumption that the coal seam aquifer would have no beneficial use and therefore no consequence result from the proposed extraction - without detailed water quality data from the evaluation wells, comment on this assumption is not possible. Consent conditions that require the maintenance of high standards of construction as listed in the EA will be essential to ensure that risks associated with contamination are avoided.	Refer Issue 19 above. Additionally, AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
		3. Storage, treatment and utilisation of waste water from gas extraction. The predicted water production is based on a small number of evaluation wells and may be of limited reliability. Yields in excess of the predicted amount has implication to matters such as storage capacity, optimal agricultural re-use and may require serious consideration of other options for utilisation of treated production water, should approval to discharge not be granted. The EA refers to a downstream supply of treated waste water however it is not clear if this is via existing natural drainage (such as the Avon River) or a piped supply - further assessment of these options is required as part of the development of EMPs and operational consent conditions.	Noted. Refer to Issue 19 and 20.
		4. Impacts of transmission pipeline construction (from Stratford to Hexham) on surface water drainage systems e.g. Creek and river crossings. Consent conditions for these activities (pipeline crossings) may include considerations under the *Fisheries Management Act 1994*, depending on the particular stream involved and the likely impacts.	Noted, however in accordance with Section 75U of the EP&A Act, a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994* is not required for a project approved under Part 3A.

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5.0 Response to Community Interest Groups and Business Submissions

5.1 Overview

A total of 10 submissions were received from community interest groups and businesses, including:

- Submission 5 / 66 Barrington-Gloucester-Stroud Preservation Alliance (two separate submissions were received from this interest group);
- Submission 49 Garrigal Aboriginal Com Inc;
- Submission 63 NSW Farmers, Stroud Branch;
- Submission 115 Gloucester Coal;
- Submission 117 The Wilderness Society Newcastle Inc;
- Submission 127 Johnsons Creek Conservation Committee;
- Submission 138 Rivers SOS;
- Submission 139 The Gloucester Project Inc.; and
- Submission 142 Ironstone Community Action Group.

Reponses to these submissions are provided in the following section.

5.2 Response to Submissions

Issue #	Category	Issue	Response
Submission 5 / 66 Barrington-Gloucester-Stroud Preservation Alliance			
1	Water quality	No commitment is made to treating the water generated by the extraction of CSG to any specified standard.	The level of treatment would be dependent on the final use of the water. AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report. Refer to **Section 3.1.4** of the Submissions Report for further discussion.
2		An evaluation of soil is needed before any treated water is used for irrigation.	Refer to Issue 1 above and **Section 3.1.4** of the Submissions Report.
3		The volume of the produced water and its content is based on a few trial wells and cannot be extrapolated to the whole gas field.	Refer to Issue 1 above and **Section 3.1.4**of the Submissions Report.
4		No reference to the existing quality of water in the local rivers. Discharging of water with high TDS levels will impact these rivers.	Refer to Issue 1 above and **Section 3.1.4** of the Submissions Report.
5		No data on the pH or solid content of	Refer to Issue 1 above and **Section**

Issue #	Category	Issue	Response
		the produced or treated water. Therefore the possible accumulation of metals or other toxins in the soil or waterways over time is unknown.	**3.1.4** of the Submissions Report.
6		How often or how much water discharge will there be? The demand for irrigation in the area is reduced because of rain.	The operation of the Stage 1 GFDA may result in the generation of up to 2 ML per day which would require treatment and storage. AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1.4** of the Submissions Report.
7		The possibility that farmers may not want the treated water due to unsuitable quality or uneconomic irrigation is not considered. No other option but to discharge into waterways.	Analysis of the viability of irrigation of treated water would continue to be undertaken by AGL. It is noted that AGL owns 330 ha of land within the Stage 1 GFDA and would investigate opportunities to irrigate this area for improved pasture.
8		Potential for 5.25ML of water of unknown quality to be discharged per day into local waterways for 15+years. The volume of produced water and its dissolved solids may be underestimated. This discharge would be on top of discharge from Gloucester Coal's Stratford Mine, this cumulative impact is not considered.	Refer to Issue 1 above and **Section 3.1.4** of the Submissions Report. As produced water would be treated to a quality that would significantly impact the quality of the receiving waters, cumulative impacts are not anticipated.
9	Ground Water	Little information on the depth and flow of aquifers.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. A groundwater monitoring network would be established in the Project Area and surrounds to monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers). The Groundwater Management Plan would be implemented for the duration of the Project and would include ongoing monitoring of water levels and water quality prior to, and during construction, to identify impacts to shallow alluvial aquifers, shallow bedrock aquifers, and

Issue #	Category	Issue	Response
			deep bedrock aquifers. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
10	Ground Water	Presence of fractured rock aquifers in the area.	This noted in Volume 1 Chapter 13 of the EA. Determining the connectivity (if any) of different alluvial and shallow/deep bedrock aquifers is a key issue that would be addressed by AGL through the establishment of a groundwater monitoring network. AGL are currently completing a 3D seismic survey over the Stage 1 Field Development Area in order to obtain a better understanding of the underlying geology which will be utilised as part of the hydrogeological study. Refer Issue 9 above.
11	Ground Water	Although the drilling activity in the pilot project area didn't intersect any aquifers it doesn't preclude their existence within the proposed gas field area.	Aquifers are present within in the Stage 1 GFDA, and are described in Volume 1 Chapter 13 of the EA. Refer Issue 9 above.
12	Ground Water	"The complexity of the faulting (in the area) is likely to have juxtaposed the coal seams with potential sandstone aquifers in many places. This has the potential to make the coal seams 'leaky' in such places."	Refer Issue 9 and 10 above.
13	Ground Water	The inference that test wells did not affect water levels in alluvial aquifers is not evidence that the same situation would apply across the gas field.	Refer Issue 9 and 10 above.
14	Ground Water	"The report of what happened to neighbouring core drill holes (DDH20C and 'an unnamed core hole' about 400m north of LMG03) suggests greater permeability/porosity than they otherwise admit, within the coal seam sequences (not just within the coal seam)".	The incident which occurred in 2004, was the result of communication between an old coal exploration well which was in close proximity to the production test well. The old coal exploration well had not been completely plugged and abandoned by the coal title operator and both wells penetrated the same coal seams. To overcome gas migration via old coal exploration wells, any exploration wells which may communicate with a future production well due to the penetration of the same coal seam and is in close proximity, would be plugged with cement (Plugged and Abandoned) in accordance with DII guideline. Gloucester Coal would be consulted in regards to location of old coal exploration wells.

Issue #	Category	Issue	Response
15	Ground Water	The possibility that fraccing may open up communication between wells (old or new) or between permeable strata that were previously isolated is not considered.	Old coal coreholes in close proximity to production wells would be plugged with cement (plugged and abandoned) in accordance with DII guidelines in order to isolate these coreholes from communication during drilling and operation of wells. Location of old coal coreholes is sourced through DII and Gloucester Coal. Fraccing would be targeted away from the location of shallow aquifers. The frac jobs are modelled as the fraccing takes place, therefore the job can be shut down if the frac is seen to propagate towards any aquifers or permeable strata. It is in AGL's interest to stop connection between coal seams and permeable strata due to the high water inflows that would reduce or stop gas production from wells. Refer to Issue 9 above.
16	Ground Water	The monitoring program proposed to detect production wells that are extracting water from aquifers does not indicate how many wells might be affected.	Refer to Issue 9 above.
17	Ground Water	It is unclear whether the monitoring regime is capable of detecting other adverse impacts (eg. water or gas flows other than that out of the wells) in a reasonable time, as is what might be done about it.	The groundwater monitoring network established as part of the Groundwater Management Plan would monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers) prior to construction to gain a baseline understanding of water quality and flows within each of the aquifers. This dedicated monitoring network would be separate to the individual gas wells, and provide early warning of connectivity with overlying aquifers. Specific management measures and trigger levels would be developed which would allow anomalous results to be identified. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
18	Ground Water	How can the Groundwater Management Plan and hydrological study be put off until after approval given the uncertain environment?	A project approval issued in respect of the project would likely contain conditions that require submission of the Groundwater Management Plan to the Director-General, and other relevant statutory authorities in advance of well field construction.

Issue #	Category	Issue	Response
19	Ground Water	"Is the Proponent prepared to gamble a huge capital investment on the outcome of such a retrospective study (hydrological study)? Or are they assuming that no matter what the study outcome,….they will not be compelled to take any action that would seriously compromise production?"	The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report. The Proponent has undertaken sufficient investigations to provide an acceptable degree of certainty that the hydrological impacts of the Project can be appropriately monitored, managed and mitigated to avoid significant impacts to the environment.
20	Ground Water	An independent study of the disposal of produced water and of groundwater hydrology is required before concept approval.	An independent study is not required. AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report and groundwater hydrology is addressed in Issue 9 above.
21	Health	Psychological impacts are neglected.	Impacts to human health are discussed in **Section 3.4** of the Submissions Report. As the Project is not anticipated to result to impacts to human health, psychological impacts are not considered to be a relevant concern.
22	Health	AGL should estimate the extent of the already existing health damage from Stratford Mine and the health consequences of adding further physical and psychological stressors to an already compromised population.	All approvals and Environmental Protection Licences (for the existing mines and this Gloucester Gas Project) require the licence holders to remain compliant with all the criteria therein. In addition, Proponents are required to maintain compliance with the conditions of consent, which are required to be audited and reported on an annual basis. These conditions and criteria are developed by DOP and DECCW to take into account the existing baseline condition of the locality and the cumulative effects of other industries in the area. The conditions of approval for this project and the criteria outlined in AGL's Environmental Protection Licence would also be developed on this basis.
23	Health	Failure of the Cumulative Impacts section of the EA to recognise that the local community is already overwhelmed by the cumulative impacts of multiple mining projects.	The EA for the Gloucester Gas Project has been undertaken in accordance with the Environmental Assessment Requirements of the Director-General. It has also been undertaken in accordance with assessment methodologies established by DECCW, to meet their established criteria. The aim of the project has been to meet these criteria.

Issue #	Category	Issue	Response
			The criteria are not applied to individual projects. This means that other operating industries are part of the baseline that is assessed for the EA. As such, all air and noise assessments and so on, already take account of the presence of these other industries. In meeting established criteria, it means that the project plus the other operating industries in the area cumulatively meet the criteria.
24	Health	Health risks to stock have been overlooked.	AGL has as strong track record in Australia's gas industry dating back over a decade to their continuing gas producing activities in Camden in Sydney's south west. In that time AGL has not experience health impacts to humans and stock. Potential exposure pathways for effects on the health of stock may include methane gas leakage and inhalation, ingestion of contaminated water or inhalation of particulates. Methane gas leakage is discussed in **Section 3.4.1** of this Submissions Report. Potentially contaminated water is discussed in **Section 3.4.3, Section 3.1, 3.2 and 3.3** of this Submissions Report. Inhalation of particulates is discussed in **Section 3.4.1** of this Submissions Report.
25	Health	Health impacts of gas mining are un-researched.	Refer to Issue 24 above.
26	Air Quality	The dangerous substances (principally heavy vehicle exhaust emissions) emitted during the construction phase were not discussed.	This was discussed in Section 9.4.1 and 9.4.2 of the Air Quality chapter in the EA and in the Air Quality Report in Appendix F of the EA.
27	Air Quality	Flaring emissions have not been analysed.	This was discussed in Section 9.4.1 of the Air Quality chapter in the EA and in the Air Quality Report in Appendix F of the EA.
28	Air Quality	The interaction of these emissions with the emissions from Stratford Mine was neglected.	The Air Quality Assessment included assessment of the Gloucester Gas Project and the existing background which includes the existing mining activities. Refer to Section 3.5 of this Submissions Report.
29	Air Quality	Particles that enter the lungs have to be less than PM_3 and these particles constitute the principal dangers associated with this project. Because they are derived from a different	Current ambient air quality criteria for particulate matter in NSW are set for PM_{10}. The only criteria relevant in NSW relating to $PM_{2.5}$ is the National Environment Protection Council criteria.

Issue #	Category	Issue	Response
		source the PM^{10} levels bear no relationship to $PM^{2.5}$ and PM' levels, which are what need to be monitored.	A comparative assessment for PM_{10} and $PM_{2.5}$ is provided in **Section 3.5.3** of the Submissions Report and concludes that $PM_{2.5}$ would likely be below relevant guideline criteria under worst case assumptions. Refer **Section 3.4** of the Submissions Report.
30	Health	The lung function of Stratford residents may already be compromised due to mine works.	Particulates from mining activities would be the responsibility of those industries to control in accordance with their consent conditions and Environment Protection Licence. This EA included assessment of the Gloucester Gas Project and the existing background which includes the existing mining activities.
31	Air Quality	Bulldozers and other machinery must have the maximum possible exhaust suppression equipment.	Noted. The environmental safeguards proposed were provided in Section 9.5.1 of the EA. The project would also include an Air Quality Management Plan as part of the CEMP and would be subject to conditions of approval required by DOP.
32	Health	Nitrous oxides react with substances in the air to form $PM_{2.5}$ particles which can combine with water to form nitrous and nitric acid. This interacts with coal dust and releases heavy metal poisons. Tank water in the area should be monitored because of this.	The air quality impact assessment has been undertaken with the aim of understanding potential impacts. Any potential impacts identified are then subject to the development of mitigation measures in order to ensure that emissions from the project are brought under the criteria. It is also incumbent on other industries in the area to ensure their ongoing compliance with the criteria.
33	Health	Fraccing chemicals have caused health damage to humans and stock in the past, so there should be a condition that non toxic chemicals be used.	The components of fraccing fluid are described in **Section 3.4.3** of the Submissions Report. AGL has as strong track record in Australia's gas industry dating back over a decade to their continuing gas producing activities in Camden in Sydney's south west. In that time AGL has not experience health impacts to humans and stock.
34	Health	Stock and humans in the area will be at risk of compromised lung function and other organ involvement from the carcinogens and substances causing genetic malformations in volatile organic compounds (VOCs).	VOCs were assessed in Volume 2 Appendix F of the EA and are not expected to increase significantly as a result of the project. Background levels would remain well below DECCW criteria.
35	Health	Potential contamination of milk from heavy metal poisons released from coal dust settling on pasture and	Coal dust is not an emission associated with this project. Oxides of nitrogen are predicted to be well within the relevant

Issue #	Category	Issue	Response
		interacting with nitrous oxide fumes from gas mining.	DECCW criteria (refer to Air Quality Impact Assessment Addendum Report in **Appendix A** of this Submissions Report).
36	Noise	The development is inappropriately sited in a densely populated rural area, particularly with the construction noise level exceedences.	It is noted that noise levels are likely to exceed construction noise goals at some locations during various stages of the construction period, however these impacts would be temporary. Refer to **Section 3.6** of the Submissions Report for further discussion. During operation, the project will meet the relevant project noise goals.
37	Noise	Community complaints regarding noise levels, particularly at night. This can result in psychological problems.	All reasonable and feasible mitigation measures would be installed in order to meet project noise goals at affected receptors. Refer to **Section 3.6.4** of the Submissions Report.
38	Noise	Constant noise impairs concentration and learning, therefore sound proofing of Stratford School would be implemented.	The township of Stratford is located some 2 km from CPF Site 7 and greater than 4 km from CPF Site 1. Stratford, including Stratford School is located well outside the 30 dBA noise contour for operation of both CPF Site 1 and CPF Site 7, and as such no noise impacts are anticipated as a result of operation of the CPF. Furthermore, construction noise levels are likely to meet construction activity noise goals at 2 km from both CPF locations. Therefore impacts during construction are not expected. Further detailed noise assessments as described in Volume 1 Chapter 14 of the EA would be undertaken for the project during detailed design. If exceedences are predicted to occur at Stratford School, consideration of appropriate noise mitigation would be undertaken. Refer to **Section 3.6.4** of the Submissions Report for further discussion.
39	Noise	Noise monitoring should include low frequency, subsonic noise and should not be restricted to outside measurements.	Further detailed noise assessments as described in Volume 1 Chapter 14 of the EA would be undertaken for the project during detailed design. These assessments would include measurements of low frequency and noise characteristics, and appropriate mitigation measures would be implemented to reduce noise levels to project noise goals.
40	Visual	The visual impact on residents was	The EA was undertaken in accordance

Issue #	Category	Issue	Response
		belittled in the EA.	with the Director-General's Environmental Assessment Requirements (EARs) which required land use with significant visual value to be taken into account. The visual assessment was undertaken on the basis of objective scientific principles. It is recognised that appreciation of aesthetics can be a subjective issue, however, the technical assessment did not find significant impacts on that basis. **Section 3.9** of this Submissions Report also provides further discussion and explanation of the visual aspects of the project.
41	Socio-Economic	Decrease in real estate value.	Land values are not a viable planning consideration, primarily due to the vagueries which govern this area of the economy. Land values can fluctuate for many reasons including supply and demand as well as numerable other influencing factors. There is no empirical evidence to suggest that this type of development has affected land values in relation to this type of coal seam methane gas development elsewhere in NSW.
42	Health	Feelings of powerlessness results in depression and increased stress. This can cause physical health problems, all of which need to be monitored.	The EA has included aspects that could affect the social wellbeing of the local population. This includes air, noise and traffic emissions as well as potential effects to local lifestyle and amenity, heritage and visual aspects. In addition, AGL has and continues to consult with the landowners and local community on a regular basis on order that all issues of concern can be addressed. This Submissions Report includes additional information and discussion on issues of particular concern to interested parties and the local community. Conditions of an approval issued by DOP would take concerns into account and these conditions would become a matter of compliance for AGL. Many mitigation measures would be developed through the preparation of management plans that would require the sign off of the Director-General and which would be required to be audited independently on an annual basis. In addition, AGL have a complaints procedure for the Project in order that ongoing communication can be

Issue #	Category	Issue	Response
			precipitated by the community.
43	Hazards	Public perception of the gas and oil industry is that it is a dangerous industry.	Noted. The location of well sites is in accordance with DoP's *Locational Guidelines; Development in the vicinity of operating coal seam methane wells* (DIPNR, 2004). Separation distances to sensitive land uses are dependent on the type of infrastructure, and are recommended to be up to 20m. Well site within the Stage 1 GFDA would not be located within 200 m of a residence, which is well in excess of the DoP's locational guidelines.
44	Hazards	In 2004 a gas migration incident occurred at Stratford due to an old bore hole linking up with gas released by fraccing. The fractured nature of the local geology and the many unknown old bores make this is likely to be repeated.	The incident which occurred in 2004, was the result of communication between an old coal exploration well which was in close proximity to the production test well. The old coal exploration well had not been completely plugged and abandoned by the coal title operator and both wells penetrated the same coal seams. To overcome gas migration via old coal exploration wells, any exploration wells which may communicate with a future production well due to the penetration of the same coal seam and is in close proximity, would be plugged with cement (Plugged and Abandoned) in accordance with DII guideline. Gloucester Coal would be consulted in regards to location of old coal exploration wells.
45	Hazards	Inappropriate to lay pipelines so close to people's homes (the closest is 15m). Risks of bushfires, subsidence, explosions, earthquakes, fracturing of steel pipes.	Potential hazards have been addressed in Volume 1 Section 15 and Volume 3 Appendix I of the EA. Refer to **Section 3.4.2** of the Submissions Report. The location of the pipeline in proximity to residences would be in accordance with Australian standards for pipeline construction (AS2885).
46	Hazards	Flare operation risks were not assessed because of the uncertainty of the exact siting of wells. Will they ever be assessed?	As noted in **Section 3.4.1** of the Submissions Report, the Preliminary Hazard Analysis within the EA is only the preliminary step required under the planning legislation. Other studies and reports are required under other legislation, including a Hazard Operability Study, Fire Hazard Analysis, Final Safety Study and Emergency Plan. These would be undertaken over the coming months as detailed design of the project takes place.
47	Global	The Project will further accelerate global warming which has many health	Whilst there are greenhouse gas emissions from the project, they are

Issue #	Category	Issue	Response
	Warming	impacts.	minor compared to natural gas and other fuels. The EA states that *"Total greenhouse gas emissions resulting from operation of the Project were estimated to be approximately 492,000 t CO2-e per year".* Per unit of energy produced, this is a relatively lower level of GHG emissions than other fuel sources. Whilst there is a significant amount of published information linking the impacts of climate change to possible health impacts, the level of emissions, timeframe of the project and lower emissions relative to other fuels, means that the potential impacts of this project specifically linked to climate change are considered negligible.
48	Land Use	Mining should be limited to sparsely populated areas.	The Project fits within the definition of 'petroleum production' and 'petroleum related work. No mining is proposed as part of the Project.
49	Surface Water	A full and proper flood assessment (including water velocity and rainfall) is needed, including an assessment on the risk impact on the wells and related infrastructure.	During detailed design, AGL would develop a Flood Management Plan which would incorporate a Flood Risk Analysis and Flood Management Procedure. It is noted, however that the infrastructure that would be present in potentially flood prone areas is not anticipated to result in impacts to either the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Refer to **Section 3.1.3** of the Submissions Report. All storage facilities including storage ponds from produced and treated water and evaporation ponds would be constructed in accordance with relevant standards and would contain appropriate freeboard capacity to allow for high rainfall events. Refer to **Section 3.1.3** of the Submissions Report for further discussion.
50	Surface Water	Flood risks on the Avon River are far greater than envisaged.	
51	Surface Water	Lack of information on the number, location and construction of the brine ponds. The impact of flooding and high rainfall on these has not been assessed.	
52	Surface Water	No details provided on flood warning system.	
53	Surface Water	No details provided on how unsecured equipment will be relocated when flood warning occurs.	
54	Surface Water	No details provided on what flood damage may occur and what rehabilitation will be necessary.	
55	Surface Water	No justification for locating structures on flood prone areas.	Suitable well site locations are primarily based on geological considerations, however environmental and landowner constraints are also considered as described in the EA. As such, suitable geological conditions for the location of well sites may occur within the floodplain.

Issue #	Category	Issue	Response
56	Surface Water	Flood prone areas not defined therefore requirement to keep construction spoils and earth away from these areas cannot occur.	As detailed in Section 5.3 of the EA, well site locations would be situated a minimum of 40 m from major watercourses and 20 m from minor watercourses. The CEMP would include mitigation measures to ensure that the potential for erosion and sedimentation is minimised.
57	Air Quality	Exclusion of the impacts of Gloucester Coal's open cut mining operations. (EA downplays the statements made in the Appendix F). Appendix F states that no publically available data for the Stratford region were identified. This is puzzling as Gloucester Coal has been monitoring as required under its mining approval.	Gloucester Coal only monitors PM_{10} and deposited dust. All other data reported to the National Pollutant Inventory is predicted through calculations and is not actually monitored. The methodology utilised for the Air Quality Impact Assessment (AQIA) for the Project included modelling of background pollutant concentrations from the Wallsend DECCW monitoring station. This is considered to be representative of the regional air quality and includes emissions from surrounding developments. Therefore, emissions from Stratford Colliery have been considered as part of the background air quality. Based on this background concentration, the modelling concludes that all ground level pollutant concentrations resulting from operation of the proposed facilities would be below the relevant DECCW criteria for each of the proposed CPF sites. Thus the Project has considered the cumulative impacts of the proposal with other existing operations.
58	Air Quality	Need to establish the existing level of exposure to pollutants of the population in the vicinity of the Stratford Mining Lease, and then to extend these measures to incorporate the additional effects of the proposed development.	
59	Noise	Mitigation measures which isolate the receiver from the noise are suggested in the EA rather than measures which reduce the level of noise at the source.	As discussed in Section 14.6 of the EA, all reasonable and feasible mitigation would be applied at the source of the noise. These include selection of plant and equipment based on acoustic performance, positioning of plant and equipment with the noise source away from sensitive receivers, and installation of acoustic enclosures. Secondary noise controls such as portable acoustic screens would also be installed where required.
60	Noise	Focus on level of noise with no regard to type of noise.	The noise assessment was undertaken in accordance with DECCW guidelines which takes into account different types of noise when and if they are present. Further discussion of noise is provided in Section 3.6 of this Submissions Report.
61	Noise	Cumulative noise impacts with the Stratford mine are not considered.	The project noise goals are based on existing noise levels measured

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			throughout the Stage 1 GFDA, and as such incorporate existing noise emissions from the Stratford Colliery and other sources which would have contributed to existing background levels. The noise impact assessment considers the incremental noise impact the project is likely to have on the existing background noise levels in the area, and therefore provides an assessment of cumulative noise impacts.
62	Noise	The noise assessment is too narrow and technical to enable individual landholders assess the impact.	The noise impact assessment is a technical assessment prepared in accordance with relevant statutory guidelines.
63	Noise	EA should state the distance from a well head and the CPF at which noise will no longer be audible.	The noise assessment was undertaken in accordance with DECCW guidelines in order to meet the criteria. The criteria act as the threshold levels of acceptability in relation to potential impacts. Further discussion of noise is provided in **Section 3.6** of this Submissions Report.
64	Noise	The map showing well site constraints does not accurately identify all residences in and adjacent to the Stage 1 GFDA. It should be redrawn to accurately identify all affected residences within 3km of a well site.	Noted. Figure 5.4 in the EA identifies indicative well site constraints within the Stage 1 GFDA. Implementation of the locational principles described in Section 5.2 of the EA would ensure that well sites would not be located within 200 m of an existing residence. During detailed design and finalisation of well site locations, further constraints analysis would confirm the location of all residences prior to construction.
65	Noise	Core noise control and mitigation requirements should be set as conditions for approval and not left for later development in a noise management plan.	Core noise control measures are discussed in Section 14.6 of the EA. Refer to **Section 3.6** of the Submissions Report for further discussion.
66	Noise	Gas well construction, drilling and fraccing should only occur during standard daytime hours at all sites within 2km of a residence.	Approval is sought for general construction of wells, including fraccing during daytime hours only. Drilling activities would require 24 hour operation at times, and as such AGL propose to undertake drilling during evening and night time hours where project noise goals can be achieved, or as otherwise agreed with affected landowners (refer Section 14.6 of the EA).
67	Noise	Use of noise control and mitigation measures, eg. Temporary acoustic screens, during drilling and well head	All available noise control and mitigation measures would be considered and implemented where feasible and

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		construction should be mandatory at all sites within 2km of a residence.	reasonable in order to meet the relevant noise criteria at all residences and other sensitive receptors at which the relevant noise levels are predicted to exceed criteria.
68	Noise	Measures cited by Atkins Acoustics (Appendix H p53) as 'readily available' should be required to be applied to all activities.	All feasible and reasonable mitigation measures to reduce noise emissions at the source would be considered. Where the relevant noise criteria at sensitive receptors cannot be met, consultation with the affected residents would be undertaken to reach an appropriate outcome.
69	Noise	Consultation with 'affected receptors' concerning noise should include all receptors in the radius within which the relevant target goals are expected to be exceeded.	Where the relevant noise criteria at sensitive receptors cannot be met, consultation with the affected residents would be undertaken.
70	Noise	Stronger commitments should be required in relation to noise minimisation.	Refer to response for issue 67.
71	Noise	No indication that the proponent has taken account of the record of actual noise impacts of the Gloucester Coal processing plant when modelling the potential noise impacts of the CPF.	Background noise levels were measured at representative locations (referred to in the EA as Reference Measurement Locations) within the Stage 1 GFDA and in the vicinity of each of the potential CPF locations. This included installing noise loggers and monitoring noise levels for at least seven days at these locations (identified as R1, R2, R4, R5, R7 and R8) in Section 14.2.1 of the EA) to continually monitor background noise. This methodology is in accordance with requirements of the INP.
			A representative selection of Reference Measurement Locations were selected to encompass the range of background noise that might be experienced throughout the Stage 1 GFDA. Receptors likely to be affected by noise from Stratford Colliery (R1, R2, and R8) were selected in the vicinity of CPF Site 7 to ensure background noise contributions from the Colliery were included in the assessment. Receptors away from industrial noise sources were selected in the vicinity of CPF Site 1 (R4, R5 and R7) to measure background levels not currently affected by significant noise sources. Refer to **Section 3.6** of the Submissions Report.
72	Noise	Proponent should identify and apply	Noted. Refer to **Section 3.6** of the

Issue #	Category	Issue	Response
		best practicable technology in the selection and operation of noise sources.	Submissions Report.
73	Noise	Detailed operational noise assessment of the well head plant and equipment should be undertaken following final plant and equipment selection.	Section 14.5.1 of Volume 1 of the EA states that noise controls and mitigation requirements during well head development would be considered on a site-specific basis and managed in accordance with a Noise Management Plan. This would include background noise monitoring to confirm site-specific target assessment goals are met. Refer to **Section 3.6** for further discussion.
74	Noise	No well head should be established where the operational noise impact of the well, after implementation of mitigation measures, would be intrusive, ie. where the Laeq 15min level exceeds the RBL by more than 5dBA at a residence. This should also apply to any nodal compression units.	Noted. All well sites would be mitigated appropriately to meet the project noise goals identified in the EA. Refer to **Section 3.6** of the Submissions Report for further discussion.
75	Heritage	The Vale of Gloucester has heritage significance at local, state and national levels for historical, aesthetic, social, historic and technical reasons. AGL have failed to acknowledge this aesthetic significance.	The significance of the Vale of Gloucester has already been established via its formal listings which the assessment took into account. Refer to **Section 3.9** of this Submissions Report.
76	Heritage	Heritage should not be identified as a low priority issue.	Refer to **Section 3.9** of this Submissions Report.
77	Heritage	The EA and Appendix K both identify the Vale of Gloucester as a culturally significant landscape but it is not assessed.	The Vale of Gloucester is identified in Section 6.1 of Appendix K of the EA and its significance (as established under the RNE listing) was re-iterated in Section 7.3.2. The potential impacts to the listed values of the area were discussed in Section 8.3.3 of Appendix K of the EA which concluded that there would be no detrimental effects to the Vale on a historic heritage basis. The Vale is also assessed as part of the overall project area subject to the visual assessment in Chapter 18 of the EA. Aspects of the visual assessment have been clarified within **Section 3.9** of this Submissions Report.
78	Heritage	Misleading statements about the percentage of land area impacted upon. The EA states that the GFDA cover 16% of the Vale of Gloucester but fails to note that this is a highly visible, central part of the area.	This aspect was taken into account in the visual assessment. This is discussed further in **Section 3.9** of the Submissions Report.
79	Heritage /	The impact on heritage vistas is not	Impacts on the scenic qualities of the

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	Visual	considered.	Vale of Gloucester were assessed in Chapter 18 of the EA (Visual Impacts) and Chapter 19 and Appendix K of the EA (Heritage Assessment). Refer to **Section 3.9** of the Submissions Report for further discussion.
80	Visual	A 'measurement' of the area's scenic significance should be made based on the enjoyment and use of these scenic qualities.	Refer to **Section 3.8** and **3.9** of the Submissions Report.
81	Visual	The assessment should identify and consider the significance of both individual views and more sweeping views from within and into the area. Viewsheds should be calculated for proposed items to determine their overall visibility and impact.	Refer to **Section 3.8** of the Submissions Report.
82	Socio-Economic	The focus of the Socio-Economic assessment should be on those who are directly affected, ie. those who reside within the proposed extraction fields with the addition of those residing outside that area who might also suffer adverse consequences. The potential effects should be grouped under physical health, psychological health, social disruption, consequences for the local economy and property value loss.	The Socio-Economic Assessment in the EA focussed on all parties who had the potential to be affected by the project, whether directly or indirectly. Health issues were not a requirement of the Director-General's EARs, however, health issues of concern have been discussed in **Section 3.4** of the Submissions Report. Refer to response to Submission 2, Issue 35 in relation to the submission on land values.
83	Socio-Economic	Loss of tourism as scenic area with pristine environment will be turned into another polluted quasi-industrial area.	There is no evidence to support this claim. Refer to **Section 3.9** and **3.11** of the Submissions Report.
84	Socio-Economic	No discussion on the issue of land and property values, which is of great community concern.	Land values are not a viable planning consideration, primarily due to the vagueries which govern this area of the economy. Land values can fluctuate for many reasons including supply and demand as well as numerable other influencing factors. There is no empirical evidence to suggest that this type of development has affected land values in relation to this type of coal seam gas development elsewhere in NSW.
85	Cumulative Impacts	Cumulative assessment of the Stage 1 area should be undertaken in regard to the Gloucester Coal Ltd coal mining projects in the Stratford area and the future stages of the AGL gas project in the Gloucester area.	This EA included assessment of the Gloucester Gas Project and the existing background which includes the existing mining activities. Future stages of the AGL project would require further assessment at the time of a formal Project Approval process.
86	Cumulative Impacts	Cumulative health impacts should be assessed in regard to both future AGL	The Air Quality Assessment included assessment of the Gloucester Gas

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		project stages and the Gloucester Coal development.	Project and the existing background which includes the existing mining activities.
87	Cumulative Impacts	Cumulative impacts of the pollutants of concern with the impact of coal pollutants have not been addressed.	The air quality impact assessment has been undertaken with the aim of understanding potential impacts. Potential impacts identified are then subject to the development of mitigation measures in order to ensure that emissions from the project are brought under the criteria. It is also incumbent on other industries in the area to ensure their ongoing compliance with the criteria.
88	Cumulative Impacts	Cumulative noise impacts with the Gloucester Coal Ltd's Stratford Mine must be assessed.	Refer to Issue 71 above.
89	Cumulative Impacts	Cumulative impacts with future AGL project stages on the economic impact on land use, ground water impacts and scenic heritage impacts must be assessed.	The areas subject to Concept Plan approval would require subsequent Project Applications and Environmental Assessments to be lodged with Department of Planning. These Project Applications would assess in further detail the potential impacts of future stages of development.
90	Sustainability	Fails to adequately consider the principles of ESD.	The principles of Ecologically Sustainable Development are addressed in Section 28.3 of the EA.
91	Sustainability	EA incorrectly interprets at 28.3.1 the precautionary principle by adding 'whenever practicable' to the definition.	Noted.
92	Sustainability	There is sufficient scientific evidence to invoke the precautionary principle in regard to gas migration, water degradation, water and soil pollution and water table damage, and to therefore place the burden of proof to the contrary on the proponent. Reference to F.C.Loughnan report, Atkinson report, commentary by Prof. Grady.	The Precautionary Principle has been addressed in Section 28.3.1 of the EA.
93	Sustainability	The issue of intergenerational equity needs to consider scenic heritage qualities.	The issues of intergenerational equity and visual impacts were addressed in Section 28.3.2 and Section 18 respectively of the EA. Further discussion of scenic values is provided in **Section 3.9** of the Submissions Report.
94	Geology	How do they plan to isolate the desired gas-recovery zone form other geological units?	A Groundwater Management Plan would be developed for the project prior to construction, which would include

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95	Ground Water	The extraction trials suggest greater porosity/permeability within the coal seam sequences than is admitted.	development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. A groundwater monitoring network would be established in the Project Area and surrounds to monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers). The Groundwater Management Plan would be implemented for the duration of the Project and would include ongoing monitoring of water levels and water quality prior to, and during construction, to identify impacts to shallow alluvial aquifers, shallow bedrock aquifers, and deep bedrock aquifers. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
96	Ground Water	Very limited evidence-base used to interpret lack of hydrological connectivity.	
97	Ground Water	Have not assessed the potential for dewatered coal seam units to become sinks for water from elsewhere (neighbouring geological units, remote geological units via fracture zones or 'open' faults, or from surface waters via alluvial aquifers).	
98	Ground Water	How will they accurately recognise a situation when a production seam is overproducing water? What will they monitor to understand the process involved?	
99	Ground Water	No exact way to know if production zones are leaky at depth. Sealing individual coal seam zones in the drill hole won't necessarily solve the problem.	
100	Ground Water	Increased aquifer permeability - the pilot program is not necessarily representative of all geological situations to be encountered.	
101	Ground Water	Reduction in stream flow - mitigation measures statement has nothing to do with mitigation measures, it is about monitoring and not mitigating.	
102	Ground Water	Monitoring of target seams and aquifers should apply to contiguous non-seam aquifers.	
Submission 63 **NSW Farmers, Stroud Branch**			
1		Farmers in the District have supported coal mining on the basis of nil discharge to the Mammy Johnson River. Members have numerous concerns for the Concept Plan and Project Approval which completely negate all existing water management conditions which currently apply to the Karuah Valley catchment.	Discharge to waterways would be governed by an Environment Protection Licence. While project approval may be given for discharge as part of the project, it would be contingent on the completion of appropriate management plans. Refer to **Section 3.1** of the Submissions Report for further discussion on the management of produced water.
2	Ground Water	Destruction of aquifers.	Potential impacts to aquifers would be managed through the preparation of a Groundwater Management Plan (refer Chapter 13 of the EA), which is discussed in **Section 3.2** of the

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			Submissions Report.
3	Ground Water	Contamination of underground water supplies by fraccing water.	Shallow alluvial aquifers which are considered beneficial aquifers are not the target of fraccing activities. Shallow aquifers are protected from contamination during well construction by well casing which isolates shallow aquifers from the well. Fraccing fluid is discussed in **Section 3.4.3** of the Submissions Report. Refer to Issue 2 above.
4	Statutory Planning	The Part 3a application exempts the need to obtain water use approval.	Noted.
5	Waste / Surface Water	Concern for discharge of treated water in rivers.	Noted. AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential local re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
6	Waste	Reverse osmosis appears to be the best option available to treat the water, but the applicant is already searching for a cheaper option.	AGL is proposing to treat produced water using reverse osmosis (RO). Refer to Issue 5 above and Section 3.1 of this Submissions Report.
7	Surface Water	Soil disturbance during construction will cause increased soil runoff in waterways with a higher nutrient load and extensive weed generation potential.	**Section 3.1** of this Submissions Report provides discussion on construction environmental management and downstream impacts on waterways.
8	Surface Water	Creek and river crossing work will destroy and disturb land in riparian zones, potentially causing soil erosion.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP for sensitive watercourse crossings. Where HDD is proposed, the crossing would be designed to avoid direct and indirect

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			impacts to the watercourse. Further discussion is provided in **Section 3.1**.
9	Geology	Presence of Acid Sulphate Soils.	The issue of Acid Sulphate Soils was addressed in Section 17 of the EA.
10	Surface Water	All wells should be located a minimum of 40m from the riparian zone boundary due to flooding.	Infrastructure that would be present in potentially flood prone areas is not anticipated to result in impacts to either the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Refer to Section 3.1.3 of the Submissions Report. As detailed in Section 5.3 of the EA, well site locations would be situated a minimum of 40 m from major watercourses and 20m from minor watercourses.
11	Consultation	Lack of government employees at consultation meetings.	Relevant statutory agencies were invited to meetings. Representatives from local government within the project area sit on the Community Consultative Committee. Community consultation is discussed further in **Section 3.11** of the Submissions Report.
12	Surface Water	Good water quality in the Karuah Valley is crucial for agriculture, human use and to maintain the quality of the Port Stephens Great Lakes Marine Park.	**Section 3.1** of this Submissions Report provides discussion on construction environmental management and downstream impacts on waterways.
13	Surface Water / Ground Water	Need to protect water supply and ground water for the greater demand resulting from climate change.	Noted.
Submission 115 **Gloucester Coal**			
1		Gloucester Coal welcomes other complementary activities being established provided restrictions or adverse impacts are not brought about to Gloucester Coal's operation. Gloucester Coal requests the Department of Planning give full consideration to Gloucester Coal's currently consented mining and exploration activities in this regard.	Noted. AGL would continue to consult with Gloucester Coal regarding operations in the Gloucester Basin. AGL will work with Gloucester Coal to develop a Cooperation Agreement for areas with overlapping tenure as required by DII.
Submission 117 **The Wilderness Society Newcastle Inc**			
1	General Comments	The Wilderness Society considers the project environmentally destructive due to its impact on matters of	This project was referred to DEWHA under the EPBC Act and the project was deemed to be Controlled. As this report shows, the matters of NES of interest

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		National Environmental Significance.	would either be avoided (such as the wetlands), mitigated (such as potential downstream impacts to waterways and wetlands) or offset (such as the small-flowered grevillea). This is discussed further in **Section 3.3.5** of the Submissions Report.
2		The current level of information in the EA is insufficient in terms of detail. Therefore overall impacts of the proposal cannot be readily quantified. A precautionary approach to this proposal should be adopted.	The EA undertook the precautionary approach in undertaking a habitat assessment. This provides the presumption of presence if the habitat is present regardless or not of whether the threatened species is found. **Section 3.3.5** of this Submissions Report provides further detail on how the currently conservative list of potential impacts would be refined and how any residual impacts would be offset.
3	Fauna and Flora	1) Impacts will occur to native fauna and flora and their ecological habitats in respect of the gas pipeline corridor (100m wide by 96km long) These habitats include The Karuah, Hunter and Williams Rivers, RAMSAR listed Hunter Estuary Wetlands and the Wallaroo National Park. These areas include species listed under the TSC Act1995 and National Park and Wildlife Act 1974.	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3.1** of this Submissions Report.
4		2) The Ecological Survey included in the EA is based on a small research and observation window and presents only a snapshot or sample. Surveys should be undertaken over several seasons, longer than a 12 month period.	See Issue 2 above and **Section 3.3.5** of this Submissions Report.
5		3) Field Surveys are inadequate. No detailed field survey techniques were used and a heavy reliance is made on "desktop survey".	See Issue 2 above and **Section 3.3.5** of this Submissions Report.
6		4) The ecological survey is based on assumptions and limitations due to locations of well heads, pipelines and infrastructure etc not being accurately known. Therefore actual sites have not been sufficiently represented.	See Issue 2 above and **Section 3.3.5** of this Submissions Report.
7		5) The results of field surveys are limited and grossly affected due to previous heavy rainfall and some areas being inaccessible and therefore not surveyed.	See Issue 2 above and **Section 3.3.5** of this Submissions Report.
8		Some conclusions regarding the assumed presence of species (based	See Issue 2 above and **Section 3.3.5** of

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		on desktop review assumptions) within the study areas are contradictory.	this Submissions Report.
9		Conclusions drawn solely from desktop analysis omit potential samples from developing and/or existing ecologies.	See Issue 2 above and **Section 3.3.5** of this Submissions Report.
10		A second sampling period was not scheduled to measure conclusions solely reliant upon desktop research.	See Issue 2 above and **Section 3.3.5** of this Submissions Report.
11		Removal of single paddock trees will compromise habitat for microbats, Barking Owl and their movement corridors.	Removal of single paddock trees will be avoided. If unavoidable, removal of hollow bearing trees would be in accordance with the Hollow Bearing Tree Management Strategy described in Chapter 25 of the EA to minimise potential impacts.
12	State Protected Matters	The Pipeline will traverse Wallaroo National Park. Several native Flora and Fauna species exist within the park and are listed under the EPBC Act and National Parks and Wildlife Act	The route through the National Park is within an existing cleared easement requiring no additional vegetation clearing, which represents a better environmental outcome than pursuing a pipeline route outside the National Park. DECCW (National Parks and Wildlife Service) has been consulted on this route selection.
13		EECs, Threatened Ecological Communities and possibly Critically Endangered Ecological Communities exist within the parameters of the project area. To clarify this full and extensive field surveys should be undertaken.	See Issue 2 above and **Section 3.3.5** of this Submissions Report. Justification for the level of survey undertaken is provided in Section 3.3.2 of this Submissions Report.
14		The Green and Golden Bell Frog has been recorded close to the site in 140 locations. The NSW Governments steps to protect and recover species should be followed. (see submission for list)	AGL would be undertaking further pre construction surveys to refine the currently conservative list of potential impacts. Management Plans specifically to mitigate potential downstream impacts to waterways, wetlands and other species (such as Green and Golden Bell frog) would be prepared as part of the CEMP.
15		Koala habitat in the Port Stephens LGA will be impacted.	Koala habitat was assessed in Appendix G of the EA. Refer to **Section 3.3.5** of the Submissions Report with respect to offsets available for Koala habitat.
16	Natural Water Resources	1) The assessment fails to acknowledge the need for protection zones surrounding natural water sources.	Watercourse crossings would be guided by specific management plans as part of the CEMP as noted in the EA.
17		2) Water pumping and drilling will disturb natural aquifers and can cause	Potential impacts to aquifers would be managed through the preparation of a

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		permanent damage.	Groundwater Management Plan (refer Chapter 13 of the EA), which is discussed in **Section 3.2** of the Submissions Report.
18		3) A flood risk assessment has not been prepared. Contaminated water may affect waterways, aquifers, ground and stream water.	AGL would develop a Flood Management Plan which would incorporate a Flood Risk Analysis and Flood Management Procedure. The infrastructure that would be present in potentially flood prone areas is not anticipated to result in impacts to either the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Refer to **Section 3.1.3** of the Submissions Report. A range of mitigation and management measures are provided in Section 12.5 of the EA to prevent the contamination of watercourses affected directly and indirectly by the project.
19	Community Consultation	Community Consultation only occurred in one affected LGA. This is insufficient and is considered grossly inadequate.	Community consultation program primarily focussed on the Gloucester LGA as over half of the Concept Area, the Stage 1 GFDA and a portion of the proposed pipeline corridor are located within this LGA. The proposed pipeline corridor also travels through the Great Lakes LGA, Dungog LGA, Port Stephens LGA, Maitland LGA and Newcastle LGA. Each of these LGAs were consulted by the Proponent as key Local Government agencies, and the LGAs of Gloucester, Dungog, the Great Lakes and Port Stephens were also involved in the Community Consultative Committee (CCC). All landowners directly affected by the either the Stage 1 Field Area and the Pipeline have been consulted in relation to the project requirements. Further information on community consultation is provided in **Section 3.11** of this Submissions Report.
Submission 127 **Johnsons Creek Conservation Committee**			
1	Ground Water	Request for independent Ground Water Study to be conducted in Manning and Karuah Catchments and in entire Exploration Area.	Potential impacts to aquifers would be managed through the preparation of a Groundwater Management Plan (refer Chapter 13 of the EA), which is discussed in **Section 3.2** of the Submissions Report. The Exploration Area is not the subject of this project application.

