NSW GOVERNMENT | Department of Primary Industries

OUT14/10810

10 APR 2014

Sophie Butcher
Planner, Mining Projects
NSW Department of Planning & Infrastructure
GPO Box 39
SYNDEY NSW 2001

Dear Sophie

Thank you for your email of (4 April 2014) concerning Request for Director General's Requirements (DGRs) for the Narrabri Gas Project.

The Office of Agricultural Sustainability and Food Security (the Office) has reviewed the preliminary Environmental Assessment for the Narrabri Gas Project (GHD, March 2014) and requests that an Agricultural Impact Statement (AIS) is included in the EIS. Specific guidance on satisfying the requirements for the AIS should be taken from the Department of Primary Industries, Agricultural Impact Statement Technical Notes which are available at:
http://www.dpi.nsw.gov.au/agriculture/resources/lup/development-assessment

The DGRs should specifically include requests for:

- The requirement for an AIS;
- Information on the projects possible impacts on Biophysical Strategic Agricultural Land (BSAL), if any areas of BSAL are identified on the project's site verification certificate when issued;
- Detailed information on any "beneficial reuse" strategy with regard to agricultural soils;
- Mitigation details regarding the possible identified adverse impact of reduced access to state forests (p.42) for apiary activities; and
- A requirement to consult with NSW Apiarists' Association to develop a coexistence strategy for the state forest.

This advice from the Office is forwarded direct to the Department of Planning & Infrastructure in accordance with agreed arrangements for mining applications that affect agricultural land.

Additional advice from the other divisions within the Department of Primary Industries may be forwarded by separate letter. If you wish to discuss the issue further please call Rob Williamson on telephone 02 6391 3166 or by email robert.williamson@dpi.nsw.gov.au

Yours sincerely

Rebekah Gomez-Fort

Rebekah Gomez-Fort
A/ Director Office of Agricultural Sustainability and Food Security

Locked Bag 21, Orange NSW 2800 (161 Kite Street, Orange NSW 2800)
Tel: 02 6391 3223 | Fax: 02 6391 3551 | www.dpi.nsw.gov.au | ABN: 72 189 919 072

Sophie Butcher
Planner
Sophie.butcher@planning.nsw.gov.au

15 April 2014

DGR's Input Request – Narrabri Gas Project (SSD 6456)

Thank you for your request dated 4 April 2014 inviting input into the Director General Requirements for the above project. We have reviewed the proposal and note that additional to the impacts identified in the Preliminary Environmental Assessment, Crown Lands suggest the following be addressed in the full Environmental Impact Statement:

Access Ways

The preliminary assessment highlights that preference will be given for undertaking construction of tracks and infrastructure on existing access ways. These access ways will include significant areas of Crown Land, such as Crown roads and travelling stock reserves. These parcels of Crown Land often provide important vegetation connectivity and structural complexity in cleared landscapes – making them most vulnerable to further disturbance.

Within the northern sections of the Project area, the possibility of utilising cleared land for access ways and infrastructure should be assessed against the implications of further disturbance to existing Crown Land parcels with high value for public use, conservation and wildlife corridors.

Further detail relating to habitat fragmentation needs to be provided.

Recreation/Amenity

The State Forest has historically provided the local community and tourists with the opportunity for enjoyment of public land and natural values within close proximity to the large rural urban centre of Narrabri. Such recreational use of public land will be lost or significantly altered across the project area, and alternatives should be explored fully in the EIS.

The feasibility of works taking place on adjacent cleared lands with limited agricultural productivity has not been addressed.

Trade & Investment Crown Lands

Groundwater Impacts

Calculations need to be provided on the amount of water to be extracted from aquifers. Disposal procedures for these quantities of water will need to be fully outlined, including areas to be irrigated, sources of licensed discharge and full descriptions of treatment methodology.
Geological implications of water/gas extractions, outline risk levels for collapse of seams/aquifers.

Expansion on the issue of "changes to groundwater quality" is required.

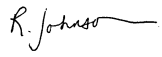
Surface Water Impacts

Of the highly significant surface water impacts outlined, no mitigation or avoidance strategies were supplied in the preliminary assessment.

The EIS must provide details of measures taken to avoid or mitigate all of the impacts listed.

Should you wish to discuss this further please contact Anna Cronin on (02) 6764 5127.

Yours sincerely,



Rebecca Johnson
Coordinator Client Services
Crown Lands
NSW Trade and Investment

FE14/248
C14/143
14th April 2014
Sophie Butcher
Mining Projects
NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Sophie

RE: Narrabri Gas Project (SSD 6456) Director General Requirements – NSW DPI Fisheries

NSW DPI Aquaculture & Aquatic Environment Branch (AAE) is responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, the Department ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act respectively) and the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013).*

The EA should specifically address impacts on the aquatic ecology of waterways (e.g. Bohena, Bibblewindi, Cowallah, Yellow Spring & Jack Creeks) as proposed below;

GENERAL AQUATIC ECOLOGICAL ASSESSMENT

An aquatic ecological assessment should be made of the impacts of the development on Bohena, Bibblewindi, Cowallah, Yellow Spring & Jack Creeks & include the following information;

- A recent aerial photograph (preferably colour) of the locality (or reproduction of such a photograph) should be provided.
- Area which may be affected either directly or indirectly by the development or activity should be identified and shown on an appropriately scaled map (and aerial photographs).
- Waterways within the area of development are to be identified.
- Description and quantification of aquatic and riparian vegetation should be presented and mapped. This should include an assessment of the extent and condition of riparian vegetation and the extent and condition of freshwater aquatic vegetation and the presence of significant habitat features (e.g. gravel beds, snags, reed beds, etc)
- Details of the location of all waterways crossings and construction designs, such as bridges, culverts, access tracks, or pipelines.

FISHERIES AQUACULTURE & AQUATIC ENVIRONMENT BRANCH
TAMWORTH AGRICULTURAL INSTITUTE
4 Marsden Park Road
CALALA NSW 2340
www.industry.nsw.gov.au
Tel: 02 6763 1255
Fax: 02 6763 1265

WATERWAY CROSSINGS

The design and construction of bridges, culverts, access tracks or pipeline crossings across all waterways should be undertaken in accordance with the Department's Policy and *Guidelines for Fish Friendly Waterway Crossings (2004) Why Do Fish Need to Cross the Road?* The waterway crossings need to ensure that the works are undertaken with minimal impact on the aquatic environment within the immediate vicinity of the proposed works. *Fisheries NSW* need to be consulted with regards to any temporary measures that will result in blocking fish passage. This includes coffer dams, temporary access tracks or redirecting flows whilst works are conducted.

RIPARIAN BUFFER ZONES

Fisheries NSW policy advocates the use of terrestrial buffer zones as per the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)* available on the Department's website at http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals/fish-habitat-conservation which states that "*NSW DPI will generally require riparian buffer zones to be established and maintained for developments or activities in or adjacent to TYPE 1 or 2 habitats or CLASS 1-3 waterways."*

Should you have any queries regarding this correspondence please contact me on (02) 6763 1255 or 0429 908 856.

D. Ward

David Ward
Regional Assessment Officer (Tamworth)

FISHERIES AQUACULTURE & AQUATIC ENVIRONMENT BRANCH www.industry.nsw.gov.au
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Department of Primary Industries
Office of Water

Contact Christie Jackson
Phone (02) 6701 9652
Email christie.jackson@water.nsw.gov.au
Our ref ER22899

Ms Sophie Butcher
NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Ms Butcher

Request for Director General Requirements for Narrabri Gas Project (SSD 6456) [Our Ref: ER22899]

The NSW Office of Water (Office of Water) has reviewed the supporting documentation accompanying the request for Director General's Requirements and provides the following comments below, and further detail in **Attachment A**.

It is recommended that the Environmental Impact Statement be required to include:

- Assessment of any water licensing requirements (including those for ongoing water take post-closure).
- Details of water proposed to be taken (including through inflow and seepage) from each water source as defined by the relevant water sharing plan. This should include a description of the expected spatial and temporal pattern of water take (eg year on year), as well as a detailed site water balance outlining predicted annual water production for the life of the project.
- The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.
- A detailed description of the produced water resulting from the project, including outlining the management, treatment and disposal methods to be implemented, and the final disposal pathway.
- A detailed assessment against the NSW Aquifer Interference Policy (2012), using the NSW Office of Water assessment framework.
- Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.
- Proposed surface water and groundwater monitoring for the project.
- Detailed surface water and groundwater modelling to assess impacts of the project, undertaken in accordance with standards outlined in relevant National and State Guidelines. The EIS should also describe plan for ongoing validation calibration and development of the model.
- Consideration of relevant Federal and State policies and guidelines.