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2	Community Consultation	Request that neighbouring landholders be notified immediately of any planned drilling, gas wells, trenching involving the main pipeline and water and gas gathering lines that may affect them.	Prior to works in the Stage 1 GFDA, AGL would place a notice in the local paper outlining the proposed works and their duration. A similar notice would be prepared as a letter and preferably hand delivered or sent by post followed up by a phone call to nearby residences to notify them of drilling activities. The letter would contain contact phone numbers to make enquires or complaints if required. Prior to construction works commencing on the pipeline, a notice would be sent to all landowners within 1km either side of the proposed alignment to notify them of the proposed activities and their anticipated duration.
3	Compensation	Request landowners in affected area be paid a substantial amount of compensation for inconvenience of having their land downgraded.	Negotiations with landowners whose property is directly affected by project infrastructure would be in accordance with agreements negotiated between the landowner and AGL. Compensation to landowners in areas not directly affected by project infrastructure (i.e. property does not contain project infrastructure) is not considered to be warranted.
4	Precautionary Principle	Request that Government apply the concept of the precautionary principle as anything AGL will do will impact on environment and have significant, serious and irreversible environmental harm.	The Precautionary Principle was addressed in Section 28.3 of the EA.
5	Water Quality/Land Use/Terrestrial Ecology	Objection to AGL Gas trenching 187 creeks between Stratford and Hexham and boring under Karuah River, Williams River and Hunter River. Creeks and rivers will be crossed 3-6 times in some place with a 100m clearance around pipeline, through bushland, people's properties, damage done to wildlife corridors, displacement of wildlife, potential death.	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Chapter 10 of the EA and discussed further in **Section 3.3.1** of the Submissions Report.
6	Water Quality/Aquatic Ecology	Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol.1 Pages 12-20).	Impacts to waterways during construction would be managed through the preparation of a Construction Environmental Management Plan, which would include an Erosion and Sediment Control Plan and Soil and Water Management Plan as described in Volume 1 Chapter 25 of the EA. Further discussion on construction environmental management and downstream impacts on waterways and management of produced water is discussed in **Section 3.1** of the

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			Submissions Report.
7	Terrestrial Ecology	EA states that Karuah River is a Class I fish habitat and of high sensitivity. To allow discharge into this river is completely unacceptable. Children of the future need fresh, clear water to enjoy.	Refer to **Section 3.1.1** of the Submissions Report for discussion on construction environmental management and downstream impacts on waterways and **Section 3.1.4** for management of produced water.
8	Surface Water/Health/ Ecology	AGL Gas seeks approval for river discharge. Majority of concept area is in Karuah Catchment, from which Midcoast Water take water for town supplies of Stroud and Stroud Road. Section of Karuah River is Habitat Protection Zone for Marine Park.	Refer to **Section 3.1.1** of the Submissions Report for discussion on construction environmental management and downstream impacts on waterways and **Section 3.1.4** for management of produced water.
9	Surface Water/Ground Water	Guarantee needed from Government that there will be no impacts on water resources when AGL intends to divert and trench creeks and bore under rivers.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. The range and type of measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report.
10	Terrestrial Ecology	How will the Government implement to stop impacts on vulnerable, endangered and threatened species?	The project would be subject to conditions of project approval issued by DOP, management plans that form part of the conditions of consent, and an Environment Protection Licence issued by DECCW.
11	Terrestrial Ecology	How can the Government justify trenching through creeks/watercourses and habitat areas and destroying bushland and habitat trees for our wildlife in the pipeline corridor?	The EA considered and assessed impacts on ecology, land use and water quality, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.
12	Terrestrial Ecology	Will the Government guarantee there will be no impacts on any threatened species, biodiversity or wetlands? Management plans proposed by AGL	

Issue #	Category	Issue	Response
		should be prepared and assessed prior to granting approval.	
13	Specific Inquiry	How is methane gas extraction seen to be a good alternative to coal, when it produces so many unknown health and environmental problems around, NSW, QLD and overseas?	Refer to response to Submission 2, Issue 42 in relation to establishing exposure pathways that could represent health effects and Submission 5, Issue 23
14	Specific Inquiry	The Government can immediately stop environmental concerns from mining, green house gas emissions, including downstream emissions by putting their support into solar and wind. Why is the Government not focusing on going clean and green by using the sun and wind to generate power to produce electricity?	The extraction of coal seam gas to support energy generation in NSW is in accordance with climate change and greenhouse emission initiatives of the NSW Government.
15	Specific Inquiry	If the Government truly wanted to stop gas emissions by industry and mining, why not stop these destructive forms of mining?	Refer to Issue 14 above.
16	Specific Inquiry	Why is the Government continually approving the destruction of land and degradation of rivers by mining coal, methane gas and hot rocks as the main form of production electricity when these methods are the most damaging to the environment and downgrading the land to become useless for any other purpose?	Refer to Issue 14 above.
17	Specific Inquiry	AGL advised at the community meeting on 27/1/10 that water quality currently extracted from the pilot project is relatively uncontaminated, but that as drilling moves further south towards marine base geology, this will result in more toxic water being produced. What tests have been carried out regarding the marine base geology?	There appears to be a misunderstanding between water salinity and water toxicity. The discussion would have been generally that the marine strata found throughout the Gloucester Basin generally lies between Bowens Road and Glenview seams, and the Mammy Johnsons formation and the Duralie road formations. Around these marine influenced formations the produced water extracted from the well is likely to be more saline than the water extracted in other areas of the basin.
18	Specific Inquiry	We request a copy of these test and results as this matter needs urgent attention.	
19	Waste	Where is landfill facility for salt disposal located?	Options for disposal of salt are currently being investigated. In the event that the salt cannot be utilised, it would be disposed of in an appropriately licensed landfill facility. It is noted that the Gloucester Landfill does not accept salt waste, and an appropriately licensed waste management facility outside the Gloucester LGA would be required.
20	Cumulative	What will be the cumulative	Salt disposal, where required, would be

Issue #	Category	Issue	Response
	Impacts	environmental impact from dumping thousands of tons of salt long term?	to an appropriately licensed waste management facility.
21	Waste/Health	Although contaminated water is supposedly going to be treated for salinity, what heavy metals will remain in the treated water?	Water would be treated to the criteria specified by DECCW in the conditions of consent and the Environment Protection Licence.
22	Specific Inquiry	How can the government approve the Gloucester Gas Project when there are so many options and assumptions and no definite Water Management plans?	If approved, the project would be undertaken in accordance with the conditions of project approval which would include the requirement for preparation of an appropriate suite of environmental management plans.
23	Surface Water/Health	River discharge will have detrimental impact on thousands of people who rely on good quality water for drinking, agriculture, tourism, Karuah oysters industry, ecosystem as a whole. River system supplies 2 towns' drinking water - discharging puts health and safety at risk.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
24	Surface Water	Farmers have concerns about river discharge because at times of high flow many riverflats are inundated with floodwater filling billabongs, wetlands that can take months to dry up/drain.	
25	Waste/Surface Water	Discharging wastewater into river system will turn river into a drain that flows directly into marine park habitat protection zone and Port Stephens.	
26	Surface Water	Government has responsibility and duty of care to protect our rivers and water quality for downstream communities.	
27	Specific Inquiry	Why, when the government departments have already denied a mine (Duralie Coal) the right to discharge any wastewater directly or indirectly into the Karuah Catchment, does another mining company (AGL Gas) insist on asking for the same thing?	Discharge to waterways would be governed by an Environment Protection Licence. While project approval may be given for discharge as part of the project, it would be contingent on the completion of appropriate management plans. AGL propose to treat produced water prior to discharging. Refer to **Section 3.1.4** of the Submissions Report.
28	Water Quality/Aquatic Ecology	50 of the creeks to be trenched are between villages of Craven and Stroud Road in 20/30km stretch and flow into Wards River, Mammy Johnsons River and the Karuah River. Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol. ?	Impacts to waterways during construction would be managed through the preparation of a Construction Environmental Management Plan, which would include an Erosion and Sediment Control Plan and Soil and Water Management Plan as described in Volume 1 Chapter 25 of the EA. Further discussion on construction environmental management and

Issue #	Category	Issue	Response
		Pages 12-20).	downstream impacts on waterways and management of produced water is discussed in **Section 3.1** of the Submissions Report. Refer to Issue 23 to 27 above.
29	Terrestrial Ecology	EA states that Karuah River is a Class I fish habitat and of high sensitivity. To allow discharge into this river is completely unacceptable. Children of the future need fresh, clear water to enjoy.	
30	Waste	To allow deliberate pollution of this river system is completely unacceptable and should never be permitted.	Refer to Issue 23 to 27 above.
31	Specific Inquiry	Who is responsible for AGL's wastewater once it leaves the site?	AGL is responsible for ensuring that the Project complies with all conditions contained within a Project Approval and Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
32	Cumulative Impacts	Will river discharge and irrigation of river flats and floodplains with wastewater have a cumulative impact on river system and connected waterways?	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
33	Health	Can the Government guarantee downstream water users good quality water in the long term?	Refer to Issue 27 above.
34	Specific Inquiry	Will the government take full responsibility should the drinking water become polluted by wastewater either directly or indirectly?	Refer to Issue 31 above.
35	Surface Water/Waste	Petition to Government: 4312 signatures requesting Government to never approve river discharge in the Karuah catchment area. Duralie Coal has this Condition of Consent - the same is expected for AGL Gas.	Refer to Issue 27 above.
36	Surface Water	No Creek or River discharge must be enforced as government legislation to protect river systems.	Refer to Issue 27 above.
37	Ground Water/Surface Water	How would the government justify any future proposals by AGL Gas to drill, trench through for gas and water gathering lines or irrigate riverflats and floodplains in the Karuah catchment without thorough independent groundwater and surface water	Future proposals by AGL would be the subject of separate future environmental assessment and applications.

Issue #	Category	Issue	Response
		studies being carried out?	
38	Ground Water	Request for buffer zone between river and all gas mining activities (including future irrigation) of at least 400m or more to protect alluvial aquifers in riverflats, floodplains.	As detailed in Section 5.3 of the EA, well site locations would be situated a minimum of 40 m from major watercourses and 20 m from minor watercourses.
39	General	Exploration Licence Area does not equate to an area of minimal environmental impacts. This area has not been thoroughly assessed - needs complete assessment.	The Exploration Area is not the subject of this project application.
40	Water Quality	Environmental impacts on water quality of Wards River and Mammy Johnsons River will also have detrimental impact on downstream water users, Karuah River and Port Stephens Marine Park.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1**.Refer to **Section 3.1.4** for discussion on management of produced water.
41	Ground Water	AGL Gas is currently drilling on a prime riverflat without knowing the impact that drilling will have on aquifers of Gloucester River.	The exploration works currently being undertaken by AGL are in accordance with approval issued by the Department of Industry and Investment and are separate to the Project Application.
42	Ground Water	Who will take responsibility for any contamination and/or damage to aquifers or river systems in concept area?	AGL is responsible for ensuring that the Project complies with all conditions contained within a Project Approval and Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
43	Waste	Why has company already been given 'the right' to produce waste water that needs to then be stored in lined holding dams (because of toxicity) without prior osmosis or desalination	The exploration works undertaken by AGL are in accordance with approval issued by the Department of Industry and Investment (formerly Department of Primary Industries).

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		plant being built whether approved or not?	
44	Ground Water	Why is the company given free licence to drain aquifers of Gloucester Valley and surrounding areas?	Refer to Issue 43 above.
45	Fraccing/ Health	Why is company able to use containers of fraccing fluid which is going into ground water/aquifers without beforehand disclosing it to community that may potentially poison?	Refer to Issue 43 above.
46	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3 .1** of the Submissions Report.
47		Environmental damage has not been measured through independent companies, it has been conducted through people employed by AGL Gas. The amount of damage done to natural water resources cannot be measure through their assumption and feasibility studies.	AECOM is an independent company commissioned to undertake the preparation of the EA. Notwithstanding, DOP, DECCW and other agencies provide independent review and assessment of the documentation .
48	Health	Trenching, boring techniques will degrade creeks, rivers, aquifers and swamps and will alter these forever - it is too late after work has commenced.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1**.
49	Surface Water	AGL must have as one of their Conditions of Consent, absolutely 'No Creek or River Discharge'.	Discharge to waterways would be governed by an Environment Protection Licence. As noted above, while project approval may be given for discharge as part of the project, it would be contingent

Issue #	Category	Issue	Response
			on the completion of appropriate management plans.
50	Surface Water	Whether the water is treated or not through the various listed methods in their E.A. is unacceptable (Vol. 1, pgs. 4-7) In section 120 of the POEO Act it states that: It is illegal to pollute or cause or permit pollution of waters. A person who pollutes any water is guilty of an offence.'	AGL is responsible for ensuring that the Project complies with all conditions contained within a Project Approval and Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
51	Surface Water	Strong objection to any wastewater being discharged off site in to the local waterways and/or creeks, rivers.	Discharge to waterways would be governed by an Environment Protection Licence. As noted above, while project approval may be given for discharge as part of the project, it would be contingent on the completion of appropriate management plans.
52	Surface Water	Demand for Protection of River Flats and Flood Plains, adopting a "No Irrigation or waste-water treated or not, via any method as a Condition of Consent" ' including a '1km Protection Zone for every soak/swamp, billabong wetlands, creeks, rivers and any natural water sources etc.'	Refer to Issue 51 above.
53	General	'To not proceed with AGL Gas's proposal is the best option for the environment, waterways and The Bucketts Way Valley to Hexham.'	Noted.
54	Society/Health	'Farming, tourism and health of people can only exist without gas mining'.	Impacts to agricultural land, tourism and health are discussed in **Sections 3.7**, **3.9** and **3.4** of the Submissions Report, respectively. The EA has demonstrated that potential impacts can be managed such that CSG extraction can co-exist with existing land uses without significant impacts.
55	Ground Water	An independent study of the Ground Water System (Aquifers) in the entire Gloucester Basin to Isaacs Road Booral, must be carried out to determine the cumulative impact on this ground water from the extraction of gas, before any approval is even considered, for AGL Gas to proceed further than they already have under the 'Exploration Licence of sinking wells'.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. A groundwater monitoring network would be established in the Project Area and surrounds to monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers). The Groundwater Management Plan would be implemented for the duration of the Project and would include ongoing

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			monitoring of water levels and water quality prior to, and during construction, to identify impacts to shallow alluvial aquifers, shallow bedrock aquifers, and deep bedrock aquifers. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
56	Ground Water	Objection to dewatering the aquifers in order to draw methane gas out.	Noted.
57	Ground Water	Dewatering of aquifers should be metered - AGL Gas be charged for potable water, commercial bores sunk, water extracted in exploration and production and damage done to aquifers.	Appropriate groundwater/bore licences would be sought for each well through NOW prior to drilling. Metering would occur via the SCADA system and reporting would be as per licence requirements.
58	Ground Water	No regulations/guidelines have been set for re-injection of water containing toxic fraccing chemicals that would be pumped back into the aquifers.	Noted.
59	Ground Water	What is AGL's projection of when they expect the aquifers to naturally recharge?	Baseline monitoring that would be undertaken as part of the Groundwater Management Plan (refer Issue 55 above, and **Section 3.2** of the Submissions Report) would enable projections for the natural recharge of the coal seam aquifers to occur.
60	Ground Water	How does AGL Gas propose to deal with ground subsidence caused by dewatering and gas extraction?	As no coal is removed other than through the drilling of the well, ground subsidence is not expected to occur.
61	Ground Water	What time frame are they going to accept responsibility for resulting damages 'drilling/fraccing etc.' where the environmental impacts of shallow, alluvial deep bedrock aquifers are altered immediately? (Vol 1. pgs 13-1)	Refer to Issue 55 above, and **Section 3.2** of the Submissions Report AGL is responsible for ensuring that the Project complies with all conditions contained within a Project Approval and Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
62	Ground Water	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels or composition.	Noted. The water quality is poorest in the deep coal seam aquifers being developed for CSG, and pumping is not expected to degrade water quality or influence the shallower aquifers. Refer to Issue 55 above, and **Section 3.2** of the Submissions Report
63	Ground Water	Damage to aquifers cannot be reversed.	Noted. Refer to Issue 55 and 62 above, and **Section 3.2** of the Submissions Report

Issue #	Category	Issue	Response
64		Offsetting other tracks of land to replace land destroyed is unacceptable.	Noted.
65	Fraccing	Fraccing requires immense quantities of water in process which would lead to a complete removal of ground water.	The fraccing process is described in Section 5.4.6 of Volume 1 of the EA. The process requires injection of water and stimulation fluid and sand into selected target zones at high pressure. Currently AGL obtains agreement from local landowners to purchase dam water from their property. Produced water stored in one of the produced water storage ponds would eventually be utilised, or if required, water would be sourced from licensed stand pipes or other approved sources.
66	Fraccing	Injecting waste water back into underground aquifers, mixed with fraccing chemicals is environmentally damaging.	The option of aquifer re-injection as a disposal option was considered in Section 4 of the EA however is not currently proposed as part of the project.
67	Fraccing	Chemical composition of fraccing fluid is highly toxic. Although they may be vegetable based, experience shows that intense chemical reaction is required for this process.	The composition of fraccing fluid is discussed in **Section 3.4.3** of the Submission Report.
68	Fraccing	Toxic fraccing chemicals mixed with water, 'treated or not' in dams is unacceptable. Dams will fill up and overflow due to high coastal rainfall, despite AGL's justification that capacity would be found in farm dams located in areas without significant catchment'.	All storage facilities including storage ponds from produced and treated water and evaporation ponds would be constructed in accordance with relevant standards and would contain appropriate freeboard capacity to allow for high rainfall events. Refer to **Section 3.1.3** of the Submission Report for further discussion.
69	Waste	Disposing of fraccing fluids in aquifers, creeks and rivers will poison aquatic ecosystems and water and is completely unacceptable.	Aquifer re-injection as a disposal option was considered in Volume 1 Section 4 of the EA however is not currently proposed as part of the project. The composition of fraccing fluid is discussed in **Section 3.4.3** of the Submissions Report.
70	Fraccing	Where will AGL draw the copious amounts of water from, required for fraccing/drilling gas wells?	The fraccing process is described in Section 5.4.6 and 5.4.7 of the EA. Currently AGL obtains agreement from local landowners to purchase dam water from their property. Produced water stored in one of the produced water storage ponds would eventually be utilised, or if required, water would be sourced from licensed stand pipes or other approved sources.
71	Fraccing	What is the precise composition of fraccing fluid or is it a trade secret? How much fraccing fluid is used in	The composition and use of fraccing fluid is discussed in **Section 3.4.3** of this Submissions Report.

Issue #	Category	Issue	Response
		each well?	
72	Fraccing/Waste	What method of disposal is used for highly toxic fraccing fluid?	As part of the fraccing process, fraccing fluids would become heavily diluted in the produced water. Produced water would be treated. Produced water management is described in **Section 3.1** of this Submissions Report.
73	Surface Water	Demand guarantee from Government that there will be no damage done to Aquifers, creeks, rivers, swamps, wetlands and the remain preserved in natural state.	Refer to Issue 9 above.
74	Compensation / Health	Environmental bond to be adopted before AGL work commences. Bond to be held by independent custodian. Community will then have finances should they experience health affects and opportunity to repair environment. Deposits to be made throughout the year covering 'immediate, short and long-term environmental damage and health effects of people/animals associated with gas mining report by LB Clarke NSW National Parks and Wildlife Service, 2001).	AGL would be required to lodge a security bond as part of licensing of petroleum activities under DII. A security bond would be required as a guarantee to ensure rehabilitation is undertaken in accordance with DII's requirements. Security / environmental bonds would be held by DII.
75	Compensation / Health	Environmental bond would be transferable should AGL sell their exploration/mining licence. Said company must continue to pay bond. Bond accessible by environmental groups and land owners affected in the Valley, until the people say it's in a clean, safe and better state.	Bonds would likely be transferable and would be paid in accordance with DII requirements. DII would determine whether rehabilitation is adequate upon completion as required.
76	Visual Impacts	Gas mine will destroy aesthetics of a beautiful valley, creating visual alteration of the landscape, destroy tourism are forever turning area into industrial chemical mining area.	Significant visual impacts and changes to the nature of the Gloucester area are not expected. Refer to **Sections 3.7, 3.8** and **3.9** of the Submissions Report.
77	Waste	Gas plant will alter rural valley. Chemical residue will remain in water and soil and production will visually alter valley through hundreds of gas wells, waste water holding plants and CPFs.	Refer to Issue 76 above.
78	Air/Water Quality	Gas mine will produce air and water pollution due to methane gas escaping during drilling/fraccing process while boring the gas wells near creeks/rivers.	Air emissions were assessed in Chapter 9 and Appendix of the EA. An addendum to the air quality assessment is provided in **Appendix A** of this report. Pollutant emissions are predicted to be below relevant criteria set by DECCW. Water quality is addressed in Chapter 11 of the EA and discussed further in **Section 3.1**

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			of this Submissions Report.
79	Heritage	Heritage has been downgraded to a low priority despite it being identified in the DGRs. AGL failed to assess significance of Vale of Gloucester by dismissing it as being irrelevant.	Heritage was not identified as a low priority issue. Further discussion is provided in **Section 3.11.1** of this Submissions Report.
80	Heritage	This will impact forever on Gloucester Stroud Valley and the Bucketts Way Tourist Country Drive Experience.	The impact to the Bucketts Way Tourist Country Drive Experience would be limited to the construction phase of the pipeline in the two small sections where the pipeline route follows the Way. Once construction is complete the pipeline would be below the ground and therefore not visible. CPF sites 1 and 7 would have limited visibility from Bucketts Way, however, views are fleeting and are no more visually prominent than the current operations of Gloucester Coal and the rail loop, once the construction phase is complete. Additionally, the distance of Site 1 from the Way reduces the visual impact. Further discussion has been provided in Section 3.9 of the Submissions Report.
81	Heritage	Valley's heritage significance through its scenic qualities is of highest importance. Historical towns of Stroud and Booral may be affected.	The towns of Stroud and Booral are located over 30km from the Stage 1 GFDA, 7km from the southern extent of the concept area and approximately 5km from the pipeline. At these distances and given the undulating nature of the terrain, the scenic qualities of the towns would not be impacted as the development would not be visible.
82	Heritage	Assessment is currently inadequate, therefore will continue to be eroded by successive stages of AGL development, as it will continue to be assessed to this standard. Valley's significance will be lost.	Future proposals by AGL would be the subject of separate future assessments and applications.
83	Heritage	Vale of Gloucester: heritage recognised by National Trust of Australia (NSW) in 1975 but entry was not finalised before register abolished in 2004.	This is noted in Chapter 18 of the EA.
84	Heritage	Gloucester Valley - heritage significance at local, state and national levels for historical, aesthetic, social and technical/research reasons. AGL have only mentioned heritage value - fail to acknowledge aesthetic significance.	The aesthetic significance of the Vale is discussed in Chapter 18 of the EA. Further discussion is provided in **Section 3.9** of the Submissions Report.
85	Socio-	EA does not assess economic impact on tourism industry and land values	Economic impacts on the tourism industry were assessed in Chapter 20 of

Issue #	Category	Issue	Response
	Economics	within the area.	the EA. Further discussion is provided in **Section 3.9** of this Submissions Report.
86	Heritage	EA does not assess impact of development on valley's cultural heritage, including vistas, despite this being a DGR.	The EA includes a full Heritage Assessment (Appendix K of the EA). The heritage assessment includes assessment of the Vale of Gloucester which is also assessed in the Visual Impacts chapter of the EA (Chapter 18). As such, the EA addresses the Director-General's Environmental Assessment Requirements. In recognition of the concerns raised over visual issues, further discussion has been provided in Section 3.9 of the Submissions Report.
87	Cumulative Impacts	Full and proper assessment of cumulative impacts is critical.	The issues relating to cumulative impacts are addressed in Section 24 of the EA.
88	Socio-Economics	AGL Gas will reduce agricultural production due to land lost due to gas wells and infrastructure due to potential air/water quality, dust, noise and loss of rural Gloucester township.	Agricultural use in the area is in the form of grazing. AGL has, and continues to consult with landowners on whose land project infrastructure would be located. Utilising the locational principles for siting a project infrastructure, including well sites, combined with consultation with landowners, AGL will aim to locate wells to minimise impact to landowners where possible. Refer to **3.7.1** of the Submissions Report in relation to impacts on agricultural land use, and Submission 5/66 Issue 43.in relation to DoP's location guidelines for the location of coal seam gas wells.
89	Health	No studies done in NSW on possible affects of human health relating to people living in the vicinity of gas wells. A full thorough study should be carried out before any consideration is given to the proposal.	Methane gas leakage is discussed in **Section 3.4.1** of the Submissions Report. Potentially contaminated water is discussed in **Section 3.4.3, 3.1, 3.2** and **3.3** of the Submissions Report. Inhalation of particulates is discussed in **Section 3.4.1** of the Submissions Report.
90	Health	Gas wells are industrial sites and consideration should be given to classifying them as industrial chemical sites and should be controlled by relevant regulations.	The classification of gas wells is not relevant to the assessment of impacts which has been undertaken in accordance with the relevant legislation.
91	Health	CSG is a new industry and health and environmental affects have not been proven safe. Industry in Australia has not been around long enough to register problems in people/animals.	AGL has as strong track record in Australia's gas industry dating back over a decade to their continuing gas producing activities in Camden in Sydney's south west. In that time AGL

Issue #	Category	Issue	Response
			has not experience health impacts to humans or stock. **Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
92	Health	Information coming from other CSG areas is alarming. QLD Gas has problems with their evaporation pond, causing environmental problems.	Refer to response to Submission 20, Issue 78, and **Section 3.1.5** of the Submissions Report.
93	Health	Drill for Natural Gas Pollute Water - A. Lustgarten and ProPublica "As of 5th September 2009, the American EPA publicly acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours, with links to damaged kidney, immune systems and reproductive fluids."	**Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
94	Health	Clear evidence in America that cattle are dying after grazing close to CSM wells. Wildlife have developed cancer tumours after grazing and drinking around supposedly rehabilitated well sites.	Refer to Issues 91 - 93 above.
95	General	Gas mining cannot successfully co-exist with rural agricultural lands.	Refer to **3.7.1** of the Submissions Report.
96	Design	AGL needs to use extra pipe length to avoid bushland and water crossings by using more pip and right/left bends in their pipeline.	As described in Section 4.3.1 of the EA, the pipeline route was determined based on an initial study area, consisting of a 10 km wide corridor from Stratford to Hexham. This was refined utilising GIS and multi criteria analysis methods. Significant consideration was given to protected areas such as RAMSAR wetlands, National Parks and State Forests, and other protected areas, as well as a range of other constraints. This included realignment of the pipeline where necessary during and following ecological surveys being undertaken as part of the EA for the project.
97	Water Quality	AGL have failed to do a flood study or flood risk analysis and potential damage caused to gas wells or gas pipes. There should not be any gas wells on creeks/river banks. 40, 20 and 10 metre clearance from a river bank is unacceptable.	AGL would develop a Flood Management Plan which would incorporate a Flood Risk Analysis and Flood Management Procedure. The infrastructure that would be present in potentially flood prone areas is not anticipated to result in impacts to either the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Infrastructure that would be present in potentially flood prone areas is not
98	Water/Health	No gas wells should occur in the river flats and floodplain areas.	
99	Risk Assessment	What damage will the forces of natural flooding processes and trees coming down in creeks and rivers, have on	

Issue #	Category	Issue	Response
		gas wells connective pipes and pipe line?	anticipated to result in impacts to either the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Refer to **Section 3.1.3** of the Submissions Report.
100	Risk Assessment	What is the long term affect of continued flooding on creek/river pipeline and gas wells?	No long term impact is anticipated.
101	Waste	Once water has been 'processed' through desalination or other process (as per EA), waste sludge is left - highly toxic and no means of disposal.	A concentrated brine waste stream would be generated by the reverse osmosis treatment methodology. Disposal of this waste stream is discussed in **Section 3.1.4** of the Submissions Report.
102	Waste	Does desalination remove toxic chemicals and heavy metals or just remove the salt?	The desalination treatment process would be designed to treat the produced water to whatever standard is required, depending on final land use. This would include treatment of all contaminants of concern including heavy metals.
103	Waste	What are they going to do with the brine left over after processing water?	A concentrated brine waste stream would be generated by the reverse osmosis treatment methodology. Disposal of this waste stream is discussed in **Section 3.1.4**.
104	Noise	AGL underhandedly seeking to operate 24 hours/day, 7 days/week. Noise also produced from desalination plant, drilling/fraccing and diesel generators at each gas well hole through extraction of water.	Section 5.5.6 of the EA clearly states that hours of operation would be 24 hours per day, seven days per week.
105	Noise	Noise study is inadequate and needs to be redone properly.	The noise assessment was undertaken in accordance with DECCW guidelines. Further discussion of noise is provided in **Section 3.6** of this Submissions Report.
106	Noise	Noise has been assessed against raised background noise levels of Stratford Coal. Assessment does not fully address noise levels throughout stage 1 development area -low background noise away from coal mine area means noise will be far higher than assessed.	The project noise goals are based on existing noise levels measured throughout the Stage 1 GFDA, and as such incorporate existing noise emissions from the Stratford Colliery which would have contributed to existing background levels. The noise impact assessment considers the incremental noise impact the project is likely to have on the existing background noise levels in the area, and therefore provides an assessment of cumulative noise impacts.
107	Noise/Compensation	If community feels affected by noise, AGL Gas should be made to pay for independent monitoring and if it is proven that AGL are operating outside their guidelines, compensation should	AGL would implement all reasonable and feasible mitigation measures to ensure operational noise criteria are met.

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		be paid.	
108	Rehabilitation	Areas damaged by trenching can never be rehabilitated to their original state. Aquifers cannot be replaced. Core soils brought to surface could be toxic.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. Rehabilitation of watercourse crossings is described in **Section 3.1.2** of the Submissions Report. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report. Potential impacts to aquifers would be addressed as part of groundwater management, discussed in **Section 3.2** of the Submissions Report.
109	Community Consultation	Community meetings have been poorly advised, questions were frequently stifled, meetings were staged and managed, difficult questions were not answered.	Community drop sessions were advertised in the Gloucester Advocate, Dungog Chronicle, Maitland Mercury, and Port Stephens Examiner. The advertisements were placed at least two weeks in advance and were advertised over a two week period. This is considered to be adequate.
110	Community Consultation	Meetings were not properly or continually advertised in towns, issues raise were avoided or referred back to the EA.	Refer to Issue 109 above.
111	Community Consultation	Drop in meetings were poorly advertised.	Refer to Issue 109 above.
112	Community Consultation	AGL has not given community a decent length of time for people to understand ramifications of having AGL Gas conduct business in valley.	Community consultation has been ongoing since 2008. Consultation is discussed in **Section 3.11** of this Submissions Report.
113	Community Consultation	Project covers six shires - could have been more meetings for people to understand what was fully involved.	The level of consultation undertaken is considered to be adequate. Consultation was focussed on the areas of greatest impact – primarily Gloucester LGA.

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			Landowners directly impacted by the pipeline in other LGAs were consulted with directly by AGL. Consultation is discussed in **Section 3.11** of this Submissions Report.
114	Community Consultation	AGL did not provide meetings for people in Council shires of Dungog, Maitland, Port Stephens and Newcastle.	Community consultation program primarily focussed on the Gloucester LGA as over half of the Concept Area, the Stage 1 GFDA and a portion of the proposed pipeline corridor are located within this LGA. The proposed pipeline corridor also travels through the Great Lakes LGA, Dungog LGA, Port Stephens LGA, Maitland LGA and Newcastle LGA. Each of these LGAs were consulted by the Proponent as key Local Government agencies, and the LGAs of Gloucester, Dungog, the Great Lakes and Port Stephens were also involved in the Community Consultative Committee (CCC). Five drop in sessions were held during the preparation of the EA in September/October 2008 and a further four drop in session during the EA exhibition period. Consultation is discussed in **Section 3.11** of this Submissions Report.
115	Fraccing	Heavy metals and sulphur contaminated rock from coal seam from fraccing brought to surface will cause major environmental problems if exposed to water, rain water-causing runoff or dumped near creeks or rivers.	Management of drill cuttings is discussed in Section 5.4.3 of the EA. Drill cuttings would either be stored in tanks and disposed off site, or buried at sufficient depth within the construction footprint of the well.
116	General	Gas extraction is anything but 'the new alternative to coal'. Methane gas should never be mined and is anything but 'green'.	The extraction of coal seam gas to support power generation in NSW is in accordance with climate change and greenhouse emission initiatives of the NSW Government.
117	Health/Socioeconomics	Too many direct impacts that AGL Gas will inflict on people, air, water, environment, wildlife and socioeconomics and is too risky.	Refer to response to Submission 5, Issue 23. In addition, refer to Section 3.3 and 3.11 of the Submissions Report in relation to wildlife and socio-economic issues.
Submission 138 **RIVERS SOS**			
1	Environmental Degradation	Rivers SOS disagrees with AGL's statement that this EA will cause 'minimal, insignificant or unlikely impact/s'.	Noted.

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2	Ground Water/Surface Water	Demand for full and independent ground water study is conducted of aquifers, creeks and rivers in valley area.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
3	Ground Water	Objection to AGL's proposal to dewater aquifers through fraccing process and removal of aquifers to release methane gas.	Noted.
4	Ground Water	Urge government to 'protect all aquifers'. If approval is given, dewatering of aquifers must be metered and AGL must pay for aquifer water removed. AGL should be charged for any bores sunk and all potable water pumped.	Appropriate groundwater/bore licences would be sought for each well through NOW prior to drilling. Metering would occur via the SCADA system and reporting would be as per licence requirements.
5	Compensation	Environmental Bond must be in place as part of conditions of approval. Money must be 'Held in Trust by the Custodian' as part of AGL Gas' 'Compensation to the Environment'.	Refer to Submission 127, Issues 74 and 75.
6	Ground Water/Surface Water	Pipeline crosses RAMSAR wetlands, creeks trenched, diverted and bored rivers - all unacceptable.	Refer to **Section 3.1** of the Submissions Report for discussion on construction environmental management and downstream impacts on waterways.
7	Terrestrial Ecology	Pipeline crosses sensitive areas of bushland of wildlife habitat and a 100m/30m ROW is very damaging and must not proceed.	The area of disturbance along the pipeline would be limited to a width of up to 30 m. Refer to **Section 3.3 .1** of the Submissions Report. As described in Section 4.3.1 of the EA, the pipeline route was determined based on an initial study area, consisting of a 10 km wide corridor from Stratford to Hexham. This was refined utilising GIS and multi criteria analysis methods. Significant consideration was given to protected areas such as RAMSAR wetlands, National Parks and State Forests, and other protected areas, as well as a range of other constraints. This included realignment of the pipeline where necessary during and following ecological surveys being undertaken as part of the EA for the project.
8	Aquatic Ecology/Surface Water	Trenching/diverting and boring natural waterways will increase turbidity, erosion and sedimentation of surface waters and make a direct impact on	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for

Issue #	Category	Issue	Response
		stream aquatic vegetation and aquatic species, e.g. fish, platypus and insects (as quoted in EA vol. 1 pgs. 12-20).	sediment and erosion control as well as rehabilitation practices. Rehabilitation of watercourse crossings is described in Section 3.1.2 of the Submissions Report. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report.
9	EA Process	Adequate study has not been done of AGL's proposal from Barrington to Hexham and what impacts will be caused to people and the environment.	The EA was undertaken in accordance with the Environmental Assessment Requirements (EARs) for the project. Further information has been provided here where there have been specific queries raised.
10	Specific Inquiry	Request for Government protection for valley basin, under threat from AGL Gas mining.	Noted.
11	Ground Water/Surface Water	Rivers SOS has informed the 44 groups who believe creek and river discharge should never happen. Rivers SOS Alliance requests a 1km Protection Zone around natural water-sources and that legislation must stipulate 'No Creek or River Discharge' from mining operations at any time.	Discharge to waterways would be governed by an Environment Protection Licence. While project approval may be given for discharge as part of the project, it would be contingent on the completion of appropriate management plans
12	Surface Water	Call on government to stop AGL from irrigating on river flats, flood plains, tributaries of the Karuah River system, whether the water is treated or not.	Refer to Issue 11 above.
13	Surface Water	In section 120 of the PEOA Act it states that : It is illegal to pollute or cause or permit pollution of waters. A person who pollutes any water is guilty of an offence.' Therefore, Rivers SOS expects 'No creek or river discharge', as implemented by Duralie Coal, is implemented for AGL Gas.	If approved, the project would be undertaken in accordance with the conditions of project approval. The project would be subject to an Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
14	Ground Water	Gloucester, Williams, Karuah and Hunter Rivers are all to be 'bored	Where HDD is proposed, the crossing would be designed to avoid direct and

Issue #	Category	Issue	Response
		under' diverting hundreds of creeks to be trenched/diverted according to EA. Impacts of pipelines on creeks and river crossings are too great, and project that destroys wildlife corridors and displaces animals should not proceed.	indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report.
15	Surface Water	There has been a collection of 4312 signatures from general public who do not want any discharge into rivers and creeks. Signatures were collected to stop Duralie Coal from having their 'No River Discharge' Condition of Consent removed. This petition is relevant to AGL not discharging into same Karuah Catchment area.	Refer to Issue 11 above.
16	Surface Water	No Creek or River discharge must be enforced as government legislation to protect river systems.	Refer to Issue 11 above.
17	Health/Surface Water	AGL may treat the water and then remix it with untreated water. Concern that any water from below ground brought to the surface, treated or not, will have trace elements associated with coal deposits, including fraccing fluid.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
18	Waste	EA specifies that salt will be produced. If unable to find a buyer for salts they will put it into landfill. This is completely unacceptable and will cause huge environmental damage in short term and years to come. QLD Gas is having problems with their evaporation ponds and salt is causing environmental damage.	If salt is disposed in landfill, a waste management facility appropriately licensed by the DECCW would be utilised.
19	Waste/ Surface Water/ Health	EA proposes holding dams in valley for eco-toxic waste-water. Concern that dams will overflow taking toxic water into creeks and rivers. Heavy metals, sulphur salts and methane gas have escaped into water around the state - aquatic ecosystems and fish are killed - colour and quality of water source is permanently affected.	All storage facilities including storage ponds for produced and treated water and evaporation ponds would be constructed in accordance with relevant standards and would contain appropriate freeboard capacity to allow for high rainfall events. Refer to **Section 3.1.3** of the Submissions Report for further discussion.
20	Waste	AGL Gas must be required to contain all waste water on site, preventing discharge to local waterways.	Waste water would be contained on site prior to disposal in a accordance with conditions of project approval and Environment Protection Licence A discussion of produced water management methods is provided in **Section 3.1.4** of the Submissions

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			Report.
21	Health/ Surface Water	Already environmental concern with this process as evaporation methods have failed elsewhere in the country and in USA with dreadful consequences.	A discussion of produced water management methods is provided in **Section 3.1.4** of the Submissions Report.
22	Terrestrial Ecology	Dams are already constructed but must be fenced and bird-netted, minimising danger to wildlife. Must be done immediately.	The existing storage ponds which operate as part of the Stratford Pilot Project are fenced with four strands of barbed wire with netlock mesh wire also secured to prevent wildlife from entering the storage pond area. This is mainly as a precautionary measure to prevent animals slipping into the storage pond due to the plastic liner and drowning. Rope ladders are set in place down the storage pond wall to allow wildlife to escape if an animal did manage to slip into the pond.
23	Transparency	NSW Government should monitor and test water quality in holding dams and make results public knowledge. Concern about brine leftover from proposed treatment of water.	Disposal of the concentrated brine waste stream is discussed in **Section 3.1.4** of the Submissions Report.
24	Waste	Gas plant will alter rural valley. Chemical residue will remain in water and soil and production will visually alter valley through hundred of gas wells, waste water holding plants and CPFs.	Refer to response to Submission 127, Issue 77
25	Air Quality	Development will cause air and water pollution.	Chapter 9 and Chapter 12 of the EA address potential air quality and water quality impacts respectively.
26	Water Quality	Fraccing process contaminates aquifers, Methane Gas escapes into creeks.	Potential risks associated with escape of methane gas were assessed in Chapter 15 and Volume 3 Appendix I of the EA. Further discussion is provided in **Section 3.4.1** of the Submissions Report.
27	Socio-economic	Spoil valley basin and affect tourism and leisure activities.	Refer to **Sections 3.8** and **3.9** of the Submissions Report.
28	EA Process	Using Precautionary Principle this project cannot proceed any further.	The Precautionary Principle addressed in Section 28.3.1 of the EA.
29	Surface Water	Alarming concern for gas wells that are 40m off rivers to 10m off creeks. Due to high rainfall in valley, these creeks and rivers flood regularly and having gas wells or ground cracked close to natural water sources is catastrophic.	During detailed design, AGL would develop a Flood Management Plan which would incorporate a Flood Risk Analysis and Flood Management Procedure. It is noted, however that the infrastructure that would be present in potentially flood prone areas is not anticipated to result in impacts to either

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			the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Refer to **Section 3.1.3** of the Submissions Report.
30	Specific Request	Request that it is not approved as too many variables and unknown factors. Rivers SOS is comprised of communities around NSW who can draw first had experience from other gas extraction impacts in other areas.	The Project has been assessed in accordance with Environmental Assessment Requirements issued by the DoP.
31	General	Rich grazing land of Gloucester Valley is of more long term value to people of NSW than if destroyed through mining or discharge.	Impacts to agricultural land are assessed in Chapter 11 of the EA, and discussed in **Section 3.7** of the Submissions Report.
139 The Gloucester Project Inc.			
1	Ground Water	Doubt that steel and concrete liners used in bores could withstand seismic shifts. AGL should guarantee to research and install new technology as it becomes available to secure bores and well heads in the event of failure.	Noted. AGL is currently undertaking 2D and 3D seismic surveys to further understand the seismic characteristics of the area including location of faults. Well sites would be located away from these areas to minimise impacts of seismic shifts.
2	Geology / Ground Water	Publicised failures of well head shut down is of concern. Sensors capable of detecting seismic shifts should be installed adjacent to well heads with alarms being monitored 24/7.	There will be no seismic monitors with shut down settings next to wells. If there is a break in the pipework caused by seismic shift, a low pressure switch will activate and positively seal the well by closing the shutdown valve.
3	Ground Water	Need to monitor any changes in aquifer levels and quality as it cannot be assured that coal bed water and sub surface aquifers are separate.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
4	Ground Water	AGL should install sensors to monitor the relationship between sub-surface aquifers and coal bed water. Sensors should test pressure variations and the presence of contamination or intermixing.	Refer to Issue 3 above.
5	Ground Water	AGL must ensure that no contaminating or hazardous substances are used during the drilling and fraccing processes. Only environmentally safe materials should be used in drilling and fraccing.	If approved, the project, including substances used in the fraccing and drilling process, would be undertaken in accordance with the conditions of project approval. The project would be subject to an Environment Protection Licence

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			issued by DECCW under the Protection of the Environment Operation Act 1997. Refer to **Section 3.4.3** of the Submissions Report for further discussion on fraccing fluids.
6	Ground Water	The composition of the materials used in drilling and fraccing should be available to the CCC and to water management authorities.	Discussion in relation to the composition of fraccing fluids is provided in **Section 3.4.3** of the Submissions Report.
7	Ground Water	Constant downstream monitors should be installed to detect any inappropriate effects on downstream water, both at surface and aquifer level.	Surface and groundwater monitoring programs would be established as required in accordance with an Irrigation Drainage Management Plan (refer **Section 3.1.4** of the Submissions Report) and Groundwater Management Plan (**Section 3.2** of the Submissions Report).
8	Waste	Potential downwind contamination from dried margins of evaporation dams.	The evaporation ponds at the CPF would be managed in accordance with an Operational Environmental Management Plan (OEMP). AGL would implement mitigation measures to minimise the potential for the ponds to generate dust, if required.
9	Waste	The disposal of toxic residue from water purification needs further consideration. A comprehensive and transparent program should be developed to guarantee the safe disposal of residues from the water purification processes.	Disposal of the concentrated brine waste stream is discussed in **Section 3.1.4** of the Submissions Report.
10	Waste	Where evaporation dams are to be used, measures such as automatic washing sprays to prevent deposits on the dam margins should be installed.	The evaporation ponds at the CPF would be managed in accordance with an Operational Environmental Management Plan (OEMP). AGL would implement mitigation measures minimise the potential for the ponds to generate dust, if required.
11	Waste	Where there is surface exposure of potential contaminants, sensors should be maintained to detect any transfer of contaminants to neighbouring areas by wind or water.	
12	Waste	Concern that the volume of waste water will exceed local absorption capacity unless additional steps are taken, and that over irrigation could lead to a lifting of the water table (potentially resulting in salination).	Irrigation of pastures and crops is a common practice of landholders within the region. Irrigation would be managed as per an Irrigation Drainage Management Plan and would occur opportunistically during favourable weather conditions and during the period when soil moisture deficit occurs, typically between July to January. Refer to **Section 3.1.4** of the Submissions Report for further discussion.

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13	Waste	AGL should explore (eg. revisiting The Gloucester Project's proposals for horticultural development) further measures for absorbing purified coal bed water in ways which also serve other community interests.	AGL would continue to investigate feasible options for reuse and disposal of produced water.
14	Waste	AGL should take steps to purify water to meet horticultural criteria.	All water would be treated to the criteria specified by DECCW in the conditions of consent and the Environment Protection Licence, which would be dependent on the final use of treated water.
15	Waste	AGL should consider co-operating with other agencies to research and develop wetland systems which can absorb suitably purified water, and which can have a positive effect on the quality of local streams.	Noted. Refer to section 3.1.4 of the submissions report noting that AGL will investigate the potential for wetland rehabilitation during detail design.
16	Ground Water / Waste	AGL should co-operate in a water quality monitoring program that is transparent and geared towards improving the quality of purified coal bed water. The systems for discharging purified coal bed water should be subject to transparent monitoring so as to provide early detection of the problems of transfer or build up of undesirable substances.	Water would be treated to the criteria specified by DECCW in the conditions of consent and the Environment Protection Licence, which would be dependent on the final use of treated water.
17	Traffic	Increased pressure on local roadways. The Government (along with financial contributions from the extraction industries-gas and coal) should complete a full upgrade of The Bucketts Way, including road widening, increasing passing lanes, surface improvement and an upgrade to heavy vehicle standards.	AGL intends to meet with relevant authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period..
Submission 142 **Ironstone Community Action Group**			
1	Health	Health effects in America can happen in Australia and the Methane Gas industry and our government should be slower to adopt this technology.	Refer to response to Submission 20, Issue 80
2	Health	Reports of failed evaporation dams in QLD, aquifers being drained in Broke NSW, alarming health reports from EPA of America	Refer to response to Submission 20, Issue 78 and 80
3	Specific Inquiry	Why is there no legislation to state how much of an area a mining company can take out in their application/exploration area, concept area, and have all proposed stages	Noted.

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		highlighted to the general public from the beginning?	
4	Specific Inquiry	Why is there no legislative requirement to limit a mining company to one Shire Council area at a time?	Noted.
5	Specific Inquiry	When will the Government stop mining companies using the terms 'minimal, insignificant or unlikely' when referring to their footprint, envelope, impacts (damage) caused to the environment and people's property?	Noted.
6	Specific Inquiry	Area of project is unacceptable - government should not pass such a large project.	Noted.
7	Surface Water/Waste	Petition to Government: 4312 signatures requesting Government to never approve river discharge in the Karuah catchment area. Duralie Coal has this Condition of Consent - the same is expected for AGL Gas.	All water would be treated to the criteria specified by DECCW in the conditions of consent and the Environment Protection Licence.
8	Surface Water	No Creek or River discharge must be Condition of Consent for AGL: no discharge via any creeks, rivers, billabongs, gullies or irrigating waste water whether treated or not on river flats, flood plains, gullies that naturally run into Gloucester River, Avon River, little Manning, Manning River Taree or Wards River running into Mammy Johnsons River and Karuah River to Port Stephens.	Discharge to waterways would be governed by an Environment Protection Licence. As noted above, while project approval may be given for discharge as part of the project, it would be contingent on the completion of appropriate management plans.
9	Transparency	Entire project should be approved instead of seeking to have different stages approved separately.	Noted.
10	Community Consultation	The six Shire Council areas have not had full public consultation as 4 of these areas were not provided with public meetings. People in Gloucester, Stratford, Wards River and Clarence town had limited 'drop-in meetings' where even people in those towns were unaware that AGL was in their hall for the meeting time 3-8pm.	Community drop in sessions were advertised in the Gloucester Advocate, Dungog Chronicle, Maitland Mercury, and Port Stephens Examiner. The advertisements were placed at least two weeks in advance and were advertised over a two week period. This is considered to be adequate. Community consultation program primarily focussed on the Gloucester LGA as over half of the Concept Area, the Stage 1 GFDA and a portion of the proposed pipeline corridor are located within this LGA. The proposed pipeline corridor also travels through the Great Lakes LGA, Dungog LGA, Port Stephens LGA, Maitland LGA and Newcastle LGA. Each of these LGAs were consulted by

Issue #	Category	Issue	Response
			the Proponent as key Local Government agencies, and the LGAs of Gloucester, Dungog, the Great Lakes and Port Stephens were also involved in the Community Consultative Committee (CCC). Refer to Submission 127, Issues 109 to 114, and **Section 3.11** of this Submissions Report.
11	Land Use	Depth of pipeline is of concern. Depending on property owners use of the land. If they plough fields, pipe is buried deeper, however if they don't plough, it is buried closer to surface.	The pipeline would be constructed in accordance with Australian Standard AS2885, which prescribes requirements for pipeline design, construction operation and maintenance. The depth of the pipeline would be in accordance with these requirements. Where possible, landowner preferences for depth of cover over the pipeline would be taken into consideration.
12	Land Use	Discrepancy does not provide for alternate future scenarios if crop planting occurs in areas where pipeline is buried close to surface.	Existing landowners have been consulted and agreements are in place. These agreements would identify the areas of land affected by the pipeline in which cropping/ploughing activities would be depth restricted. Refer to section 3.7.1 of the submissions report.
13	Land Use	Access agreements are involuntarily inflicted upon people. People do not choose to live in commercial/industrial area but in valley with clean air, country towns/villages, bushland and native animals, creeks and rivers.	Access arrangements would be made with landholders prior to construction and landowner considerations are taken into account.The proposed works would not result in a commercial/industrial land use, but would comply with the predominately rural zoning (1(a)) under LEP 2002 within the GDFA. Flexibility has been built into the Project to allow for potential land use issues to be accommodated in the final stages of design, construction and operation of the Project.
14	Ground Water	Barrington, Gloucester to Stroud, Booral to 12 Mile Creek Valley Basin is unique in natural beauty, high rainfall and rich rural grazing, due to aquifers, both deep and shallow. To approve the AGL project would authorise the removal of the valley with its natural abundant rich-growing land and natural creeks/rivers.	The Project is not anticipated to impact shallow aquifers. The productivity of the region would not be significantly impacted by the Project. Potential impacts to agricultural land uses are discussed in **Section 3.7** of the Submissions Report. Potential impacts to visual amenity are discussed in **Section 3.8** of the Submissions Report.
15	Ground Water	Request for full Ground Water study before any further work is carried out, or any further approval sought. There are so many unanswered questions on how this development will affect	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and

Issue #	Category	Issue	Response
		ground water area. Study needs to be done from Barrington to south of Booral.	development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
16	Environmental Degradation	The gas transmission pipe line would be 'destroying bushland, people's property, impacts on water/environment and wildlife habitat, is a massive impact and is not "minimal or insignificant" '.	The EA considered and assessed impacts on ecology, land use and water quality, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are considered to be able to be managed to an acceptable level.
17	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3.1** of the Submissions Report.
18	Ground Water/ Surface Water	Trenching will increase turbidity, erosion and sedimentation of surface waters and permanent alteration to natural appearances of creeks and/or rivers.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. Rehabilitation of watercourse crossings is described in Section 3.1.2. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report.
19	Ground Water/ Surface Water	Cementing of bedrock in creeks/rivers is AGL's solution, yet impact will be immediate.	Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be

Issue #	Category	Issue	Response
			designed to avoid direct and indirect impacts to the watercourse.
20	Water Quality/ Land Use/ Terrestrial Ecology	Objection to AGL Gas trenching 187 creeks between Stratford and Hexham and boring under Karuah River, Williams River and Hunter River. Creeks and rivers will be crossed 3-6 times in some place with a 100m clearance around pipeline, through bushland, people's properties, damage done to wildlife corridors, displacement of wildlife, potential death.	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3.1** of the Submissions Report.
21	Terrestrial Ecology	Who checks each tree for wildlife in the pipe line corridor through bushland before felling of trees starts?	Pre-clearance surveys were a recommendation of the Ecology Assessment for specific species, and would be carried out by a qualified ecologist.
22	Terrestrial Ecology	Where will animals be placed when homes of wildlife are destroyed? It's not as easy as putting a possum up another tree 100m away - they will be displaced causing stress and/or death as wildlife need time to rebuild.	While specific management measures would be put in place via the management plans in the CEMP, it was also a recommendation of the EA that: *Authorised wildlife rescuers should be on hand to rescue and relocate fauna disaffected, disoriented or displaced by vegetation clearing and excavation of the trench.* These types of measures would be included in the formal management plans.
23	Water Quality/Aquatic Ecology	50 of the creeks to be trenched are between villages of Craven and Stroud Road in 20/30km stretch and flow into Wards River, Mammy Johnsons River and the Karuah River.	Impacts to waterways during construction would be managed through the preparation of a Construction Environmental Management Plan, which would include an Erosion and Sediment Control Plan and Soil and Water Management Plan as described in Volume 1 Chapter 25 of the EA. Further discussion on construction environmental management and downstream impacts on waterways and management of produced water is discussed in **Section 3.1** of the Submissions Report. Refer to Issue 23 to 27 of submission 127.
24	Surface Water	Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol. ? Pages 12-20).	Impacts to waterways during construction would be managed through the preparation of a Construction Environmental Management Plan, which would include an Erosion and Sediment Control Plan and Soil and Water Management Plan as described in

Issue #	Category	Issue	Response
			Volume 1 Chapter 25 of the EA. Further discussion on construction environmental management and downstream impacts on waterways is provided in **Section 3.1**, and management of produced water is discussed in **Section 3.2**.
25	Community Consultation	Environmental damage has not been measured through independent companies, it has been conducted through people employed by AGL Gas. The amount of damage done to natural water resources cannot be measured through their assumption and feasibility studies.	AECOM is an independent company commissioned to undertake the preparation of the EA. Notwithstanding, DOP, DECCW and other agencies provide independent review and assessment of the documentation
26	Land Use	Maps in EA show that AGL do not follow road first but cut through and around peoples rural land and bushland, which is totally unacceptable.	The pipeline route has been designed based on a variety of factors including safety, constructability, avoidance or minimisation of environmental damage and also routes which are least inconvenient or most advantageous to landowners.
27	Land Use	High pressure gas pipe to Hexham from proposed processing facility at either Site 1 or 7 or more central processing facilities will be needed further south. CPFs will end up throughout their exploration area.	Further CPFs are not required and are not part of this Project Application.
28	Community Consultation	Community meetings have been poorly advised, questions were frequently stifled, meetings were staged and managed, difficult questions were not answered.	Community drop sessions were advertised in the Gloucester Advocate, Dungog Chronicle, Maitland Mercury, and Port Stephens Examiner. The advertisements were placed at least two weeks in advance and were advertised over a two week period. This is considered to be adequate. Refer to Submission 127 Issue 109 to 114, and **Section 3.11** of this Submissions Report.
29	Community Consultation	Meetings were not properly or continually advertised in towns, issues raise were avoided or referred back to the EA.	
30	Landowners Rights	People told AGL and Ian Shaw to go away though he returned.	Noted.
31	Landowners Rights	Rights of people have been taken away. Right to live in a clean environment, drink clean water and breathe clean air.	Noted.
32	Environmental Degradation	AGL will turn the valley into a gas wasteland.	Refer to **Section 3.7** and **3.8** of the Submissions Report for a discussion on impacts to agricultural land use and visual amenity resulting from the Project.
33	Compensation	Compensation needs to occur for loss of land, peace and enjoyment, towns removed etc above market value	Negotiations with landowners whose property supported project infrastructure would be in accordance with agreements

Issue #	Category	Issue	Response
		before mine moved into area.	negotiated between the landowner and AGL.
34	Surface Water	AGL must have as one of their Conditions of Consent, absolutely 'No Creek or River Discharge'.	Refer to Submission 127 Issue 49, and **Section 3.1.4** of the Submissions Report which discusses produced water management.
35	Surface Water	Whether the water is treated or not through the various listed methods in their E.A. is unacceptable (Vol. 1, pgs. 4-7)	Refer to Submission 127 Issue 50, and **Section 3.1.4** of the Submissions Report which discusses produced water management.
36		In section 120 of the POEO Act it states that : It is illegal to pollute or cause or permit pollution of waters. A person who pollutes any water is guilty of an offence.'	If approved, the project would be undertaken in accordance with the conditions of project approval. The project would be subject to an Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
37	Surface Water	Strong objection to any wastewater being discharged off site in to the local waterways and/or creeks, rivers.	Refer to **Section 3.1.4** of the Submissions Report which discusses produced water management.
38		Demand for Protection of River Flats and Flood Plains, adopting a "No Irrigation or waste-water treated or not, via any method as a Condition of Consent" ' including a '1km Protection Zone for every soak/swamp, billabong wetlands, creeks, rivers and any natural water sources etc.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
39		Reinjection of water after fraccing into aquifers seems to pose environmental problem and consequences. Environmental damage needs to be measured through independent company.	Aquifer re-injection as an alternative produced water management option was considered in Section 4 of the EA however is not proposed as part of the project.
40	Surface Water	AGL Gas must be required to contain all waste-water on site, preventing any discharge to local waterways, Creeks and Rivers, minimising any impact and preventing the quality of the natural water sources from being degraded and altered'.	No water would be discharged to waterways unless an Environment Protection Licence has been granted.
41	Surface Water	Environmental measures must be undertaken to identify any possible adverse effects on all water supply sources of surrounding/downstream landholders and implement mitigation measures as necessary'.	Refer to Issue 38 above.
42	General	'To not proceed with AGL Gas's	Noted.

Issue #	Category	Issue	Response
		proposal is the best option for the environment, waterways and The Bucketts Way Valley to Hexham.'	
43	Society/Health	'Farming, tourism and health of people can only exist without Gas mining'.	Impacts to agricultural land, tourism and health are discussed in **Sections 3.7**, **3.8** and **3.4** of the Submissions Report, respectively. The EA has demonstrated that potential impacts can be managed such that CSG extraction can co-exist with existing land uses without significant impacts.
44	Ground Water	An independent study of the Ground Water System (Aquifers) in the entire Gloucester Basin to Isaacs Road Booral, must be carried out to determine the cumulative impact on this ground water from the extraction of gas, before any approval is even considered, for AGL Gas to proceed further than they already have under the 'Exploration Licence of sinking wells'.	Refer to **Section 3.2** of the Submissions Report.
45	Ground Water	Objection to dewatering the aquifers in order to draw methane gas out	Noted.
46	Ground Water	Dewatering of aquifers should be metered - AGL Gas be charged for potable water, commercial bores sunk, water extracted in exploration and production and damage done to aquifers.	Appropriate groundwater/bore licences would be sought for each well through NOW prior to drilling. Metering would occur via the SCADA system and reporting would be as per licence requirements.
47	Ground Water	No regulations/guidelines have been set for re-injection of water containing toxic fraccing chemicals that would be pumped back into the aquifers.	Aquifer re-injection as an alternative produced water management option was considered in Section 4 of the EA however is not proposed as part of the project.
48	Ground Water	What is AGL's projection of when they expect the aquifers to naturally recharge?	Refer to Submission 127 Issue 59 and **Section 3.2** of this Submissions Report.
49	Ground Water	How does AGL Gas propose to deal with ground subsidence caused by dewatering and gas extraction?	As no coal is removed other than through the drilling of the well, ground subsidence is not expected to occur.
50	Ground Water	What time frame are they going to accept responsibility for resulting damages 'drilling/fraccing etc.' where the environmental impacts of shallow, alluvial deep bedrock aquifers are altered immediately? (Vol 1. pgs 13-1)	Refer to Submission 127 Issue 61 and **Section 3.2** of this Submissions Report.
51	Ground Water	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels of composition.	The water quality is poorest in the deep coal seam aquifers being developed for CSG, and pumping is not expected to degrade water quality or influence the

Issue #	Category	Issue	Response
			shallower aquifers. Refer to Submission 127 Issue 62 and **Section 3.2** of this Submissions Report.
52	Ground Water	Damage to aquifers cannot be reversed.	Noted.
53	Rehabilitation	Offsetting other tracks of land to replace land destroyed is unacceptable.	Noted.
54	Precautionary Principle	Request that Government apply this concept as anything AGL will do will impact on environment and have significant, serious and irreversible environmental harm.	Noted.
55	Fraccing	Drawing water from rivers and local aquifers for fraccing could lead to depletion of Ground Water.	Water would not be sourced from rivers and beneficial aquifers for fraccing.
56	Fraccing	Injecting waste water back into underground aquifers, mixed with fraccing chemicals is environmentally damaging.	Aquifer re-injection as an alternative produced water management option was considered in Section 4 of the EA however is not proposed as part of the project.
57	Fraccing	Chemical composition of fraccing fluid is highly toxic.	The composition of fraccing fluid is discussed in **Section 3.4.3** of the Submissions Report.
58	Fraccing	Treatment of used fraccing chemicals is only partial and /or unproven and there's no place to dispose of these chemicals.	Water treatment is discussed in **Section 3.1.4** of the Submissions Report.
59	Fraccing	Disposal of fraccing fluids into natural water bodies can poison aquatic ecosystems	No water would be disposed to waterways without an Environment Protection Licence. The terms of that EPL would include specific criteria to be met prior to discharge and so all water discharged at that point would need to comply.
60	Fraccing	Toxic fraccing chemicals mixed with water, 'treated or not' in dams is unacceptable. Dams will fill up and overflow due to high coastal rainfall, despite AGL's justification that capacity would be found in farm dams located in areas without significant catchment'.	All storage facilities including storage ponds from produced and treated water and evaporation ponds would be constructed in accordance with relevant standards and would contain appropriate freeboard capacity to allow for high rainfall events.
61	Fraccing	Where are the farms located as stated in the section Treated Water Management? (Vol. 1, pgs. 4-8)	Utilisation of existing storage dams on farms to store treated water have not yet been determined or negotiated with landowners who may be interested in receiving water.
62	Fraccing	Where will AGL draw the copious amounts of water from, required for	The fraccing process is described in Section 5.4.6 and 5.4.7 of the EA.

Issue #	Category	Issue	Response
		fraccing/drilling gas wells?	Currently AGL obtains agreement from local landowners to purchase dam water from their property. Produced water stored in one of the produced water storage ponds would eventually be utilised, or if required, water would be sourced from licensed stand pipes or other approved sources.
63	Fraccing	Where do AGL source their fraccing/drilling fluids from and who are the distributors?	Fraccing fluids are sourced by specialised contractors engaged to undertake fraccing activities.
64	Fraccing	What is the precise composition of fraccing fluid or is it a trade secret?	The composition and quantity of fraccing fluid used is discussed in **Section 3.4.3** of the Submission Report.
65	Fraccing	How much fraccing fluid is used in each well?	Refer to Issue 64 above.
66	Fraccing	What method of disposal is used for the highly toxic fraccing fluid?	Refer to Submission 127, Issue 72 and **Section 3.4.3** of the Submission Report.
67	Land Use	Why the need for a 100m wide pipeline corridor to Hexham?	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3.1** of the Submissions Report.
68	Compensation	Does AGL gas have an 'Environmental Bond' in place and what is the exact amount of this Bond? If not, why not?	All exploration works have been approved with DII and each approval has a security bond to be paid by AGL as part of the approval.
69		Environmental bond to be adopted before AGL work commences. Bond to be held by independent custodian. Community will then have finances should they experience health affects and opportunity to repair environment. Deposits to be made throughout the year covering 'immediate, short and long-term environmental damage and health effects of people/animals associated with gas mining report by LB Clarke NSW National Parks and Wildlife Service, 2001).	Refer to Submission 127, Issue 74.
70	Compensation /Health	Environmental bond would be transferable should AGL sell their exploration/mining licence. Said company must continue to pay bond. Bond accessible by environmental groups and land owners affected in the Valley, until the people say it's in a clean, safe and better state.	Refer to Submission 127, Issue 75.
71	Air/Water	Gas mine will produce air and water	Air emissions were assessed in Chapter

Issue #	Category	Issue	Response
	Quality	pollution due to methane gas escaping during drilling/fraccing process while boring the gas wells near creeks/rivers.	9 and Appendix of the EA. An addendum to the air quality assessment is provided in **Appendix A** of this report. Pollutant emissions are predicted to be below relevant criteria set by DECCW. Water quality is addressed in Chapter 11 of the EA and discussed further in **Section 3.1** of this Submissions Report.
72	Visual Impacts	Gas mine will destroy aesthetics of a beautiful valley, creating visual alteration of the landscape, destroy tourism are forever turning area into industrial chemical mining area.	Refer to Issue 43.
73	Water Quality	Damage will be caused by trenching and diverting creeks and boring under rivers. Act of laying gas pipe causes some waterways to be crossed 4-6 times each.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. Rehabilitation of watercourse crossings is described in Section 3.1.2. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report.
74		Cementing of bedrock in creeks/rivers is AGL's solution, yet impact will be immediate.	Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse.
75	Water Quality	How then, can AGL justify that there 'will be insignificant or minimal damage to creeks/rivers etc.'?	Refer to Submission 127, Issue 33 and response 73 above
76	Heritage	Heritage has been downgraded to a low priority despite it being identified in the DGRs. AGL failed to assess significance of Vale of Gloucester by	Refer to Submission 127, Issue 79.

Issue #	Category	Issue	Response
		dismissing it as being irrelevant.	
77	Heritage	This will impact forever on Gloucester Stroud Valley and the Bucketts Way Tourist Country Drive Experience.	Refer to Submission 127, Issue 80.
78	Heritage	Valley's heritage significance through its scenic qualities is of highest importance. Historical towns of Stroud and Booral may be affected.	Refer to Submission 127, Issue 81.
79	Heritage	Assessment is currently inadequate, therefore will continue to be eroded by successive stages of AGL development, as it will continue to be assessed to this standard. Valley's significance will be lost.	Refer to Submission 127, Issue 82.
80	Heritage	Vale of Gloucester: heritage recognised by National Trust of Australia (NSW) in 1975 but entry was not finalised before register abolished in 2004.	This is noted in Chapter 18 of the EA.
81	Heritage	Gloucester Valley - heritage significance at local, state and national levels for historical, aesthetic, social and technical/research reasons. AGL have only mentioned heritage value - fail to acknowledge aesthetic significance.	Refer to Submission 127, Issue 84.
82	Socio-Economics	EA does not assess economic impact on tourism industry and land values within the area.	Refer to Submission 127, Issue 85.
83	Heritage	EA does not assess impact of development on valley's cultural heritage, including vistas, despite this being a DGR.	Refer to Submission 127, Issue 86.
84	Cumulative Impacts	Full and proper assessment of cumulative impacts is critical.	Refer to Submission 127, Issue 87
85		AGL Gas will reduce agricultural production due to land lost due to gas wells and infrastructure due to potential air/water quality, dust, noise and loss of rural Gloucester township.	Refer to Submission 127, Issue 88.
86	Water Quality	Trenching and diverting creeks and boring under rivers damages natural water bodies permanently despite AGL stating bedrock would be cemented back after trenching.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. Rehabilitation of watercourse crossings is described in Section 3.1.2. These measures would be dependent on site characteristics such as soil stability, existing vegetation and water flow, and identified in a site

Issue #	Category	Issue	Response
			specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1**.
87	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3 .1**..
88	Water Quality/Land Use/Terrestrial Ecology	Objection to AGL Gas trenching 187 creeks between Stratford and Hexham and boring under Karuah River, Williams River and Hunter River. Creeks and rivers will be crossed 3-6 times in some place with a 100m clearance around pipeline, through bushland, people's properties, damage done to wildlife corridors, displacement of wildlife, potential death.	Noted.
89	Terrestrial Ecology	Who checks each tree for wildlife in the pipe line corridor through bushland before felling of trees starts?	Pre-clearance surveys were a recommendation of the Ecology Assessment for specific species, and would be carried out by a qualified ecologist.
90	Water Quality/Aquatic Ecology	50 of the creeks to be trenched are between villages of Craven and Stroud Road in 20/30km stretch and flow into Wards River, Mammy Johnsons River and the Karuah River. Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol. ? Pages 12-20).	Impacts to waterways during construction would be managed through the preparation of a Construction Environmental Management Plan, which would include an Erosion and Sediment Control Plan and Soil and Water Management Plan as described in Volume 1 Chapter 25 of the EA. Further discussion on construction environmental management and downstream impacts on waterways and management of produced water is discussed in **Section 3.1** of the Submissions Report. Refer to Submission 127, Issue 23 to 27.
91	Community Consultation	Environmental damage has not been measured through independent	AECOM is an independent company commissioned to undertake the

Issue #	Category	Issue	Response
		companies, it has been conducted through people employed by AGL Gas. The amount of damage done to natural water resources cannot be measure through their assumption and feasibility studies.	preparation of the EA. Notwithstanding, DOP, DECCW and other agencies provide independent review and assessment of the documentation
92	Health	Trenching, boring techniques will degrade creeks, rivers, aquifers and swamps and will alter these forever - it is too late after work has commenced.	Refer to Issue 86 above.
93	Health	No studies done in NSW on possible affects of human health relating to people living in the vicinity of gas wells. A full thorough study should be carried out before any consideration is given to the proposal.	Methane gas leakage is discussed in **Section 3.4.1** of the Submissions Report. Potentially contaminated water is discussed in **Section 3.4.3, 3.1, 3.2** and **3.3** of the Submissions Report. Inhalation of particulates is discussed in **Section 3.4.1** of the Submissions Report.
94	Health	Gas wells are industrial sites and consideration should be given to classifying them as industrial chemical sites and should be controlled by relevant regulations.	The classification of gas wells is not relevant to the assessment of impacts which has been undertaken in accordance with the relevant legislation.
95	Health	CSG is a new industry and health and environmental affects have not been prove safe. Industry in Australia has not been around long enough to register problems in people/animals.	Refer to response to Submission 2, Issue 42 in relation to establishing exposure pathways that could represent health effects. AGL has as strong track record in Australia's gas industry dating back over a decade to their continuing gas producing activities in Camden in Sydney's south west. In that time AGL has not experience health impacts to humans and stock.
96	Health	Information coming from other CSG areas is alarming. QLD Gas has problems with their evaporation pond, causing environmental problems.	Refer to response to Submission 20, Issue 78, and **Section 3.1.5** of the Submissions Report.
97	Health	Drill for Natural Gas Pollute Water - A. Lustgarten and ProPublica "As of 5th September 2009, the American EPA publicly acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours, with links to damaged kidney, immune systems and reproductive fluids."	**Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
98	Health	Clear evidence in America that cattle are dying after grazing close to CSM wells. Wildlife have developed cancer tumours after grazing and drinking around supposedly rehabilitated well	AGL has as strong track record in Australia's gas industry dating back over a decade to their continuing gas producing activities in Camden in Sydney's south west. In that time AGL

Issue #	Category	Issue	Response
		sites.	has not experience health impacts to humans and stock,
99	Water Quality/Health	AGL have failed to do a flood study or flood risk analysis and potential damage caused to gas wells or gas pipes. There should not be any gas wells on creeks/river banks. 40, 20 and 10 metre clearance from a river bank is unacceptable.	Refer to Submission 127, Issues 97.
100	Water/Health	No gas wells should occur in the river flats and floodplain areas.	Refer to Submission 127, Issues 98.
101	Risk Assessment	What damage will the forces of natural flooding processes and trees coming down in creeks and rivers, have on gas wells connective pipes and pipe line?	Refer to Submission 127, Issues 99.
102	Risk Assessment	What is the long term affect of continued flooding on creek/river pipeline and gas wells?	Refer to Submission 127, Issue 100
103	Waste	Once water has been 'processed' through desalination or other process (as per EA), waste sludge is left - highly toxic and no means of disposal.	Refer to Submission 127, Issue 101.
104	Waste	Does desalination remove toxic chemicals and heavy metals or just remove the salt?	Refer to Submission 127, Issue 102.
105	Waste	What are they going to do with the brine left over after processing water?	Refer to Submission 127, Issue 103.
106	Rehabilitation	Areas damaged by trenching can never be rehabilitated to their original state. Aquifers cannot be replaced. Core soils brought to surface could be toxic.	Refer to Submission 127, Issue 108.
107	Fraccing	Heavy metals and sulphur contaminated rock from coal seam from fraccing brought to surface will cause major environmental problems if exposed to water, rain water-causing runoff or dumped near creeks or rivers.	Refer to Submission 127, Issue 115.

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6.0 Response to Individual Submissions

6.1 Overview

A total of 76 individual submissions and 49 form letter submission were received from the public including the local community. Responses to these submissions are provided in the following section. Where concerns have been previously addressed in Chapter 4 or 5, reference is made to the relevant submission and issue number.

6.2 Response to Submissions

Issue #	Category	Issue	Response
Community Submission 2			
1	Environmental Degradation	Destruction of bushland, people's property, impact on water/environment and wildlife habitat.	The EA has demonstrated that potential impacts can be managed such that the Project can be constructed and operated without significant impacts to biophyisical, social and economic environments.
2	Surface Water	A condition of consent should be 'no creek or river discharge' on high flow, medium flow etc. whether the water is treated or not. None of the listed treatment methods are acceptable.	Refer to Submission 127, Issue 49.
3	Statutory Planning	Section 120 of the POEO Act 1997 states that "it is illegal to pollute or cause or permit pollution of waters. A person who pollutes any water is guilty of an offence.'	Refer to Submission 142 Issue 36.
4	Surface Water	AGL must be required to contain all waste water on site. A consent condition to be imposed stating 'No irrigation of waste-water treated or not, via any method'. A 1km Protection Zone must be adopted for every natural water source.	If approved, the project would be undertaken in accordance with the conditions of project approval. The project would be subject to an Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
5	Surface Water	Protection of the environment should be guaranteed by no drilling/fraccing of aquifers and not discharging anything into any aquifers or waterways.	See response to issue 4 above
6	Surface Water	Need to identify any possible adverse effects on all water supply sources of surrounding/downstream landholders and implement mitigation measures as required.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
7	Surface Water	To not proceed with the proposal is the best option for the environment and waterways	Refer to Issue 1.

Issue #	Category	Issue	Response
		to Hexham.	
8	Ground Water	Request an independent ground water study to be conducted in the entire Gloucester Basin to Isaac Road Booral, before approval is considered.	Refer to Submission 127 Issue 55.
9	Ground Water	Objection to dewatering of aquifers/groundwater through drilling and fraccing.	Noted.
10	Ground Water	If approved, dewatering of aquifers should be metered and AGL should pay charges for purchases of potable water, for any commercial bores sunk, for water extracted in exploration and production stages, and for damage to aquifers.	Refer to Submission 127 Issue 57.
11	Ground Water	Regulations and guidelines for the re-injection of water containing toxic fraccing chemicals to be pumped into aquifers must be set.	Refer to Submission 127 Issue 66.
12	Ground Water	When are the aquifers expected to naturally recharge?	Refer to Submission 127 Issue 59 and **Section 3.2** of this Submissions Report.
13	Ground Water	How is ground subsidence caused by dewatering and gas extraction to be dealt with?	As no coal is removed other than through the drilling of the well, ground subsidence is not expected to occur.
14	Ground Water	Over what time frame are they going to accept responsibility for resulting damages 'drilling/fraccing' etc, where the environmental impacts of shallow, alluvial, deep bedrock aquifers are altered immediately? (vol 1 p13-1).	Refer to Submission 127 Issue 55 and 61 and **Section 3.2** of this Submissions Report.
15	Ground Water	Drilling through aquifers, near creeks or rivers must be stopped before environmental damage (changing salinity levels or composition) is registered. Offsetting is not acceptable.	Refer to Submission 127 Issue 62 and **Section 3.2** of this Submissions Report.
16	Ground Water	Fraccing requires immense quantities of groundwater which can potentially lead to depletion of groundwater.	Groundwater is not extracted for the purposes of fraccing. Refer to Submission 127 Issue 65.
17	Ground Water	Injecting 'waste water' back into aquifers mixed with fraccing chemicals can result in environmental damage though water seepage.	Refer to Submission 127 Issue 66.

Issue #	Category	Issue	Response
18	Ground Water	Disposing of toxic fraccing fluids/chemicals in aquifers and waterways can poison aquatic ecosystems or groundwater. Treatment of used fraccing chemicals is only partial and/or unproven, and as such there is no place to dispose of these toxic chemicals.	Refer to Submission 127 Issue 66 and 69.
19	Ground Water	Toxic fraccing chemicals mixed with water (treated or not) and stored in dams would overflow due to high coastal rainfall causing concern for the environment.	Refer to Submission 127 Issue 68.
20	Fraccing	Where are the farms located as stated in the Treated Water Management section (vol. 1 p4-8)?	Refer to Submission 142 issue 61.
21	Fraccing	Where will the water come from that is required for fraccing/drilling gas wells?	Refer to Submission 142, Issue 62.
22	Fraccing	Where do AGL source their fraccing/drilling fluids from and who are the distributors?	Fraccing fluids are sourced by specialised contractors engaged to undertake fraccing activities.
23	Fraccing	What is the precise composition of fraccing fluid? How much fraccing fluid is used in each well?	Refer to Section 3.4.3 of the Submissions Report.
24	Fraccing	What method of disposal is used for the highly toxic fraccing fluid?	Refer to Submission 127 Issue 72 and **Section 3.4.3** of the Submission Report..
25	Surface and Groundwater	Demand a guarantee from the Government that there will be no damage done to aquifers or other natural water sources.	Refer to Submission 127, Issue 1 and 9.
26	Environmental Degradation	Holds the Government Departments and AGL accountable for damage caused to the Gloucester Valley in the exploration area.	Noted.
27	Environmental Bond	Demands an 'Environmental Bond' is adopted, held in place by an Independent Custodian for the life of the gas mine and thereafter. Funds could be used by the community for health and environmental impacts.	Refer to Submission 127, Issue 74.
29	Environmental Bond	The environmental bond should be transferable should AGL sell their exploration/mining licence to another company, who would be held accountable for damage caused by the project. This bond would be accessed by environmental groups and affected landowners, assisted by Government personnel.	Refer to Submission 127, Issue 75.