- Details of all relevant management plans to be developed for the project, including, but not limited to, water management plans, produced water management plan, monitoring plans, rehabilitation plans and erosion and sedimentation control plans.
- A description of how the proponent plans to stage development of the project, including the development of any plans, models, infrastructure, and monitoring requirements.
- A table outlining where each element of the Director General's Requirements are addressed in the Environmental Impact Statement.

Should you require further information please contact Christie Jackson, Water Regulation Officer on (02) 6701 9652.

Yours sincerely

Mitchell Isaacs
Manager Strategic Stakeholder Liaison
14 April 2014

NSW Office of Water Comments on Director General Requirements
NARRABRI GAS PROJECT (SSD 6456)

Relevant Legislation

The Environmental Impact Statement (EIS) should take into account the objects and regulatory requirements of the *Water Act 1912* and *Water Management Act 2000* (*WMA 2000*), as applicable. Proposals and management plans should be consistent with the Objects (s.3) and Water Management Principles (s.5) of the *WMA 2000*.

Water Sharing Plans

The proposal is located within the area covered by the:

- Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources.
- Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources.
- Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources.
- Water Sharing Plan for the NSW Murray-Darling Basin Fractured Rock Groundwater Sources.
- Water Sharing Plan for the NSW Murray-Darling Basin Porous Rock Groundwater Sources.

The EIS is required to:

- Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan (WSP) including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection, water quality and surface-groundwater connectivity.
- Provide a description of any site water use (amount of water from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.
- Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP.
- Provide a detailed and consolidated site water balance.

Relevant Policies and Guidelines

The EIS should take into account the following policies (as applicable):

- NSW Aquifer Interference Policy (2012);
- Guidelines for Controlled Activities on Waterfront Land (2012);
- NSW State Rivers and Estuary Policy (1993);
- NSW State Groundwater Policy Framework Document (1997);
- NSW State Groundwater Quality Protection Policy (1998);
- NSW State Groundwater Dependent Ecosystems Policy (2002); and
- Department of Primary Industries Risk Assessment Guidelines for Groundwater Dependent Ecosystems (2012).
- NSW Water Extraction Monitoring Policy (2007)
- Australian Groundwater Modelling Guidelines (2012)
- NSW Code of Conduct for Coal Seam Gas Well Integrity (DTIRIS 2012)
- Guidelines for Groundwater Monitoring and Modelling Plan (NOW, 2014)

http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/default.aspx
http://www.water.nsw.gov.au/Water-licensing/Approvals/Controlled-activities/default.aspx

The EIS needs to demonstrate the proposal is consistent with the spirit and principles of these policy documents.

Licensing Considerations

The EIS is required to provide:

- Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site - if relevant).
- Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.
- Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.).
- Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc) and
- Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing or relevant exemptions.
- Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages
- Details on the location, purpose, size and capacity of any new proposed dams/storages.

Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.

The EIS should also include details regarding the treatment/storage/disposal of extracted water, including potential impacts on the environment, surface and/or groundwater quality and other water users as appropriate.

The Harvestable Right gives landholders the right to capture and use for any purpose 10% of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor. The MHRDC includes the capacity of all existing dams on the property that do not have a current water licence. Storages capturing up to the harvestable right capacity are not required to be licensed but any capacity of the total of all storages/dams on the property greater than the MHRDC may require a licence.

For more information on Harvestable Right dams visit:
http://www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff

Groundwater Assessment

To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources including:

- Works likely to intercept, connect with or infiltrate the groundwater sources.
- Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.

- A description of the flow gradients and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).
- Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and

  GDEs to establish a baseline incorporating typical temporal and spatial variations.
- The predicted impacts of any final landform on the groundwater regime.
- The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.
- An assessment of the quality of the groundwater for the local groundwater catchment.
- An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).
- Measures proposed to protect groundwater quality, both in the short and long term, so that remediation is not required.
- Protective measures for any groundwater dependent ecosystems (GDEs).
- Proposed methods of the disposal of waste water and approval from the relevant authority.
- The results of any models or predictive tools used.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.
- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

Groundwater Dependent Ecosystems

It is suggested the EIS considers the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:

- Identify any potential impacts on GDEs as a result of the proposal including:
  - the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections; and
  - the effect on the function of GDEs (habitat, groundwater levels, connectivity).

- Provide safeguard measures for any GDEs.

Watercourse and Riparian Land

The EIS should consider the Guidelines for Controlled Activities on Waterfront Land (2012).

The EIS should address the potential impacts of the project on all watercourses likely to be affected by the project, existing riparian vegetation and the rehabilitation of riparian land. It is recommended the EIS provides details on all watercourses potentially affected by the proposal, including:

- Scaled plans showing the location of:
  - watercourses and top of bank;
  - riparian corridor widths to be established along the creeks;
  - existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);
  - the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and
  - proposed location of any asset protection zones.
- Photographs of the watercourses.
- A detailed description of all potential impacts on the watercourses/riparian land.
- A description of the design features and measures to be incorporated to mitigate potential impacts.
- Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.

Drill Pad, Well and Access Road Construction

- While approvals under the *Water Management Act 2000* are not required due to the exemptions in the *Environmental Planning & Assessment Act 1979*, any construction activity within 40m of any watercourse crossings, should be designed by a suitably qualified person, consistent with the NSW Guidelines for Controlled Activities (July 2012).

- Construction of all wells must be undertaken by a driller holding a water drillers' licence valid in New South Wales.

- The length of time that a core hole is maintained as an open hole should be minimised.

- Construction, suspension and abandonment should be carried out in accordance with the NSW Code of Practice for Coal Seam Gas Well Integrity (DTIRIS 2012).

End Attachment A

NSW GOVERNMENT | Trade & Investment

Office of the Secretary

V14/157#27
SECO14/125

Mr Sam Haddad
Director General
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Haddad

Narrabri Gas Project (SSD 6456)

Thank you for the opportunity to provide input to the Director General's Requirements (DGRs) for the Environmental Impact Statement of the Narrabri Gas Project proposed by Santos NSW (Eastern) Pty Ltd (SSD 6456).

Please find enclosed detailed advice on the matters which NSW Trade & Investment would like to be included in the DGRs for the Narrabri Gas Proposal.

I understand that several organisational units within the cluster have already responded to you directly. This response consolidates the previous advice with additional input from other parts of NSW Trade & Investment and therefore constitutes whole-of-cluster advice on this matter.

Contact details are provided for specific contributions to the overall advice, should you require further information.

Yours sincerely

Mark I Paterson AO
Secretary
17.4.14.

Cc Sophie Butcher

Encl

GPO Box 5477, Sydney NSW 2001, Australia
Level 49 MLC Centre, 19 Martin Place, Sydney NSW 2000, Australia
Tel: +612 9338 6600 Fax: +612 9338 6860 www.trade.nsw.gov.au ABN: 72 189 919 072

NSW Trade & Investment

Consolidated NSW Trade & Investment input for the Director General's Requirements (DGRs) for the Environmental Impact Statement (EIS) of Santos NSW (Eastern) Pty Ltd's Narrabri Gas Project (SSD 6456).
17 April 2014

Mineral resources
The EIS must include a section on Rehabilitation which includes the following information.

Project Description
The project description must show the proposed extent and sequence of the development by reference to plans and charts.

Project Schedule and Rehabilitation
Information on the production field development strategy and scheduling, including minimising disturbance and maximising opportunities for progressive rehabilitation is required. The EIS should identify a conceptual schedule of production well and infrastructure construction, operation and decommissioning. This is required to give an indication of how many of the proposed 850 production wells and associated infrastructure will be in operation at any one time and what will be the maximum area of disturbance (and associated rehabilitation liability) during all phases of the project.

Rehabilitation Planning
Each of the following aspects of rehabilitation planning should be addressed in the Rehabilitation section of the EIS:

1. *Final Land Use* – describe the preferred final land use goal for disturbed areas including an evaluation of alternatives. This should include a discussion of how the final land use(s) are aligned with relevant local and regional strategic land use objectives as well as the benefits of the post production land to the surrounding environment, a subsequent landowner, the local community and the state of NSW.