Issue #	Category	Issue	Response
30	Environmental Degradation	The proposed works will 'turn this rural valley into a major gas well extraction plant, using chemicals and producing visual alteration on landscape, gas wells…, waste water holding dams, central processing facilities, air and water pollution due to methane gas escaping during drilling/fraccing process...'.	Refer to Submission 127, Issue 54.
31	Surface Water	The act of laying their gas pipe is causing some waterways to be crossed 4-6 times each. This technique alters these areas immediately and is unacceptable and will have an immediate impact.	Refer to Submission 142 Issue 73.
32	Heritage	AGL have failed to assess the significance of the Vale of Gloucester and to apply heritage assessment principles.	The significance of the Vale is discussed in Chapter 18 of the EA. Further discussion is provided in **Section 3.9** of the Submissions Report.
33	Heritage	The scenic qualities of the area weren't taken into account.	The scenic qualities of the area were assessed in Chapters 18 and 19 of the EA. Visual amenity is further discussed in **Section 3.8** of the Submissions Report.
34	Heritage	The Vale of Gloucester has heritage significance at local, state and national levels for historical, aesthetic, social, historic and technical reasons. AGL have failed to acknowledge this aesthetic significance.	Refer to Submission 127 Issue 84.
35	Socio-Economic	No assessment of the economic impact on the tourism industry and land values within the area.	Refer to Submission 127, Issue 85.
36	Heritage	The impact on the valley's cultural heritage is not assessed including vistas.	Refer to Submission 127, Issue 86.
37	Socio-Economic	AGL will reduce agricultural production because of land lost due to gas wells and infrastructure due to potential issues, air and water quality, dust, noise, loss of rural Gloucester township.	Refer to response to Submission 127, Issue 88.
38	Surface Water	Trenching and diverting creeks' and 'boring under rivers' permanently damages these natural water sources regardless of the company stating the bedrock after trenching would be cemented back.	Refer Submission 142 Issue 86.
39	Ecology	Pipeline will impact on bushland and habitat for wildlife, swamps and RAMSAR wetlands.	Refer Submission 142 Issue 87.

Issue #	Category	Issue	Response
40	Ecology	Strongly object to gas trenching through creeks and boring under the Karuah River, the Williams River and the Hunter River. Who checks each tree for wildlife in the pipeline corridor through bushland before tree felling starts?	Noted. Further discussion on the flora and fauna survey methodology and preclearance surveys is provided in **Section 3.3.4** and **3.4.4** of the Submission Report. Given that flora and fauna surveys have been undertaken, the use of pre-clearance surveys is considered adequate prior to clearing.
41	Surface Water	The trenching of creeks of increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and species. This is unacceptable as the environmental damage has not been measured through independent companies. In real terms the amount of damage done to natural water resources cannot be measured through their assumptions and feasibility studies.	Refer to Submission 127Issue 6 and 9.
42	Health	No studies done in NSW on the possible effects on human health relating to people living in the vicinity of gas wells. A full study should be carried out before any consideration is given to the proposal.	Refer Submission 142 Issue 93.
43	Statutory Planning	"Gas wells are industrial sites and consideration should be given to classifying them as industrial chemical sites and should be controlled by relevant regulations."	Refer Submission 127 Issue 90.
44	Health	CSG is a new industry and the health and environmental affects have not been proven safe. QLD gas has problems with their evaporation pond which has proven to be unsuccessful and causing environmental problems.	Refer Submission 142 Issue 95.
45	Health	Drill for Natural Gas Pollute Water A. Lustgarten & ProPublica "As of 5th September 2009, the American EPA publicly acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours, with links to damaged kidney, immune systems and reproductive development."	**Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
46	Ecology	Evidence in America that cattle are dying after grazing close to CSM wells. Wildlife has developed cancers and tumours after grazing around supposedly rehabilitated well sites. Gas mining cannot successfully co-exist with rural agricultural lands.	Refer to Submission 142, Issue 98.

Issue #	Category	Issue	Response
		The industry in Australia has not been around long enough to register problems in people and animal health/affects.	
47	Ecology	100m clearance around pipeline to Hexham will cause massive impact to all wildlife, displaced, injured and killed. AGL needs to use extra pipe length to avoid bushland and water crossings by using more pipe and bends in their pipe length.	Refer to Submission 127, Issue 96 and Issue 5.
48	Surface Water	No flood study or flood risk analysis undertaken. There should not be any gas wells on creeks and river banks or in the river flats and flood plain areas.	Refer to Submission 127, Issue 97, 98, 99
49	Surface Water	What damage will the natural flooding process and trees coming down on creeks and rivers have on gas wells, connecting pipes and pipe line? What is the long term affect of continued flooding on creek/river pipeline and gas wells?	
50	Waste	Once water has been processed, the remaining waste sludge is highly toxic. Does desalination remove toxic chemicals and heavy metals or just remove the salt? What will happen to the brine left over after processing the water?	Refer to Submission 127, Issue 101.
51	Noise	Noise will be produced from the CPF, desalination plant, drilling/fraccing and diesel generators at each gas well hole.	Refer to Submission 127, Issue 104 and 105.
52	Noise	The noise assessment does not fully address noise levels throughout stage 1 development area which will be far higher than the assessed because low background noise away from the coal mine area. The noise study is inadequate and must be redone properly.	Refer to Submission 127, Issue 106.
53	Noise	Demand guarantee that AGL will operate within the guidelines, or if a member of the community feels that they are being affected by noise, that AGL would be made to pay for independent monitoring. If it's proven that AGL are operating outside their guidelines then compensation must be paid to those affected.	Refer to Submission 127, Issue 107.
54	Rehabilitation	Areas damaged by trenching through creeks and boring under rivers can never be rehabilitated to their original state nor will the 100m pipeline corridor through.	Refer to Submission 127, Issue 108.

Issue #	Category	Issue	Response
		Aquifers cannot be replaced. Core soils brought to the surface could be toxic.	
55	Consultation	Meetings were poorly advertised, questions were frequently stifled, staged and managed meetings, difficult questions were not answered. The drop in meeting were also poorly advertised.	Refer to Submission 127, Issue 109.
56		Lack of time for community to understand the ramifications of having AGL gas conduct their business in this valley.	Community consultation has been ongoing since 2008. Consultation is discussed in **Section 3.11** of the Submissions Report.
57		No meetings provided for the people in the shires of Dungog, Maitland, Port Stephens and Newcastle.	Refer to Submission 127, Issue 114.
58	Geology and Contamination	Heavy metals and sulphur contaminated rock from coal seam from fraccing brought to the surface will cause major environmental problems if this is exposed to water, rainwater-causing runoff or dumped near creeks/rivers.	Refer to Submission 127, Issue 115.
Submission 3			
1	Health	Gas mining is toxic to people, animals and the environment.	**Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
2	Statutory Planning	This development should be assessed as an industrial development and should be bound by the relevant regulations (each gas well is an industrial site).	The classification of gas wells is not relevant to the assessment of impacts which has been undertaken in accordance with the relevant legislation.
3	Land Use	Change of landscape from rural to industrial.	Significant visual impacts and changes to the nature of the Gloucester area are not expected. Refer to **Sections 3.7** and **3.8** of the Submissions Report.
4	Environmental Degradation	Environmental damage should be assessed by independent companies. In real terms, the environmental damage to natural water resources and agricultural land cannot be measured through their assumptions and feasibility studies.	AECOM is an independent company commissioned to undertake the preparation of the EA. Notwithstanding, DOP, DECCW and other agencies provide independent review and assessment of the EA documentation.
5	Health	Chemicals used in gas well mining are toxic. Fraccing fluids cause leukaemia, cancer and adrenal tumours, plus damage to the immune system.	**Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
6	Health	Fraccing chemicals and minerals in coal deposits seep into aquifers, water bodies	**Section 3.4** of the Submissions Report provides a discussion on the

Issue #	Category	Issue	Response
		and air. This is a health risk and the health cost to the government/community in the future will be greater than the revenue the government will receive from this project.	key issues of concern in relation to health.
7	Health	American studies show cattle grazing near wells die and wildlife develop tumours.	Refer to **Section 3.4.1** of the Submissions Report in relation to methane leakage at well sites.
8	Land Use	Agriculture and people cannot coexist with gas mining.	Refer to Submission 127 Issue 54 and **Section 3.7.1** of the Submissions Report.
9	Socio-Economic	Increased industrial noise, traffic, land/soil and air pollution will decrease property values. Compensation should be provided.	Negotiations with landowners whose property is directly affected by project infrastructure would be in accordance with agreements negotiated between the landowner and AGL. Compensation to landowners in areas not directly affected by project infrastructure (i.e. property does not contain project infrastructure) is not considered to be warranted as potentials impacts can be managed and minimised to acceptable levels.
10	Land Use	The valley cannot support coal mines and gas mining without irreparable destruction of pristine farming land.	Impacts to agricultural land use are discussed in **Section 3.7** of this Submissions Report.
Submission 4			
1	Environmental Degradation	No respect for farms, wetlands, aquifers, bushland and other ecosystems.	refer to issue 127 issue 88
2	Land Use	Already a lot of industry in a productive agricultural area.	There would be minimal loss of productivity as a result of the proposed works (Refer to 20-10 above). Rehabilitation would be undertaken for each project component. Each well site would be reduced to a maximum 40 x 15 m production footprint (15m x 15 m minimum). Considering a worst case scenario, the maximum amount of agricultural/grazing land that would be excluded would be approximately 0.1% of the total GDFA (which totals approximately 50km2). CPF Site 7 is located on land earmarked for future industrial land and as such would be consistent with future land use zoning.

Issue #	Category	Issue	Response
Submission 7			
1	Socio-Economic	AGL must compensate for wear and tear on existing council infrastructure.	Refer to Submission 62 Issue 14.
2	Waste	Explicit provision for the safe disposal or usage of the salt created by the project must be explained before approval is granted.	Options for disposal of salt are currently being investigated. In the event that the salt cannot be utilised, it would be disposed of in an appropriately licensed landfill facility. It is noted that the Gloucester Landfill does not accept salt waste, and an appropriately licensed waste management facility outside the Gloucester LGA would be required.
3	Waste	No waste water should be discharged off-site. River flats and floodplains should be protected and a no irrigation of waste-water, treated or not, via any method should be a condition of consent.	Refer to Submission 127 Issue 49
4	Surface Water	A 1km protection zone must be adopted for every natural water source.	Refer to Submission 127 Issue 52
5	Environmental Bond	The Government should impose an Environmental Bond on AGL to honour their EA which states 'minimal or insignificant damage.'	Refer to Submission 127 Issue 74
6	Environmental Degradation	Air and water pollution due to methane gas escaping during drilling/fraccing process.	Refer to Submission 127, Issue 78.
7	Visual / Socio-Economic	Destruction of the aesthetics of the area therefore damaging the tourism industry.	Visual impacts are discussed in **Section 3.8** of the submissions report. Impacts to tourism are discussed in **Section 3.9** of the Submissions Report.
8	Ground Water	Dewatering of aquifers should be monitored.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
9		AGL should pay charges for purchases of potable water, for any commercial bores sunk and for water extracted in exploration and production stages.	Refer to Submission 127 Issue 57.
Submission 8			
1	Socio-	Not assured that ratepayers and residents	As discussed in Volume 1 Section

Issue #	Category	Issue	Response
	Economic	will not have to pay for wear and tear on existing council infrastructure that this project will impose, eg. Road damage.	16.9 of the EA, a detailed Traffic Management Plan would be prepared for the Project and submitted to the Director-General for approval, which would incorporate dilapidation assessments prior to and following construction of the Project to assess road networks to be used during the construction period. Impacts attributable to the Project would be made good by AGL. AGL intends to meet with all relevant road authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period.
2	Waste	Explicit provision for the safe disposal or usage of the salt created by the project must be explained before approval is granted.	Refer to Submission 127, Issue 19.
Submission 9			
1	Air Quality	Pollution affecting the brain development of local young children. Concerned about level of PM2.5 and poly aromatic hydrocarbons (PAHs). Development Issues in local kindergarten children should be monitored stringently and maximum penalties imposed if child development issues rates increase.	The Air Quality Impact Assessment (Appendix G of the EA) demonstrates that the project would comply with all DECCW criteria for pollutants emitted from the project. A comparative assessment for PM_{10} and $PM_{2.5}$ is provided in **Section 3.5.3** of the Submissions Report and concludes that $PM_{2.5}$ would likely be below relevant guideline criteria under worst case assumptions.
2	Health	Siting a project with significant toxic emissions in a rural residential area is inappropriate.	Refer to Issue 1 above.
3	Cumulative Impacts	Cumulative impact with Stratford coal mine has been omitted, particularly with regard to health.	The Air Quality Assessment included assessment of the Gloucester Gas Project and the existing background which includes the existing mining activities. Refer to Section 3.5 of this Submissions Report.
4	Health	Health impacts have been ignored. Potentially close to 3500 people's health will be impacted on.	**Section 3.4** of the Submissions Report provides a discussion on the key issues of concern in relation to health.
5	Project	Faulty costing and poor logic in respect of	Refer to Submission 5/66 Issue 47.

Issue #	Category	Issue	Response
	Justification	Greenhouse Gas Emission savings.	
6	Health	Nitrous Oxides emitted will exacerbate the existing acid rainwater problem in the area, resulting in an increase in heavy metal levels.	Refer to Issue 1 above. The Air Quality Impact Assessment (Appendix G of the EA) demonstrates that the project would comply with all DECCW criteria for pollutants emitted from the project, including nitrous oxide.
7	Health	Where coal dust lands on pasture, dairy and beef cattle may take in heavy metal poisons.	Coal dust is not an emission associated with this project.
8	Air Quality	Monitoring of $PM_{2.5}$ particles must occur as well as health screening of all those residents within at least 3km of the existing mine and the proposed operations.	Refer to Issue 1 above and **Section 3.5.3** of the Submissions Report.
9	Health	High cost associated with health impacts should be included in the calculations as to the financial viability of the project.	Health impacts are not expected as a result of the Project.
10	Alternatives	A non-fossil fuel source should be used.	Noted.
Submission 10			
1	Environmental Degradation	Disturbance and long-term destruction of food producing farming property and heritage natural environment.	Refer to response to Submission 2, Issue 37. The natural environment was assessed as part of the flora and fauna studies in the EA and the heritage aspects were assessed in the Heritage Assessment in the EA.
2	Ecology	Adverse impacts on water/environment and wildlife habitat.	Impacts to waterways during construction would be managed through the preparation of a Construction Environmental Management Plan, which would include an Erosion and Sediment Control Plan and Soil and Water Management Plan as described in Volume 1 Chapter 25 of the EA. Further discussion on construction environmental management and downstream impacts on waterways is provided in **Section 3.1** of the Submissions Report. The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3** of the Submissions Report**.**
3	Alternatives	Short term viability of fossil fuelled energy.	Noted.
4	Surface Water / Ground	Potential impacts on surface and	Potential impacts to surface water and groundwater were assessed in

Issue #	Category	Issue	Response
	Water	groundwater.	Chapter 12 and 13 of the EA, respectively. Further discussion is provided in **Sections 3.1** and **3.2** of the Submissions Report.
5	Water Quality	An independent study on water quality should be conducted.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
6	Health	The environment and local community are already under stress from mining operations in the area.	Refer to response to Submission 5, Issue 23.
Submission 11			
1	Environmental Degradation	Destruction of the environment.	Noted.
2	Ecology	Effect on wildlife.	Refer to Submission 10, Issue 2.
Submission 12, 14, 16, 19, 26, 29, 30			
1	General	Oppose Gloucester Gas project	Noted.
2	Terrestrial Ecology/Aquatic Ecology	AGL pipeline will alter ecology forever of directly impacted 187 creeks, RAMSAR wetlands, Karuah and Hunter Rivers and swamps and wildlife habitats	Refer to Submission 127, Issue 5 and 46.
3	Surface Water	EA fails to acknowledge need for protection zones surrounding natural water sources	Refer to Submission 127, Issue 6.
4	Ground Water	Pumping water from aquifers causes water to move between different levels of aquifer, deteriorating ground water quality	Refer to Submission 127, Issue 55 to 63.
5	Ground Water	Drilling through aquifers near creeks and rivers is irrevocably destructive	Refer to Submission 127, Issue 55 to 63.
6	Ground Water	Trenching and diverting creeks and boring under rivers damages water sources permanently	Refer to Submission 127, Issue 9.
7	Risk Assessment	Flood risk assessment has not been carried out leaving potential for fraccing fluids and chemicals to run into waterways and poison aquifers and ground water systems.	Refer to Submission 127, Issue 97.
Submission 13			
1	Conditions of approval	AGL should be required to finalise exact pipeline alignment and easement agreements with all landowners before approval is given.	The location of the pipeline alignment is negotiated with each landowner as part of the easement agreement. Agreement with a

Issue #	Category	Issue	Response
			majority of landowners affected by the pipeline is required before a Pipeline License can be issued from DII
2	Conditions of approval	DoP should ensure an independent arbitrator is available to resolve disputes regarding the pipeline route.	Dispute resolution is included within the landowner agreement. If the parties cannot reach agreement then the matter can be referred to an independent expert to make a determination. The alignment has been chosen based upon route selection criteria as outlined in Section 4.3.1 of the EA with one of the criteria being that the alignment has been co-located with existing infrastructure corridors where possible in order to reduce impacts upon land use and development potential.
3	Conditions of approval	Complete and submit an electrical induction report for public display and comment before approval.	An electrical induction report has been prepared by EPCM Consultants (*Report of the Study of Powerline Effects*, EPCM Consultants, March 2010) on behalf of AGL. This report will be provided to Transgrid, and other relevant authorities if required which forms part of the detail design of the pipeline. It is not proposed to publically display this report.
4	Conditions of approval	AGL should be required to finalise written agreements with all landowners on specific conditions for site access and construction methods for all properties before approval.	Refer to Issue 1 above. Conditions for site access and construction methods would be agreed with each landowner as part of landowner agreements.
5	Conditions of approval	Ensure pipeline easement is wholly within the existing easements before approval is granted. If necessary, AGL should be required to reduce ROW and use special construction techniques to ensure this.	Refer to issue 2 above. Reduced ROWs would be utilised where possible to minimise disturbance along the easement during construction.
6	Compensation	As per DPI requirements, a written process for compensation agreements and guidelines for methods used should be provided. DoP should ensure that an independent tribunal is available to provide arbitration for compensation disputes.	Refer to issue 2 above. Compensation for the pipeline easement has been assessed by a registered valuer in accordance with the Land Acquisition (Just Terms Compensation) Act 1991
7	Conditions of approval	AGL should consult the Rural Fire Service before approval.	Consultation with the Rural Fire Service would be undertaken.
8	Consultation	Group meetings of potentially affected landowners should be held.	AGL would continue to consult with landowners individually. Group meetings are not considered to be an effective means of resolving

Issue #	Category	Issue	Response
			individual landowner requirements.
9	Consultation	All landowners should be advised via letter of the proposed location of pipeline construction camp. Opportunity to object should be provided.	Consultation with landowners affected by the location of the proposed pipeline construction camp would be undertaken.
10	Hazards	A detailed report on AC induction and AC corrosion risks to the pipeline should be completed and exhibited publicly.	AC corrosion and induction are assessed in the investigation *Report of the Study of Powerline Effects* prepared by EPCM Consultants. Refer to Issue 3 above.
11	Compensation	As a landowner affect by the pipeline alignment, the respondent has not received written or verbal advice regarding easement agreements or compensation proposals.	As part of the consultation process with landowners affected by the pipeline, AGL would seek permission from each landowner to undertake a valuation jointly with the landowner to ensure all their concerns were covered as part of the valuation. This permission was not received being why an easement agreement compensation offer had not been presented. AGL have since obtained an offsite valuation and sent a License Agreement and Agreement to Grant Easement for this property on the 25th February 2010 for landowner consideration.
12	Pipeline alignment	Route through landholding can easily be replaced with one that diverts around small land holdings, traverses only grazing land.	The alignment has been chosen based upon route selection criteria as outlined in Section 4.3.1 of the EA with one of the criteria being that the alignment has been co-located with existing infrastructure corridors where possible in order to reduce impacts upon land use and development potential.
13	Pipeline alignment	Use of a 30 m ROW, offset from an existing Transgrid easement (currently proposed) would result in alienating an unnecessary amount of the landholding, and destroying several stands of trees. A 6 m exclusion zone over the pipeline would materially affect the Respondent's ability to further develop the landholding.	AGL would consult directly with affected landowners, and aim to minimise, as far as practicable, impacts to each landowner during construction and operation. Where practical and feasible, the pipeline easement will be restricted to existing easements.
Submission 15			
1	Extension	Request for extension of time to lodge submission.	Refer to Submission 111.
Submission 18			
1	Noise	Noise impacts have been underestimated.	Refer to Submission 127, Issue 105 to 107.

Issue #	Category	Issue	Response
2	Noise	The map showing well site constraints does not accurately identify all residences in and adjacent to the Stage 1 GFDA. It should be redrawn to accurately identify all affected residences within 3km of a well site.	Refer to Submission 5, Issue 64.
3	Noise	Core noise control and mitigation requirements should be set as conditions for approval and not left for later development in a noise management plan.	Refer to Submission 5, Issue 65.
4	Noise	Gas well construction, drilling and fraccing should only occur during standard daytime hours at all sites within 2km of a residence.	Refer to Submission 5, Issue 66.
5	Noise	Use of noise control and mitigation measures, eg. Temporary acoustic screens, during drilling and well head construction should be mandatory at all sites within 2km of a residence.	Refer to Submission 5, Issue 67.
6	Noise	Measures cited by Atkins Acoustics (Appendix H p53) as 'readily available' should be required to be applied to all activities.	Refer to Submission 5, Issue 68.
7	Noise	Consultation with 'affected receptors' concerning noise should include all receptors in the radius within which the relevant target goals are expected to be exceeded.	Refer to Submission 5, Issue 69.
8	Noise	Stronger commitments should be required in relation to noise minimisation.	Noted.
9	Noise	No indication that the proponent has taken account of the record of actual noise impacts of the Gloucester Coal processing plant when modelling the potential noise impacts of the CPF.	Refer to Submission 5, Issue 71.
10	Noise	Proponent should identify and apply best practicable technology in the selection and operation of noise sources.	Refer to Submission 5, Issue 72.
11	Noise	Greater weighting should be applied to the potential noise impacts in evaluating the two CPF sites.	Noted, however a range of other constraints also require evaluation.
12	Noise	Detailed operational noise assessment of the well head plant and equipment should be undertaken following final plant and equipment selection.	Refer to Submission 5, Issue 73.
13	Noise	No well head should be established where the operational noise impact of the well, after implementation of mitigation measures, would be intrusive, ie. where the Laeq 15min level exceeds the RBL by more	Refer to Submission 5, Issue 74.

Issue #	Category	Issue	Response
		than 5dBA at a residence. This should also apply to any nodal compression units.	
Submission 20			
1	Environmental Degradation	This project will alter forever the rural valley (people's livelihoods, clean air, water, farming, tourism will be removed from the valley should project proceed further).	Refer **Sections 3.1, 3.2, 3.4, 3.7, 3.8** and **3.9** of Submissions Report.
2	Surface Water	AGL must have as one of their Conditions of Consent, absolutely 'No Creek or River Discharge'.	Refer to Submission 127 Issue 49.
3	Surface Water	Whether the water is treated or not through the various listed methods in their E.A. is unacceptable (Vol. 1, pgs. 4-7)	Refer to Submission 127 Issue 50.
4	Terrestrial Ecology	Removal of habitat kills wildlife. Impact from 30m minimum ROW will be massive, not minimal or insignificant.	Refer to Submission 142, Issues 16 and 17.
5	Terrestrial Ecology/Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Removal of canopy in area of their pipeline, forcing areas out of trees and into paths of ground predators etc.	Refer to Submission 127, Issue 46.
6	Terrestrial Ecology	Environmental damage that will occur cannot be simulated in AGL's flora and fauna studies.	Flora and fauna assessments were undertaken in accordance with the requirements of the DoP's Environmental Assessment Requirements.
7	General	Use of 'minimal or insignificant' is offensive and untrue.	Noted.
8	Community Consultation	Timeframe given has not been enough to read through EA completely.	An extended period of 8 weeks for public exhibition of the EA beyond the minimum statutory period of 30 days was provided to allow individuals to review and provide comment on the project.
9	Transparency	Belief that EA document has been written by AECOM Australia Pty Ltd in order to 'bamboozle and confuse'.	The EA was prepared in accordance with the requirements of the DoP's Environmental Assessment Requirements.
10	Land Use	Land will cease to be rural productive land once this is approved, due to maze of pipes between gas wells.	There would be minimal loss of productivity of agricultural land. The majority of infrastructure for the Project would be located within the Stage 1 GDFA. Within the Stage 1 GDFA, land use is predominately used for grazing activities. The impact on grazing activities would be temporary during construction of

Issue #	Category	Issue	Response
			well sites and pipelines with the only exclusion zone to grazing activities comprising the construction footprint (90 m x 90m for well sites). Once well sites have been commissioned and initially rehabilitated, grazing activities can resume with the exception of exclusion within the production footprint (hardstand area typically 15 m x 15 m, with a fenced area of some 4 m x 6 m for a single well). Once the pipeline has been constructed and surface rehabilitation is completed, the presence of the underlying infrastructure would have a negligible impact on grazing activities on the surface. Upon final rehabilitation of the well site, there would be no exclusions and all previous grazing activities can continue. Impacts to agricultural land uses are discussed further in Section 3.7 of the Submissions Report.
11	Transparency	AGL has declined to answer questions needed for clarification.	Respondents were requested to document all clarifications as part of their submissions to the DoP during the public exhibition period.
12	Community Consultation	AGL failed to hold adequate community meetings; people did not know of meetings; advertising once in a paper is not satisfactory.	Refer to Submission 127, Issue 109.
13	Community Consultation	AGL did not hold public meetings in Dungog, Maitland, Port Stephens or Newcastle as receptionist stated 'people can travel to Clarence town'. Why did the company fail to hold meetings in these towns so peoples' questions could be answered?	Refer to Submission 127, Issue 114.
14	Community Consultation	Ian Shaw, Councillor of Gloucester Council and working for AGL has been reported by landowners to continue to come onto private property when asked to leave.	This has not been reported as an issue by land owners.
15	Ground Water	Objection to AGL's proposal to dewater the aquifers through drilling/fraccing process.	Noted.
16	Ground Water	Ground water areas will cease to exist after they are drained dry by AGL gas extraction process - water coming to surface will be toxic, comprised of heavy metals, sulphur salts which are naturally occurring minerals	Refer to Submission 127, Issue 55 and 115.

Issue #	Category	Issue	Response
		in coal, including fraccing chemicals, clays, gels and oils in water being brought up and residue left in ground. Where is this going to end up?	
17	Ground Water	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels of composition.	Refer to Submission 127, Issue 62.
18	Ground Water	Damage to aquifers cannot be reversed.	Refer to Submission 127, Issue 63.
19	Ground Water	Gas company drained dry aquifer of Broke NSW. If it happened there, it can happen here (Gloucester area) too.	This comment is unsubstantiated. AGL holds a current exploration licence for an area in Broke NSW. AGL has just completed a comprehensive groundwater investigation at Broke which clearly indicates there is negligible connectivity between shallow and deep aquifers. No shallow aquifers have been impacted to date.
20	Ground/Surface Water	When will the Government authorise protection zones around all natural water sources?	Refer to Submission 117, Issue 16.
21	Ground Water	Request for independent Ground Water Study to be conducted.	Refer to Submission 127, Issue 55.
22	Surface Water	Objection to company taking tankers of water out from Jacks Rd Gloucester or anywhere. Where are they taking the water from Jacks Rd? Where is the water coming from? AGL should be charged for water used.	The tankers are transporting produced water from other exploration wells to holding ponds on the Teidman property as approved by DII. Appropriate Groundwater Licenses have been obtained through NOW prior to drilling commencing.
23	Ground Water	Dewatering of aquifers should be metered - AGL Gas be charged for potable water, commercial bores sunk, water extracted in exploration and production and damage done to aquifers.	Refer to Submission 127, Issue 57.
24	Ground Water	No regulations/guidelines have been set for re-injection of water containing toxic fraccing chemicals that would be pumped back into the aquifers.	Noted. Refer to Submission 127, Issue 58 and 69.
25	Ground Water/Compensation	AGL Gas should be charged a substantial amount for damage done to aquifers. This money must be 'Held in Trust' by a custodian as part of AGL's 'Compensation to the Environment'	Noted.
26	Ground Water	No regulations/guidelines have been set for re-injection of water containing toxic fraccing chemicals that would be pumped back into the aquifers. How can AGL Gas even consider this proposal in their EA?	Aquifer re-injection as an alternative produced water management option was considered in Section 4 of the EA however is not proposed as part of the project.

Issue #	Category	Issue	Response
27	Ground Water	What is AGL's projection of when they expect the aquifers to naturally recharge?	Refer to Submission 127, Issue 59.
28	Ground Water	How does AGL Gas propose to deal with ground subsidence caused by dewatering and gas extraction?	Refer to Submission 127, Issue 60.
29	Ground Water	What time frame are they going to accept responsibility for resulting damages 'drilling/fraccing etc.' where the environmental impacts of shallow, alluvial deep bedrock aquifers are altered immediately? (Vol 1. pgs 13-1)	Refer to Submission 127, Issue 61.
30	Transparency	In EA it says 4 gas wells to each hole, meaning that there will be hundreds of gas wells, and spaced 600 apart, they can then put gas wells in between. Belief that AGL are attempting to pass entire project while trying to hide it under Stage 1.	AGL is seeking approval for up to 110 wells in the Stage 1 GFDA. As discussed in Section 5.4.1 of the EA, wells may be co-located with up to four wells at one location, however the total number of wells within the current Project Area would not exceed 110.
31	Surface Water	AGL must have as one of their Conditions of Consent, absolutely 'No Creek or River Discharge'.	Refer to Issue 2
32	Surface Water	Whether the water is treated or not through the various listed methods in their EA. is unacceptable (Vol. 1, pgs. 4-7)	Refer to Issue 3
33	Surface Water/ Transparency	In section 120 of the PEOA Act it states that : It is illegal to pollute or cause or permit pollution of waters. A person who pollutes any water is guilty of an offence.' Strong objection to the fact that AGL proceeds with river discharge knowing Duralie Coal 15 month campaign for No Creek or River discharge.	Refer to Submission 142 Issue 36.
34	Surface Water	Government must legislate No Creek or River discharge.	Refer to Submission 142 Issue 36.
35	Surface Water	Strong objection to any wastewater being discharged off site in to the local waterways and/or creeks, rivers. Demand for Protection of River Flats and Flood Plains, adopting a "No Irrigation or waste-water treated or not, via any method as a Condition of Consent" ' including a '1km Protection Zone for every soak/swamp, billabong wetlands, creeks, rivers and any natural water sources etc.'	Refer to submission 127 issue 51
36	Waste	AGL must be required to contain all waste-water on site, preventing any discharge to	Refer to Submission 142 Issue 36.

Issue #	Category	Issue	Response
		local waterways.	
37	Ground Water	Independent ground water study must be carried out to determine cumulative impact on ground water from extraction of gas	Refer to Submission 127, Issue 55.
38	Waste	Water sitting around coal seam has heavy metals and sulphur which break down into salts.	Salts which are located within rocks in the Gloucester Basin in varying quantities are deposited through the breakdown of minerals within rocks over time and are a function of Australia's geomorphology, climate and age. The salts vary quite widely, but major groups include: Halides: halite, sylvite (KCl), and fluorite Sulfates: such as gypsum, barite, and anhydrite Nitrates: nitratine (soda niter) and niter Borates: typically found in arid-salt-lake deposits. A common borate is borax, which has been used in soaps as a surfactant. Carbonates: such as trona. The main salts that have been identified in the produced water is sodium bicarbonate and halite. Produced water will be managed in accordance with the Water Management Strategy discussed in **Section 3.1** of the Submissions Report.
39		AGL intends to sell or deposit into landfill. Where is the landfill for salt?	Refer to Submission 127, Issue 19.
40		If this was to proceed, does anyone in Government not realise the environmental damage to be done to whole area?	The EA considered and assessed environmental, social and economic impacts of the project, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.
41	Fraccing	Drawing water from rivers and local aquifers for fraccing could lead to depletion of Ground Water.	Water would not be sourced from rivers and beneficial aquifers for fraccing.

Issue #	Category	Issue	Response
42	Fraccing	Injecting waste water back into underground aquifers, mixed with fraccing chemicals is environmentally damaging.	Aquifer re-injection as a disposal option was considered in Volume 1 Section 4 of the EA however is not proposed as part of the project.
43	Fraccing	Chemical composition of fraccing fluid is highly toxic.	Refer to **Section 3.4.3** of the Submissions Report.
44	Fraccing	Treatment of used fraccing chemicals is only partial and /or unproven and there's no place to dispose of these chemicals.	Produced water (containing diluted fraccing fluid) would be treated on-site using reverse osmosis (RO) as described in the EA. Produced water management is described in **Section 3.1** of the Submissions Report.
45	Fraccing	Disposal of fraccing fluids into natural water bodies can poison aquatic ecosystems	Aquifer re-injection as a disposal option was considered in Volume 1 Section 4 of the EA however is not currently proposed as part of the project.
46	Fraccing	Toxic fraccing chemicals mixed with water, 'treated or not' in dams is unacceptable. Dams will fill up and overflow due to high coastal rainfall, despite AGL's justification that capacity would be found in farm dams located in areas without significant catchment'.	All storage facilities including storage ponds for produced and treated water and evaporation ponds would be constructed in accordance with relevant standards and would contain appropriate freeboard capacity to allow for high rainfall events. Refer to **Section 3.1.3** of the Submissions Report for further discussion.
47	Fraccing	Where are the farms located as stated in the section Treated Water Management? (Vol. 1, pgs. 4-8)	Refer to Submission 142 Issue 61.
48	Fraccing	Where will AGL draw the copious amounts of water from, required for fraccing/drilling gas wells?	Refer to response to Submission 127, Issue 70.
49	Fraccing	Where do AGL source their fraccing/drilling fluids from and who are the distributors?	Fraccing fluids are sourced by specialised contractors engaged to undertake fraccing activities.
50	Fraccing	What is the precise composition of fraccing fluid or is it a trade secret?	Refer to **Section 3.4.3** of the Submissions Report.
51	Fraccing	How much fraccing fluid is used in each well?	Refer to **Section 3.4.3** of the Submissions Report.
52	Fraccing	What method of disposal is used for the highly toxic fraccing fluid?	Produced water (containing diluted fraccing fluids) would be treated on-site using reverse osmosis as described in the EA. Produced water management is described in **Section 3.1** of the Submissions

Issue #	Category	Issue	Response
			Report.
53	Land Use	Why the need for a 100m wide pipeline corridor to Hexham?	The area of disturbance along the pipeline would be limited to a width of up to 30 m, with clearing limited to approximately 19 ha for the entire project as described in Volume 1 Chapter 10 of the EA and discussed further in **Section 3.3.1** of the Submissions Report.
54	Compensation	Does AGL gas have an 'Environmental Bond' in place and what is the exact amount of this Bond? If not, why not?	Refer to Submission 142 Issue 68
55	Compensation / Health	Environmental bond to be adopted before AGL work commences. Bond to be held by independent custodian. Community will then have finances should they experience health affects and opportunity to repair environment. Deposits to be made throughout the year covering 'immediate, short and long-term environmental damage and health effects of people/animals associated with gas mining report by LB Clarke NSW National Parks and Wildlife Service (2001).	Refer to Submission 127, Issue 74.
56	Compensation / Health	Environmental bond would be transferable should AGL sell their exploration/mining licence. Said company must continue to pay bond. Bond accessible by environmental groups and land owners affected in the Valley, until the people say it's in a clean, safe and better state.	Refer to Submission 127, Issue 75.
57	Air/Water Quality	Gas mine will produce air and water pollution due to methane gas escaping during drilling/fraccing process while boring the gas wells near creeks/rivers.	See **Section 3.4** of the Submissions Report on methane leakage mitigation
58	Visual Impacts	Gas mine will destroy aesthetics of a beautiful valley, creating visual alteration of the landscape, destroy tourism are forever turning area into industrial chemical mining area.	Refer to **Section 3.8** and **3.9** of the Submissions Report.
59	Water Quality	Damage will be caused by trenching and diverting creeks and boring under rivers. Act of laying gas pipe causes some waterways to be crossed 4-6 times each.	All open trench crossings, or crossings which may have a direct impact on the watercourse, would have site specific management measures implemented for sediment and erosion control as well as rehabilitation practices. Rehabilitation of watercourse crossings is described in **Section 3.1.2** of the Submissions Report. These measures would be dependent on site characteristics such as soil stability, existing
60		Cementing of bedrock in creeks/rivers is AGL's solution, yet impact will be immediate.	
61	Water Quality	How then, can AGL justify that there 'will be insignificant or minimal damage to creeks/rivers etc.'?	

Issue #	Category	Issue	Response
			vegetation and water flow, and identified in a site specific management plan and included in the CEMP for the pipeline (refer to Volume 1 Section 25.2 of the EA). Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. Further discussion is provided in **Section 3.1** of the Submissions Report. Potential impacts to aquifers would be addressed as part of hydrogeological investigations proposed by AGL which would be undertaken prior to construction of the project. Refer to **Section 3.2** of the Submissions Report.
62	Heritage	Heritage has been downgraded to a low priority despite it being identified in the DGRs. AGL failed to assess significance of Vale of Gloucester by dismissing it as being irrelevant.	Refer to response to Submission 127, Issue 79 and **Section 3.10** of this Submissions Report.
63	Heritage	This will impact forever on Gloucester Stroud Valley and the Bucketts Way Tourist Country Drive Experience.	Refer to response to Submission 127, Issue 80
64	Heritage	Valley's heritage significance through its scenic qualities is of highest importance. Historical towns of Stroud and Booral may be affected.	Refer to response to Submission 127, Issue 81
65	Heritage	Assessment is currently inadequate, therefore will continue to be eroded by successive stages of AGL development, as it will continue to be assessed to this standard. Valley's significance will be lost.	Refer to response to Submission 127, Issue 82
66	Heritage	Vale of Gloucester: heritage recognised by National Trust of Australia (NSW) in 1975 but entry was not finalised before register abolished in 2004.	This is noted in Chapter 18 of the EA.
67	Heritage	Gloucester Valley - heritage significance at local, state and national levels for historical, aesthetic, social and technical/research reasons. AGL have only mentioned heritage value - fail to acknowledge aesthetic significance.	The aesthetic significance of the Vale is discussed in Chapter 18 of the EA. Further discussion is provided in **Section 3.10** of the Submissions Report

Issue #	Category	Issue	Response
68	Socio-Economics	EA does not assess economic impact on tourism industry and land values within the area.	Refer to Submission 127, Issue 85.
69	Heritage	EA does not assess impact of development on valley's cultural heritage, including vistas, despite this being a DGR.	Refer to Submission 127, Issue 86.
70	Cumulative Impacts	Full and proper assessment of cumulative impacts is critical.	The issues relating to cumulative impacts are addressed in Section 24 of the EA.
71	Environmental Degradation	AGL Gas will reduce agricultural production due to land lost due to gas wells and infrastructure due to potential air/water quality, dust, noise and loss of rural Gloucester township.	Refer to response to Submission 127, Issue 88.
72	Water Quality	Trenching and diverting creeks and boring under rivers damages natural water bodies permanently despite AGL stating bedrock would be cemented back after trenching.	Refer to Submission 142, Issue 86.
73	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	Refer to Submission 127, Issue 5 and 46.
74	Water Quality/Land Use/Terrestrial Ecology	Objection to AGL Gas trenching 187 creeks between Stratford and Hexham and boring under Karuah River, Williams River and Hunter River. Creeks and rivers will be crossed 3-6 times in some place with a 100m clearance around pipeline, through bushland, people's properties, damage done to wildlife corridors, displacement of wildlife, potential death.	Refer to Submission 142 Issue 20.
75	Water Quality/Aquatic Ecology	50 of the creeks to be trenched are between villages of Craven and Stroud Road in 20/30km stretch and flow into Wards River, Mammy Johnsons River and the Karuah River.	Refer to Submission 127, Issue 28.
76		Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol. ? Pages 12-20).	Refer to Submission 127, Issue 6.
77	Community Consultation	Environmental damage has not been measured through independent companies, it has been conducted through people employed by AGL Gas. The amount of damage done to natural water resources cannot be measure through their assumption and feasibility studies.	Refer to Submission 127, Issue 47.