2. *Rehabilitation Objectives* – provide a set of clear rehabilitation objectives and completion criteria for rehabilitation of the production well sites and associated infrastructure/auxiliary sites. Consideration should be given to the identification of project domains when proposing rehabilitation objectives and completion criteria. The rehabilitation objectives should make reference to capability class targets for agricultural land use and habitat/vegetation types for natural/ bushland land use.

The completion criteria must be specific, measurable, achievable, realistic and time-bound. If necessary, objective criteria may be presented as ranges rather than finite indicator levels. Subjective criteria may also apply where a gap in technical knowledge exists. Further refinement of these criteria will be undertaken and included in the Rehabilitation Management Plan (RMP) should the project be approved.

3. *Rehabilitation Methodology* – provide details regarding the rehabilitation methods to be used for disturbed areas and expected time frames for each stage of the rehabilitation process. Provide details on proposed rehabilitation monitoring and an outline of proposed rehabilitation research programs and trials.

The EIS should also include an evaluation of current rehabilitation techniques and performance against existing rehabilitation objectives and completion criteria.

4. *Conceptual Final Landform Plan* – provide a final landform plan showing final contours and the target vegetation/habitat outcomes for the project. Any infrastructure associated with the project that is proposed to remain as part of the final land use must be identified in this plan or a clear statement provided where this is not practical (i.e. gas and water gathering lines).

5. *Post-closure maintenance* - Describe how post-closure rehabilitation areas will be actively managed and maintained in accordance with the intended land use(s) in order to demonstrate progress towards meeting the closure objectives and completion criteria in a timely manner.

Additional regulatory controls

The proponent should also be advised at this stage that the Office of Coal Seam Gas (within NSW Trade & Investment) intends to apply conditions on the production lease applications which:

(a) require compliance with:

- the NSW Code of Practice for Coal Seam Gas Well Integrity (NSW Trade and Investment, 2012);
- the NSW Code of Practice for Coal Seam Gas Fracture Stimulation (NSW Trade and Investment, 2012); and
- the ban on the use of BTEX chemicals in conducting fracture stimulation or drilling activities.

(b) require consultation with the Division of Resources and Energy (within NSW Trade & Investment) in relation to the removal of steel casing from wells, during the decommissioning phase, where they intersect coal seams which are potentially mineable by underground methods.

For more information, please contact Rachel Connell on (02) 8281 7316.

Energy supply

The EIS is to provide projections on the likely contribution of the proposed development to meeting projected demand for gas.

The annual Australian Energy Market Operator (AEMO) reports on gas demand provide an overview of gas demand and reserve projections over 20 years, as well as analysis of daily peak gas demand projections against supply infrastructure capacities for NSW and other regions in the National Electricity Market. (For more detail, refer: http://www.aemo.com.au/Gas/Planning/Gas-Statement-of-Opportunities)

The key message in the latest report is that major shortages of gas supply are likely in NSW, affecting thousands of households and businesses unless sufficient coal seam gas in NSW is developed by 2017 (with the dwindling supplies from SA as a result of the rapidly increasing LNG export demand from Qld).

This may require rationing of gas on peak demand days, and will adversely impact the NSW economy, manufacturing and business sectors and associated employment.

Coal Seam Gas projects such as the Narrabri Gas Project will assist in developing a gas resource within NSW, thereby diversifying supply and addressing the projected shortfalls identified by AEMO.

If sufficient additional gas is brought online, it will assist in putting downward pressure on the cost of living for NSW households and businesses by supporting a reliable, diverse and competitive energy market.

For more information, contact Andrew Lewis on (02) 8281 7403.

Water

The NSW Office of Water (within NSW Trade & Investment) recommends that the EIS include:

- Assessment of any water licensing requirements (including those for ongoing water take post-closure).
- Details of water proposed to be taken (including through inflow and seepage) from each water source as defined by the relevant water sharing plan. This should include a description of the expected spatial and temporal pattern of water take (e.g. year-on-year), as well as a detailed site water balance outlining predicted annual water production for the life of the project.
- The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.
- A detailed description of the produced water resulting from the project, including outlining the management, treatment and disposal methods to be implemented, and the final disposal pathway.
- A detailed assessment against the NSW Aquifer Interference Policy (2012), using the NSW Office of Water assessment framework.
- Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.
- Proposed surface water and groundwater monitoring for the project.
- Detailed surface water and groundwater modelling to assess impacts of the project, undertaken in accordance with standards outlined in relevant National and State Guidelines. The EIS should also describe the plan for ongoing validation calibration and development of the model.
- Consideration of relevant Federal and State policies and guidelines.
- Details of all relevant management plans to be developed for the project, including, but not limited to, water management plans, produced water management plan, monitoring plans, rehabilitation plans and erosion and sedimentation control plans.
- A description of how the proponent plans to stage development of the project, including the development of any plans, models, infrastructure, and monitoring requirements.
- A table outlining where each element of the Director General's Requirements is addressed in the EIS.

<u>Relevant Legislation</u>

The EIS should take into account the objects and regulatory requirements of the *Water Act 1912* and *Water Management Act 2000* (WMA 2000), as applicable. Proposals and management plans should be consistent with the Objects (s.3) and Water Management Principles (s.5) of the WMA 2000.

<u>Water Sharing Plans</u>

The proposal is located within the area covered by the:

- Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources.
- Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources.
- Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources.
- Water Sharing Plan for the NSW Murray-Darling Basin Fractured Rock Groundwater Sources.

- Water Sharing Plan for the NSW Murray-Darling Basin Porous Rock Groundwater Sources.

The EIS is required to:

- Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan (WSP) including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection, water quality and surface-groundwater connectivity.
- Provide a description of any site water use (amount of water from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.
- Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP.
- Provide a detailed and consolidated site water balance.

Relevant Policies and Guidelines

The EIS should take into account the following policies (as applicable):

- NSW Aquifer Interference Policy (2012)
- Guidelines for Controlled Activities on Waterfront Land (2012)
- NSW State Rivers and Estuary Policy (1993)
- NSW State Groundwater Policy Framework Document (1997)
- NSW State Groundwater Quality Protection Policy (1998)
- NSW State Groundwater Dependent Ecosystems Policy (2002)
- Department of Primary Industries Risk Assessment Guidelines for Groundwater Dependent Ecosystems (2012)
- NSW Water Extraction Monitoring Policy (2007)
- Australian Groundwater Modelling Guidelines (2012)
- NSW Code of Conduct for Coal Seam Gas Well Integrity (DTIRIS 2012)
- Guidelines for Groundwater Monitoring and Modelling Plan (NOW, 2014)

http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/default.aspx
http://www.water.nsw.gov.au/Water-licensing/Approvals/Controlled-activities/default.aspx

The EIS needs to demonstrate the proposal is consistent with the spirit and principles of these policy documents.

Licensing Considerations

The EIS is required to provide:

- Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site - if relevant);
- Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water;
- Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.);
- Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc);
- Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing or relevant exemptions;
- Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storage; and

- Details on the location, purpose, size and capacity of any new proposed dams/storages.

Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.

The EIS should also include details regarding the treatment/storage/disposal of extracted water, including potential impacts on the environment, surface and/or groundwater quality and other water users as appropriate.

The Harvestable Right gives landholders the right to capture and use for any purpose 10% of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor. The MHRDC includes the capacity of all existing dams on the property that do not have a current water licence. Storages capturing up to the harvestable right capacity are not required to be licensed but any capacity of the total of all storages/dams on the property greater than the MHRDC may require a licence.

For more information on Harvestable Right dams, refer:
http://www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff

Groundwater Assessment

To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources including:

- Works likely to intercept, connect with or infiltrate the groundwater sources.
- Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- A description of the flow gradients and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).
- Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.
- The predicted impacts of any final landform on the groundwater regime.
- The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.
- An assessment of the quality of the groundwater for the local groundwater catchment.
- An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).
- Measures proposed to protect groundwater quality, both in the short and long term, so that remediation is not required.
- Protective measures for any groundwater dependent ecosystems (GDEs).
- Proposed methods of the disposal of waste water and approval from the relevant authority.
- The results of any models or predictive tools used.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.

- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

Groundwater Dependent Ecosystems

It is suggested the EIS considers the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:

- Identify any potential impacts on GDEs as a result of the proposal including:
  - the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections;
  - the effect on the function of GDEs (habitat, groundwater levels, connectivity).
- Provide safeguard measures for any GDEs.

Watercourse and Riparian Land

The EIS should consider the Guidelines for Controlled Activities on Waterfront Land (2012).

The EIS should address the potential impacts of the project on all watercourses likely to be affected by the project, existing riparian vegetation and the rehabilitation of riparian land. It is recommended the EIS provides details on all watercourses potentially affected by the proposal, including:

- Scaled plans showing the location of:
  - watercourses and top of bank;
  - riparian corridor widths to be established along the creeks;
  - existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);
  - the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and
  - proposed location of any asset protection zones.
- Photographs of the watercourses.
- A detailed description of all potential impacts on the watercourses/riparian land.
- A description of the design features and measures to be incorporated to mitigate potential impacts.
- Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.

Drill Pad, Well and Access Road Construction

- While approvals under the *Water Management Act 2000* are not required due to the exemptions in the *Environmental Planning & Assessment Act 1979*, any construction activity within 40m of any watercourse crossings, should be designed by a suitably qualified person, consistent with the NSW Guidelines for Controlled Activities (July 2012).
- Construction of all wells must be undertaken by a driller holding a water drillers' licence valid in New South Wales.
- The length of time that a core hole is maintained as an open hole should be minimised.
- Construction, suspension and abandonment should be carried out in accordance with the NSW Code of Practice for Coal Seam Gas Well Integrity (DTIRIS 2012).

For more information, please contact Christie Jackson, on (02) 6701 9652.

Crown Lands
Additional to the impacts identified in the Preliminary Environmental Assessment, Crown Lands suggest the following be addressed in the full EIS.

Access Ways
The preliminary assessment highlights that preference will be given for undertaking construction of tracks and infrastructure on existing access ways. These access ways will include significant areas of Crown Land, such as Crown roads and travelling stock reserves. These parcels of Crown Land often provide important vegetation connectivity and structural complexity in cleared landscapes – making them most vulnerable to further disturbance.

Within the northern sections of the Project area, the possibility of utilising cleared land for access ways and infrastructure should be assessed against the implications of further disturbance to existing Crown Land parcels with high value for public use, conservation and wildlife corridors.

Further detail relating to habitat fragmentation needs to be provided.

Recreation/Amenity
The State Forest has historically provided the local community and tourists with the opportunity for enjoyment of public land and natural values within close proximity to the large rural urban centre of Narrabri. Such recreational use of public land will be lost or significantly altered across the project area, and alternatives should be explored fully in the EIS.

The feasibility of works taking place on adjacent cleared lands with limited agricultural productivity has not been addressed.

The EIS must provide details of measures taken to avoid or mitigate all of the impacts listed.

For more information, please contact Anna Cronin on (02) 6764 5127.

Fish habitats
NSW Department of Primary Industries – Fisheries NSW is responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, the Department ensures that developments comply with the requirements of the *Fisheries Management Act 1994* (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act respectively) and the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013).*

The EIS should specifically address impacts on the aquatic ecology of waterways (e.g. Bohena, Bibblewindi, Cowallah, Yellow Spring & Jack Creeks) as proposed below.

General aquatic ecological assessment
An aquatic ecological assessment should be made of the impacts of the development on Bohena, Bibblewindi, Cowallah, Yellow Spring & Jack Creeks & include the following information;

- A recent aerial photograph (preferably colour) of the locality (or reproduction of such a photograph) should be provided.
- Area which may be affected either directly or indirectly by the development or activity should be identified and shown on an appropriately scaled map (and aerial photographs).
- Waterways within the area of development are to be identified.
- Description and quantification of aquatic and riparian vegetation should be presented and mapped. This should include an assessment of the extent and condition of riparian vegetation and the extent and condition of freshwater aquatic vegetation and the

presence of significant habitat features (e.g. gravel beds, snags, reed beds, etc)
- Details of the location of all waterways crossings and construction designs, such as bridges, culverts, access tracks, or pipelines.

Waterway crossings

The design and construction of bridges, culverts, access tracks or pipeline crossings across all waterways should be undertaken in accordance with the Department's Policy and *Guidelines for Fish Friendly Waterway Crossings (2004) Why Do Fish Need to Cross the Road?* The waterway crossings need to ensure that the works are undertaken with minimal impact on the aquatic environment within the immediate vicinity of the proposed works. *Fisheries NSW* need to be consulted with regards to any temporary measures that will result in blocking fish passage. This includes coffer dams, temporary access tracks or redirecting flows whilst works are conducted.

Riparian buffer zones

Fisheries NSW policy advocates the use of terrestrial buffer zones as per the *Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013)* available on the Department's website at http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals/fish-habitat-conservation which states that "*NSW DPI will generally require riparian buffer zones to be established and maintained for developments or activities in or adjacent to TYPE 1 or 2 habitats or CLASS 1-3 waterways.*"

For more information, please contact David Ward on (02) 6763 1255 or 0429 908 856.

Agricultural sustainability

The Office of Agricultural Sustainability and Food Security (OASFS) has reviewed the preliminary Environmental Assessment for the Narrabri Gas Project (GHD, March 2014) and requests that an Agricultural Impact Statement (AIS) is included in the EIS.

Specific guidance on satisfying the requirements for the AIS should be taken from the Department of Primary Industries, Agricultural Impact Statement Technical Notes which are available at: http://www.dpi.nsw.gov.au/agriculture/resources/lup/development-assessment

The DGRs should specifically include requests for:
- The requirement for an AIS.
- Information on the projects possible impacts on Biophysical Strategic Agricultural Land (BSAL), if any areas of BSAL are identified on the project's site verification certificate when issued.
- Detailed information on any "beneficial reuse" strategy with regard to agricultural soils.
- Mitigation details regarding the possible identified adverse impact of reduced access to state forests (p.42) for apiary activities.
- A requirement to consult with NSW Apiarists' Association to develop a coexistence strategy for the state forest.

For more information, please contact Rob Williamson on (02) 6391 3166.

Forests

A significant amount of Coal Seam Gas (CSG) exploration activity is already being conducted by Santos in the Pilliga East and Bibblewindi State forests under an existing agreement assigned by its predecessor (Eastern Star Gas). Given the extent to which that activity might be expanded and matured to a gas production level, Forests Corporation NSW (FCNSW) have undertaken detailed negotiation over many months with Santos to ensure adequate resources are available to review and process the many and varied activities on the forest land.

Nonetheless, FCNSW wishes to comment in relation to some specific provisions of the new PEA that are considered important to be incorporated within the DGRs, as follows.

Decommissioning and Rehabilitation (Section 2.5)
FCNSW continues to work with the NSW Office of Coal Seam Gas in the formulation of rehabilitation planning and revegetation standards specific to the Narrabri Gas Project. As part of Santos' proposed rehabilitation strategy, FCNSW would expect the opportunity to:

- advise on site preparation techniques and the management of resultant regeneration to encourage vegetation communities compatible with FCNSW land use objectives for the area; and
- assess each rehabilitation project area against the agreed quantifiable measures prior to transfer back to FCNSW.

Occupation Permit (Section 4.3.3)
FCNSW is drafting a new Forest Permit in response to the expanding range of operations associated with the Narrabri Gas Project. This new permit will supersede the existing agreement held between FCNSW and Santos.

Bush fire planning (Section 5.14)
As part of the drafting of the new Forest Permit, Santos are required to submit a revised operations bush fire management plan. The new plan will focus on:

- bush fire danger ratings and equivalent restrictions to operations which present a risk to fire ignition and spread; and
- forest evacuation planning.

For more information, please contact Geoff Coggins on (02) 9872 0589.

NSW EPA

Mr Howard Reed
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Sophie Butcher

Notice Number	1521467
File Number	EF13/5437
Date	17-Apr-2014

Narrabri Gas Project (SSD 6456)

I refer to your request, received on 4 April 2014, for the Environment Protection Authority's (EPA) input to the Director General's Requirements (DGR's) for the environmental assessment of the Narrabri Gas Field proposal. I appreciate the opportunity for input.

The EPA has considered the details of the proposal as provided by the Department of Planning and Infrastructure and has identified the information it requires to be assessed and considered. This is detailed in **Attachment A**.

In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

1. Surface water quality impacts including the potential impact of water pollution on local water courses.
2. The impact on groundwater, including the impact on groundwater dependant ecosystems and other water users;
3. Noise and vibration impacts during both the construction and operation phases, including traffic noise. The assessment should address the impacts on nearby receptors and noise amenity in accordance with the NSW Industrial Noise Policy and identify strategies to mitigate potential noise impacts.
4. Air quality impacts during both construction and operation including mitigation and management of dust.
5. Cumulative impacts during construction and operation.

In carrying out the assessment the applicant should refer to the relevant guidelines in **Attachment B** and also any industry codes of practice or best environmental management practice guidelines.

Based on the information provided with the request for Director General Requirements, the applicant will require an Environment Protection Licence to carry out Scheduled Activity works at the premises. The

applicant will need to make an application to the EPA to obtain this licence should the project be granted development consent.

The EPA requests that the Environmental Impact Statement (EIS) follows the format of the Department of Planning and Infrastructures EIS Guidelines and addresses the EPA's specific issues, as outlines in the attachment to this letter. This will assist the EPA in reviewing the environmental assessment and enable earlier identification of any deficiencies in the information provided. In turn, this will reduce delays in the assessment process.

The EPA notes in the Preliminary Environmental Assessment that a gas transmission pipeline would be part of a separate approvals process and is not included as part of this proposed development. The EPA recommends to DPI that they make it clear to the proponent that submitting a portion of a overall plan for an approval carries an inherent business risk and that if this proposal ultimately receives approval it in no way affects or suggests additional or subsequent proposals will be approved.

The EPA requests that 1 x hard copy and 1 x electronic copy of the EIS be provided to the EPA when the proponent lodges its application. These documents should be lodged at the EPA Armidale Office, PO Box 494 Armidale NSW 2350.

If you require further information about this matter please contact Jessica Creed on 02 6773 7000.

Yours sincerely

.....12-4-14.....

Carmen Dwyer

Special Project Manager - Coal Seam Gas

North - Dubbo

(by Delegation)

Attachment A - Environmental Assessment Requirements for Narrabri Gas Project

Attachment B - General Guidance Material

NSW EPA

ATTACHMENT A

Environmental Impact Statement Requirements for the Narrabri Gas Project (SSD 6546)

A Executive summary

The executive summary should include a brief discussion of the extent to which the proposal achieves identified environmental outcomes.

B The proposal

1. Objectives of the proposal

- The objectives of the proposal should be clearly stated and refer to:
  a) the size and type of the operation, the nature of the processes and the products, by-products and wastes produced
  b) a life cycle approach to the production, use or disposal of products
  c) the anticipated level of performance in meeting required environmental standards and cleaner production principles
  d) the staging and timing of the proposal and any plans for future expansion
  e) the proposal's relationship to any other industry or facility.

2. Description of the proposal

General

- Outline the production process including:
  a) the environmental "mass balance" for the process – quantify in-flow and out-flow of materials, any points of discharge to the environment and their respective destinations (sewer, stormwater, atmosphere, recycling, landfill etc)
  b) any life-cycle strategies for the products.
- Outline cleaner production actions, including:
  a) measures to minimise waste (typically through addressing source reduction)
  b) proposals for use or recycling of by-products

c) proposed disposal methods for solid and liquid waste

d) air management systems including all potential sources of air emissions, proposals to re-use or treat emissions, emission levels relative to relevant standards in regulations, discharge points

e) water management system including all potential sources of water pollution, proposals for re-use, treatment etc, emission levels of any wastewater discharged, discharge points, summary of options explored to avoid a discharge, reduce its frequency or reduce its impacts, and rationale for selection of option to discharge.

f) soil contamination treatment and prevention systems.

- Outline construction works including:

a) actions to address any existing soil contamination

b) any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site)

c) construction timetable and staging; hours of construction; proposed construction methods

d) environment protection measures, including noise mitigation measures, dust control measures and erosion and sediment control measures.

Air

- Identify all sources of air emissions from the development.
  Note: emissions can be classed as either:
  - *point (eg emissions from stack or vent) or*
  - *fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, conveyors, storage facilities, plant and yard operation, vehicle movements (dust from road, exhausts, loss from load), land clearing and construction works).*
- Provide details of the project that are essential for predicting and assessing air impacts including:

a) the quantities and physio-chemical parameters (eg concentration, moisture content, bulk density, particle sizes etc) of materials to be used, transported, produced or stored

b) an outline of procedures for handling, transport, production and storage

c) the management of solid, liquid and gaseous waste streams with potential for significant air impacts.

Noise and vibration

- Identify all noise sources from the development (including both construction and operation phases). Detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials.
- Specify the times of operation for all phases of the development and for all noise producing activities.
- For projects with a significant potential traffic noise impact provide details of road alignment (include gradients, road surface, topography, bridges, culverts etc), and land use along the proposed road and measurement locations – diagrams should be to a scale sufficient to delineate individual residential blocks.

Water

- Provide details of the project that are essential for predicting and assessing impacts to waters:
  a) including the quantity and physio-chemical properties of all potential water pollutants and the risks they pose to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters (as defined on www.environment.nsw.gov.au/ieo, using technical criteria derived from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC 2000)
  b) the management of discharges with potential for water impacts
  c) drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.
- Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts eg effluent ponds) and showing potential areas of modification of contours, drainage etc.
- Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

Waste and chemicals

- Provide details of the quantity and type of both liquid waste and non-liquid waste generated, handled, processed or disposed of at the premises. Waste must be classified according to the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes* (NSW EPA, 1999).
- Provide details of liquid waste and non-liquid waste management at the facility, including:
  a) the transportation, assessment and handling of waste arriving at or generated at the site
  b) any stockpiling of wastes or recovered materials at the site
  c) any waste processing related to the facility, including reuse, recycling, reprocessing (including composting) or treatment both on- and off-site
  d) the method for disposing of all wastes or recovered materials at the facility
  e) the emissions arising from the handling, storage, processing and reprocessing of waste at the facility
  f) the proposed controls for managing the environmental impacts of these activities.
- Provide details of spoil disposal with particular attention to:
  a. the quantity of spoil material likely to be generated
  b. proposed strategies for the handling, stockpiling, reuse/recycling and disposal of spoil
  c. the need to maximise reuse of spoil material in the construction industry
  d. identification of the history of spoil material and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material

e. designation of transportation routes for transport of spoil.

- Provide details of procedures for the assessment, handling, storage, transport and disposal of all hazardous and dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
- Provide details of the type and quantity of any chemical substances to be used or stored and describe arrangements for their safe use and storage.
- Reference should be made to the guidelines: *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (NSW EPA, 1999).

ESD

- Demonstrate that the planning process and any subsequent development incorporates objectives and mechanisms for achieving ESD, including:
  a. an assessment of a range of options available for use of the resource, including the benefits of each option to future generations
  b. proper valuation and pricing of environmental resources
  c. identification of who will bear the environmental costs of the proposal.

3. Rehabilitation

- Outline considerations of site maintenance, and proposed plans for the final condition of the site (ensuring its suitability for future uses).

4. Consideration of alternatives and justification for the proposal

- Consider the environmental consequences of adopting alternatives, including alternative:
  a. sites and site layouts
  b. access modes and routes
  c. materials handling and production processes
  d. waste and water management
  e. impact mitigation measures
  f. energy sources
- Selection of the preferred option should be justified in terms of:
  a) ability to satisfy the objectives of the proposal
  b) relative environmental and other costs of each alternative
  c) acceptability of environmental impacts and contribution to identified environmental objectives
  d) acceptability of any environmental risks or uncertainties
  e) reliability of proposed environmental impact mitigation measures

f) efficient use (including maximising re-use) of land, raw materials, energy and other resources.

C The location

1. General

- Provide an overview of the affected environment to place the proposal in its local and regional environmental context including:
  a) meteorological data (eg rainfall, temperature and evaporation, wind speed and direction)
  b) topography (landform element, slope type, gradient and length)
  c) surrounding land uses (potential synergies and conflicts)
  d) geomorphology (rates of landform change and current erosion and deposition processes)
  e) soil types and properties (including erodibility; engineering and structural properties; dispersibility; permeability; presence of acid sulfate soils and potential acid sulfate soils)
  f) ecological information (water system habitat, vegetation, fauna)
  g) availability of services and the accessibility of the site for passenger and freight transport.