Issue #	Category	Issue	Response
78	Health	Trenching, boring techniques will degrade creeks, rivers, aquifers and swamps and will alter these forever - it is too late after work has commenced.	Refer to Submission 127, Issue 48.
79	Health	No studies done in NSW on possible affects of human health relating to people living in the vicinity of gas wells. A full thorough study should be carried out before any consideration is given to the proposal.	Refer to Submission 127, Issue 89.
80	Health	Gas wells are industrial sites and consideration should be given to classifying them as industrial chemical sites and should be controlled by relevant regulations.	Refer to Submission 127, Issue 90.
81	Health	CSG is a new industry and health and environmental affects have not been proving safe. Industry in Australia has not been around long enough to register problems in people/animals.	Refer to Submission 127, Issue 91.
82	Health	Information coming from other CSG areas is alarming. QLD Gas has problems with their evaporation pond, causing environmental problems.	Refer to Submission 127, Issue 92.
83	Health	Drill for Natural Gas Pollute Water - A. Lustgarten and ProPublica "As of 5th September 2009, the American EPA publicly acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours, with links to damaged kidney, immune systems and reproductive fluids."	Refer to Submission 127, Issue 93.
84	Health	Clear evidence in America that cattle are dying after grazing close to CSM wells. Wildlife has developed cancer tumours after grazing and drinking around supposedly rehabilitated well sites.	Refer to Submission 127, Issue 94.
85	Water Quality/Health	AGL have failed to do a flood study or flood risk analysis and potential damage caused to gas wells or gas pipes. There should not be any gas wells on creeks/river banks. 40, 20 and 10 metre clearance from a river bank is unacceptable.	Refer to Submission 127, Issue 97 to 99.
86	Water/Health	No gas wells should occur in the river flats and floodplain areas.	
87	Risk Assessment	What damage will the forces of natural flooding processes and trees coming down in creeks and rivers, have on gas wells connective pipes and pipe line?	
88	Risk Assessment	What is the long term affect of continued flooding on creek/river pipeline and gas	

Issue #	Category	Issue	Response
		wells?	
89	Precautionary Principle	Request that Government apply the precautionary principle concept as anything AGL will do will impact on environment and have significant, serious and irreversible environmental harm.	The Precautionary Principle has been addressed in Section 28.3.1 of the EA.
90	Waste	Once water has been 'processed' through desalination or other process (as per EA), waste sludge is left - highly toxic and no means of disposal.	Refer to Submission 127, Issue 101.
91	Waste	Does desalination remove toxic chemicals and heavy metals or just remove the salt?	Refer to Submission 127, Issue 102.
92	Waste	What are they going to do with the brine left over after processing water?	Refer to Submission 127, Issue 103.
93	Noise	AGL seeking to operate 24 hours/day, 7 days/week. Noise also produced from desalination plant, drilling/fraccing and diesel generators at each gas well hole through extraction of water.	Refer to Submission 127, Issue 104.
94	Noise	Noise study is inadequate and needs to be redone properly.	Refer to Submission 127, Issue 105.
95	Noise	Noise has been assessed against raised background noise levels of Stratford Coal. Assessment does not fully address noise levels throughout stage 1 development area -low background noise away from coal mine area means noise will be far higher than assessed.	Refer to Submission 127, Issue 106.
96	Noise/ Compensation	If community feels affected by noise, AGL Gas should be made to pay for independent monitoring and if it is proven that AGL are operating outside their guidelines, compensation should be paid.	Refer to Submission 127, Issue 107.
97	Rehabilitation	Areas damaged by trenching can never be rehabilitated to their original state. Aquifers cannot be replaced. Core soils brought to surface could be toxic.	Refer to Submission 127, Issue 108.
98	Community Consultation	Community meetings have been poorly advised, questions were frequently stifled, meetings were staged and managed, difficult questions were not answered.	Refer to Submission 127, Issue 109 to 111.
99	Community Consultation	Meetings were not properly or continually advertised in towns, issues raise were avoided or referred back to the EA.	
100	Community Consultation	Drop in meetings were poorly advertised.	

Issue #	Category	Issue	Response
101	Community Consultation	AGL has not given community a decent length of time for people to understand ramifications of having AGL Gas conduct business in valley.	Refer to, Issue 8 above.
102	Community Consultation	Project covers six shires - could have been more meetings for people to understand what was fully involved.	Refer to Submission 127, Issue 113.
103	Community Consultation	AGL did not provide meetings for people in Council shires of Dungog, Maitland, Port Stephens and Newcastle.	Refer to Submission 127, Issue 114.
104	Fraccing	Heavy metals and sulphur contaminated rock from coal seam from fraccing brought to surface will cause major environmental problems if exposed to water, rain water-causing runoff or dumped near creeks or rivers.	Refer to Submission 127, Issue 115.
105	General	Gas extraction is anything but 'the new alternative to coal'. Methane gas should never be mined and is anything but 'green'.	Noted.
106	Health/Socio-economics	Too many direct impacts that AGL Gas will inflict on people, air, water, environment, wildlife and socioeconomics and is too risky.	Refer to Submission 127, Issue 117.
107	Specific Inquiry	Spraying of weeds and access to peoples properties to maintain pipeline or gas wells: what notice is given to the landowner? Can AGL access your property at anytime?	AGL would enter into agreements with individual landowners which would detail access arrangements for ongoing maintenance of the pipeline corridor.
108	Specific Inquiry	Do organic farms have the right to say no to weed spraying, regardless of what product is used along the pipeline corridor, and request just boring the gas well and no fraccing chemicals to be used?	AGL would consult directly with individual land owners in this regard.
109	Fraccing	What are the ingredients of the fraccing chemicals/fluid that AGL is using for any of their sites? Vegetable based? Where do they come from? America or somewhere else?	Fraccing fluids are sourced by specialised contractors engaged to undertake fraccing activities.
110	Fraccing	Apart from being vegetable based, what other properties are added to this fluid? Who makes it and how? Are they then transferred to what size drums or containers? Is fraccing fluid is used to 'crack apart' the ground in some way?	The fraccing fluid is used to create a fracture through the target coal seams and to place sand within the fracture to assist in the stimulation of CSG production from the coal seam. Refer to **Section 3.4.3** of the Submissions Report.

Issue #	Category	Issue	Response
111	Specific Inquiry	What is Bentonite clay and what is it used for in the fraccing process?	Bentonite is not used in the fraccing process. Bentonite is a naturally forming clay generally formed from alteration of extrusive volcanic rocks such as volcanic ash. Bentonite is used as an additive in the drilling process, added to drilling muds to add viscosity to the drilling fluids to assist in carrying the drilled rock particles (cuttings) to the surface of the well.
112	Specific Inquiry	What are all the compounds of Bentonite clay?	Bentonite clay is principally made up of Montmorillomite and beidellite which belong to the Smectite Group of sheet silicates. As bentonite is a naturally formed material it can also contain other minerals dependant on the rock that was originally broken down such as quartz, biotite, feldspar, zircon.
113	Specific Inquiry	What is the gel/clay made of and its purpose being put into the ground and list the ingredients please?	Note that bentonite and fraccing fluids are used in two different processes. Fraccing fluid is used to create a fracture through the target coal seams and to place sand within the fracture to assist in the stimulation of CSG production from the coal seam. See Section **3.4.3** of Submissions Report. Bentonite is used as an additive in the drilling process, added to drilling muds to add viscosity to the drilling fluids to assist in carrying the drilled rock particles (cuttings) to the surface of the well.
114	Specific Inquiry	Is acid used through any part of gas extraction on any AGL work site or drilling process?	Hydrochloric acid may be used to prepare the coal seam for the fracturing process. Typically it is done if the perforation charges have not penetrated fully into the coal seam. The role of hydrochloric acid is to clean the cement from the fracture. This removes the potential blockages and allows the water and sand to penetrate the coal and initiate the fracturing process. The acid is highly diluted with water on the surface prior to being pumped down the well.
115	Specific	Aquifer water (deep ground or not), taken to	As part of the Stratford Pilot Project

Issue #	Category	Issue	Response
	Inquiry	surface is pumped into a truck, then taken to Tidemans property, Fairbairn's Road, is that correct?	currently operated by AGL, all produced water is captured at the drill site and subsequently transported back to the Teidmans property via a sump truck and disposed in the existing holding ponds on the property.
116	Specific Inquiry	The holding dams at Tidemans property are lined, is that correct? Are the dams lined to stop the 'salts' in the water from going into the ground water?	The holding ponds at the Teidman property are lined in accordance with the DII approval to prevent migration of potential contaminants in to the ground surface.
117	Specific Inquiry	With regard to salts in the ground water - are these not naturally occurring minerals in coal? Do they break down to become salts (lead salts, magnesium salts, sulphur salts etc.) which have caused huge environmental problems elsewhere in creeks and rivers in NSW alone? How does AGL intend to stop this happening here?	Salts which are located within rocks in the Gloucester Basin in varying quantities are deposited through the breakdown of minerals within rocks over time and are a function of Australia's geomorphology, climate and age. The salts vary quite widely, but major groups include: Halides: halite, sylvite (KCl), and fluorite Sulfates: such as gypsum, barite, and anhydrite Nitrates: nitratine (soda niter) and niter Borates: typically found in arid-salt-lake deposits. A common borate is borax, which has been used in soaps as a surfactant. Carbonates: such as trona. The main salts that have been identified in the produced water is sodium bicarbonate and halite. The produced water will treated and disposed in accordance with the Water Management Strategy discussed in Section 3.1 of the Submissions Report.
118	Specific Inquiry	Salts' from water around coal seams is not 'rock salt, ocean salt' is it? What is the salt then?	Refer to Issue 117 above.
119	Specific Inquiry	Combined fraccing fluid/chemicals/vegetable based product goes into the ground water - what risk will this cause, when it comes out somewhere else? Will it be safe for people to drink? If not then how is it safe for the environment and wildlife?	Refer to **Section 3.4.3** of the Submissions Report.
120	Specific Inquiry	While you remove some of the fraccing fluid with the ground water, how much fluid is going to remain and come out somewhere	See **Section 3.4.3** in the Submissions Report regarding percentage of fraccing fluid

Issue #	Category	Issue	Response
		else in the aquifer?	recoverable and treatable.
121	Specific Inquiry	The holding dams at Tidemans property has a fence around it, to stop wallabies, kangaroos - is this correct? Why is there then no netting as a roof to stop any birds, possums, being able to gain access to the toxic holding pond? Or completely shade clothed off to even stop frogs, lizards being able to gain access?	The existing storage ponds which operate as part of the Stratford Pilot Project are fenced with four strands of barbed wire with netlock mesh wire also secured to prevent wildlife from entering the storage pond area. This is mainly as a precautionary measure to prevent animals slipping into the storage pond due to the plastic liner and drowning.
122	Specific Inquiry	It was mentioned ladders are around the holding dam. Why were these installed and for what purpose?	Rope ladders are set in place down the storage pond wall to allow wildlife to escape if an animal did manage to slip into the pond. This is in accordance with the current approval issued by DII.
123	Specific Inquiry	Is the water transferred anywhere else, to any other holding dams or elsewhere out of the Gloucester valley basin?	Produced water from the Stratford Pilot Project is not transferred elsewhere out of the Gloucester Valley.
124	Specific Inquiry	Pg ES2 - mentions 'gas and water processing facilities' meaning more than one, not one CPF at Stratford or Fairbairn's Rd - there are more. This is misleading and alarming - how many CPFs is AGL meaning?	AGL proposes to construct a single CPF as part of the Project, at either CPF Site 1 or CPF Site 7, as detailed in the EA.
125	Rehabilitation	Pg ES2 - 'abandoning underground infrastructure' - yet removal will occur where there are coal seams etc. The land will then become a graveyard of rusting pipes etc. This is not a 'clean up done properly'. Removal of everything is best.	AGL would manage decommissioned infrastructure in accordance with DII requirements. This is discussed in Volume 1 Section 5.4.17 of the EA.
126	EA Process	Pg ES2 - In seeking Concept Plan approval, the EA has been written on a broad scale, working on hypothetical, not real environmental damage to aquifers, creeks, rivers, valley, properties, views, lifestyle choices. Each area has specific characteristics, needs to be assessed differently. EA should not be given licence to put more gas wells in - new applications should be launched as the scope of works have changed.	The areas subject to Concept Plan approval would require subsequent Project Applications and Environmental Assessments to be lodged with Department of Planning. These Project Applications would assess in further detail the potential impacts of future stages of development.
127	Socio-Economics	Pg ES31 - EA has been justified based on 'environmental, social and economic considerations'. Valley would continue to exist where it is open to more opportunities than being monopolised by mining impacts. No one by choice wants to live next to coal or gas mines.	Noted.

Issue #	Category	Issue	Response
128	Environmental Degradation	Pg ES31 - To state 'the project would not have significant adverse impact on the biophysical environment' is a statement to which we can hold AGL accountable. Drilling already causes impact on visual amenity, aquifers and underground sub-surface.	The exploration works currently being undertaken by AGL are in accordance with approval issued by the Department of Industry and Investment and are separate to the Project Application.
129	Socio-Economics	No one will be able to live around gas wells, nor would anyone want to live around CPFs.	The assessment of both CPF Site 1 and CPF Site7 has taken into account the closest receptors and other residents further away in order to ensure that all criteria can be met and appropriate mitigation and management measures are in place. The well sites have been located on properties with whom AGL have, and would continue to consult with. The location of well sites is in accordance with DoP's *Locational Guidelines; Development in the vicinity of operating coal seam methane wells* (DIPNR, 2004). Separation distances to sensitive land uses are dependent on the type of infrastructure, and are recommended to be up to 20 m. Well site within the Stage 1 GFDA would not be located within 200 m of a residence, which is well in excess of the DoP's locational guidelines. No single well is closer than 200m to a residence and this remains one of the location principles for all the well sites.
130	Socio-Economics	Gas extraction will stop tourism dead, stop locals shopping in Gloucester, force people to go elsewhere.	These claims are unsubstantiated.
131	Health	It is too late after health affects like those in Colorado and other US states occur. Cancer is prolific around coal seam gas extraction areas.	Potential health impacts are discussed in **Section 3.4** of the Submissions Report.
132	Specific Inquiry	AGL justifies that the project should proceed because there will be a loss of opportunity if it does not proceed, and it will be a competitive gas supply with the Hunter region.	Noted.

Issue #	Category	Issue	Response
133	Specific Inquiry	Company employees stated at a public meeting that they were racing QLD Gas down to Hexham. QLD Gas are showing environmental problems with the evaporation dams etc.	The statement regarding racing QLD Gas to Hexham is incorrect. A comparison between environmental management of ponds in Queensland and the proposed Project is provided in **Section 3.1.5** of the Submissions Report.
134	Socio-Economics	If the project does not proceed AGL suggested that there would be a loss of economic, social benefits to local communities to the Hunter region and wider NSW community. However, this area was fine without AGL. Gas is the new black coal.	The Project would provide an opportunity for expenditure on local goods and services. Without the Project, such additional benefits would not realised.
135	Specific Inquiry	AGL suggests there is a shortfall in gas supply to NSW - the market may in turn increase in less efficient alternatives such as fossil fuels which would increase GHG emissions. However, AGL Gas has too many concerning variables. The toxins released through methane mining released into the environment, air and water are no better. Move to sun and/or wind.	Refer to Submission 5, Issue 47.
136	Noise	Drilling within area is already disturbing people. This should not be inflicted on people who have chosen to live in a country area. To say 'sensitive receivers' is offensive - people living away from mines have background noises of nature.	The term ‘sensitive receiver’ is used in DECCW’s *NSW Industrial Noise Policy* to describe residential and other receivers who have the potential to be impacted by noise.
137	Compensation	What happens to people who are forced to sell? They should be compensated above market value and a percentage on top of that to find another property plus removal costs. Chain Valley Bay is a classic example of mining gone wrong - people are still waiting for house compensation for houses that are below lakes water line. Company not forced to pay by Government.	No landowners would be forced to sell their property. The type of mining referred to at Chain Valley Bay is not the type of mining proposed as part of this Project.
138	Climate Change/Water Security	Objection to the statement that climate change will reduce water in Hunter Valley and that water from AGL project will 'have positive impacts to community by providing reliable source of water from treated produced water.' Aquifers being dragged to surface and removed from natural processes - unacceptable.	Treated water generated by the Project would potentially provide an alternate source of water for the purposes of irrigation and other uses, in particular during dry periods which are likely to become more frequent with the impacts of climate change.

Issue #	Category	Issue	Response
139	Specific Inquiry	Site 1 Fairbairn's Road or Site 7 Stratford, although sometimes it says Site 1 and/or Site 1 and 7. Which is it? Where are Sites 2, 3, 4, 5 and 6?	AGL proposes to construct a single CPF as part of the Project, at either CPF Site 1 or CPF Site 7, as detailed in the EA. Sites 2 to 6 were alternative site locations for the CPF. These sites are discussed in Section 4.3.2 of the EA.
140	Specific Inquiry	Grid pattern for gas wells - 600 x 600 - does not stop AGL coming in 300 or 200m from each gas well. Stage 1 says minimum 110 wells, yet they mention 'infill wells, where they can put 4 gas well pipes out of each gas bore hole, resulting in 440 more gas wells.	AGL is seeking approval for up to 110 wells in the Stage 1 GFDA. As discussed in Section 5.4.1 of the EA, wells may be co-located with up to four wells at one location, however the total number of wells within the current Project Area would not exceed 110.
141	Ground Water	AGL state they will avoid 'sensitive areas' yet they are trenching/diverting creeks multiple times and boring under hundreds of creeks. Unacceptable and shows impact is not 'minimal or insignificant'.	Refer to Submission 127 Issue 48.
142	Design	River crossings and people's properties could be avoided if more pipeline length was used.	As described in Section 4.3.1 of the EA, the pipeline route was determined based on an initial study area, consisting of a 10 km wide corridor from Stratford to Hexham. This was refined utilising GIS and multi criteria analysis methods. Significant consideration was given to protected areas such as RAMSAR wetlands, National Parks and State Forests, and other protected areas, as well as a range of other constraints. This included realignment of the pipeline where necessary during and following ecological surveys being undertaken as part of the EA for the project.
143	Specific Inquiry	AGL stated they are seeking to export to customers at Hexham. Have also mentioned that they are not going to supply local valley area and consider putting a gas point in for another company to connect up Gloucester, although they would not deal with domestic market.	Noted.

Issue #	Category	Issue	Response
144	EA Process	Concept area cannot be seen as whole application - company wants permission for whole area to be able to sink hundreds of gas wells as extensions of Stage 1. Each stage should be seen as new works, and not extensions of Stage 1, with unique environmental issues explored.	The areas subject to Concept Plan approval would require subsequent Project Applications and Environmental Assessments to be lodged with Department of Planning. These Project Applications would assess in further detail the potential impacts of future stages of development.
145	Design	Stated that 200 or 300 wells are likely to be developed but nothing to say that is the maximum.	Refer to Issue 144 above.
146	Specific Inquiry	Why are they not able to notify in the EA the exact locations of each well?	The exact location of well sites is subject to further detailed design and will take into consideration a range of environmental factors including landowner preferences and geological constraints.
147	Noise	No complaint hot line for people woken up and wanting to make complaint call if they can't sleep. Operating 24 hours/7 days is unacceptable.	AGL would implement complaint handling procedures to deal with issues such as noise complaints during construction and operation of the Project. This may include a complaint hotline.
Submission 22			
1	Waste	Objection to the production of toxic water.	Noted.
2	Water Quality	Use of discharged water for irrigation can cause salinity problems and damage the water table, as well as impacts to town water supplies. Reverse osmosis will not remove all contaminants.	Refer to Submission 127 Issue 102.
3	Land Use	Change from a rural landscape to an industrial one. Concern that 20,000 ha of improved and semi improved pasture will be lost to the Project.	Significant visual impacts and changes to the nature of the Gloucester area are not expected. Refer to Sections 3.7 and 3.8 of the Submissions Report.
4	Health	Damage to physical and psychological wellbeing of the local population.	Refer to Submission 5/66 Issue 21.
5	Socio-Economic	Loss of tourism industry.	Refer to **Sections 3.8** and **3.9** of the Submissions Report.
6	Geology	Investigations show that the seams in the area are fractured laterally and lie at an angle. (Gloucester Basin Well Completion Report). Geology of the area poses a problem for extraction, a danger when drilling and a risk of gas seepage and migration both into the surrounding soils, aquifers and the air, eg. American examples and C.M. Atkinson report.	Refer to Submission 5/66 Issue 44.

Issue #	Category	Issue	Response
7	Statutory Planning	There will be 600 to 1000 wells, not the 60-90 stated as part of the Stage 1 area.	Refer to Submission 20 Issue 140.
8	Surface Water	What attempts to reduce harm to the waterways are being considered and enforceable, what penalties will there be for non-compliance?	AGL is responsible for ensuring that the Project complies with all conditions contained within a Project Approval and Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act. Management of surface water impacts is assessed in Chapter 12 of the EA and discussed in **Section 3.1** of the Submissions Report.
9	Ground Water	Borehole logging should be done incrementally and the cementing of the casing performed as they go, to ensure no aquifer contamination occurs – not after well drilling has been completed.	To construct a gas well, the well is drilled in stages. Initially the surface casing is installed and cemented to an adequate depth in order to protect beneficial aquifers. Smaller hole sections are then progressively drilled in stages. On the completion of drilling each stage, if borehole logging is planned it is completed then followed by the steel casing being inserted and cemented in place in order to seal the wellbore from deeper non beneficial aquifers.
10	Hazards	Gas migration will occur and will be increased to dangerous levels by fraccing.	Refer to Submission 5/66 Issue 44.
11	Waste	What will be done with the contaminated drilling circulation water?	Refer to Submission 127 Issue 115.
12	Hazards	What chemicals are used during the fraccing process?	The composition of fraccing fluid is discussed in **Section 3.4.3** of the Submissions Report.
13	Hazards	Drilling sludge brought to the surface can be contaminated and when left to dry on the surface would contaminate the air, water and soil.	Refer to Submission 127 Issue 115.
14	Noise	The pump equipment installed on every well will have a noise impact 24hrs/day. No	This equipment was included in the noise impact assessment. Refer to

Issue #	Category	Issue	Response
		details are provided as to the dB levels of this. Wildlife may leave the area due to this noise.	Volume 1 Chapter 14 of the EA and Section 3.6 of the Submissions Report.
15	Visual	Light pollution from lighting facilities on well heads.	Lighting facilities on well heads would only be required temporarily when drilling is occurring 24 hours per day. This would be limited to several days and would be undertaken in consultation with affected residents. Refer to **Section 3.8.5** of the Submissions Report
16	Waste	What will happen to the unevaporated residues of the treated water?	Refer to **Section 3.1.4** of the Submissions Report.
17	Socio-Economic	Disruption to existing land and landowners due to routine well inspections, maintenance etc.	This project would be undertaken in full consultation with landowners to avoid or minimise inconveniences to landowners.
18	Rehabilitation	What will happen to the wells once their economically productive life is over? There is no mention of remediation.	Remediation is discussed in Volume 1 Section 5.4.17 and Chapter 22 of the EA.
19	Hazards	Camden Gas Project has computerised shutdown systems with 4 hour emergency timeframes. What will the emergency timeframe be?	The Project would have computerised monitoring equipment. Emergency shutdown procedures would be developed as part of detailed design. Refer to **Section 3.4** of the Submissions Report.
20	Traffic	Trucks will cause a massive increase in local road usage, what will this result in?	Traffic and transport are assessed in Volume 1 Chapter 16 of the EA.
21	Waste	How many centralised evaporation ponds will be required and where?	Evaporation ponds would be located at the CPF and the Teidman property. The number of ponds used for evaporation would be determined during detailed design.
Submission 25			
1	Ground Water	An independent study on groundwater hydrology and disposal of produced water is required.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1.4** of the Submissions Report. A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring

Issue #	Category	Issue	Response
			network/program, and development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
2	Health	Project will add physical and psychological stressors to an already compromised population. Consideration of specific and cumulative health impacts is needed.	Refer to response to Submission 5/66, Issue 21.
3	Surface Water	A flood impact assessment is needed.	Refer to Submission 127 Issue 97.
4	Noise	Impacts predicted by noise assessment were underestimated.	Refer to Submission 127 Issue 106.
5	Noise	At what distance from a well head and the CPF will the noise no longer be audible.	Audibility would depend on a range of factors including topography, weather conditions, location of built structures to act as acoustic shields as well as other factors and the distance cannot be accurately estimated. AGL would implement all reasonable and feasible mitigation measures to ensure operational noise meets the set criteria which have been developed in Chapter 14 of the EA.
6	Cumulative Impacts	Cumulative impact with Stratford coal mine and future project stages is needed.	This EA included assessment of the Gloucester Gas Project and the existing background which includes the existing mining activities. The assessment was undertaken to all relevant standards and guidelines. Successive stages of this project would need to be undertaken independently but also taking in all cumulative effects and would still need to be undertaken in accordance with government agency requirements.
7	Cumulative Impacts	The CPF site 7 should be located where it was originally intended on land acquired for this purpose (CPF site 1).	Noted.
Submission 27			
1	Issues Prioritisation	Disagree with the water management rating as medium and waste as low.	The issues identified are prioritised based on the 1) potential severity of the risk, and 2) the potential consequences. The potential severity of impacts to water quality was rated as 2 Medium (Regional implications, modest or medium

Issue #	Category	Issue	Response
			term accumulation of impacts). The potential consequence was rated as 1 Low (minor environmental change, offsets readily available) based on the ability of the Project to select locations for the wells and pipeline to avoid sites of heritage interest.
2	Surface Water / Ground Water	The amount of information and assessment provided is minimal.	The EA was prepared in accordance with the requirements of the DoP's Environmental Assessment Requirements.
3	Ground Water	The proposed Groundwater Management Plan includes planning and design aspects which should be determined before approval.	Noted.
4	Ground Water	Complex geology in the area makes distinction between aquifers difficult.	This will form part of the Groundwater Management Plan. Refer to **Section 3.2** of the Submissions Report.
5	Ground Water	The hydrogeology of the area is poorly understood. The results of the 3D seismic surveys that AGL are currently undertaking should have been made public before the EA was published.	The 3D survey had not commenced before the EA went public and are not a primary tool in assessing the hydrogeology of the area.
5-95	Ground Water	The extraction trials suggest greater porosity/permeability within the coal seam sequences than is admitted.	Refer to Submission 5/66 Issue 96
5-96	Ground Water	Very limited evidence-base used to interpret lack of hydrological connectivity.	This will form part of the Groundwater Management Plan. Refer to **Section 3.2** of the Submissions Report.
8	Waste	The cost of treating the water is a significant factor when considering the cost-benefit of the project operating costs but it is not addressed.	Cost of the project has been considered by AGL.
9	Surface Water	Any development in the catchment of the Avon River should not be allowed to reduce the water quality from current levels.	Noted. Refer to **Section 3.1** of the Submissions Report.
10	Waste	No information provided on other impurities in the water. The EA should identify a 'typical' range of water quality parameters that may be of concern. The quality of the water before and after treatment should be provided.	Refer to **Section 3.1** of the Submissions Report.
11	Surface Water	A detailed baseline and ongoing surface	A Groundwater Management Plan

Issue #	Category	Issue	Response
	/ Ground Water	and ground water quality monitoring program should be required.	would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. These issues are addressed in **Section 3.1** and **3.2** of the Submissions Report.
12	Surface Water	No flood study was carried out, despite acknowledging that some wells and infrastructure will be in flood-prone areas.	Refer to Submission 127 Issue 97 to 99.
13	Statutory Planning	Development on flood plains is not allowed under LEPs, why then can these gas wells be located in a flood plain? (Assurance that gas wells would be constructed to withstand floods is inadequate).	*Gloucester Local Environment Plan 2000* permits development on flood liable land provided the development will not risk the safety of the community or any residents of the land, impede the flow of water or increase the effect of the flood on the locality, or adversely affect the water table in the locality. Refer to **Section 3.1.3** of the Submissions Report.
14	Precautionary Principle	Scant regard is given to the internationally accepted ESD principle.	The principles of Ecologically Sustainable Development are addressed in Section 28.3 of the EA.
15	Geology	How do they plan to isolate the desired gas-recovery zone form other geological units?	Refer to Submission 5/66 Issue 94.
16	Ground Water	Have not assessed the potential for dewatered coal seam units to become sinks for water from elsewhere (neighbouring geological units, remote geological units via fracture zones or 'open' faults, or from surface waters via alluvial aquifers).	Refer to Submission 5/66 Issue 97.
17	Ground Water	How will they accurately recognise a situation when a production seam is overproducing water? What will they monitor to understand the process involved?	Refer to Submission 5/66 Issue 98.
18	Ground Water	No exact way to know if production zones are leaky at depth. Sealing individual coal seam zones in the drill hole won't necessarily solve the problem.	Refer to Submission 5/66 Issue 99.
19	Ground Water	Increased aquifer permeability - the pilot program is not necessarily representative of all geological situations to be encountered.	Refer to Submission 5/66 Issue 100.
20	Ground Water	Reduction in stream flow - mitigation measures statement has nothing to do with	Refer to Submission 5/66 Issue 101.

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		mitigation measures, it is about monitoring and not mitigating.	
21	Ground Water	Monitoring of target seams and aquifers should apply to contiguous non-seam aquifers.	Refer to Submission 5/66 Issue 102.
22	Ground Water	Presence of fractured rock aquifers in the area.	Refer to Submission 5/66 Issue 10.
23	Ground Water	Although the drilling activity in the pilot project area didn't intersect any aquifers it doesn't preclude their existence within the proposed gas field area.	Refer to Submission 5/66 Issue 11.
24	Ground Water	"The complexity of the faulting (in the area) is likely to have juxtaposed the coal seams with potential sandstone aquifers in many places. This has the potential to make the coal seams 'leaky' in such places."	Refer to Submission 5/66 Issue 12.
Submission 28			
1	Ground Water	Risks of damage to aquifers and contamination from produced water. Further independent studies on this should occur.	Refer to Submission 127 Issue 55 and 62.
2	Health	No concern is shown for the adverse affect of the project on human health.	Section 3.4 of the Submissions Report provides a discussion of the key issues of concern in relation to health.
3	Surface Water	Have not addressed the affect of floods on the project and the environment.	Refer to Submission 127 Issue 97 to 99.
4	Noise	The noise assessment is vague and no account is taken of the effects of topography on the distribution of sound.	As described in Appendix H, the noise modelling was undertaken in using the DECCW approved Environmental Noise Model which takes into consideration distance, ground absorption, atmospheric absorption and topography.
Submission 32			
1	Noise	Continuous noise impact from proposed CPF at Site 7.	Refer to Submission 127 Issues 104 to 107.
2	Visual	Light impact from CPF at Site 7.	Refer to **Section 3.8.5** of the Submissions Report
3	Traffic	Increased traffic movements through the village of Stratford. Particularly at dangerous intersection at Crowthers Road.	A Traffic Management Plan would be developed for the Project and would include mitigation measures at dangerous intersections.
4	Consultation	No return correspondence. Lack of detail	An extended period of 8 weeks for

Issue #	Category	Issue	Response
		provided in drop in meetings. Exhibition of Christmas period shows lack of regard for those wanting to make submissions.	public exhibition of the EA beyond the minimum statutory period of 30 days was provided to allow individuals to review and provide comment on the project.
5	Land Use	Original site at Tiedemans Lane (Site 1) is preferred, particularly due to less traffic impacts and fewer residents affected.	Noted.
Submission 33			
1	Land Use	Change of environment from pristine agricultural land to heavily industrialised land.	Visual impacts and proposed mitigation measures have been addressed in **Section 3.8** of the Submissions Report. The presence of surface and subsurface field infrastructure would not change the rural nature of the landscape.
2	Health	Link between drilling fluids and leukaemia, cancer, adrenal tumours, damaged kidneys, immune system and reproductive development. Humans and livestock at risk.	**Section 3.4** of the Submissions Report provides a discussion of the key issues of concern in relation to health.
Submission 35			
1	Ground Water	Need an independent ground water study.	Refer to Submission 127 Issue 1 and 55.
2	Ground Water	Government needs to ensure the protection of aquifers.	Noted.
3	Environmental Degradation	AGL must be held accountable for any environmental damage.	AGL is responsible for ensuring that the Project complies with all conditions contained within a Project Approval and Environment Protection Licence issued in respect of the project to ensure that water discharged from the project complies with the relevant criteria and the POEO Act.
4	Groundwater	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels of composition.	Refer to Submission 127, Issue 55 and 62.
5	Surface Water	Have not addressed the affect of floods on the project and the environment.	Refer to Submission 127, Issues 97 to 99.
6	Health	Health impacts have not been addressed.	**Section 3.4** of the Submissions Report provides a discussion of the key issues of concern in relation to health.
7	Noise	Assessment of noise impacts as 'insignificant' is incorrect.	Refer to Submission 127 Issues 104 to 107.
8	Land Use	The valley is needed as a food resource due to its climate. Climate change will result	The Project is not anticipated to significantly impact the agricultural

Issue #	Category	Issue	Response
		in a decrease in other food producing areas.	land uses within the area. Refer to **Section 3.7** of this Submissions Report.
Submission 60			
1	Ground Water	Objection to destruction of aquifers.	The Project would managed to minimise potential impacts to aquifers. A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. A groundwater monitoring network would be established in the Project Area and surrounds to monitor water level and quality of the groundwater resources (superficial/alluvial aquifer, shallow aquifers and deep aquifers).
2	Ground Water	Contamination of underground water supplies by fraccing water.	Refer to **Section 3.1** of the Submissions Report. **Section 3.4** of the Submissions Report provides a discussion of the key issues of concern in relation to health.
3	Statutory Planning	The Part 3a application exempts the need to obtain water use approval.	Refer to Submission 1 Issue 2.
4	Waste / Surface Water	Concern for discharge of treated water in rivers.	Refer to **Section 3.1** of the Submissions Report.
5	Waste	Reverse osmosis appears to be the best option available to treat the water, but the applicant is already searching for a cheaper option.	Produced water would be treated using reverse osmosis as described in the EA. Produced water management is described in **Section 3.1** of the Submissions Report.
6	Surface Water	Soil disturbance during construction will cause increased soil runoff in waterways with a higher nutrient load and extensive weed generation potential.	Refer to **Section 3.1** of the Submissions Report for discussion on construction environmental management and downstream impacts on waterways.
7	Surface Water	Creek and river crossing work will destroy and disturb land in riparian zones, potentially causing soil erosion.	Refer to Submission 127 Issue 6.
8	Geology	Presence of Acid Sulphate Soils.	Management of acid sulphate soils is described in Section 17.5.4 and 17.6 of the EA. The Acid Sulfate Soils Management Plan would include inspection schedules post

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			completion to ensure no liberation of acidic material and waters.
9	Surface Water	All wells should be located a minimum of 40m from the riparian zone boundary due to flooding.	Refer to Submission 63 Issue 10.
10	Consultation	Lack of government employees at consultation meetings.	Relevant statutory agencies were invited to meetings representatives from each of the local councils are members of the CCC
11	Surface Water / Ground Water	Need to protect water supply and ground water for the greater demand resulting from climate change.	Noted.
Submission 64			
1	Workforce camp	Instead of a camp for the workforce, a mix of affordable and family permanent housing should be built in Gloucester by AGL. This housing would be for exclusive use during project construction and then made available generally after construction.	The establishment of construction workforce camps are considered to be the most feasible option for the Project. Alternatives were considered in Chapter 4 of the EA.
2	Ground Water	Extensive monitoring of ground water is required and should start before drilling occurs. The ground water data should be reported to a community consultative committee on a regular basis.	Refer to Submission 5/66 Issue 9.
3	Noise	Generators should not be used in the operation of wells as they will generate too much noise. Reticulated electric power should be used instead.	As described in Volume 1 Section 5.4.10 initial electricity supply would be via the use of small power generators.
4	Hazards	Flash fires should be taken into account at wells, CPF and pipeline risk analysis as the potential for a significant (methane) cloud build up is not low.	Flash fires were considered in Volume 3 Appendix I and Volume 1 Section 15.4.2 of the EA.
5		No assessment of stray electric currents from the pipeline cathodic protection system has been stated.	An assessment of cathodic protection is currently being undertaken. The cathodic protection would be designed as required to avoid impacts.
6	Hazards	The risk contour should be measured from the outside of the well area, not the centre, as gas equipment extends to the boundary of the well.	Risk contours were measured in accordance with relevant statutory requirements as discussed in Volume 1 Section 15.2.2 of the EA. Refer to Submission 20 Issue 129.
7	Hazards	The area around the well fails to meet the safety criteria for residential areas. The proponent should modify the wells so that the risk level is reduced to the residential level.	The areas directly around the well sites are not residential areas. All wells would be located a minimum distance of 200 m from well head infrastructure. Refer to Issue 6 above and

Issue #	Category	Issue	Response
			Submission 20 Issue 129.
8	Traffic	The bridge on Wenham Cox Road that crosses the Avon River would not be satisfactory for the increased traffic to the CPF Site 1. The bridge should be replaced with a 2 lane high level structure.	An assessment of road and infrastructure condition would be undertaken in consultation with the local road authority. Upgrades would be undertaken if required.
9	Visual	The significant loss of visual amenity for elevated residences must be taken into account.	Refer to Submission 5/66 Issue 40, and **Section 3.8** of the Submissions Report
10	Visual / Hazard	Gas flaring, particularly at Site 7, could cause distraction to motorists. The gas flare should be screened.	Refer to **Section 3.8.5** of the Submissions Report
Submission 65			
1	Waste	AGL should be required to use its preferred option of irrigation and not be allowed to discharge water into waterways.	Produced water management is described in **Section 3.1** of the Submissions Report. Management would include discharge to waterways in accordance with an Environment Protection Licence issued by DECCW.
2	Surface Water	Where will the water used in fraccing be sourced?	Refer to Submission 127 Issue 70.
3	Surface Water	Will the lack of off stream storage in Gloucester result in ratepayers being denied water in times of shortage?	No.
4	Traffic	Local roads cannot withstand increased traffic. Gloucester Council must be compensated.	Refer to response to Submission 62, Issue 14.
5	Ecology	McKinleys Lane should not be used for any heavy traffic due to the threatened Grey-Crowned Babbler using this area for breeding.	The grey crowned babbler species awareness and identification already forms part of AGL's safety and environmental inductions for employees and contractors. A site specific workplan would form part of the Flora and Fauna Management Plan for the protection of the Babbler, in particular for known habitat areas, and a general workplan for across the Project.
6	Noise	The use of diesel generators on the wells will cause unacceptable noise levels to a substantially populated area. All gas wells should be connected onto the established power grid instead.	Refer to Submission 64 Issue 3 and **Section 3.6** of the Submission Report.
7	Heritage	Inadequate heritage study, particularly with regard to the Vale of Gloucester as the entrance to the Barrington Tops.	Refer to Submission 127, Issue 79 to 84. The proximity to Barrington Tops and other tourist destinations was considered in the Socio-Economic assessment in Chapter 20 of the EA and is further

Issue #	Category	Issue	Response
			discussed in Section **3.8, 3.9** and **3.10** of this Submissions Report.
8	Geology / Ground Water	3D geology and hydrology studies should be completed before approval.	2D and 3D seismic surveys are currently being undertaken throughout the Stage 1 GFDA. A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. The Groundwater Management Plan is discussed in **Section 3.2** of the Submissions Report.
Submission 67			
1	Ground Water	Aquifers contaminated by re-injection of toxic water.	Refer to Submission 127 Issue 66.
2	Waste	No contaminated water should be disposed of in areas which could overflow and contaminate surrounding water courses.	Refer to Submission 127 Issue 68.
3	Environmental Degradation / Health	Lack of information on the long-term effects of this project on air pollution, land and aquifer contamination, or human and animal health.	**Section 3.4** of the Submissions Report provides a discussion of the key issues of concern in relation to health.
4	Environmental Bond	AGL should set aside funds, independent of government influence, held by qualified bodies to provide for future compensation where required.	If approved, the project would be undertaken in accordance with the conditions of a Project Approval.
5	Visual / Socio-Economic	Visual impact will damage tourism industry.	Refer to Submission 127, Issue 76.
6	Statutory Planning	The well sites are industrial sites and should be assessed under such legislation.	Refer Submission 127 Issue 90.
7	Noise	Massive noise impact on people and animals.	Refer to **Section 3.6** of the Submissions Report.
8	Land Use	Destruction of arable land for industrial use.	Refer to Submission 147 Issue 7 and **Section 3.7** of the Submissions Report.
Submission 69			
1	Traffic	Local roads cannot withstand increased traffic. Gloucester Council must be compensated.	Refer to response to Submission 62, Issue 14.
2	Ecology	McKinleys Lane should not be used for any heavy traffic due to the threatened Grey-Crowned Babbler using this area for breeding.	The grey crowned babbler species awareness and identification already forms part of AGL's safety and environmental inductions for employees and contractors. A site

Issue #	Category	Issue	Response
			specific workplan would form part of the Flora and Fauna Management Plan for the protection of the Babbler, in particular for known habitat areas, and a general workplan for across the Project.
3	Traffic/Alternative	Create access to wells off McInleys Lane, via Fairbairns Lane, which is a sealed road and AGL already own or have agreed access with the landowners.	Noted.
4	Traffic	Destruction of local roads will require repair and will cause accidents - will the government guarantee to maintain these roads?	Refer to response to Submission 62, Issue14.
5	Air Quality / Health	Dust and other industrial pollution will cause health problems (inhalation of particles).	**Section 3.4** of the Submissions Report provides a discussion of the key issues of concern in relation to health.
6	Land Use	The land will be polluted and damaged, therefore making it unfit for agriculture and tourism.	Refer to Submission 147 Issue 7 and **Section 3.7** of the Submissions Report.
Submission 70			
1	Surface Water	Construction of an open trench within the spring fed area will jeopardise the spring from coming to the surface to feed Black Soils Creek.	Refer to Submission 63 Issue 8.
2	Surface Water	A condition should be imposed that prior to construction of any trenches and laying of pipeline within proximity of any spring fed creeks or other water source, an independent EA should be carried out to determine impacts.	Refer to Submission 63 Issue 8.
Submission 72			
1	Surface Water	A condition of consent should be 'no creek or river discharge' on high flow, medium flow etc. whether the water is treated or not. None of the listed treatment methods are acceptable.	Refer to Submission 127 Issue 49.
2	Environmental Degradation	Destruction of creek and wildlife habitat on private property. Concern that AGL will blast the hard Karuah rock to create the pipeline.	Refer to Submission 127 Issue 48.
3	Environmental Degradation	There is a corridor where the pipeline could be placed which is where 5 other easements are situated in the front of the property, and where the original pipeline was going.	The original alignment referred to was investigated and deemed to have too much environmental risk due to the need to drill the Karuah River three times. Upon further investigation an alternative alignment was found to the east of the Bucketts Way eliminating 2 of

Issue #	Category	Issue	Response
			the drills across the Karuah River. The revised alignment was deemed to be more environmentally favourable.
4	Consultation	Lack of time for community to understand the ramifications of having AGL gas conduct their business in this valley.	Refer to Submission 20 Issue 8.
5	Health	American EPA and QLD gas problems.	Refer to Submission 127 Issue 94.
6	Socio-Economic	Devaluation of property.	Refer to Submissions 5/66, Issue 41.
7	Statutory Planning	The 'Licence Agreement and Agreement to Grant Easement' has many inconsistencies, mistakes and loop holes.	Landowners have the right to obtain legal advise in relation to the Agreement if they have queries or concerns.
8	Health	No studies have been done on the possible human health impacts to people living in the vicinity of gas wells.	**Section 3.4** of the Submissions Report provides a discussion of the key issues of concern in relation to health. Methane gas leakage is discussed in **Section 3.4.1** of the Submissions Report. Potentially contaminated water is discussed in **Section 3.4.3, 3.1, 3.2** and **3.3** of the Submissions Report. Inhalation of particulates is discussed in **Section 3.4.1** of the Submissions Report.
9	Hazards	Pipeline safety, including potential gas line explosions.	Hazards associated with the pipeline were assessed in Volume 3 Appendix I and Volume 1 Chapter 15 of the EA.
Submission 76			
1	Ground Water	Groundwater loss and damage to aquifers.	Refer to Submission 127 Issue 1 and 55.
2	Land Use	How many landholders will be affected? Is there a criterion where DoP assesses the effect of a project on the livelihoods of many farmers and then is prepared to	Should the Project be considered to have a significant environmental, social or economic impact, the DoP may not approve the development.