2. Air

- Describe the topography and surrounding land uses. Provide details of the exact locations of dwellings, schools and hospitals. Where appropriate provide a perspective view of the study area such as the terrain file used in dispersion models.
- Describe surrounding buildings that may effect plume dispersion.
- Provide and analyse site representative data on following meteorological parameters:
  a) temperature and humidity
  b) rainfall, evaporation and cloud cover
  c) wind speed and direction
  d) atmospheric stability class
  e) mixing height (the height that emissions will be ultimately mixed in the atmosphere)
  f) katabatic air drainage
  g) air re-circulation.

3. Noise and vibration

- Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality.
- Identify the land use zoning of the site and the immediate vicinity and the potentially affected areas.

4. Water

- Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective. The Water Quality and River Flow Objectives on the website: www.environment.nsw.gov.au/ieo should be used to identify the agreed environmental values and human uses for any affected waterways. This will help with the description of the local and regional area.

5. Soil Contamination Issues

- Provide details of site history – if earthworks are proposed, this needs to be considered with regard to possible soil contamination, for example if the site was previously a landfill site or if irrigation of effluent has occurred.

D Identification and prioritisation of issues / scoping of impact assessment

- Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account:
  a) relevant NSW government guidelines
  b) industry guidelines
  c) EISs for similar projects
  d) relevant research and reference material
  e) relevant preliminary studies or reports for the proposal
  f) consultation with stakeholders.
- Provide a summary of the outcomes of the process including:
  a) all issues identified including local, regional and global impacts (eg increased/ decreased greenhouse emissions)
  b) key issues which will require a full analysis (including comprehensive baseline assessment)
  c) issues not needing full analysis though they may be addressed in the mitigation strategy
  d) justification for the level of analysis proposed (the capacity of the proposal to give rise to high concentrations of pollution compared with the ambient environment or environmental outcomes is an important factor in setting the level of assessment).

E The environmental issues

1. General

- The potential impacts identified in the scoping study need to be assessed to determine their significance, particularly in terms of achieving environmental outcomes, and minimising environmental pollution.
- Identify gaps in information and data relevant to significant impacts of the proposal and any actions proposed to fill those information gaps so as to enable development of appropriate management and mitigation measures. This is in accordance with ESD requirements.

Note: The level of detail should match the level of importance of the issue in decision making which is dependent on the environmental risk.

Describe baseline conditions

- Provide a description of existing environmental conditions for any potential impacts.

Assess impacts

- For any potential impacts relevant for the assessment of the proposal provide a detailed analysis of the impacts of the proposal on the environment including the cumulative impact of the proposal on the receiving environment especially where there are sensitive receivers.
- Describe the methodology used and assumptions made in undertaking this analysis (including any modelling or monitoring undertaken) and indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the predicted impacts.
- The analysis should also make linkages between different areas of assessment where necessary to enable a full assessment of environmental impacts eg assessment of impacts on air quality will often need to draw on the analysis of traffic, health, social, soil and/or ecological systems impacts; etc.
- The assessment needs to consider impacts at all phases of the project cycle including: exploration (if relevant or significant), construction, routine operation, start-up operations, upset operations and decommissioning if relevant.
- The level of assessment should be commensurate with the risk to the environment.

Describe management and mitigation measures

- Describe any mitigation measures and management options proposed to prevent, control, abate or mitigate identified environmental impacts associated with the proposal and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- Proponents are expected to implement a 'reasonable level of performance' to minimise environmental impacts. The proponent must indicate how the proposal meets reasonable levels of performance. For example, reference technology based criteria if available, or identify good practice for this type of activity or development. A 'reasonable level of performance' involves adopting and implementing

technology and management practices to achieve certain pollutant emissions levels in economically viable operations. Technology-based criteria evolve gradually over time as technologies and practices change.

- Use environmental impacts as key criteria in selecting between alternative sites, designs and technologies, and to avoid options having the highest environmental impacts.
- Outline any proposed approach (such as an Environmental Management Plan) that will demonstrate how commitments made in the EIS will be implemented. Areas that should be described include:

  a) operational procedures to manage environmental impacts

  b) monitoring procedures

  c) training programs

  d) community consultation

  e) complaint mechanisms including site contacts

  f) strategies to use monitoring information to improve performance

  g) strategies to achieve acceptable environmental impacts and to respond in event of exceedences.

5. Air

Describe baseline conditions

- Provide a description of existing air quality and meteorology, using existing information and site representative ambient monitoring data.

Assess impacts

- Identify all pollutants of concern and estimate emissions by quantity (and size for particles), source and discharge point.
- Assess the risk associated with potential discharges of fugitive and point source emissions for all stages of the proposal. Assessment of risk relates to environmental harm, risk to human health and amenity.
- Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2005)*.
- Demonstrate the projects ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act 1997* and the *POEO (Clean Air) Regulation 2002*.
- Estimate the resulting ground level concentrations of all pollutants. Where necessary (eg potentially significant impacts and complex terrain effects), use an appropriate dispersion model to estimate ambient pollutant concentrations. Discuss choice of model and parameters with the EPA.
- Describe the effects and significance of pollutant concentration on the environment, human health, amenity and regional ambient air quality standards or goals.

-
- Describe the contribution that the development will make to regional and global pollution, particularly in sensitive locations.
- For potentially odorous emissions provide the emission rates in terms of odour units (determined by techniques compatible with EPA procedures). Use sampling and analysis techniques for individual or complex odours and for point or diffuse sources, as appropriate.

Note: With dust and odour, it may be possible to use data from existing similar activities to generate emission rates.

- Reference should be made to relevant guidelines e.g. *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2001); *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (EPA, 2001); *Load Calculation Protocol for use by holders of NSW Environment Protection Licences when calculating Assessable Pollutant Loads* (EPA, 1999).

Describe management and mitigation measures

Outline specifications of pollution control equipment (including manufacturer's performance guarantees where available) and management protocols for both point and fugitive emissions. Where possible, this should include cleaner production processes.

6. Noise and vibration

Describe baseline conditions

- Determine the existing background (LA90) and ambient (LAeq) noise levels in accordance with the *NSW Industrial Noise Policy*.
- Determine the existing road traffic noise levels in accordance with the *NSW Environmental Criteria for Road Traffic Noise*, where road traffic noise impacts may occur.
- The noise impact assessment report should provide details of all monitoring of existing ambient noise levels including:
  a) details of equipment used for the measurements
  b) a brief description of where the equipment was positioned
  c) a statement justifying the choice of monitoring site, including the procedure used to choose the site, having regards to the definition of 'noise sensitive locations(s)' and 'most affected locations(s)' described in Section 3.1.2 of the *NSW Industrial Noise Policy*
  d) details of the exact location of the monitoring site and a description of land uses in surrounding areas
  e) a description of the dominant and background noise sources at the site
  f) day, evening and night assessment background levels for each day of the monitoring period
  g) the final Rating Background Level (RBL) value

h) graphs of the measured noise levels for each day should be provided

i) a record of periods of affected data (due to adverse weather and extraneous noise), methods used to exclude invalid data and a statement indicating the need for any re-monitoring under Step 1 in Section B1.3 of the *NSW Industrial Noise Policy*

j) determination of LAeq noise levels from existing industry.

Assess impacts

- Determine the project specific noise levels for the site. For each identified potentially affected receiver, this should include:

  a) determination of the intrusive criterion for each identified potentially affected receiver

  b) selection and justification of the appropriate amenity category for each identified potentially affected receiver

  c) determination of the amenity criterion for each receiver

  d) determination of the appropriate sleep disturbance limit.

- Maximum noise levels during night-time period (10pm-7am) should be assessed to analyse possible affects on sleep. Where LA1(1min) noise levels from the site are less than 15 dB above the background LA90 noise level, sleep disturbance impacts are unlikely. Where this is not the case, further analysis is required. Additional guidance is provided in Appendix B of the *NSW Environmental Criteria for Road Traffic Noise.*

- Determine expected noise level and noise character (eg tonality, impulsiveness, vibration, etc) likely to be generated from noise sources during:

  a) site establishment

  b) construction

  c) operational phases

  d) transport including traffic noise generated by the proposal

  e) other services.