Issue #	Category	Issue	Response
		decline the proposal because of this?	The environmental, social or economic impacts of the Gloucester Gas Project have been assessed in the EA are not considered to be significant, provided the recommended mitigation and management measures detailed in the EA are implemented.
3	Socio-Economic	Loss of lifestyle and depletion of workable land.	Refer to Submission 147 Issue 7 and **Section 3.7** of the Submissions Report.
4	Visual	Was a visual inspection done of the area?	This was undertaken as part of the visual assessment (refer Chapter 18 of the EA). Further discussion on visual impacts is provided in **Section 3.8** of the Submissions Report.
5	Socio-Economic	AGL should bury all pipes deep enough to allow all forms of grazing and cropping so as not to disadvantage the present landholders should they wish to sell.	The depth of pipeline burial depends on a number of factors, not least of which is health and safety. The location of the wells and pipelines has been discussed (and would be the subject of ongoing consultation) with each landowner to ensure that the wells and pipelines are placed in locations agreeable to them. Refer to Section 3.7 of the Submissions Report
6	Surface Water	Possible overflowing of dams where waste water is stored due to higher than average rainfall.	Refer to Submission 127 Issue 68.
7	Land Use	Because of climate change, agricultural land should be kept and natural gas plants should only be built in drier areas and over larger properties.	The location of coal seam gas developments is dependent on the location of viable resources (i.e. coal measures). It is not necessarily possible to correlate the location of coal seam gas developments with drier climatic conditions.
Submission 83			
1	Surface Water	A condition of consent should be 'no creek or river discharge' on high flow, medium flow etc. whether the water is treated or not. None of the listed treatment methods are acceptable.	Refer to Submission 127 Issue 49
2	Environmental Degradation	Destruction of creek and wildlife habitat on private property. Concern that AGL will blast the hard Karuah rock to create the pipeline.	Refer to Submission 127 Issue 48
.3	Environmental	There is a corridor where the pipeline could	Refer to Submission 72 Issue 3.

Issue #	Category	Issue	Response
	Degradation	be placed which is where 5 other easements are situated in the front of the property, and where the original pipeline was going.	
4	Consultation	Lack of time for community to understand the ramifications of having AGL gas conduct their business in this valley.	Refer to Submission 20 Issue 8.
5	Health	American EPA and QLD gas problems.	Refer to Submission 127 Issue 94.
6	Socio-Economic	Devaluation of property.	Refer to Submissions 5/66, Issue 41.
7	Statutory Planning	The 'Licence Agreement and Agreement to Grant Easement' has many inconsistencies, mistakes and loop holes.	Refer to Submission 72 Issue 7
8	Health	No studies have been done on the possible human health impacts to people living in the vicinity of gas wells.	Refer to Submission 72 Issue 8.
9	Hazards	Pipeline safety, including potential gas line explosions.	Refer to Submission 72 Issue 9.
Submission 87			
1	Air Quality	Air quality control does not deal with emissions from the diesel generators on each gas well.	Construction emissions including emissions from generators as assessed in Volume 1 Section 9.4.1 of the EA.
2	Socio-Economic	What will be the impact on the families living within the first stage gas field and the township of Gloucester?	The socio-economic effects of the project are discussed in Chapter 20 of the EA, and discussed further in **Section 3.9** of the Submission Report.
3	Health	"What will be the health effects in the winter with a temperature inversion and the people living in this toxic soup generated by the well generators and the CPF compressors working 24/7 along with the cumulative effects of an increasing operation at Gloucester coal?"	Air quality impacts have been assessed in accordance with DECCW's *Approved Methods for the sampling and analysis of air pollutants in NSW* (DEC, 2007). An Air Quality Impact Assessment Addendum Report is provided in **Appendix A** to the Submissions Report. Emissions for relevant pollutants are expected to be well within relevant criteria set by DECCW.
4	Air Quality	The geography of the valley will have a significant effect on air quality control.	Refer to Issue 3 above.
5	Air Quality	Air quality receptors will need to be placed throughout the field to monitor pollution levels. Needs to be a way to cease operation if pollution levels exceed safe levels.	Air quality during construction and operation would be managed and monitored (if required) in accordance with an Environment Protection Licence.
6	Air Quality	Pollution control on PM1-2.5 (not PM10) should be undertaken as these are the	Heavy vehicle and construction emissions were discussed in

Issue #	Category	Issue	Response
		particles that are dangerous to human and animal health.	Section 9.4.1 and 9.4.2 of Volume 1 Chapter 9 of the EA, and in the Air Quality Impact Assessment in Volume 2 Appendix F of the EA. Current ambient air quality criteria for particulate matter in NSW are set for PM_{10}. The only criteria relevant in NSW relating to $PM_{2.5}$ is the National Environment Protection Council criteria. A comparative assessment for PM_{10} and $PM_{2.5}$ is provided in **Section 3.5.3** of the Submissions Report and concludes that $PM_{2.5}$ would likely be below relevant guideline criteria under worst case assumptions.
7	Air Quality	Air Quality monitoring starting over the entire field during the well flaring stage is necessary to monitor pollution and possible health risks.	Refer to Issue 5 above.
8	Noise	No study was done on the noise generated by the well diesel generators that run 24/7.	Generators would be required at well sites during operation, however noise from these generators is not expected to significantly affect predicted noise emissions. Appendix H of the EA identified the primary noise sources at well heads as the valves and vacuum pump motor. Further detailed noise assessments as described in Chapter 14 of the EA would be undertaken for the project during detailed design to ensure that project noise goals are met at residential receivers.
9	Visual	Visual assessment did not include the houses along Buckets Way to the west of the field, residents in Forbesdale Estate and some existing residents in Avon Valley Estate. Some 20-30 houses, not specified in the assessment, would be overlooking the gas field.	Refer to Submission 5, Issue 40.
10	Socio-Economic	Detrimental impact on tourism industry due to change of rural landscape to an industrial one.	Refer to Submission 127 Issue 85.
11	Surface Water	What would happen to the properties affected by river and stream depletion caused by the gas mining, would it be assumed that total buy out of all properties would be done by AGL if this was to occur?	The project is not anticipated to result in depletion of stream and river resources.
12	Traffic	Increase in traffic, therefore road funding to council should occur.	As discussed in Volume 1 Section 16.9 of the EA, a detailed Traffic

Issue #	Category	Issue	Response
			Management Plan would be prepared for the Project which would incorporate dilapidation assessments prior to and following construction of the Project to assess road networks to be used during the construction period. Impacts attributable to the Project would be made good by AGL. AGL intends to meet with all relevant road authorities prior to project construction to discuss road crossing approvals and road condition assessments before and after construction of the road networks to be used during the construction period. Given the operation of the Project would not result in a demand for infrastructure and impacts attributable to the Project during construction would be made good by AGL, compensation is not considered to be warranted.
13	Socio-Economic	A compensation agreement has not been finalised for the seismic study nor has any compensation been paid for gas wells.	Since the public exhibition period has closed, compensation agreements have been agreed with 100% of the landowners within the Stage 1 GFDA affected by the seismic survey. Compensation for all gas wells have been paid in accordance with the executed agreement.
Submission 108			
1	Tourism	The Gloucester Valley is an area of significant natural beauty and historic value. Tourism activities may be adversely affected due to noise and visual impacts caused by the project.	Potential impacts on tourism in the Gloucester area were considered in Chapter 20 of the EA and are discussed in **Section 3.9** of this Submissions Report. Refer to **Section 3.8** of the Submissions Report relating to visual impact.
2	Geological	The existing inclined strata is well known not to be suitable for gas extraction due to the possibility of shearing or displacement.	Further seismic investigation is being undertaken to obtain a better understanding of the underlying geology.
3	Ground water	The EA does not adequately address the possibility that ground water aquifers and coal bed ground water will come into contact.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a

Issue #	Category	Issue	Response
			hydrogeological (conceptual) model. This is also addressed in Chapter 13 (Section 13.3.1) of the EA.
4	Water Treatment	The proposed water disposal method by market is foolish.	Noted.
5	Water Treatment	The quality of water for sale is not known.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
6	Water Treatment	The cost of adequate water treatment for horticultural use would be uneconomic	Refer to Issue 5 above.
7	Water Treatment	Would there be future approval for discharge into local waterways?	Yes. Discharge to waters is discussed in **Section 3.1** of the Submissions Report.
8	General Comments	Spoiling the natural beauty of the area for short term gain is short sighted. The EA does not adequately address any of the above issues.	Refer to Section 3.8 of the Submissions Report relating to visual impact
Submission 109			
1	Socio-economic	Gloucester Valley residents will derive no benefit from this project as AGL has no plans to supply Gloucester with gas.	There are a series of benefits available to Gloucester residents as well as the broader community of the region and State. In particular reference to Gloucester residents, there would be financial benefits to the economy as goods and services are sought from the local community, as discussed in Chapter 20 of the EA. .
2	Air/Water Quality	Why should we have poor quality air and water?	Air emissions were assessed in Chapter 9 and Appendix of the EA. An addendum to the air quality assessment is provided in **Appendix A** of this report. Pollutant emissions are predicted to be below relevant criteria set by DECCW. Water quality is addressed in Chapter 11 of the EA and

Issue #	Category	Issue	Response
			discussed further in **Section 3.1** of this Submissions Report.
3	Socio-economic	Why should we be subjected to lower property values when Sydney prices are on the increase?	Land values are not a viable planning consideration, primarily due to the vagueries which govern this area of the economy. Land values can fluctuate for many reasons including supply and demand as well as innumerable other influencing factors. There is no empirical evidence to suggest that this type of development has affected land values in relation to this type of coal seam methane gas development elsewhere in NSW.
4	Noise	Why should we have to suffer higher than normal noise levels at night (85d is over the top at night)?	Operation project noise goals shown in Section 14.5.2 of the EA indicates night time noise goals are between 35 and 43 dBA. Noise mitigation measures would be implemented to ensure these criteria are met at receptors.
Submission 110			
1	General	Strong opposition to Gloucester Gas Project	Noted.
2	Ecology	Ecological damage to aquifers, river systems, wetlands, wildlife habitats will be unacceptable.	Refer to submission 127 Issue 6 and 9 Refer to **Section 3.1** for further discussion on management of produced water and **Section 3.2** for the management of groundwater..
Submission 111			
1	Ground Water / Waste	There is no sale market for the treated water. No alternative disposal method is considered.	Alternative water management options were assessed in Chapter 4 of the EA. AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
2	Waste	How the contaminated solids will be disposed of has not been addressed. If it is to be stored in irrigation holding dams and eventually discharged into the existing river systems the added impact will be disastrous not only for adjacent farming activities but also for downstream users.	The disposal of the concentrated brine waste stream is discussed in Section 5.5.4 of the EA. Water Management and disposal of the concentrated brine waste stream is discussed further in **Section 3.1** of the Submissions

Issue #	Category	Issue	Response
		The EA has not considered this.	Report.
3	Waste	If it is proposed (but not disclosed) to transport the polluted water to some other site what will be the impact of the large number of tankers on an already stressed road system and on the disposal site?	Produced water requiring to be transported by tanker will only be transported to the CPF or Teidman property.
4	Noise	The CPF will generate non-stop unacceptable levels of noise.	Refer to Submission 127 Issues 104 to 107 and **Section 3.6** of the Submissions Report.
5	Noise	The CPF should be located at the end of the existing Parkers Road where it would be relatively unobtrusive. Cost to the Proponent should not outway the health and convenience of the local residents.	Noted, however this site as a potential location for the CPF has not been assessed, and is not owned by AGL.
6	Health	Living with constant unacceptable noise levels affects people's nervous systems, which causes other physical reactions and brings about a general deterioration in community health standards.	The noise assessment was undertaken in accordance with DECCW guidelines in order to meet the criteria. The criteria act as the threshold levels of acceptability in relation to potential impacts. Further discussion of noise is provided in **Section 3.6** of this Submissions Report.
7	Health	There are already health effects in the area resulting from the coal mine and any additional impact from the CPF would be unacceptable.	Health impacts are discussed in **Section 3.4.3** of the Submissions Report. The Project is not anticipated to result in significant health impacts.
8	Health/consultation	Additional one-on-one community consultation should occur with each Stratford resident and final approval should be dependent upon the matter of added noise mitigation and rectification of health problems being satisfied.	AGL would consult directly with residents potentially affected by exceedences of relevant noise criteria during construction. During operation of the project, AGL would implement mitigation measures sufficient to meet the noise criteria at nearby receptors.
9	Heritage	The significance of the heritage aspects of the Gloucester Valley region has not been adequately dealt with.	Refer to Submission 127 Issue 86.
10	Visual	The visual impact upon the scenic beauty of the Region arising from the construction of the wells and of the roads connecting the operating wells will have a devastating effect.	The EA was undertaken in accordance with the Director-General's Environmental Assessment Requirements (EARs) which required land use with significant visual value to be taken into account. The visual assessment was undertaken on the basis of objective scientific principles. It is recognised that appreciation of aesthetics can be a subjective issue, however, the technical assessment did not find

Issue #	Category	Issue	Response
			significant impacts on that basis. **Section 3.8** of this Submissions Report also provides further discussion and explanation of the visual aspects of the project.
11	Socio-economic	Visual impact will be detrimental to the tourist industry in the area, which will impact on the existing community employment levels.	Refer to Submission 108 Issue 1.
12	Socio-economic	Land values in the area will decrease as a result of the Project.	Refer to Submission 109 Issue 3.
13	Ground Water	The Proponent should be required to present a more detailed analysis considering the source of original water to be used in the process, the method by which water will be provided to well sites, the water quantities required, the proposed water treatment methods, the volume of water needing treatment, the containment method for contaminated water and the disposal methods for the contaminated water.	AGL is currently preparing a Water Management Strategy for the management of produced water generated during extraction of CSG. Investigations into potential re-use of the treated water are ongoing. Water Management is discussed further in **Section 3.1** of the Submissions Report.
Submission 112			
1	General	Oppose Gloucester Gas project	Noted.
2	Terrestrial Ecology/Aquatic Ecology	AGL pipeline will alter ecology forever of directly impacted 187 creeks, RAMSAR wetlands, Karuah and Hunter Rivers and swamps and wildlife habitats	Refer to Submission 127 Issues 6 and 9.
3	Surface Water	EA fails to acknowledge need for protection zones surrounding natural water sources	Refer to Submission 117 Issue 16.
4	Ground Water	Pumping water from aquifers causes water to move between different levels of aquifer, deteriorating ground water quality	Refer to Submission 117 Issue 17.
5	Ground Water	Drilling through aquifers near creeks and rivers is irrevocably destructive	Chapter 13 of the EA identifies measures to isolate shallow beneficial aquifers from production wells to ensure these aquifers are not affected by the Project. Refer to **Section 3.1** for further discussion on management of produced water.
6	Ground Water	Trenching and diverting creeks and boring under rivers damages water sources permanently	Refer to Submission 127 Issues 6 and 9.
7	Risk Assessment	Flood risk assessment has not been carried out leaving potential for fraccing fluids and chemicals to run into waterways and poison	Refer to Submission 127 Issue 97 to 99.

Issue #	Category	Issue	Response
		aquifers and ground water systems.	
Submission 113			
1	General	Oppose Gloucester Gas project	Noted.
2	Terrestrial Ecology/Aquatic Ecology	AGL pipeline will alter ecology forever of directly impacted 187 creeks, RAMSAR wetlands, Karuah and Hunter Rivers and swamps and wildlife habitats	Refer to Submission 127 Issues 6 and 9.
3	Surface Water	EA fails to acknowledge need for protection zones surrounding natural water sources	Refer to Submission 117 Issue 16.
4	Ground Water	Pumping water from aquifers causes water to move between different levels of aquifer, deteriorating ground water quality	Refer to Submission 117 Issue 17.
5	Ground Water	Drilling through aquifers near creeks and rivers is irrevocably destructive	Chapter 13 of the EA identifies measures to isolate shallow beneficial aquifers from production wells to ensure these aquifers are not affected by the Project. Refer to **Section 3.1** for further discussion on management of produced water.
6	Ground Water	Trenching and diverting creeks and boring under rivers damages water sources permanently	Refer to Submission 127 Issues 6 and 9.
7	Risk Assessment	Flood risk assessment has not been carried out leaving potential for fraccing fluids and chemicals to run into waterways and poison aquifers and ground water systems.	Refer to Submission 127 Issue 97 to 99.
Submission 116			
1	General	Oppose Gloucester Gas project	Noted.
2	Terrestrial Ecology/Aquatic Ecology	AGL pipeline will alter ecology forever of directly impacted 187 creeks, RAMSAR wetlands, Karuah and Hunter Rivers and swamps and wildlife habitats	Refer to Submission 127 Issues 6 and 9.
3	Surface Water	EA fails to acknowledge need for protection zones surrounding natural water sources	Refer to Submission 117 Issue 16.
4	Ground Water	Pumping water from aquifers causes water to move between different levels of aquifer, deteriorating ground water quality	Refer to Submission 117 Issue 17.
5	Ground Water	Drilling through aquifers near creeks and rivers is irrevocably destructive	Chapter 13 of the EA identifies measures to isolate shallow beneficial aquifers from production wells to ensure these aquifers are not affected by the Project. Refer to **Section 3.1** for further discussion on management of produced water.

Issue #	Category	Issue	Response
6	Ground Water	Trenching and diverting creeks and boring under rivers damages water sources permanently	Refer to Submission 127 Issues 6 and 9.
7	Risk Assessment	Flood risk assessment has not been carried out leaving potential for fraccing fluids and chemicals to run into waterways and poison aquifers and ground water systems.	Refer to Submission 127 Issue 97 to 99.
Submission 118			
1	Ecological Sustainability	Like base load electricity generation, mineral extraction is not ecologically sustainable. A hole is left in the environment and remediation is not an acceptable solution.	The extraction of coal seam gas to support power generation in NSW is in accordance with climate change and greenhouse emission initiatives of the NSW Government. The EA considered and assessed environmental, social and economic impacts of the project, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.
2	Tourism	The area is ideal for holidays comprising pristine agricultural land. The landscape has already been degraded due to the Stratford Coal Mine including visual, air quality impacts and increased vehicle traffic damage to infrastructure.	The predominantly agricultural nature of the landscape would not be significantly affected. Refer to **Section 3.7** of the Submissions Report.
Submission 119			
1	Land Use	Change from semi rural area of environmental significance (World Heritage Barrington Tops nearby) into an industrial area.	The predominantly agricultural nature of the landscape would not be significantly affected. Refer to **Section 3.7** of the Submissions Report.
2	Socio-Economic	Decrease in land and property values.	Refer to Submission 5/66, Issue 84.
3	Health	Stress on local community.	Refer to response to Submission 5/66, Issue 42
4	Surface Water	Wells being placed within flood plains is a potential hazard as any accidental water release could contaminate the town's drinking water supply.	Accidental water release is identified in Volume 1 Chapter 12 of the EA, however design, construction and operational mitigation measures would be implemented to reduce the possibility of accidental release to an acceptable level. During detailed design, AGL would

Issue #	Category	Issue	Response
			develop a Flood Management Plan which would incorporate a Flood Risk Analysis and Flood Management Procedure. It is noted, however that the infrastructure that would be present in potentially flood prone areas is not anticipated to result in impacts to either the flood regime or flow of flood waters, nor is the infrastructure at well site locations likely to be significantly affected by the flow of flood waters. Refer to **Section 3.1.3** of the Submissions Report.
5	Ground Water	Accidental gas migration into aquifers could result in water contamination.	Refer to Submission 5/66 Issue 44.
6	Hazards	If the wells are subjected to strong flood waters how will AGL be able to cap and seal off the well?	AGL would implement a flood warning system which would allow equipment at the well head to be secured prior to being impacted by the flow of flood waters. The equipment is capable of withstanding flood flows.
7	Land Use	The Gloucester Valley is quite densely populated, therefore it is not appropriate that it be given over to coal and gas miners.	Noted.
8	Land Use	Land is being sold off to the highest bidder with no regard to local community or environmental issues.	Noted. AGL do not intend to buy land to locate wells. Agreements will be reached with the affected landowner in relation to well location and compensation.
Submission 120			
1	Cumulative Impacts	The cumulative impacts of existing coal mining and any future methane gas extraction in the same area is not considered.	Refer to Submission 25 Issue 6.
2	Geology	The geological structure of the Gloucester Valley is highly complicated and the EA does not adequately consider this.	Refer to Submission 127 Issues 1 and 55.
3	Geology	No adequate demonstration of how the proposed steel and concrete liners can withstand seismic shifts. There is evidence of inclined strata in the Valley. Disturbance and/or the presence of lubricant creates an increased possibility of oblique or vertical displacement resulting in a shearing effect and uncontrollable escape of flammable and contaminant material.	The casing and concrete can withstand some ground movement. Where a seismic event occurs that has a plane of movement crossing the well bore, the movement would deform the well, or if severe enough, pinch off and cut the well in two. While this would result in two well bores the lower well would be sealed off by the fault stopping any escape of gas. The upper well would also be sealed off at the base and the top of the well would be

Issue #	Category	Issue	Response
			sealed off by the surface facilities. AGL would ensure wells are constructed in geologically stable locations. Notwithstanding safety and environmental issues, production would be inhibited if wells were constructed at unstable locations.
4	Ground Water	Risks of drilling through sensitive aquifers changes the balance between underground water tables and coal seam gas deposits.	Refer to Submission 127 Issues 1 and 55.
5	Ground Water	The volume of water extracted could exceed water absorption capacity and over-irrigation of treated discharge water could cause a lifting of the water table, leading to mineral redepositing at the surface (salination).	Refer to Submission 5/66 Issue 9.
6		What chemicals are proposed for use in the fraccing process?	Refer to Section 3.4.3 of the Submissions Report
7	Surface Water	Little attention is given to acceptable methods of water treatment, purification standards and the effect of inevitable discharge into streams and rivers. The waterways in the area provide water for many downstream communities. No commitment is made to purify water to either horticultural or drinking water standards.	Refer to Submission 5/66 Issues 1 to 8.
8	Ground Water	The proposed techniques for underground crossing of numerous watercourses is not addressed.	Watercourse crossing techniques are described in Volume 1 Section 5.6.4 of the EA.
9	Surface Water	Flood risk is not assessed.	Refer to Submission 127 Issue 97 to 99.
10	Socio-Economic	The impact on the tourism industry is not assessed.	Refer to Submission 108 Issue 1.
11	Heritage	The impact on the area's cultural heritage is not considered, despite being listed in the assessment requirements.	Refer to Submission 24, Issue 25.
12	Socio-Economic	No assessment on the economic effect on land values.	Refer to Submission 109, Issue 3.
13	Health	Inadequate reference to the far-reaching effects on public health.	Health impacts are discussed in **Section 3.4** of the Submissions Report. The Project is not anticipated to result in significant health impacts.
14	Traffic	Does not address the additional pressure being placed on the existing fragile road system.	Refer to Submission 87, Issue 12.
Submission 125			

Issue #	Category	Issue	Response
1	Ground Water/Surface Water	Request for independent Ground and Surface Water Study to be conducted.	Refer Submission 127 Issue 1 and 55.
2	Precautionary Principle	AGL Gas has stated that project is considered to be generally consistent with precautionary principle. Generally consistent is not good enough. Project must apply Precautionary Principle completely.	The principles of Ecologically Sustainable Development are addressed in Section 28.3 of Volume 1 of the EA.
3	Surface Water/Health/ Ecology	AGL Gas seeks approval for river discharge. Majority of concept area is in Karuah Catchment, from which Midcoast Water take water for town supplies of Stroud and Stroud Road. Section of Karuah River is Habitat Protection Zone for Marine Park.	Refer to Submission 5/66 Issues 1 to 8.
4	Surface Water	Farmers have concerns about river discharge because at times of high flow many riverflats are inundated with floodwater filling billbongs, wetlands that can take months to dry up/drain.	Refer to Submission 127 Issues 23 to 26.
5		Discharging wastewater into river system will turn river into a drain that flows directly into marine park habitat protection zone and Port Stephens.	Refer to Submission 127 Issues 23 to 26.
6	Surface Water/Health	River discharge will have detrimental impact on thousands of people who rely on good quality water for drinking, agriculture, tourism, Karuah oysters industry, ecosystem as a whole. River system supplies 2 towns' drinking water - discharging puts health and safety at risk.	Refer to Submission 127 Issues 23 to 26.
7	Surface Water	Government has responsibility and duty of care to protect our rivers and water quality for downstream communities.	Refer to Submission 127 Issues 23 to 26.
8	Surface Water/Ground Water	Gas pipeline will trench through some creeks, bore under rivers, divert creeks.	Refer to Submission 127 Issue 6.
9	Terrestrial Ecology	EA states that Karuah River is a Class I fish habitat and of high sensitivity. To allow discharge into this river is completely unacceptable. Children of the future need fresh, clear water to enjoy.	Refer to Submission 127 Issue 49 and 50
10	Surface Water	There are 13 years of guarantees and promises made by the Government regarding protection of Mammy Johnsons River and water quality. Community expects government to honour promises by stamping river discharge.	The Gloucester Gas Project will be assessed separately based on potential impacts, mitigations measures presented in the EA.

Issue #	Category	Issue	Response
11	Waste	Who is responsible for AGL Gas' wastewater once it leaves the site?	Refer to Submission 127 Issue 31.
12	Surface Water	Will river discharge and the irrigation of river flats and floodplains with wastewater have a cumulative impact on the river system and connected waterways?	Refer to Submission 142 Issue 38.
13	Health	Can AGL guarantee the downstream water users good quality water in the long term?	Refer to Submission 127 Issue 23 and 31.
14	Surface Water	Will the government take full responsibility should the drinking water become polluted by wastewater either directly or indirectly?	Refer to Submission 127 Issue 23 and 31.
15	Surface Water/Waste	Petition to Government: 4312 signatures requesting Government to never approve river discharge in the Karuah catchment area. Duralie Coal has this Condition of Consent - the same is expected for AGL Gas.	Refer to Submission 127 Issue 33
16	Surface Water	'No river discharge now or ever' should be incorporated for all creeks, river that belong to everyone not just a select few that twist and change the legislation (mining/industry) to pollute natural waterways if they pay to pollute.	Refer to Submission 127 Issue 33
17	Ground Water	Request for buffer zone between river and all gas mining activities (including future irrigation) of at least 400m or more to protect alluvial aquifers in riverflats, floodplains.	Chapter 13 of the EA identifies measures to isolate shallow beneficial aquifers from production wells to ensure these aquifers are not affected by the Project. Refer to **Section 3.1** for further discussion on management of produced water.
18	Ground Water	Carry out independent studies of these areas in accordance with objectives of Atlas of Groundwater Dependant Ecosystems Program under National Water Initiative.	Potential impacts to aquifers would be managed through the preparation of a Groundwater Management Plan (refer Chapter 13 of the EA), which is discussed in **Section 3.2** of the Submissions Report.
19	Specific Inquiry	How many gas and water gathering lines are we going to end up with in the concept area?	The EA states that some 200 – 300 wells may be developed within the Concept Area, which would be assessed as part of future project applications.

Issue #	Category	Issue	Response
20	Ground Water/Surface Water	Request for individual groundwater and surface water studies be carried out on all creeks/watercourses and rivers in the concept area before any gas wells and the water and gas gathering lines are even considered for approval?	Refer to Issue 18 above.
21	Specific Inquiry	Request for a detailed map on the planned gas wells and the water and gas gathering lines in the concept area before any approval is even considered.	The location gas wells in the Concept Area has not been determined. These would be assessed as part of future project applications as described at Issue 19 above. .
22	General	Exploration Licence Area does not equate to an area of minimal environmental impacts. This area has not been thoroughly assessed - needs complete assessment.	The Exploration Area is not the subject of this project application.
23	Health	Belief that Government has a duty of care to protect domestic water supply catchments for health and safety of community.	Noted.
24	Health	Will the Government take full responsibility for health and safety of communities who are reliant on good quality water from two rivers in project area (Karuah and Williams Rivers) that supply domestic water for thousands of people?	Refer to Submission 127 Issue 61.
25	Ground Water	Dewatering of aquifers should be metered - AGL Gas be charged for potable water, commercial bores sunk, water extracted in exploration and production and damage done to aquifers.	Refer to Submission 127 Issue 57.
26	Ground Water	No regulations or guidelines have been set regarding reinjection of aquifer water from fraccing that would be pumped back into aquifers. How can AGL even consider this in their proposal?	Refer to Submission 127 Issue 58.
27	Ground Water	What is AGL's projection of when they expect the aquifers to naturally recharge?	Refer to Submission 127 Issue 59.
28	Environmental Degradation	How does AGL Gas propose to deal with ground subsidence caused by dewatering and gas extraction?	Refer to Submission 127 Issue 60.
29	Ground Water	What time frame are they going to accept responsibility for resulting damages 'drilling/fraccing etc' where the environmental impacts of shallow, alluvial, deep bedrock aquifers are altered immediately? (Vol. 1, pgs 13-1)	Refer to Submission 127 Issue 61.

Issue #	Category	Issue	Response
30	Ground Water	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels of composition.	Refer to Submission 127 Issue 62.
31	Ground Water	Damage to aquifers cannot be reversed.	Noted. Refer to Issue 55 and 62 above, and **Section 3.2** of the Submissions Report
32	Fraccing	Injecting waste water back into underground aquifers, mixed with fraccing chemicals is environmentally damaging.	Refer to Submission 127 Issue 66.
33	Fraccing	Chemical composition of fraccing fluid is highly toxic.	Refer to Submission 127 Issue 67.
34	Fraccing	Treatment of used fraccing chemicals is only partial and /or unproven and there's no place to dispose of these chemicals.	Refer to Submission 142 Issue 58
35	Fraccing	Disposal of fraccing fluids into natural water bodies can poison aquatic ecosystems.	Refer to Submission 127 Issue 66 and 69.
36	Fraccing	Toxic fraccing chemicals mixed with water, 'treated or not' in dams is unacceptable. Dams will fill up and overflow due to high coastal rainfall, despite AGL's justification that capacity would be found in farm dams located in areas without significant catchment'.	Refer to Submission 127, Issue 68.
37	Fraccing	Where are the farms located as stated in the section Treated Water Management? (Vol. 1, pgs. 4-8)	Refer to Submission 142 Issue 61.
38	Fraccing	Where will AGL draw the copious amounts of water from, required for fraccing/drilling gas wells?	Refer to Submission 127, Issue 70.
39	Fraccing	Where do AGL source their fraccing/drilling fluids from and who are the distributors?	Fraccing fluids are sourced by specialised contractors engaged to undertake fraccing activities.
40	Fraccing	What is the precise composition of fraccing fluid or is it a trade secret?	Refer to Submission 127 Issue 71.
41	Fraccing	How much fraccing fluid is used in each well?	Refer to Submission 127 Issue 71.
42	Fraccing	What method of disposal is used for the highly toxic fraccing fluid?	Refer to Submission 127 Issue 72.
43	Land Use	Why the need for a 100m wide pipeline corridor to Hexham?	Refer to Submission 127 Issue 46.
44	Compensation /Health	Does AGL gas have an 'Environmental Bond' in place and what is the exact amount of this Bond? If not, why not?	Refer to Submission 142 Issue 68 and Submission 127 Issue 74

Issue #	Category	Issue	Response
45	Compensation /Health	Environmental bond to be adopted before AGL work commences. Bond to be held by independent custodian. Community will then have finances should they experience health affects and opportunity to repair environment.	
46	Compensation /Health	Deposits to be made throughout the year covering 'immediate, short and long-term environmental damage and health effects of people/animals associated with gas mining report by LB Clarke NSW National Parks and Wildlife Service, 2001).	
48	Air/Water Quality	Gas mine will produce air and water pollution due to methane gas escaping during drilling/fraccing process while boring the gas wells near creeks/rivers.	Refer to Submission 142 Issue 71
49	Risk Assessment	What damage will the forces of natural flooding processes and trees coming down in creeks and rivers, have on gas wells connective pipes and pipe line?	Refer to Submission 127 Issue 97 to 99.
50	Risk Assessment	What is the long term affect of continued flooding on creek/river pipeline and gas wells?	Refer to Submission 127 Issue 100.
51	Waste	Once water has been 'processed' through desalination or other process (as per EA), waste sludge is left - highly toxic and no means of disposal.	Refer to Submission 127 Issue 101.
52	Waste	Does desalination remove toxic chemicals and heavy metals or just remove the salt?	Refer to Submission 127 Issue 102.
53	Waste	What are they going to do with the brine left over after processing water?	Refer to Submission 127 Issue 103.
54	Heritage	Heritage has been downgraded to a low priority despite it being identified in the DGRs. AGL failed to assess significance of Vale of Gloucester by dismissing it as being irrelevant.	Refer to Submission 5, Issue 79.
55	Heritage	This will impact forever on Gloucester Stroud Valley and the Bucketts Way Tourist Country Drive Experience.	Refer to Submission 127, Issue 80
56	Heritage	Valley's heritage significance through its scenic qualities is of highest importance. Historical towns of Stroud and Booral may be affected.	Refer to Submission 127, Issue 81
57	Heritage	Assessment is currently inadequate, therefore will continue to be eroded by	Refer to Submission 127, Issue 82

Issue #	Category	Issue	Response
		successive stages of AGL development, as it will continue to be assessed to this standard. Valley's significance will be lost.	
58	Noise	AGL underhandedly seeking to operate 24 hours/day, 7 days/week. Noise also produced from desalination plant, drilling/fraccing and diesel generators at each gas well hole through extraction of water.	Refer to Submission 127 Issue 104.
59	Noise	Noise study is inadequate and needs to be redone properly.	Refer to Submission 127 Issue 105.
60	Noise	Noise has been assessed against raised background noise levels of Stratford Coal. Assessment does not fully address noise levels throughout stage 1 development area - low background noise away from coal mine area means noise will be far higher than assessed.	Refer to Submission 127 Issue 106.
61	Noise/ Compensation	If community feels affected by noise, AGL Gas should be made to pay for independent monitoring and if it is proven that AGL are operating outside their guidelines, compensation should be paid.	Refer to Submission 127 Issue 107.
62	Rehabilitation	The first rule to rehabilitation is to avoid damage in the first place. It is hard, slow and expensive to return them to their original state. For this reason, the highest priority for stream rehabilitators is to avoid further damage to streams, especially streams that remain in good condition.	Noted. Refer to **Section 3.1.2** of the Submission Report.
Submission 128			
1	Ecological Sustainability	Long term harm to environment. The loss of 20,000 ha productive land.	When considering the impact of field infrastructure on agricultural activities, it can be assumed that approximately 110 well sites (some 15 m x 15 m) would exclude only about 0.05%, or 2.5 ha of the total 50km^2 area within the GFDA. As such, it is expected that the overall impact on agricultural activities would be minor. Further discussion is provided in **Section 3.7** of the Submission Report.
2	Gas Migration	There is a high risk of underground gas migration due to geological formations of the area. Migration will occur into surrounding soils, underground aquifers and the air.	Refer to Submission 5/66 Issue 44.

Issue #	Category	Issue	Response
3		Laterally fractured seams increase the risks for gas seepage, especially during extraction and drilling . Migration can affect the productive life and viability of the mine. Gas may be left trapped and unrecoverable. Post capping & abandonment, subject to natural pressure, catastrophic events may result.	Refer to Submission 5/66 Issue 44.
4		There is a possibility of accidental methane eruption, above ground and into nearby boreholes. The respondent quotes ref CM Atkinson, Coal Bed Methane Hazards in NSW.	Refer to Submission 5/66 Issue 44.
5	Fraccing	Fraccing and resultant air, water and soil contamination, in particular given a 600m grid pattern, fraccing of one well may overlap the fracture of an adjoining well or wells, thereby polluting the "whole strata" under the valley.	Fraccing typically affects the coal seam within 50 m of the well bore. As such, overlapping of adjoining wells would not be expected, and would be located to avoid this situation occurring.
6	Light Pollution	Light pollution during construction of wells.	Refer to **Section 3.8.5** of the Submissions Report.
7	Health Risks	Physical and Psychological health impacts may result for the local population and tourists due to the physical and visual changes in the landscape and influx of workers and resources into the area. Such changes/stresses may result in changes in crime, social diseases and psychological outcomes. The rise in health costs in gas producing areas is well documented.	Refer to Submission 5/66 Issue 21.
8	Physical Threats	Lightning strike at well sites has not been addressed.	Lightning strike was considered in the PHA in Appendix I of the EA (refer Appendix 1 Table A1:1 of Appendix I of the EA). A lightning protection system would be installed to mitigate this occurrence. No further impact assessment is required.
9	Unemployment	Due to visual impact and resultant negative impacts on tourism, livelihoods will be threatened.	Refer to Submission 108 Issue 1.
10	Water treatment	1) Impacts on drinking water quality and cost.	Refer to Submission 5/66 Issue 1.
11		2) Disposal of Co produced water has proved to be the biggest environmental problem associated with CSG fields in the USA.	Refer to Submission 5/66 Issue 1.
12		3) The volume of waste water generated by	This claim is not supported.

Issue #	Category	Issue	Response
		the project will be far greater than that disclosed and up to 1000 wells (with up to 50,000 litres of contaminated water per well)	
13		4) Additional details are required in respect of "some form" of desalination and filtration water treatment.	Refer to Submission 5/66 Issue 1.
14		5)The area suffers from local flooding and high rainfall, additional water for irrigation is not required. If irrigation proceeds the water table may be affected.	Refer to Submission 5/66 Issue 1.
15		6) It is an unacceptable proposal to discharge and resultant water into the local town supply or local rivers.AGL has confirmed that water will not be filtered adequately and will not remove contaminants.	Refer to Submission 5/66 Issue 1.
16		7) The head waters of this valley include the World Heritage Area of Barrington Tops, in NSW.	Noted, however the headwaters of the valley would not be affected by the project.
17		8) Gas pipeline infrastructure will cut trenches through watercourses and tributaries in the area.	Refer to Submission 127 Issue 6 and 9.
18		9) Surface water runoff containing contaminants from 1200 vehicle movements per day/per well.	The EA states that daily vehicle movements per well would be in the order of 100 movements during peak construction periods.
19	Endangered Fauna	Threatened Species, Migratory Species and Wetlands of International Importance exist and may be present within the projects operational area.	Threatened and migratory species were assessed in Appendix G of the EA. Significant impacts are not anticipated provided the mitigation measures outlined in the EA are implemented.
20	Noise	Noise pollution resulting from construction activities, vehicle movements and equipment ie generators etc.	Refer to Submission 127 Issue 104 to 107 and **Section 3.6** of the Submissions Report.
21	Safety	Breathing Apparatus have not been distributed to local residents.	Breathing apparatus are not required. Air emissions were assessed in Chapter 9 and Appendix of the EA. An addendum to the air quality assessment is provided in **Appendix A** of this report. Pollutant emissions are predicted to be below relevant criteria set by DECCW.
22	Heritage and Tourism	Physical impacts on an historic agricultural area. The area has successfully developed and sustained a variety of land based	The heritage assessment identified that there would be no impacts to the agricultural nature of the Vale of

Issue #	Category	Issue	Response
		activities over the last 100 years including; dairying, beef cattle, timber, orchards, horse stud, turf farming, vineyards, food cultivation, agriculture and more recently tourism. The project will generate permanent and disruptive visual and physical impacts to this heritage environment.	Gloucester. Tourism was discussed in several sections of the EA and discussed also in **Section 3.9** of the Submissions Report.
23	Visual Impact	The project will cause visual impacts, creating an industrial scene with associated noise and traffic to an area of rural and heritage scenery. Visual change will include roads and tracks, hundreds of gas wells, new fenced compounds and cement slabs, electricity wires. These visual impacts will 'destroy' tourism, and create an exodus of residents and tourists.	Significant visual impacts and changes to the nature of the Gloucester area are not expected. Refer to **Section 3.8 and 3.9** of the Submissions Report.
24	Air Quality	Resultant loss of air quality due to gas flaring, gas migration, construction dust, construction vehicle and equipment exhaust fumes, regular vehicle movement exhaust and evaporation of other toxic substances.	Air emissions were assessed in Chapter 9 and Appendix of the EA. An addendum to the air quality assessment is provided in **Appendix A** of this report. Pollutant emissions are predicted to be below relevant criteria set by DECCW.
25	Remediation	Abandonment of wells is abandonment of responsibility.	Well sites would be remediated in accordance with DII requirements.
Submission 137			
1	Impact on Tourism	The project will impact on Gloucester's current reliance on scenic-rural based tourism, agricultural production and new housing development in the long term. As "Gloucester will be surrounded by a sea of gas wells" and infrastructure.	Refer to Submission 108 Issue 1 and Submission 127 Issue 90.
2	Effects on Groundwater	Long term cumulative effects on Gloucester's complex geology.	Refer to Submission 127 Issues 1 and 55.
Submission 140			
1	Ground Water	Request for independent Ground Water Study to be conducted by an independent body.	Refer to Submission 127 Issues 1 and 55.
2	Surface Water/Waste	Petition to Government: 4312 signatures requesting Government to never approve river discharge in the Karuah catchment area. Duralie Coal has this Condition of Consent - the same is expected for AGL Gas.	Refer to Submission 127 Issue 33
3	Surface Water	AGL must have as one of their Conditions of Consent, absolutely 'No Creek or River Discharge'.	Refer to Submission 127 Issue 49
4	Ground Water	Objection to dewatering the aquifers in	Noted.

Issue #	Category	Issue	Response
		order to draw methane gas out	
5	Ground Water	Dewatering of aquifers should be metered - AGL Gas be charged for potable water, commercial bores sunk, water extracted in exploration and production and damage done to aquifers.	Refer to Submission 127 Issue 57.
6	Ground Water/ Compensation	AGL Gas should be charged a substantial amount for damage done to aquifers. This money must be 'Held in Trust' by a custodian as part of AGL's 'Compensation to the Environment'	Noted.
7	Health	No regulations, guidelines or health concerns raised have been adequately assessed in the EA. Reports from America are alarming and need addressing.	Refer to Submission 127 Issue 90 and 91
8	General	Gas mining should not replace coal mining - solar power is better alternative.	The extraction of coal seam gas to support power generation in NSW is in accordance with climate change and greenhouse emission initiatives of the NSW Government. The EA considered and assessed environmental, social and economic impacts of the project, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.
9	Ground Water	Reinjection of water after fraccing into aquifers seems to pose environmental problem and consequences. Environmental damage needs to be measured through independent company. Reports from America show ground water and fraccing fluids move and will eventually come out elsewhere.	A Groundwater Management Plan would be developed for the project prior to construction, which would include development of a groundwater monitoring network/program, and development and ongoing review of a hydrogeological (conceptual) model. Refer also to Submission 127 Issue 66.
10	Ground Water	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels of composition.	Refer to Submission 127 Issue 62.
11	Surface Water/Transparency	Strong objection to the fact that AGL proceeds with river discharge knowing Duralie Coal 15 month campaign for No Creek or River discharge.	Refer to Submission 127 Issue 49 and 50
12	Waste	Strong objections to waste water being held	Refer to Section 3.1.5 of the

Issue #	Category	Issue	Response
		in holding dams - will only cause environmental problems as experienced by QLD Gas.	Submissions Report
13	Waste	Object to waste water being irrigated into gullies or near creeks or rivers, natural waterways.	Refer to Submission 127 Issue 51.
14	Surface Water	AGL Gas must be required to contain all waste-water on site, preventing any discharge to local waterways, Creeks and Rivers, minimising any impact and preventing the quality of the natural water sources from being degraded and altered'.	Refer to Section 3.1.4 of the Submissions report regarding produced water management
15	Waste	Demand for Protection of River Flats and Flood Plains, adopting a "No Irrigation or waste-water treated or not, via any method as a Condition of Consent" '	Refer to Submission 127 Issue 49 and 50
16	Surface Water	Need to enforce a '1km Protection Zone for every soak/swamp, billabong wetlands, creeks, rivers and any natural water sources etc.'	Refer to Submission 127 Issue 49 and 50
17	Surface Water	Environmental measures must be undertaken to identify any possible adverse effects on all water supply sources of downstream landholders as a result of gas mining, and enforce mitigation measures.	Refer to Submission 127 Issue 23 and 31.
18	Terrestrial Ecology	Dams are already constructed but must be fenced and bird-netted, minimising danger to wildlife. Must be done immediately.	Refer to Submission 20, Issue 121.
19	Society/Health	'Farming, tourism and health of people can only exist without Gas mining'.	Refer to **Section 3.9** of the Submissions Report
20	Community Consultation	People should be notified around the area of all workings ahead of time. This would give people opportunities to lodge objections.	Refer to Submission 127 Issue 2.
21	Community Consultation	People are having this inflicted upon them and their rights to say 'no, go away and stay off my property' are being taken away from them.	Landowners affected by the project are consulted and where possible their concerns are taken into consideration. Compensation is payable to landowners whose land is used for the siting of project infrastructure.

Issue #	Category	Issue	Response
22	Compensation	Does AGL have an Environmental Bond in place that will compensate people of the valley/pipeline corridor? If so what is the yearly amount payable and to who? And if not, why not?	Refer to Submission 142 Issue 68
23	Compensation /Health	Environmental bond to be adopted before AGL work commences. Bond to be held by independent custodian. Community will then have finances should they experience health affects and opportunity to repair environment. Deposits to be made throughout the year covering 'immediate, short and long-term environmental damage and health effects of people/animals associated with gas mining report by LB Clarke NSW National Parks and Wildlife Service, 2001).	Refer to Submission 127, Issue 74 and 75.
24	Waste	Gas plant will alter rural valley. Chemical residue will remain in water and soil and production will visually alter valley through hundred of gas wells, waste water holding plants and CPFs.	Refer to Submission 127, Issue 77.
25	Air Quality/ Water Quality	Development will cause air and water pollution.	Refer to Submission 127 Issue 78.
26	Water Quality	Fraccing process contaminates aquifers, methane gas escapes into creeks.	Refer to Submission 127 Issue 78.
27	Socio-economic	Spoil valley basin and affect tourism and leisure activities.	Refer to Submission 127 Issue 85.
28	Water Quality	Damage will be caused by trenching and diverting creeks and boring under rivers. Act of laying gas pipe causes some waterways to be crossed 4-6 times each. Cementing of bedrock in creeks/rivers is AGL's solution, yet impact will be immediate.	Refer to Submission 127 Issue 48.
29	Water Quality	How then, can AGL justify that there 'will be insignificant or minimal damage to creeks/rivers etc.'?	Refer to Submission 127 Issue 48.
30	EA Process	Using Precautionary Principle this project cannot proceed any further.	The principles of Ecologically Sustainable Development are addressed in Section 28.3 of

Issue #	Category	Issue	Response
			Volume 1 of the EA.
31	Environmental Degradation	Project is already doing irreversible environmental damage through exploration drilling and core samples on river flats of Gloucester River and Fairbairnes Road Gloucester with gas wells and dirty water holding dams.	Refer to Submission 127, Issue 41.
32	Landowners Rights	No one has the 'right' to take away 'our valley, our lifestyle, our air and water' based on an industry that has many flaws in Australia and overseas.	Noted.
33	Fraccing	Fraccing requires immense quantities of water in process which would lead to a complete removal of Ground Water.	Refer to Submission 127, Issue 65.
34	Fraccing	Injecting waste water back into underground aquifers, mixed with fraccing chemicals is environmentally damaging.	Refer to Submission 127, Issue 66
35	Fraccing	Chemical composition of fraccing fluid is highly toxic. Although they may be vegetable based, experience shows that intense chemical reaction is required for this process.	Refer to Submission 127, Issue 67.
36	Fraccing	Toxic fraccing chemicals mixed with water, 'treated or not' in dams is unacceptable. Dams will fill up and overflow due to high coastal rainfall, despite AGL's justification that capacity would be found in farm dams located in areas without significant catchment'.	Refer to Submission 127, Issue 68.
37	Waste	Disposing of fraccing fluids in aquifers, creeks and rivers will poison aquatic ecosystems and water and is completely unacceptable.	Refer to Submission 127, Issue 69.
38	Fraccing	Where will AGL draw the copious amounts of water from, required for fraccing/drilling gas wells?	Refer to Submission 127, Issue 70.
39	Fraccing	What is the precise composition of fraccing fluid or is it a trade secret? How much fraccing fluid is used in each well?	Refer to Submission 127 Issue 71.
40	Fraccing/ Waste	What method of disposal is used for highly toxic fraccing fluid?	Refer to Submission 127 Issue 72.
41	Socio-economic/ Health/ Visual	To place a gas well in close proximity to Gloucester River/River flats and township is aesthetically and environmentally wrong. If development is approved this area must be left alone.	AGL has developed the EA and the project design on a set of locational principles. This includes separation distances to residents and waterways.
42	Heritage	Valley's heritage significance through its scenic qualities is of highest importance. Historical towns of Stroud and Booral may	Refer to Submission 127 Issue 81.

Issue #	Category	Issue	Response
		be affected.	
43	Heritage	EA does not assess impact of development on valley's cultural heritage, including vistas, despite this being a DGR.	Refer to Submission 127 Issue 86.
44	Socio-Economics	EA does not assess economic impact on tourism industry and land values within the area.	Refer to Submission 127 Issue 85.
45	Cumulative Impacts	Full and proper assessment of cumulative impacts is critical. AGL Gas will reduce agricultural production due to land lost due to gas wells and infrastructure due to potential air/water quality, dust, noise and loss of rural Gloucester township.	Refer to Submission 127 Issue 87.
46	Water Quality	Trenching and diverting creeks and boring under rivers damages natural water bodies permanently despite AGL stating bedrock would be cemented back after trenching.	Refer to Submission 127 Issue 48.
47	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	Refer to Submission 127 Issue 46.
48	Water Quality/ Land Use/ Terrestrial Ecology	Objection to AGL Gas trenching 187 creeks between Stratford and Hexham and boring under Karuah River, Williams River and Hunter River. Creeks and rivers will be crossed 3-6 times in some place with a 100m clearance around pipeline, through bushland, people's properties, damage done to wildlife corridors, displacement of wildlife, potential death.	Refer to Submission 127 Issue 5
49	Terrestrial Ecology	Are there any checks for wildlife by NPWS, someone independent of AGL, before clearing of corridors was to commence?	Refer to Submission 142, Issues 21 and 22.
50	Surface Water/ Ground Water	Gas pipeline will trench through some creeks, bore under rivers, divert creeks.	Refer to Submission 127 Issue 28.
51	Water Quality/Aquatic Ecology	50 of the creeks to be trenched are between villages of Craven and Stroud Road in 20/30km stretch and flow into Wards River, Mammy Johnsons River and the Karuah River. Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol. ? Pages 12-20). There has not been a full study done.	Refer to Submission 127 Issue 28.
52	Design	Condition of Consent must state that company must follow all roads and power lines first before crossing through any of the	This approach is not practical. As described in Section 4.3.1 of the EA, the pipeline route was

Issue #	Category	Issue	Response
		waterways.	determined based on an initial study area, consisting of a 10 km wide corridor from Stratford to Hexham. This was refined utilising GIS and multi criteria analysis methods. Significant consideration was given to protected areas such as RAMSAR wetlands, National Parks and State Forests, and other protected areas, as well as a range of other constraints. This included realignment of the pipeline where necessary during and following ecological surveys being undertaken as part of the EA for the project. Geotechnical surveys would be undertaken at all watercourse crossings where HDD is proposed. A specific workplan would be developed including management and mitigation measures as part of the CEMP. Where HDD is proposed, the crossing would be designed to avoid direct and indirect impacts to the watercourse. All other watercourse crossings where open trenching is proposed would be managed in accordance with a CEMP.
53	Health	No studies done in NSW on possible affects of human health relating to people living in the vicinity of gas wells. A full thorough study should be carried out before any consideration is given to the proposal.	Refer to Submission 127 Issue 89.
54	Health	Gas wells are industrial sites and consideration should be given to classifying them as industrial chemical sites and should be controlled by relevant regulations.	Refer to Submission 127 Issue 90.
55	Health	CSG is a new industry and health and environmental affects have not been proven safe. Industry in Australia has not been around long enough to register problems in people/animals.	Refer to Submission 127 Issue 91.
56	Health	Drill for Natural Gas Pollute Water - A. Lustgarten and ProPublica "As of 5th September 2009, the American EPA publicly acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours, with links to damaged kidney, immune systems and reproductive fluids."	Refer to Submission 127 Issue 93.

Issue #	Category	Issue	Response
57	Health	Clear evidence in America that cattle are dying after grazing close to CSM wells. Wildlife have developed cancer tumours after grazing and drinking around supposedly rehabilitated well sites.	Refer to Submission 127 Issue 94.
58	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	Refer to Submission 127 Issue 46.
59	Terrestrial Ecology	Removal of one habitat tree could impact whole ecosystems.	Refer to Submission 127 Issue 11.
60	Water Quality/ Health	AGL have failed to do a flood study or flood risk analysis and potential damage caused to gas wells or gas pipes. There should not be any gas wells on creeks/river banks. 40, 20 and 10 metre clearance from a river bank is unacceptable.	Refer to Submission 127 Issue 97.
61	Specific Inquiry	As these natural creeks and rivers flood in our area due to high natural rainfall, how is AGL going to prove to our community that flood water and/or trees coming down these waterways will not impact these wells?	Refer to Submission 127 Issue 97.
62	Waste	Once water has been 'processed' through desalination or other process (as per EA), waste sludge is left - highly toxic and no means of disposal.	Refer to Submission 127 Issue 101.
63	Waste	Does desalination remove toxic chemicals and heavy metals or just remove the salt?	Refer to Submission 127 Issue 102.
64	Waste	EA mentions if they cannot find suitable group to purchase 'salt' they will put it into landfill. Why would Government approve 'salt' to be dumped into landfill and put into waterways? Where is landfill located?	Refer to Submission 127 Issue 19.
65	Waste/ Specific Inquiry	What tests have been carried out on water in holding dams? When will results be made public?	Current operations at the Stratford Pilot Project operated by AGL are being undertaken in accordance with approval issued by the Department of Industry and Investment (formerly Department of Primary Industries). Water in storage ponds are managed in accordance with that approval.
66	Waste	Negative environmental impact will occur if that amount of salt is dumped and if dirty water holding dams contain heavy metals and sulphur salt.	Refer to Submission 127 Issue 19.
67	Noise	AGL underhandedly seeking to operate 24 hours/day, 7 days/week. Noise also produced from desalination plant,	Refer to Submission 127 Issue 104.

Issue #	Category	Issue	Response
		drilling/fraccing and diesel generators at each gas well hole through extraction of water.	
68	Noise	Noise study is inadequate and needs to be redone properly.	Refer to Submission 127 Issue 105.
69	Noise	Noise has been assessed against raised background noise levels of Stratford Coal. Assessment does not fully address noise levels throughout stage 1 development area - low background noise away from coal mine area means noise will be far higher than assessed.	Refer to Submission 127 Issue 106.
70	Noise/Compensation	If community feels affected by noise, AGL Gas should be made to pay for independent monitoring and if it is proven that AGL are operating outside their guidelines, compensation should be paid.	Refer to Submission 127 Issue 107.
71	Rehabilitation	No amount of rehabilitation will replace habitat trees. Affects of methane extraction are far too great.	Noted.
72	Rehabilitation	Rehabilitation of creeks and river bores can never restore them back to original state.	Rehabilitation would be undertaken as discussed in **Section 3.1 of** the Submission Report and Chapter 22 of the EA. .
73	Rehabilitation	Areas damaged by trenching can never be rehabilitated to their original state. Aquifers cannot be replaced. Core soils brought to surface could be toxic.	Refer to Submission 127 Issue 108.
74	Community Consultation	Community meetings have been poorly advised, questions were frequently stifled, meetings were staged and managed, difficult questions were not answered.	Refer to Submission 127 Issue 109.
75	Community Consultation	Meetings were not properly or continually advertised in towns, issues raise were avoided or referred back to the EA.	Refer to Submission 127 Issue 109.
76	Community Consultation	Drop in meetings were poorly advertised.	
77	Community Consultation	AGL did not hold public meetings in Dungog, Maitland, Port Stephens or Newcastle as receptionist stated 'people can travel to Clarence town'. Why did the company fail to hold meetings in these towns so peoples' questions could be answered?	
78	Fraccing	Heavy metals and sulphur contaminated rock from coal seam from fraccing brought to surface will cause major environmental problems if exposed to water, rain water-causing runoff or dumped near creeks or rivers.	Refer to Submission 127 Issue 115.

Issue #	Category	Issue	Response
79	EA Process	Concept area cannot be seen as whole application - company wants permission for whole area to be able to sink hundreds of gas wells as extensions of Stage 1. Each stage should be seen as new works, and not extensions of Stage 1, with unique environmental issues explored.	Refer to Submission 20 Issue 144.
80	Surface Water/Health/ Ecology	AGL Gas seeks approval for river discharge. Majority of concept area is in Karuah Catchment, from which Midcoast Water take water for town supplies of Stroud and Stroud Road. Section of Karuah River is Habitat Protection Zone for Marine Park.	Refer to Submission 127 Issue 8 and 49
81	Health/Socio-economics	Too many direct impacts that AGL Gas will inflict on people, air, water, environment, wildlife and socioeconomics and is too risky.	Impacts to air and water quality and ecology are assessed in the EA.
Form Letter Submission			
1	Environmental Degradation	The gas transmission pipe line would be 'destroying bushland, people's property, impacts on water/environment and wildlife habitat, is a massive impact and is not "minimal or insignificant" '.	The EA considered and assessed impacts on ecology, land use and water quality, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.
2	Ground Water	Request for independent Ground Water Study to be conducted.	Refer to Submission 127 Issue 1 and Issue 55.
3	Surface Water	AGL must have as one of their Conditions of Consent, absolutely 'No Creek or River Discharge'.	Refer to Submission 127 Issue 49
4	Surface Water	Whether the water is treated or not through the various listed methods in their E.A. is unacceptable (Vol. 1, pgs. 4-7). In section 120 of the PEOA Act it states that: It is illegal to pollute or cause or permit pollution of waters. A person who pollutes any water is guilty of an offence.'	Refer to Submission 127 Issue 50.
5	Surface Water	Strong objection to any wastewater being discharged off site in to the local waterways and/or creeks, rivers. Demand for Protection of River Flats and Flood Plains,	Refer to Submission 127 Issue 49

Issue #	Category	Issue	Response
		adopting a "No Irrigation or waste-water treated or not, via any method as a Condition of Consent" including a '1km Protection Zone for every soak/swamp, billabong wetlands, creeks, rivers and any natural water sources etc.'	
6	Surface Water	Desalination does not guarantee protection of the environment. The only way to guarantee Protection for the Environment is to not drill/frac into aquifers or discharge anything back into these aquifers, creeks or rivers.	Refer to Submission 127 Issue 50.
7	Surface Water	AGL Gas must be required to contain all waste-water on site, preventing any discharge to local waterways, Creeks and Rivers, minimising any impact and preventing the quality of the natural water sources from being degraded and altered.	Refer to Submission 127 Issue 50.
8	Surface Water	Environmental measures must be undertaken to identify any possible adverse effects on all water supply sources of surrounding/downstream landholders and implement mitigation measures as necessary.	Refer to Submission 127 Issue 50.
9	General	'To not proceed with AGL Gas's proposal is the best option for the environment, waterways and The Bucketts Way Valley to Hexham.'	The EA considered and assessed impacts on ecology, land use and water quality, and with implementation of the detailed list of management plans identified in Chapter 25 and mitigation measures detailed throughout the relevant sections of the EA, the potential impacts of the project are able to be managed to an acceptable level.
10	Society/Health	'Farming, tourism and health of people can only exist without Gas mining'.	Refer to **Sections 3.7, 3.8**, and **3.9** of the Submissions report.
11	Ground Water	An independent study of the Ground Water System (Aquifers) in the entire Gloucester Basin to Isaacs Road Booral, must be carried out to determine the cumulative impact on this ground water from the extraction of gas, before any approval is even considered, for AGL Gas to proceed further than they already have under the 'Exploration Licence of sinking wells'.	Refer to Submission 127 Issue 1 and Issue 55.
12	Ground Water	Objection to dewatering the aquifers in order to draw methane gas out.	Noted.
13	Ground Water	Dewatering of aquifers should be metered - AGL Gas be charged for potable water, commercial bores sunk, water extracted in exploration and production and damage	Refer to Submission 127 Issue 57.

Issue #	Category	Issue	Response
		done to aquifers.	
14	Ground Water	No regulations/guidelines have been set for re-injection of water containing toxic fraccing chemicals that would be pumped back into the aquifers.	The option of aquifer re-injection as a disposal option was considered in Section 4 of the EA however is not proposed as part of the project.
15	Ground Water	What is AGL's projection of when they expect the aquifers to naturally recharge?	Refer to Submission 127 Issue 59.
16	Ground Water	How does AGL Gas propose to deal with ground subsidence caused by dewatering and gas extraction?	Refer to Submission 127 Issue 60.
17	Ground Water	What time frame are they going to accept responsibility for resulting damages 'drilling/fraccing etc.' where the environmental impacts of shallow, alluvial deep bedrock aquifers are altered immediately? (Vol 1. pgs 13-1)	Refer to Submission 127 Issue 61.
18	Ground Water	Pumping from aquifers can lead to deteriorating groundwater quality either through changing salinity levels of composition.	Refer to Submission 127 Issue 62.
19	Ground Water	Damage to aquifers cannot be reversed.	Refer to Submission 127 Issue 63.
20	Fraccing	Drawing water from rivers and local aquifers for fraccing could lead to depletion of Groundwater.	Refer to Submission 20 Issue 41
21	Fraccing	Injecting waste water back into underground aquifers, mixed with fraccing chemicals is environmentally damaging.	Refer to Submission 127 Issue 66.
22	Fraccing	Chemical composition of fraccing fluid is highly toxic.	Refer to Submission 127 Issue 67.
23	Fraccing	Treatment of used fraccing chemicals is only partial and /or unproven and, there is no place to dispose of these chemicals.	The option of aquifer re-injection as a disposal option was considered in Section 4 of the EA however is not proposed as part of the project.
24	Fraccing	Disposal of fraccing fluids into natural water bodies can poison aquatic ecosystems	Refer to Issue 23 above.
25	Fraccing	Toxic fraccing chemicals mixed with water, 'treated or not' in dams is unacceptable. Dams will fill up and overflow due to high coastal rainfall, despite AGL's justification that capacity would be found in farm dams located in areas without significant catchment'.	Refer to Submission 127 Issue 68.
26	Fraccing	Where are the farms located as stated in the section Treated Water Management? (Vol. 1, pgs. 4-8)	Refer to Submission 142 Issue 61
27	Fraccing	Where will AGL draw the copious amounts of water from, required for fraccing/drilling gas wells?	Refer to Submission 127 Issue 70.

Issue #	Category	Issue	Response
28	Fraccing	Where does AGL source their fraccing/drilling fluids from and who are the distributors?	Fraccing fluids are sourced by specialised contractors engaged to undertake fraccing activities.
29	Fraccing	What is the precise composition of fraccing fluid?	Refer to Submission 127 Issue 71.
30	Fraccing	How much fraccing fluid is used in each well?	Refer to Submission 127 Issue 71.
31	Fraccing	What method of disposal is used for the highly toxic fraccing fluid?	Refer to Submission 127 Issue 72.
32	Land Use	Why the need for a 100m wide pipeline corridor to Hexham?	Refer to Submission 127 Issue 46.
33	Compensation	Does AGL gas have an 'Environmental Bond' in place and what is the exact amount of this Bond? If not, why not?	Refer to Submission 142 Issue 68
34	Compensation /Health	Environmental bond to be adopted before AGL work commences. Bond to be held by independent custodian. Community will then have finances should they experience health affects and opportunity to repair environment. Deposits to be made throughout the year covering 'immediate, short and long-term environmental damage and health effects of people/animals associated with gas mining report by LB Clarke NSW National Parks and Wildlife Service, 2001).	Refer to submission 127 issue 74
35	Compensation /Health	Environmental bond would be transferable should AGL sell their exploration/mining licence. Said company must continue to pay bond. Bond accessible by environmental groups and land owners affected in the Valley, until the people say it's in a clean, safe and better state.	refer to submission 127 issue 75
36	Air/Water Quality	Gas mine will produce air and water pollution due to methane gas escaping during drilling/fraccing process while boring the gas wells near creeks/rivers.	Air emissions were assessed in Chapter 9 and Appendix of the EA. An addendum to the air quality assessment is provided in **Appendix A** of this report. Pollutant emissions are predicted to be below relevant criteria set by DECCW. Water quality is addressed in Chapter 11 of the EA and discussed further in **Section 3.1** of this Submissions Report.
37	Visual Impacts	Gas mine will destroy aesthetics of a beautiful valley, creating visual alteration of the landscape, destroy tourism are forever turning area into industrial chemical mining area.	Refer to Submission 127, Issue 76.

Issue #	Category	Issue	Response
38	Water Quality	Damage will be caused by trenching and diverting creeks and boring under rivers. Act of laying gas pipe causes some waterways to be crossed 4-6 times each. Cementing of bedrock in creeks/rivers is AGL's solution, yet impact will be immediate. How then, can AGL justify that there 'will be insignificant or minimal damage to creeks/rivers etc.'?	Refer to Submission 127 Issue 9 and 48.
39	Heritage	Heritage has been downgraded to a low priority despite it being identified in the DGRs. AGL failed to assess significance of Vale of Gloucester by dismissing it as being irrelevant. This will impact forever on Gloucester Stroud Valley and the Bucketts Way Tourist Country Drive Experience.	Refer to Submission 127, Issue 79.
40	Heritage	Gloucester Valley's heritage significance through its scenic qualities is of highest importance. Historical towns of Stroud and Booral may be affected.	Refer to Submission 127, Issue 81.
41	Heritage	Assessment is currently inadequate, therefore will continue to be eroded by successive stages of AGL development, as it will continue to be assessed to this standard. Valley's significance will be lost.	Refer to Submission 127, Issue 82.
42	Heritage	Vale of Gloucester: heritage recognised by National Trust of Australia (NSW) in 1975 but entry was not finalised before register abolished in 2004.	This is noted in Chapter 18 of the EA.
43	Heritage	Gloucester Valley - heritage significance at local, state and national levels for historical, aesthetic, social and technical/research reasons. AGL have only mentioned heritage value - fail to acknowledge aesthetic significance.	Refer to Submission 127, Issue 84.
44	Socio-Economics	EA does not assess economic impact on tourism industry and land values within the area.	Refer to Submission 127, Issue 85.
45	Heritage	EA does not assess impact of development on valley's cultural heritage, including vistas, despite this being a DGR.	Refer to Submission 127, Issue 86.
46	Cumulative Impacts	Full and proper assessment of cumulative impacts is critical.	Refer to Submission 127, Issue 87
47	Socio-economic	AGL Gas will reduce agricultural production due to land lost due to gas wells and infrastructure due to potential air/water quality, dust, noise and loss of rural Gloucester township.	Refer to Submission 127, Issue 88.

Issue #	Category	Issue	Response
48	Water Quality	Trenching and diverting creeks and boring under rivers damages natural water bodies permanently despite AGL stating bedrock would be cemented back after trenching.	Refer to Submission 127 Issue 9 and 48.
49	Land Use	AGL's 100m corridor will impact on bushland, habitat for wildlife, impacting swamps, RAMSAR/wetlands. Pipeline will cross through or under these sensitive areas.	Refer to Submission 127 Issue 46.
50	Water Quality/Land Use/Terrestrial Ecology	Objection to AGL Gas trenching 187 creeks between Stratford and Hexham and boring under Karuah River, Williams River and Hunter River. Creeks and rivers will be crossed 3-6 times in some place with a 100m clearance around pipeline, through bushland, people's properties, damage done to wildlife corridors, displacement of wildlife, potential death.	Refer to Submission 127 Issue 5.
51	Terrestrial Ecology	Who checks each tree for wildlife in the pipe line corridor through bushland before felling of trees starts?	Pre-clearance surveys were a recommendation of the Ecology Assessment for specific species, and would be carried out by a qualified ecologist.
52	Water Quality/Aquatic Ecology	50 of the creeks to be trenched are between villages of Craven and Stroud Road in 20/30km stretch and flow into Wards River, Mammy Johnsons River and the Karuah River. Trenching will increase turbidity, erosion and sedimentation of surface waters and indirect impact to downstream aquatic vegetation and aquatic species. E.g. fish, platypus and insects (EA Vol. ? Pages 12-20).	Refer to Submission 127 Issue 28.
53		Environmental damage has not been measured through independent companies; it has been conducted through people employed by AGL Gas. The amount of damage done to natural water resources cannot be measured through their assumption and feasibility studies.	Refer to Submission 127 Issue 47.
54	Water quality	Trenching, boring techniques will degrade creeks, rivers, aquifers and swamps and will alter these forever - it is too late after work has commenced.	Refer to Submission 127 Issue 48.
55	Health	No studies done in NSW on possible affects of human health relating to people living in the vicinity of gas wells. A full thorough study should be carried out before any consideration is given to the proposal.	Refer to Submission 127 Issue 89.
56	Health	Gas wells are industrial sites and	Refer to Submission 127 Issue 90.

Issue #	Category	Issue	Response
		consideration should be given to classifying them as industrial chemical sites and should be controlled by relevant regulations.	
57	Health	CSG is a new industry and health and environmental affects have not been proven safe. Industry in Australia has not been around long enough to register problems in people/animals.	Refer to Submission 127 Issue 91.
58	Health	Information coming from other CSG areas is alarming. QLD Gas has problems with their evaporation pond, causing environmental problems.	Refer to Submission 127 Issue 92.
59	Health	Drill for Natural Gas Pollute Water - A. Lustgarten and ProPublica "As of 5th September 2009, the American EPA publicly acknowledged the link between drilling fluids and leukaemia, cancer and adrenal tumours, with links to damaged kidney, immune systems and reproductive fluids."	Refer to Submission 127 Issue 93.
60	Health	Clear evidence in America that cattle are dying after grazing close to CSM wells. Wildlife have developed cancer tumours after grazing and drinking around supposedly rehabilitated well sites.	Refer to Submission 127 Issue 94.
61	Land use	Gas mining cannot successfully co-exist with rural agricultural lands.	Refer to Section 3.7 of the Submissions report for discussion in relation to land impacts.
62	Design	Why is a pipeline width of 100 metres required? AGL needs to use extra pipe length to avoid bushland and water crossings by using more pipe and right/left bends in their pipeline.	Refer to Submission 127 Issue 96.
63	Water Quality/Health	AGL have failed to do a flood study or flood risk analysis and potential damage caused to gas wells or gas pipes. There should not be any gas wells on creeks/river banks. 40, 20 and 10 metre clearance from a river bank is unacceptable.	Refer to Submission 127 Issue 97.
64	Water/Health	No gas wells should occur in the river flats and floodplain areas.	Refer to Submission 127 Issue 97.
65	Risk Assessment	What damage will the forces of natural flooding processes and trees coming down in creeks and rivers, have on gas wells connective pipes and pipe line?	Refer to Submission 127 Issue 97.
66	Risk Assessment	What is the long term affect of continued flooding on creek/river pipeline and gas wells?	No long term impact is anticipated.

Issue #	Category	Issue	Response
67	Waste	Once water has been 'processed' through desalination or other process (as per EA), waste sludge is left - highly toxic and no means of disposal.	Refer to Submission 127 Issue 101.
68	Waste	Does desalination remove toxic chemicals and heavy metals or just remove the salt?	Refer to Submission 127 Issue 102.
69	Waste	What are they going to do with the brine left over after processing water?	Refer to Submission 127 Issue 103.
70	Noise	AGL underhandedly seeking to operate 24 hours/day, 7 days/week. Noise also produced from desalination plant, drilling/fraccing and diesel generators at each gas well hole through extraction of water.	Refer to Submission 127 Issue 104.
71	Noise	Noise study is inadequate and needs to be redone properly.	Refer to Submission 127 Issue 105.
72	Noise	Noise has been assessed against raised background noise levels of Stratford Coal. Assessment does not fully address noise levels throughout stage 1 development area - low background noise away from coal mine area means noise will be far higher than assessed.	Refer to Submission 127 Issue 106.
73	Noise/ Compensation	If community feels affected by noise, AGL Gas should be made to pay for independent monitoring and if it is proven that AGL are operating outside their guidelines, compensation should be paid.	Refer to Submission 127 Issue 107.
74	Rehabilitation	Areas damaged by trenching can never be rehabilitated to their original state. Aquifers cannot be replaced. Core soils brought to surface could be toxic.	Refer to Submission 127 Issue 108.
75	Community Consultation	Community meetings have been poorly advised, questions were frequently stifled, meetings were staged and managed, and difficult questions were not answered.	Refer to Submission 127 Issue 109.
76	Community Consultation	Meetings were not properly or continually advertised in towns, issues raise were avoided or referred back to the EA.	Refer to Submission 127 Issue 109.
77	Community Consultation	Drop in meetings were poorly advertised.	Refer to Submission 127 Issue 109.
78	Community Consultation	AGL has not given community a decent length of time for people to understand ramifications of having AGL Gas conduct business in valley.	Refer to Submission 127 Issue 112.
79	Community Consultation	Project covers six shires - could have been more meetings for people to understand what was fully involved.	Refer to Submission 127 Issue 113.

Issue #	Category	Issue	Response
80	Community Consultation	AGL did not provide meetings for people in Council shires of Dungog, Maitland, Port Stephens and Newcastle.	Refer to Submission 127 Issue 114.
81	Fraccing	Heavy metals and sulphur contaminated rock from coal seam from fraccing brought to surface will cause major environmental problems if exposed to water, rain water-causing runoff or dumped near creeks or rivers.	Refer to Submission 127 Issue 115.
82	General	Gas extraction is anything but 'the new alternative to coal'. Methane gas should never be mined and is anything but 'green'.	Refer to Submission 127 Issue 116.
83	Health/Socio-economics	Too many direct impacts that AGL Gas will inflict on people, air, water, environment, wildlife and socioeconomics and is too risky.	Refer to Submission 127 Issue 117.

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Appendix A

Air Quality Impact Assessment Addendum Report

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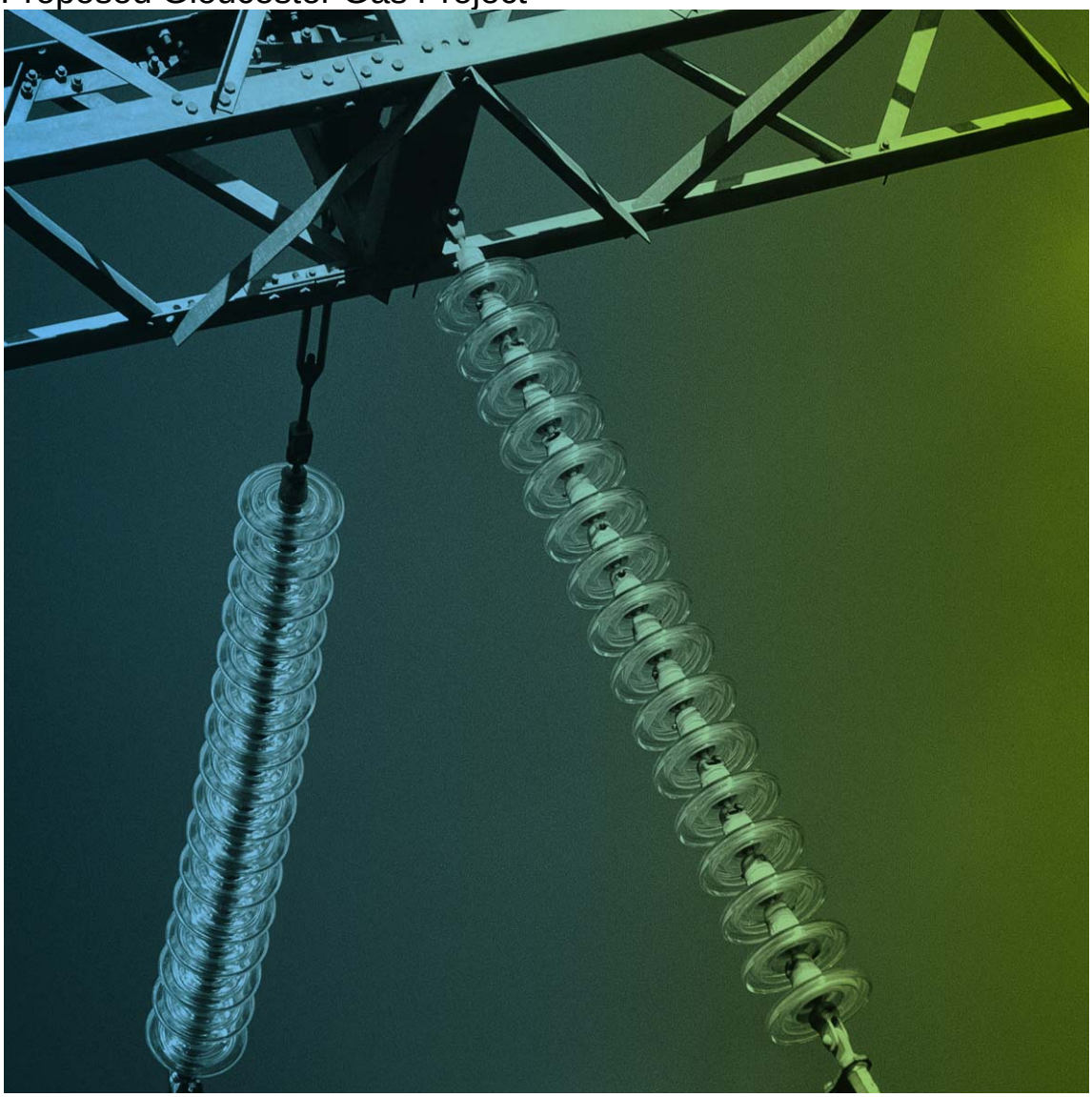
AGL Gloucester L E Pty Ltd
1 April 2010

Air Quality Impact Assessment - Addendum Report

Proposed Gloucester Gas Project



Air Quality Impact Assessment - Addendum Report

Proposed Gloucester Gas Project

Prepared for

AGL Gloucester L E Pty Ltd

Prepared by

AECOM Australia Pty Ltd
17 Warabrook Boulevard Warabrook NSW 2304,
T +61 2 4911 4900 F +61 2 4911 4999 www.aecom.com
ABN 20 093 846 925

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Copies	Recipient	Copies	Recipient
1	**Stuart Galway** **Land and Approvals Manager - Upstream Gas** **AGL Gloucester L E Pty Ltd** 22 Tate Street Gloucester NSW 2422	1	**AECOM File Copy**

Contents

1.0 Introduction

The Gloucester Gas Project (the Project) is a proposal to extract coal seam gas from the Gloucester Basin for use as an energy source for customers in NSW. The Project was originally developed by a joint venture between Lucas Energy Pty Ltd and Molopo (Gloucester) NL, who provided much of the information used in this assessment. The Project was subsequently acquired by AGL Gloucester L E Pty Ltd (AGL).

AECOM Australia Pty Ltd (AECOM) was commissioned by AGL to undertake an Environmental Assessment (EA) for the Project. Following the Department of Environment, Climate Change and Water (DECCW) review of the Air Quality Impact Assessment (AQIA) [1] submitted as part of the EA, the volumetric flow rates from the five generators that form part of the Central Processing Facility (CPF) associated with the Project were amended, requiring remodelling of emissions of oxides of nitrogen (NO_X) and carbon monoxide (CO). This assessment provides detail of the modelling performed with the amended volumetric flow rates for these pollutants only; data for all other sources remain unchanged.

1.1 Scope of Works

This assessment investigated ground level concentrations of nitrogen dioxide (NO_2) and CO resulting from operation of the proposed facility at the CPF Site 1 and CPF Site 7 locations using the amended volumetric flow rate from the proposed generators associated with the Facility. NO_X emissions were converted to NO_2 using the ozone limiting method and average and contemporaneous ambient ozone concentrations from the DECCW monitoring station at Wallsend. The following sources were modelled using AUSPLUME (v 6.0) and meteorological data generated by The Air Pollution Model (TAPM):

- 5 x 3 MW power generators (G1 – G5);
- 8 compressors (C1 – C8);
- Alternator (ALT);
- Triethylene regeneration skid (TEG1A); and
- Triethylene glycol re-boiler (TEG1B).

[1] AECOM. (2009). Air Quality Impact Assessment, Proposed Gloucester Gas Project.

2.0 Atmospheric Dispersion Modelling

2.1 Dispersion Model

Operational emissions from the CPF (at each of two proposed locations) were estimated by dispersion modelling using AUSPLUME v6.0. AUSPLUME is a Gaussian plume dispersion model developed by the Victorian EPA. AUSPLUME is approved by the DECCW for use in regulatory assessments undertaken in NSW. The model uses the Gaussian dispersion model equation to simulate the dispersion of a plume from point, area or volume sources. Mechanisms for determining the effect of terrain on plume dispersion are also included. AUSPLUME operates on an hourly time step, and, therefore, requires hourly dispersion parameter data, including wind speed and wind direction. The dispersion of each pollutant plume is determined for each hour using conventional Gaussian model assumptions. Gaussian models are best used to identify pollutant concentrations at receptor locations close to emissions sources, as they can overestimate concentrations at longer distances.