  Note: The noise impact assessment report should include noise source data for each source in 1/1 or 1/3 octave band frequencies including methods for references used to determine noise source levels. Noise source levels and characteristics can be sourced from direct measurement of similar activities or from literature (if full references are provided).

- Determine the noise levels likely to be received at the most sensitive locations (these may vary for different activities at each phase of the development). Potential impacts should be determined for any identified significant adverse meteorological conditions. Predicted noise levels under calm conditions may also aid in quantifying the extent of impact where this is not the most adverse condition.

- The noise impact assessment report should include:

  a) a plan showing the assumed location of each noise source for each prediction scenario

  b) a list of the number and type of noise sources used in each prediction scenario to simulate all potential significant operating conditions on the site

  c) any assumptions made in the predictions in terms of source heights, directivity effects, shielding from topography, buildings or barriers, etc

d) methods used to predict noise impacts including identification of any noise models used. Where modelling approaches other than the use of the ENM or SoundPlan computer models are adopted, the approach should be appropriately justified and validated

e) an assessment of appropriate weather conditions for the noise predictions including reference to any weather data used to justify the assumed conditions

f) the predicted noise impacts from each noise source as well as the combined noise level for each prediction scenario under any identified significant adverse weather conditions as well as calm conditions where appropriate

g) for developments where a significant level of noise impact is likely to occur, noise contours for the key prediction scenarios should be derived

h) an assessment of the need to include modification factors as detailed in Section 4 of the *NSW Industrial Noise Policy*.

- Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures.
- The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.
- Where relevant noise/vibration criteria cannot be met after application of all feasible and cost effective mitigation measures the residual level of noise impact needs to be quantified by identifying:

  a) locations where the noise level exceeds the criteria and extent of exceedence

  b) numbers of people (or areas) affected

  c) times when criteria will be exceeded

  d) likely impact on activities (speech, sleep, relaxation, listening, etc)

  e) change on ambient conditions

  f) the result of any community consultation or negotiated agreement.

- For the assessment of existing and future traffic noise, details of data for the road should be included such as assumed traffic volume; percentage heavy vehicles by time of day; and details of the calculation process. These details should be consistent with any traffic study carried out in the EIS.
- Where blasting is intended an assessment in accordance with the *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) should be undertaken. The following details of the blast design should be included in the noise assessment:

  a) bench height, burden spacing, spacing burden ratio

  b) blast hole diameter, inclination and spacing

  c) type of explosive, maximum instantaneous charge, initiation, blast block size, blast frequency.

Describe management and mitigation measures

- Determine the most appropriate noise mitigation measures and expected noise reduction including both noise controls and management of impacts for both construction and operational noise. This will include selecting quiet equipment and construction methods, noise barriers or acoustic screens, location of stockpiles, temporary offices, compounds and vehicle routes, scheduling of activities, etc.

- For traffic noise impacts, provide a description of the ameliorative measures considered (if required), reasons for inclusion or exclusion, and procedures for calculation of noise levels including ameliorative measures. Also include, where necessary, a discussion of any potential problems associated with the proposed ameliorative measures, such as overshadowing effects from barriers. Appropriate ameliorative measures may include:

  a) use of alternative transportation modes, alternative routes, or other methods of avoiding the new road usage

  b) control of traffic (eg: limiting times of access or speed limitations)

  c) resurfacing of the road using a quiet surface

  d) use of (additional) noise barriers or bunds

  e) treatment of the façade to reduce internal noise levels buildings where the night-time criteria is a major concern

  f) more stringent limits for noise emission from vehicles (i.e. using specially designed 'quite' trucks and/or trucks to use air bag suspension

  g) driver education

  h) appropriate truck routes

  i) limit usage of exhaust breaks

  j) use of premium muffles on trucks

  k) reducing speed limits for trucks

  l) ongoing community liaison and monitoring of complaints

  m) phasing in the increased road use.

4. Water

Describe baseline conditions

- Describe existing surface and groundwater quality – an assessment needs to be undertaken for any water resource likely to be affected by the proposal and for all conditions (e.g. a wet weather sampling program is needed if runoff events may cause impacts).

  Note: Methods of sampling and analysis need to conform with an accepted standard (e.g. Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECCW 2004) *or be approved and analyses undertaken by accredited laboratories).*

- Provide site drainage details and surface runoff yield.
- State the ambient Water Quality and River Flow Objectives for the receiving waters. These refer to the community's agreed environmental values and human uses endorsed by the Government as goals for the ambient waters. These environmental values are published on the website: www.environment.nsw.gov.au/ieo. The EIS should state the environmental values listed for the catchment and waterway type relevant to your proposal. NB: A consolidated and approved list of environmental values are not available for groundwater resources. Where groundwater may be affected the EIS should identify appropriate groundwater environmental values and justify the choice.
- State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC 2000 *Guidelines for Fresh and Marine Water Quality* (http://www.deh.gov.au/water/quality/nwqms/volume1.html)(Note that, as at 2004, the NSW Water Quality Objectives booklets and website contain technical criteria derived from the 1992 version of the ANZECC Guidelines. The Water Quality Objectives remain as Government Policy, reflecting the community's environmental values and long-term goals, but the technical criteria are replaced by the more recent ANZECC 2000 Guidelines). NB: While specific guidelines for groundwater are not available, the ANCECC 2000 Guidelines endorse the application of the trigger values and decision trees as a tool to assess risk to environmental values in groundwater.
- State any locally specific objectives, criteria or targets, which have been endorsed by the government e.g. the Healthy Rivers Commission Inquiries (www.hrc.nsw.gov.au) or the NSW Salinity Strategy (DLWC, 2000) (www.dlwc.nsw.gov.au/care/salinity/#Strategy).
- Where site specific studies are proposed to revise the trigger values supporting the ambient Water Quality and River Flow Objectives, and the results are to be used for regulatory purposes (e.g. to assess whether a licensed discharge impacts on water quality objectives), then prior agreement from the DECCW on the approach and study design must be obtained.
- Describe the state of the receiving waters and relate this to the relevant Water Quality and River Flow Objectives (i.e. are Water Quality and River Flow Objectives being achieved?). Proponents are generally only expected to source available data and information. However, proponents of large or high risk developments may be required to collect some ambient water quality / river flow / groundwater data to enable a suitable level of impact assessment. Issues to include in the description of the receiving waters could include:

  a) lake or estuary flushing characteristics

  b) specific human uses (e.g. exact location of drinking water off take)

  c) sensitive ecosystems or species conservation values

  d) a description of the condition of the local catchment e.g. erosion levels, soils, vegetation cover, etc

e) an outline of baseline groundwater information, including, but not restricted to, depth to watertable, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment

f) historic river flow data where available for the catchment.

Assess impacts

- No proposal should breach clause 120 of the *Protection of the Environment Operations Act* 1997 (i.e. pollution of waters is prohibited unless undertaken in accordance with relevant regulations).
- Identify and estimate the quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation measures are implemented.
- Include a rationale, along with relevant calculations, supporting the prediction of the discharges.
- Describe the effects and significance of any pollutant loads on the receiving environment. This should include impacts of residual discharges through modelling, monitoring or both, depending on the scale of the proposal. Determine changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, wetland hydrologic regimes and groundwater).
- Describe water quality impacts resulting from changes to hydrologic flow regimes (such as nutrient enrichment or turbidity resulting from changes in frequency and magnitude of stream flow).
- Identify any potential impacts on quality or quantity of groundwater describing their source.
- Identify potential impacts associated with geomorphological activities with potential to increase surface water and sediment runoff or to reduce surface runoff and sediment transport. Also consider possible impacts such as bed lowering, bank lowering, instream siltation, floodplain erosion and floodplain siltation.
- Identify impacts associated with the disturbance of acid sulfate soils and potential acid sulfate soils.
- Containment of spills and leaks shall be in accordance with the technical guidelines section 'Bunding and Spill Management' of the *Authorised Officers Manual* (EPA, 1995) (http://www.environment.nsw.gov.au/mao/bundingspill.htm) and the most recent versions of the Australian Standards referred to in the Guidelines. Containment should be designed for no-discharge.
- The significance of the impacts listed above should be predicted. When doing this it is important to predict the ambient water quality and river flow outcomes associated with the proposal and to demonstrate whether these are acceptable in terms of achieving protection of the Water Quality and River Flow Objectives. In particular the following questions should be answered:

  a) will the proposal protect Water Quality and River Flow Objectives where they are currently achieved in the ambient waters; and

  b) will the proposal contribute towards the achievement of Water Quality and River Flow Objectives over time, where they are not currently achieved in the ambient waters.