Dispersion modelling was undertaken in accordance with the DECCW Approved Methods[2] . This document prescribes calculation modes for accounting for terrain effects, building wake effects, horizontal and vertical dispersion curves, buoyancy effects, surface roughness, plume rise, wind speed categories and wind profile exponents.

2.2 Modelling Scenarios

The modelling investigated the pollutant levels resulting from the operation of the CPF located at two proposed sites: CPF Site 1 and CPF Site 7 (refer to **Figures 2** and **3**). The CPF was assumed to operate continuously 24 hours a day, 7 days a week for a full year for the purpose of this assessment.

2.3 Meteorological Data

Meteorological data used in the original modelling[3], generated by The Air Pollution Model (TAPM), were again used for consistency. Meteorology in the area surrounding the Project is affected by several factors such as terrain and land use. Wind speed and direction are largely affected by topography at a small scale, while factors such as synoptic scale winds and complex valley drainage flows that develop during night hours, affect wind speed and direction on a larger scale. As the proposed Project is to be located in a valley setting, wind would be channelled along the axis of the valley.

2.4 Impact Assessment Criteria

Pollutant criteria specified by the DECCW in the Approved Methods[2], representing maximum allowable levels of NO_2 and CO at the boundary of the premises or at the nearest sensitive receptor, are outlined in **Table 1**.

Table 1: DECCW Impact Assessment Criteria

Pollutant	Averaging Period	Concentration (µg/m^3)
Nitrogen dioxide (NO_2)	1 hour	246
	Annual	62
Carbon monoxide (CO)	15 minutes	100,000
	1 hour	30,000
	8 hours	10,000

[2] Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC, 2005)

[3] AECOM. (2009). Air Quality Impact Assessment, Proposed Gloucester Gas Project.

2.5 Emissions Inventory

2.5.1 Stack Characteristics

In the absence of site specific emissions data, stack exhaust conditions and the discharge rate used in the dispersion modelling for the Project were derived from a combination of manufacturers' specifications and other information provided by AGL and their equipment suppliers as outlined in the original assessment[4]. **Table 2** summarises the stack parameters used in the modelling – all data are the same as those used in the original AQIA[4] with the exception of the stack tip velocity for the generators, which was calculated from the amended volumetric flow rate and the original stack diameter provided by Clarke Energy. The source names represent plant described in **Section 1.1** of the AQIA.

Table 2: Summary of Stack Parameters

Source Name	Stack Height (m)	Stack Temperature (°C)	Diameter (m)	Stack Area (m^2)	Stack Tip Velocity (m/s)
G1 – G5	10	375.0	0.60	0.28	29.1
C1 – C8	12	447.8	0.98	0.76	15.0
ALT	12	447.8	0.69	0.38	15.0
TEG1	8	250.0	0.20	0.03	15.0
TEG2	12	250.0	0.20	0.03	15.0

2.5.2 Pollutant Emission Rates

Pollutant emissions from the CPF were estimated based on a combination of manufacturers' specifications, NPI emission factors and gas usage rates provided by Clarke Energy (for more detail, please refer to AECOM, 2009[4]). **Table 3** summarises the pollutant emission rates used in the modelling; data indicate emissions per unit. It should be noted that the emission rates for the generators are the only values that differ from those used in the original assessment[4].

Table 3: Pollutant Emission Rates

Source	NO_X		CO	
	Emission Rate (g/s)	Emission Concentration (mg/Nm^3)	Emission Rate (g/s)	Emission Concentration (mg/Nm^3)
G1 – G5	1.54	450	3.24	950
C1 – C8	0.51	250	0.29	67
ALT	0.26	60	0.14	34
TEG1	0.0073	30	0.0094	38
TEG2	0.013	52	0.016	67

2.6 Terrain Data and Receptors

The original modelling utilised digital terrain data for each of the two proposed CPF locations obtained from a topographical map covering an area of 4 km x 4 km with a grid spacing of 0.2 km, roughly centred on each alternate Project site. Initial modelling of the revised NO_X emissions using this grid indicated that maximum ground level concentrations may be located outside the modelling domain; as such, modelling was conducted for 10 km x 10 km grids with a grid spacing of 0.2 km, centred approximately on the Project sites to ensure peak

[4] AECOM. (2009). Air Quality Impact Assessment, Proposed Gloucester Gas Project.

ground level concentrations were captured by the modelling. No sensitive receptors additional to those modelled in the original assessment were assessed.

2.7 Background Pollutant Concentrations

Ambient concentrations of NO_2 were obtained from the DECCW's monitoring station at Wallsend. Annual average concentrations are shown in **Table 4**. The maximum annual average concentration of 17 $\mu g/m^3$ was adopted for this assessment. No local monitoring of CO occurs. Background concentrations of CO were assumed to be negligible based on the lack of industry and traffic in the area (refer to AECOM, 2009[5]).

Table 4: Ambient Annual Average NO_2 Concentrations - Wallsend

Year	Annual Average NO_2 ($\mu g/m^3$)
2001	17
2002	-
2003	15
2004	15
2005	15
2006	17
2007	15
Maxima	**17**

2.8 Nitrogen Oxide Conversion

For annual NO_2 concentrations, conversion of NO_X to NO_2 was achieved by assuming all the NO_X was converted to NO_2, referred to as Method 1 in the DECCW Approved Methods. Method 1 represents the most conservative assessment methodology.

A more refined approach was selected for the 1 hour NO_2 data as there is a higher chance of overestimation of short term pollutant concentrations when conservative assumptions are used to determine emission rates. The conversion of predicted 1 hour NO_X concentrations to NO_2 concentrations was achieved using the ozone limiting method (OLM) specified by the DECCW in the Approved Methods[6] . The methods assumes that the reaction of nitrogen oxide (NO) and ozone (O_3) to form NO_2 will continue until either all the NO or all the O_3 is used up. A level 2 assessment was conducted using contemporaneous model predictions and background concentrations of 1 hour average pollutant levels. The following equation was used to calculate the conversion:

$$[NO_2]_{total} - \{0.1 \times [NO_X]_{pred}\} + MIN\{(0.9) \times [NO_X]_{pred} \text{ OR } (46/48) \times [O_3]_{bkgd}\} + [NO_2]_{bkgd}$$

where:

$[NO_2]_{total}$ = the predicted concentration of NO_2 in $\mu g/m^3$;

$[NO_X]_{pred}$ = the dispersion model prediction of the ground level concentration of NO_X in $\mu g/m^3$;

MIN = the minimum of the two quantities within the braces;

$[O_3]_{bkgd}$ = the background ambient O_3 concentration in $\mu g/m^3$;

(46/48) = the molecular weight of NO_2 divided by the molecular weight of O_3 in $\mu g/m^3$;

$[NO_2]_{bkgd}$ = the background ambient NO_2 concentration in $\mu g/m^3$.

[5] AECOM. (2009). Air Quality Impact Assessment, Proposed Gloucester Gas Project.

[6] Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC, 2005)

The contemporaneous OLM requires hourly background concentrations of NO_2 and O_3 for the modelling period (1 January 2007 – 31 December 2007). These data were obtained from the DECCW from their monitoring station at Wallsend[7], which is the closest source of monitoring data available. Actual NO_2 concentrations at the proposed project sites would be expected to be lower than those recorded at Wallsend due to the rural nature of the project sites and the relative lack of pollution sources in the area.

[7] The DECCW also operates a monitoring station at Beresfield, which is a similar distance from the Project site. This site was not considered to be representative of the Project site as it is located close to ongoing significant road works (Weakley's Drive overpass) and a major arterial road (Pacific Highway).

3.0 Dispersion Modelling Results

3.1 Nitrogen Dioxide

Predicted annual average NO_2 concentrations are shown in **Table 5** for both proposed project sites. These data represent 100% conversion of NO_X to NO_2. No exceedances of the guideline level were predicted.

Table 5: Maximum Predicted Ground Level NO_2 Concentrations - Annual Average – CPF Site 1

	Maximum Predicted Annual NO_2 Concentration ($\mu g/m^3$)	
Receptor Number	**CPF Site 1**	**CPF Site 7**
1	18.6	18.8
2	17.9	18.0
3	19.0	19.3
4	18.0	19.4
5	18.1	19.6
6	18.5	19.7
7	18.3	20.0
8	18.7	20.0
9	18.9	19.9
10	18.2	20.4
11	20.7	20.5
12	18.8	20.6
13	18.4	19.4
14	19.3	20.6
15	19.4	21.4
16	19.7	18.9
17	18.2	20.4
18	18.2	19.5
19	-	19.5
All modelled locations	26.9	29.1
Criterion	***62***	
N.B. The sensitive receptors for each proposed project site are different; thus CPF Site 1 receptor 1 is different to CPF Site 7 receptor 1 and so forth. Please refer to AECOM (2009) for receptor locations.		

For the maximum hourly NO_2 concentrations, the OLM was applied at two locations for each proposed CPF site - at the sensitive receptor and at the modelling grid location with the highest predicted modelled concentrations of NO_X. The predicted NO_X concentrations were converted to NO_2 for each hour in the dispersion modelling simulation according to the corresponding background concentrations of NO_2 and O_3. Results were ranked according to background NO_2 concentration and maximum predicted cumulative NO_2 concentrations.

Table 6 shows the results for the ten highest background NO_2 concentrations at CPF Site 1 with the corresponding predicted cumulative concentrations at the selected sensitive and gridded receptor locations. No exceedances of the guideline criterion level were estimated at the sensitive receptor or gridded receptor with the highest predicted NO_X concentrations, either with or without the proposed development.

Table 6: Predicted Ground Level NO_2 Concentrations (Ranked on Background NO_2 Concentration) – CPF Site 1

Rank	Background NO_2 Concentration ($\mu g/m^3$)	Cumulative Predicted Ground Level NO_2 Concentrations ($\mu g/m^3$)	
		Sensitive Receptor	Gridded Receptor
1	65.8	65.8	65.8
2	63.9	63.9	63.9
3	62.0	62.0	62.0
4	60.2	60.2	60.2
5	60.2	60.2	60.2
6	60.2	60.2	60.2
7	60.2	60.2	60.4
8	58.3	68.9	58.3
9	58.3	58.3	58.7
10	56.4	56.4	57.6
Criterion		***246***	

Table 7 shows the ten highest predicted maximum hourly cumulative concentrations of NO_2 at the most affected sensitive and gridded receptor locations for CPF Site 1. Again, no exceedances of the guideline criterion were predicted.

Table 7: Ten highest predicted cumulative NO_2 concentrations – CPF Site 1

Rank	Sensitive Receptor		Gridded Receptor	
	Background NO_2 ($\mu g/m^3$)	Cumulative NO_2 ($\mu g/m^3$)	Background NO_2 ($\mu g/m^3$)	Cumulative NO_2
1	9.4	63.7	7.52	96.8
2	1.9	54.8	0	73.7
3	9.4	62.1	15.0	86.0
4	1.9	54.4	0	70.7
5	3.8	52.4	0	68.9
6	9.4	57.5	1.9	63.5
7	3.8	49.6	15.0	72.1
8	3.8	48.8	15.0	70.4
9	1.9	45.7	11.3	65.1
10	16.9	60.3	11.3	64.5
Criterion	***246***			

Results for CPF Site 7 are shown in **Tables 9** and **10**. **Table 8** shows the data ranked on highest background NO_2 concentrations, while **Table 10** shows the data ranked on the highest predicted cumulative NO_2 concentrations following application of the OLM to the modelling results. All predicted concentrations were well below the guideline criterion.

Table 8: Predicted Ground Level NO_2 Concentrations (Ranked on Background NO_2 Concentration) - CPF Site 7

Rank	Background NO_2 Concentration ($\mu g/m^3$)	Cumulative Predicted Ground Level NO_2 Concentrations ($\mu g/m^3$)	
		Sensitive Receptor	Gridded Receptor
1	65.8	66.5	65.8
2	63.9	63.9	63.9
3	62.0	62.0	62.0
4	60.2	60.2	60.2
5	60.2	60.2	60.2
6	60.2	60.2	60.2
7	60.2	60.2	60.5
8	58.3	58.3	58.3
9	58.3	58.3	58.8
10	56.4	56.4	61.1
Criterion		***246***	

Table 9: Ten highest predicted cumulative NO2 concentrations – CPF Site 7

Rank	Sensitive Receptor		Gridded Receptor	
	Background NO_2 ($\mu g/m^3$)	Cumulative NO_2 ($\mu g/m^3$)	Background NO_2 ($\mu g/m^3$)	Cumulative NO_2 ($\mu g/m^3$)
1	11.3	69.6	11.3	69.6
2	11.3	67.9	11.3	67.9
3	11.3	66.8	11.3	66.8
4	3.8	58.8	3.8	58.8
5	9.4	63.1	9.4	63.1
6	3.8	57.3	3.8	57.3
7	13.2	66.1	13.2	66.1
8	9.4	62.2	9.4	62.2
9	7.5	58.0	7.5	58.0
10	15.0	65.4	15.0	65.4
Criterion	***246***			

3.2 Carbon Monoxide

Maximum predicted ground level concentrations of CO resulting from operation of the CPF at the two proposed locations are shown in **Table 10**. Background concentrations of CO were assumed to be negligible based on the lack of industry and traffic in the area (refer to AECOM, 2009[8]). As shown, all predicted concentrations of CO were well below the impact assessment criteria.

Table 10: Maximum Predicted Ground Level Pollutant Concentrations - CO ($\mu g/m^3$) – CPF Site 1

[8] AECOM. (2009). Air Quality Impact Assessment, Proposed Gloucester Gas Project.

Receptor Number	CPF Site 1			CPF Site 7		
	15 min	1 hour	8 hour	15 min	1 hour	8 hour
1	93.78	97.2	60.8	141.6	189.9	93.7
2	114.4	213.0	74.8	159.3	151.6	87.0
3	146.4	156.9	70.1	218.6	224.8	92.8
4	153.1	320.4	75.5	224	212.7	98.9
5	111.7	194.4	76.4	211.7	203.6	104.0
6	119.6	139.3	113.7	234.6	236.4	108.2
7	117.1	218.2	63.7	215.5	226.7	117.7
8	121.1	127.6	72.1	213.1	232.6	114.4
9	117.7	193.3	86.3	233.4	236.7	111.1
10	171.7	213.2	85.6	205.4	192.7	110.6
11	141.6	215.6	96.2	199.3	196	115.8
12	173.6	211.5	79.3	214.1	197.8	120.8
13	117.3	150.8	70.5	176.2	193.4	95.0
14	146.1	214.9	81.0	212.5	201.7	122.3
15	151.4	187.0	81.1	200.3	265.4	161.9
16	173.7	250.0	85.1	222	203.9	93.5
17	118.3	143.1	47.4	226	242.3	129.5
18	128.6	186.1	37.3	247	288.8	74.0
19	-	-	-	212.1	266.2	75.8
All modelled locations	424.3	728.0	249.1	732.2	1278.0	587.5
Criteria	***100,000***	***30,000***	***10,000***	***100,000***	***30,000***	***10,000***

4.0 Discussion and Conclusion

This assessment predicted ground level concentrations of NO_2 and CO resulting from operation of the proposed coal seam methane facility at the two proposed project sites using an amended volumetric flow rate for the proposed generators associated with the facility. NO_X emissions were converted to NO_2 using the ozone limiting method and average and contemporaneous ambient ozone concentrations from the DECCW monitoring station at Wallsend. Modelling was conducted using AUSPLUME (v 6.0) and meteorological data generated by The Air Pollution Model (TAPM).

Results of the dispersion modelling predicted no exceedances of the DECCW's guideline criteria for these pollutants at either proposed project site. As such, the project is not expected to adversely affect air quality in the area.

Appendix B

Species List

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Appendix B Threatened species identified in the Ecological Assessment (Appendix G) of the EA with potential habitat along the pipeline corridor

Vegetation types referred to in the following tables, as identified in Chapter 10 (Table 10-3) of the EA, are referred to the corresponding identification (ID) numbers as follows:

ID	Vegetation Type	Area Removed (ha)
A	Dry foothills spotted gum	9.195
B	Rainforest	0.275
C	South Coast Shrubby Grey Gum	1.41
D	Ironbark	2.59
E	Redgum / apple	0.1
F	Spotted Gum - Ironbark Forest	1.505
G	Grey Gum – Stringybark – Bloodwood ± Spotted Gum Ironbark Forest	2.64
H	Forest Red Gum / Spotted Gum Woodland (corresponds to Hunter Lowland Redgum Forest EEC – listed under TSC Act)	0.23
I	Riparian Communities	0.22
J	Wetlands (including SEPP 14 wetlands)	0
Total Area		**18.17**

Table T1: Endangered Populations under the NSW TSC Act Potentially Occurring in the Wider Study Area.

Population		Preferred Habitat	Habitat Present in or Adjacent to Study Area		Recorded in Field Survey	Source**	Associated Vegetation types* and likelihood of occurrence
Scientific Name	Common Name		GFDA	Pipeline			
Acacia pendula	Weeping Myall	*Acacia pendula* population in the Hunter Catchment. Occurs on heavy clay soils, sometimes on the margins of small floodplains, but also in more undulating locations.	No	Yes	No	DECC, PlantNet	A.C,D,E,F,G,H Low-Only recorded to date at 6 locations: Jerrys Plains, Edderton, Wybong, Appletree Creek, Warkworth and Appletree Flat. These locations occur within the Muswellbrook and Singleton Local Government Areas (DECCW, 2010).
Cymbidium canaliculatum	Tiger Orchid	*Cymbidium canaliculatum* population in the Hunter Catchment. Grows in the hollows of trees in dry sclerophyll forest or woodland	Yes	Yes	No	DECC, PlantNet	A,B,C,D,E,F,G,H Low-Most commonly found in White-box dominated woodlands. In the Hunter Catchment *C. canaliculatum* is known to occur within Wollemi and Goulburn River National Parks. Recent surveys of Manobalai Nature Reserve (Peake & Bell unpubl.), Wingen Maid Nature Reserve (Hill *et al*. 2001), Wallabadah Nature Reserve (Peake 2004) and Towarri National Park (Hill *et al.* 2001) did not detect any occurrences of *C. canaliculatum*. There were no records of *C. canaliculatum* in a survey of Yengo National Park (Sanders *et al.* 1988).

Population		Preferred Habitat	Habitat Present in or Adjacent to Study Area		Recorded in Field Survey	Source**	Associated Vegetation types* and likelihood of occurrence
Eucalyptus parramattensis subsp. *parramattensis*	Parramatta Red Gum	*Eucalyptus parramattensis* population in Wyong and Lake Macquarie local government areas. Grows in low moist areas alongside drainage lines and adjacent to wetlands. It is often found in woodland on sandy soils.	No	Yes	No	DECC, PlantNet	E,H,I,J Low-Moderate. The majority of the population occurs within Wyong in the Porter's Creek and the Wallarah Creek catchments (DECCW, 2010).
Eucalyptus seeana	Narrow-leaved Red Gum	*Eucalyptus seeana* population in the Greater Taree local government area. Grows woodlands and open forests on low, often swampy, sandy soils.	No	Yes	No	DECC, PlantNet	E,H,I,J, Low- The Endangered Population within the Greater Taree Local Government Area represents the southern-most occurrence of the species and is isolated from other populations of the species to the north (DECCW, 2010).
Rhizanthella slateri	Eastern Australian Underground Orchid	*Rhizanthella slateri* in the Great Lakes local government area. Various habitats. Mostly sclerophyll forests where the soils has been disturbed.	Yes	Yes	No	DECC, PlantNet	A,B,C,D,E,F,G,H. Low- it is currently known from fewer than 10 locations including Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra.

**Source: DECC = NSW Threatened Species, Populations and Ecological Communities; PlantNet = NSW Flora Online

Table T2: Threatened Ecological Communities under the NSW TSC Act as Potentially Occurring in the Wider Study Area.

Threatened Ecological Community	Conservation Significance	Recorded in Field Survey		Affected by removal of vegetation?
		GFDA	Pipeline	
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	EEC	No	Yes	No
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	EEC	No	Yes	Yes – 0.23ha - this is the only EEC which will be directly impacted through removal of vegetation
Lower Hunter Spotted Gum - Ironbark Forest in the Sydney basin Bioregion	EEC	No	Yes	No
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	EEC	No	Yes	No
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	EEC	No	Yes	No
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	EEC	No	Yes	No

EEC = Endangered Ecological Community (Under TSC Act)

Table T3: Flora Species Listed under Commonwealth and / or State Legislation and Identified from database Searches as Previously Recorded from the Wider Study Area, or with Geographical Ranges that Overlap the Wider Study Area with Preferred Habitat.

Scientific Name	Common Name	Status*		Preferred Habitat	Habitat Present Within or Adjacent to Study Area		Recorded in Field Survey	Associated Vegetation types and likelihood of occurrence
		EPBC	TSC		GFDA	Pipeline		
Asperula asthenes	Trailing Woodruff	V	V	Grows in damp soils often along river banks.	Yes	Yes	No	I-Riparian communities. Low-It is found in scattered locations from Bulahdelah north to near Kempsey. Degraded riparian vegetation, weed invasion and cattle grazing have reduced suitable habitat.
Callistemon linearifolius	Netted Bottle Brush		V	Dry sclerophyll forest on the coast and adjacent ranges.	No	Yes	No	A,C,D,E,F,G,H Low-There are currently only 5-6 populations in the Sydney area and further north it has been recorded from Yengo National Park.
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	Various, including swamp-heath and woodland, mostly in coastal areas.	No	Yes	No	A,C,D,E,F,G,H,I Moderate-does not appear to have well defined habitat preferences and is known from a range of communities (DECCW, 2010).
Cynanchum elegans	White-flowered Wax Plant	E	E	Edge of rainforest vegetation, especially in gullies in scrub and on scree slopes.	No	Yes	No	A,C,D,E,F,G,H,I Low-Moderate.Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley (DECCW, 2010).
Eucalyptus glaucina	Slaty Red Gum	V	V	Grassy woodland on deep, moderately fertile and well-watered soil.	Yes	Yes	No	A,C,D,E,F,G,H Low-Found only on the north coast of NSW and in separate districts: near Casino where it can be locally common, and farther south, from Taree to Broke, west of Maitland (DECCW, 2010).

Scientific Name	Common Name	Status*		Preferred Habitat	Habitat Present Within or Adjacent to Study Area		Recorded in Field Survey	Associated Vegetation types and likelihood of occurrence
		EPBC	TSC		GFDA	Pipeline		
Eucalyptus parramattensis subsp. *decadens*		V	V	Dry sclerophyll woodland with dry heath understory, on sandy soils in low, often wet sites.	Yes	Yes	No	E,H,I,J Low-Moderate. There are two separate meta-populations of E. parramattensis subsp. decadens. The Kurri Kurri meta-population is bordered by Cessnock—Kurri Kurri in the north and Mulbring—Abedare in the south. Large aggregations of the sub-species are located in the Tomalpin area. The Tomago Sandbeds meta-population is bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south (DECCW, 2010).
Grevillea guthrieana	Guthrie's Grevillea	E	E	Grows along creeks and cliff lines in eucalypt forest, on granitic or sedimentary soil.	Yes	Yes	No	ALL Low-known from the north coast of NSW, at Booral near Bulahdelah and on the Carrai Plateau, south-west of Kempsey (DECCW, 2010).
Grevillea parviflora subsp. *parviflora*	Small-flower Grevillea	V	V	Grows in heath or shrubby woodland, in sandy or light clay soils usually over shale substrates.	Yes	Yes	Yes	A,C,D,E,F,G,H Moderate-High. The main occurrence is centred around Picton, Appin and Bargo (and possibly further south to the Moss Vale area). Separate populations are also known further north from Putty to Wyong and Lake Macquarie on the Central Coast and Cessnock and Kurri Kurri in the Lower Hunter.

Scientific Name	Common Name	Status*		Preferred Habitat	Habitat Present Within or Adjacent to Study Area		Recorded in Field Survey	Associated Vegetation types and likelihood of occurrence
		EPBC	TSC		GFDA	Pipeline		
Maundia triglochinoides			V	Grows in swamps, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients.	Yes	Yes	No	G,I,J Low-The current southern limit is Wyong; former sites around Sydney are now extinct (DECCW, 2010).
Persicaria elatior	Tall Knotweed	V	V	Growns in damp sites, especially beside streams and lakes and occasionally in swamp forest.	Yes	Yes	No	F,H,I,J Moderate-has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes (DECCW, 2010). Usually associated with disturbance.
Pomaderris queenslandica	Scant Pomaderris		E	Moist eucalypt forest or sheltered woodlands with shrubby understorey; occasionally along creeks.	Yes	Yes	No	A,B,C,D,E,F,G,H,I Low-It is only known from a few locations on the New England Tablelands and North West Slopes, including near Torrington and Coolatai, and also from several locations on the NSW north coast (DECCW, 2010).
Rhizanthella slateri	Eastern Underground Orchid	E	V	Various. Mostly sclerophyll forests where the soils has been disturbed.	Yes	Yes	No	A,C,D,E,F,G,H Low-In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra (DECCW, 2010). Often only located when the ground is disturbed.

Scientific Name	Common Name	Status*		Preferred Habitat	Habitat Present Within or Adjacent to Study Area		Recorded in Field Survey	Associated Vegetation types and likelihood of occurrence
		EPBC	TSC		GFDA	Pipeline		
Tetratheca juncea	Black-eyed Susan	V	V	Sandy, occasionally swampy heath and in dry sclerophyll forest; mostly in coastal districts.	Yes	Yes	No	A,C,D,E,F,G,H,I Moderate-Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock.
Zannichellia palustris			E	Submerged in fresh or slightly saline stationary or slowly flowing water.	Yes	Yes	No	J Low-In NSW, known only from the lower Hunter (DECCW, 2010).

*Status: E = Endangered; V = Vulnerable

**Source of record: A = Atlas of NSW Wildlife; B = BioNet; E= EPBC Protected Matters

Table T4: Threatened Fauna Species Previously Recorded from the Wider Study Area, with Potential Habitat in the Project Site.

*** Status:** [1]:= Commonwealth (EPBC) status ; [2]: = State (TSC Act) status [3]:= Action Plan; **E** = Endangered; **V** = Vulnerable; **NT** = Near Threatened; **LC** = Least Concern; **R** = Rare; **DD** = Data Deficient; **IK** = Insufficiently Known; **Mi/Ma** = Migratory and/or Marine
**** Source:** A = Atlas NSW; B = BioNet; E = EPBC Protected Matters.

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Amphibians				
Litoria aurea	Green and Golden Bell Frog	V^{1} / $E^{2,3}$	Marshes, dams and streams particularly containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.), generally free of fish and unshaded but often disturbed.	I,J Low-Of the recorded locations in NSW, most are small, coastal, or near coastal populations (DECCW, 2010).
Mixophyes balbus	Stuttering Frog	$V^{1,3}$ / E^{2}	Typically associated with permanent streams through temperate and sub-tropical rainforest and wet sclerophyll forest, rarely in dry open tableland riparian vegetation (Mahony et al. 1997), and also in moist gullies in dry forest (Gillespie and Hines, 1999).	B,I Low-Occurs along the east coast of Australia from southern Queensland to the north-eastern Victoria. The species has suffered a marked decline in distribution and abundance, particularly in south-east NSW. In recent surveys it has only been recorded at three locations south of Sydney (DECCW, 2010).
Mixophyes iteratus	Giant Barred Frog	$E^{1,2,3}$	Wet sclerophyll forest and rainforest and riparian vegetation beside permanent streams; often in leaf litter near permanent fast-flowing streams.	B,I,H Low-Coast and ranges from south-eastern Queensland to the Hawkesbury River in NSW. North-eastern NSW, particularly the Coffs Harbour-Dorrigo area, is now a stronghold (DECCW, 2010).
Reptiles				

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Hoplocephalus bitorquatus	Pale-headed Snake	V[2]	Dry eucalypt forests and woodlands, cypress woodland and occasionally rainforest or moist eucalypt forest. Prefers streamside areas, particularly in drier habitats. During the day, shelters between loose bark and tree trunks, or in hollow trunks and limbs of dead trees.	A,B,C,D,E,F,G,H,I Low-A patchy distribution from north-east Queensland to north-east NSW. In NSW it occurs from the coast to the western side of the Great Divide as far south as Tuggerah (DECCW, 2010).
Hoplocephalus stephensii	Stephens' Banded Snake	V[2] / R / IK[3]	Rainforest and wet eucalypt forest along the coast and ranges from mid-NSW to SE Qld. Semi-arboreal, sheltering beneath loose bark, in tree hollows and rarely in rafters.	B,I Low-Distribution is from Southern Queensland to Gosford in NSW (DECCW, 2010).
Birds				
Anseranas semipalmata	Magpie Goose	V[2]	Shallow wetlands (usually < 1 m deep) with dense growth of rushes and sedges. Wetlands associated with floodplains of rivers and large shallow wetlands formed by run off.	J Low-Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW (DECCW, 2010).
Botaurus poiciloptilus	Australasian Bittern	V[2,3]	Permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.).	J Moderate- In NSW they may be found over most of the state except for the far north-west (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Burhinus grallarius	Bush stone-Curlew	E^2 / NT^3	Open woodlands, lightly timbered country, mallee and mulga - prefer groundcover of small sparse shrubs, grass or litter of twigs.	A,C,D,E,F,G,H Moderate-High. The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania (DECCW, 2010).
Callocephalon fimbriatum	Gang-gang Cockatoo	V^2	In summer, generally in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also in sub-alpine Snow Gum *Eucalyptus pauciflora* woodland and occasionally in temperate rainforests. Favours old growth attributes for nesting and roosting. Moves to lower altitudes in winter, favouring drier more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or dry forest in coastal areas and often found in urban areas.	A,C,D,E,F,G,H Moderate-High. The Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes (DECCW, 2010).
Calyptorhynchus lathami	Glossy black-Cockatoo	V^2 / NT^3	Coastal forest and open inland woodland. Feeds primarily on *Allocasuarina littoralis* or *Allocasuarina torulosa*.	A,C,D,E,F,G,H,I Moderate. The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Climacteris picumnus	Brown Treecreeper	V[2] / NT[3]	Eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Euc. camaldulensis*) Forest bordering wetlands usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging. Less commonly, in similar woodland habitats on the coastal ranges and plains.	A,C,D,E,F,G,H Moderate-High. The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. The western boundary of the range runs approximately through Wagga Wagga, Temora, Forbes, Dubbo and Inverell (DECCW, 2010).
Coracina lineata	Barred Cuckoo-shrike	V[2]	Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses.	ALL (except unlikely). Low. Distribution is mainly coastal eastern Australia from Cape York to the Manning River in NSW. They are generally uncommon in their range, and are rare in NSW (DECCW, 2010).
Ephippiorhynchus asiaticus	Black-necked Stork	E[2] / LC[3]	Lakes, swamps, freshwater pools and mangroves. Nests in trees or large bushes, often over swamps.	I,J Low- Moderate. The species is widespread across coastal northern and eastern Australia, and some birds may move long distances and can be recorded well outside their normal range (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Irediparra gallinacea	Comb-crested Jacana	V[2]	Permanent wetlands with a good surface cover of floating vegetation, especially water lillies.	J Low-It occurs throughout coastal Australia and well inland in the north from the Kimberley to Sydney (DECCW, 2010).
Ixobrychus flavicollis	Black Bittern	V[2]	Freshwater and estuarine wetlands in areas of permanent water and dense vegetation. Where water is permanent, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	J Low-In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland (DECCW, 2010).
Lathamus discolor	Swift Parrot	E[1,2,3] / Ma[1]	Breeds in Tasmania and over-winters in forests and woodlands on the Australian mainland, congregating where eucalypts are flowering profusely, including Red Ironbark, Redgum and Yellow Box forests.	A,C,D,E,F,G,H Low-Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes (DECCW, 2010).
Lophoictinia isura	Square-tailed Kite	V[2] / LC[3]	Sparsely distributed in open eucalypt forests, woodlands and sand plains.	A,C,D,E,F,G,H Moderate-High. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Melanodryas cucullata	Hooded Robin	V^2 / NT^3	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey.	A,C,D,E,F,G,H Moderate. The Hooded Robin is common in few places, and rarely found on the coast. The south-eastern form is found from Brisbane to Adelaide throughout much of inland NSW, with the exception of the north-west (DECCW, 2010).
Melithreptus gularis	Black-chinned Honeyeater	V^2 / NT^3	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Euc. sideroxylon*), White Box (*Euc. albens*), Grey Box (*Euc. microcarpa*), Yellow Box (*Euc. melliodora*) and Forest Red Gum (*Euc. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees.	A,C,D,E,F,G,H Moderate-High. The species is widespread, from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. Regularly observed from the Richmond River district. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions (DECCW, 2010).
Neophema pulchella	Turquoise Parrot	V^2 / NT^3	Inhabits steep, rocky ridges and gullies, rolling hills, valleys and river-flats and the nearby plains of the Great Dividing Range (Higgins, 1999); eucalypt woodlands and open forests, with a ground cover of grasses and low understorey of shrubs (Jarman, 1973; Morris, 1980), usually with Cypress Pine *Callitris* and a variety of *Eucalyptus* species, Morris1980; Quinn and Baker-Gabb, 1993; Quinn and Reid, 1996). Occasionally in savannah and riparian woodlands and farmland, preferring edges of forest and pasture or other grassland	A,C,D,E,F,G,H,I Moderate-High The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Forages quietly and may be quite tolerant of disturbance (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Ninox connivens	Barking Owl	V^2 / NT^3	Eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses.	A,C,D,E,F,G,H,I Moderate. It has declined across much of its distribution across NSW and now occurs only sparsely. It is most frequently recorded on the western slopes and plains (DECCW, 2010).
Ninox strenua	Powerful Owl	V^2 / LC^3	Eucalypt forests along Great Dividing Range, preferring tall wet sclerophyll forests, where territories of 800-1000 ha centre on densely vegetated gullies.	A,C,D,E,F,G,H,I High In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains (DECCW, 2010).
Pomatostomus temporalis	Grey-crowned Babbler	V^2 / NT^3	Inhabits open box gum woodlands on the slopes, and Cypress Pine and open box gum woodlands on alluvial plains.	A,C,D,E,F,G,H Moderate. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Hay. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Pyrrholaemus saggitatus	Speckled Warbler	V[2]	Lives in a wide range of *Eucalyptus* dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat includes scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Mostly requires large, relatively undisturbed remnants.	A,C,D,E,F,G,H Moderate-High. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100ha survive (DECCW, 2010).
Rostratula (benghalensis) australis	Australian Painted Snipe	V[1,3] / E[2]	Shallow muddy freshwater swamps and marshes.	I,J Low-In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin (DECCW, 2010).
Stagonopleura guttata	Diamond Firetail	V[2] / NT[3]	Grassy eucalypt woodlands, including box-gum woodlands and Snow Gum *Eucalyptus pauciflora* woodlands. Also occurs in open forest, mallee, natural temperate grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	A,C,D,E,F,G,H Moderate-High. The Diamond Firetail is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Cental and South Western Slopes and the North West Plains and Riverina (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Tyto novaehollandiae	Masked Owl	V[2] / NT[3]	Dry eucalypt forests and woodlands from sea level to 1,100 m.	A,C,D,E,F,G,H High. Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner (DECCW, 2010).
Tyto tenebricosa	Sooty Owl	V[2]	Dense subtropical and temperate rainforest and fern gullies; tall wet sclerophyll forest.	B,I Low-Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands (DECCW, 2010).
Xanthomyza phrygia	Regent Honeyeater	E[1, 2,3]	Eucalypt woodland and open forest on the slopes of the Great Dividing Range and occasionally on the coast. Particularly favours box-ironbark woodland, and riparian forests of River She-oak.	A,C,D,E,F,G,H Low-Moderate. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Mammals				
Cercartetus nanus	Eastern Pygmy-Possum	V[2] / LC[3]	Found in a broad range of habitats from rainforest through sclerophyll (including box-ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest.	A,B,C,D,E,F,G,H Low-Moderate. The Eastern Pygmy-possum is found in south-eastern Australia and in NSW it extends from the coast inland as far as the Pillaga, Dubbo, Parkes and Wagga Wagga on the western slopes (DECCW, 2010).
Chalinolobus dwyeri	Large-eared Pied bat	V[1,2,3]	Dry forests and woodlands, moist eucalypt forests, caves and mines.	A,C,D,E,F,G,H Low-Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW (DECCW, 2010).
Dasyurus maculatus	Spotted-tailed Quoll	E[1] / V[2,3]	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individuals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. They make latrines.	ALL-(except J) Low-Moderate. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V^2 / LC^3	Moist forest habitats with trees taller than 20 m. Roosts in eucalypt hollows; also found under loose bark on tress or in buildings.	ALL-(except J) Moderate. The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania (DECCW, 2010).
Macropus parma	Parma Wallaby	V^2 / NT^3	Moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	ALL-(except J) Low. Once occurred from north-eastern NSW to the Bega area in the southeast. Range is now confined to the coast and ranges of central and northern NSW (DECCW, 2010).
Miniopterus australis	Little Bent-wing Bat	V^2 / LC^3	Moist eucalypt forest, rainforest or dense coastal banksia scrub. Roosts in caves, tunnels and sometimes tree hollows Forages for small insects beneath the canopy of densely vegetated habitats.	ALL-(except J) Moderate-May utilise the air spaces above densely vegetated areas. East coast of Australia from Cape York in Queensland to Wollongong in NSW (DECCW, 2010).
Miniopterus schreibersii	Common Bent-wing Bat	V^2 / LC^3	Occurs in dry sclerophyll forest and woodland east of the Great Dividing Range typically in well-timbered gullies. Roosts in caves, derelict mines, storm-water tunnels, buildings and other man-made structures. Hunts in forested areas, catching moths and other flying insects above the tree tops.	A,C,D,E,F,G,H Moderate-May fly over the tree tops of forested areas. Eastern Bent-wing Bats occur along the east and north-west coasts of Australia (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Mormopterus norfolkensis	Eastern Free-tail Bat	V^2 / DD^3	Occurs in dry sclerophyll forest and woodland east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures.	A,C,D,E,F,G,H Moderate-High. The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW (DECCW, 2010).
Myotis adversus	Large-footed Myotis	V^2	Roosts in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forages over streams and pools.	A,C,D,E,F,G,H,I Moderate-High. The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers (DECCW, 2010).
Petaurus australis	Yellow-bellied Glider	$V^{,2,3}$	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Prefers mixed coastal forests to dry escarpment forests in the north.	ALL-(except J) Moderate. The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Very mobile and occupies large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Petaurus norfolcensis	Squirrel Glider	V^2 / NT^3	Mature or old growth box, box-ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or acacia midstorey.	A,C,D,E,F,G,H Low-Moderate. The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. The species requires abundant tree hollows for refuge and nest sites (DECCW, 2010).
Phascogale tapoatafa	Brush-tailed Phascogale	V^2 / NT^3	Dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also heath, swamps, rainforest and wet sclerophyll forest.	A,C,D,E,F,G,H Low. The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is more frequently found in forest on the Great Dividing Range in the north-east and south-east of the State. There are also a few records from central NSW (DECCW, 2010).
Phascolarctos cinereus	Koala	V^2 / NT^3	Inhabits eucalypt woodlands and forests. Feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	A,C,D,E,F,G,H Moderate. The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations in the western region (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Planigale maculata	Common Planigale	V^2 / LC^3	Inhabits rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water. They are active at night and during the day shelter in saucer-shaped nests built in crevices, hollow logs, beneath bark or under rocks.	ALL-(except J) Low-Coastal north-eastern NSW, coastal east Queensland and Arnhem Land. The species reaches its southern distribution limit on the NSW lower north coast (DECCW, 2010).
Potorous tridactylus	Long-nosed Potoroo	$V^{1,2,3}$	Coastal wet heath, dry and wet forests with thick ground cover.	ALL-(except J) Low-In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm (DECCW, 2010).
Pteropus poliocephalus	Grey-headed Flying-fox	$V^{1,2,3}$	Roosting sites usually in dense forest adjacent to waterbodies. Forages within 15 km of camp in flowering trees or rainforests, eucalypts, paperbarks and banksias.	ALL-(except J) Moderate-High. Grey-headed Flying-foxes are found within 200 km of the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria (DECCW, 2010). Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. They travel up to 50 km to forage (DECCW, 2010).

Scientific Name	Common Name	Status *	Preferred Habitat	Associated Vegetation types and likelihood of occurrence
Saccolaimus flaviventris	Yellow-bellied Sheath-tail Bat	V[2] / LC[3]	Roosts in tree hollows and buildings; and in mammal burrows in treeless areas. Forages in most habitats across its very wide range, with and without trees.	ALL-(except J) Moderate-High The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. There are scattered records of this species across the New England Tablelands and North West Slopes. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory (DECCW, 2010).
Scoteanax rueppellii	Greater Broad-nosed Bat	V[2] / NT[3]	Woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Usually roosts in tree hollows, sometimes in buildings.	ALL-(except J) Moderate-High. The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects (DECCW, 2010).

*** Status:** [1]:= Commonwealth (EPBC) status ; [2]: = State (TSC Act) status [3]:= Action Plan; **E** = Endangered; **V** = Vulnerable; **NT** = Near Threatened; **LC** = Least Concern; **R** = Rare; **DD** = Data Deficient; **IK** = Insufficiently Known; **Mi/Ma** = Migratory and/or Marine

**** Source:** A = Atlas NSW; B = BioNet; E = EPBC Protected Matters

Worldwide Locations

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Bolivia	+591-3-354-8564
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