- Consult with the DECCW as soon as possible if a mixing zone is proposed (a mixing zone could exist where effluent is discharged into a receiving water body, where the quality of the water being discharged does not immediately meet water quality objectives. The mixing zone could result in dilution, assimilation and decay of the effluent to allow water quality objectives to be met further downstream, at the edge of the mixing zone). The DECCW will advise the proponent under what conditions a mixing zone will and will not be acceptable, as well as the information and modelling requirements for assessment.

Note: The assessment of water quality impacts needs to be undertaken in a total catchment management context to provide a wide perspective on development impacts, in particular cumulative impacts.

- Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.
- Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact.
- Reference should be made to the relevant guidelines e.g. *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004), *Guidelines for Fresh and Marine Water Quality* ANZECC 2000), *Environmental Guidelines: Use of effluent by Irrigation* (DECCW, 2004).

Describe management and mitigation measures

- Outline stormwater management to control pollutants at the source and contain them within the site. Also describe measures for maintaining and monitoring any stormwater controls.
- Outline erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment. Also include measures to maintain and monitor controls as well as rehabilitation strategies.
- Describe waste water treatment measures that are appropriate to the type and volume of waste water and are based on a hierarchy of avoiding generation of waste water; capturing all contaminated water (including stormwater) on the site; reusing/recycling waste water; and treating any unavoidable discharge from the site to meet specified water quality requirements.
- Outline pollution control measures relating to storage of materials, possibility of accidental spills (eg preparation of contingency plans), appropriate disposal methods, and generation of leachate.
- Describe hydrological impact mitigation measures including:
  a) site selection (avoiding sites prone to flooding and waterlogging, actively eroding or affected by deposition)
  b) minimising runoff
  c) minimising reductions or modifications to flow regimes
  d) avoiding modifications to groundwater.
- Describe groundwater impact mitigation measures including:
  a) site selection
  b) retention of native vegetation and revegetation
  c) artificial recharge
  d) providing surface storages with impervious linings
  e) monitoring program.
- Describe geomorphological impact mitigation measures including:
  a) site selection

b) erosion and sediment controls

c) minimising instream works

d) treating existing accelerated erosion and deposition

e) monitoring program.

- Any proposed monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (DECCW 2004).

5. Soils and contamination

Describe baseline conditions

- Provide any details (in addition to those provided in the location description - Section C) that are needed to describe the existing situation in terms of soil types and properties and soil contamination.

Assess impacts

- Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of:

  a) disturbing any existing contaminated soil

  b) contamination of soil by operation of the activity

  c) subsidence or instability

  d) soil erosion

  e) disturbing acid sulfate or potential acid sulfate soils.

- Reference should be made to relevant guidelines e.g. *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 1997); *Contaminated Sites – Guidelines on Significant Risk of Harm and Duty to Report* (EPA, 1999).

Describe management and mitigation measures

- Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including:

  a) erosion and sediment control measures

  b) proposals for site remediation – see *Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998)

  c) proposals for the management of these soils – see *Assessing and Managing Acid Sulfate Soils,* Environment Protection Authority, 1995 (note that this is the only methodology accepted by the EPA).

6. Waste and chemicals

Describe baseline conditions

- Describe any existing waste or chemicals operations related to the proposal.
- Provide details of estimated volumes of brine and other by-products resulting from the proposal.

Assess impacts

- Assess the adequacy of proposed measures to minimise natural resource consumption and minimise impacts from the handling, transporting, storage, processing and reprocessing of waste and/or chemicals.
- Reference should be made to relevant guidelines e.g. *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (EPA, 1999).

Describe management and mitigation measures

- Provide details of brine and other by-product management including details around handling, transport, storage, processing and disposal options.
- Outline measures to minimise the consumption of natural resources.
- Outline measures to avoid the generation of waste and promote the re-use and recycling and reprocessing of any waste.
- Outline measures to support any approved regional or industry waste plans.

7. Cumulative impacts

- Identify the extent that the receiving environment is already stressed by existing development and background levels of emissions to which this proposal will contribute.
- Assess the impact of the proposal against the long term air, noise and water quality objectives for the area or region.
- Identify infrastructure requirements flowing from the proposal (eg water and sewerage services, transport infrastructure upgrades).
- Assess likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts (eg travel demand management strategies).

F. List of approvals and licences

- Identify all approvals and licences required under environment protection legislation including details of all scheduled activities, types of ancillary activities and types of discharges (to air, land, water).

G. Compilation of mitigation measures

- Outline how the proposal and its environmental protection measures would be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licences or approvals (eg outline of an environmental management plan).
- The mitigation strategy should include the environmental management and cleaner production principles which would be followed when planning, designing, establishing and operating the proposal. It should include two sections, one setting out the program for managing the proposal and the other outlining the monitoring program with a feedback loop to the management program.

H. Justification for the Proposal

- Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.

ATTACHMENT B - GUIDANCE MATERIAL

Assessing Environmental Impacts

Air quality

- Protection of the Environment Operations (Clean Air) Regulation 2002
- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW
- Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales
- (Technical Framework: Assessment and Management of Odour from Stationery Sources in NSW, November 2006.

Greenhouse gas emissions

- The Greenhouse Gas Protocol: Corporate Standard, World Council for Sustainable Business Development & World Resources Institute http://www.ghgprotocol.org/standards/corporate-standard
- National Greenhouse Accounts (NGA) Factors, Australian Department of Climate Change (Latest release), http://www.climatechange.gov.au/publications/greenhouse-acctg/national-greenhouse-factors.aspx
- National Greenhouse and Energy Reporting System, Technical Guidelines (latest release) http://www.climatechange.gov.au/en/government/initiatives/national-greenhouse-energy-reporting/tools-resources.aspx
- National Carbon Accounting Toolbox http://www.climatechange.gov.au/government/initiatives/ncat.aspx
- Australian Greenhouse Emissions Information System (AGEIS) http://ageis.climatechange.gov.au/

Noise and vibration

- NSW Industrial Noise Policy (EPA, 1999)
- NSW Environmental Criteria for Road Traffic Noise (EPA, 1999)
- Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC 1990)
- Interim Noise Construction Guidelines (DECC 2009)
- Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects, 2007. See http://www.environment.nsw.gov.au/noise/railnoise.htm for more guidence material.
- Assessing Vibration: a Technical Guideline, DECC, 2006.

Water and Soils

Water quality

- National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)
- NWQMS Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC 2000)
- Water Quality and River Flow Objectives for the Namoi River Catchment (DEC, 2006) http://www.environment.nsw.gov.au/ieo/Namoi/index.htm
- Namoi River Catchment Action Plan (CAP)

Waste water

- National Water Quality Management Strategy: Guidelines for Sewerage Systems - Effluent Management (ARMCANZ/ANZECC 1997)
- National Water Quality Management Strategy: Guidelines for Sewerage Systems – Use of Reclaimed Water (ARMCANZ/ANZECC 2000)
- Environmental Guidelines for the Utilisation of Treated Effluent by Irrigation (NSW DEC 2004)

Stormwater

- Managing Urban Stormwater: Soils and Construction 4th Edition (Landcom 2004)
- Managing Urban Stormwater: Soils and Construction – Vol 2E Mines and Quarries, 2008.
- Managing Urban Stormwater: Source Control (EPA 1998)
- Managing Urban Stormwater: Treatment Techniques (EPA 1998)

Groundwater

- State Groundwater Policy Framework Document (DLWC 1997)
- The NSW State Groundwater Quality Protection Policy (DLWC 1998)
- (Draft) NSW State Groundwater Quantity Management Policy
- NSW State Groundwater Dependent Ecosystems Policy (DLWC, 2002)
- National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ & ANZECC, 1995)

Waste

- Guideline for the Use and Disposal of Biosolids Products (NSW EPA 1997)
- Environmental Guidelines: Solid Waste Landfills (NSW EPA 1996)
- Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)
- Waste Classification Guidelines Part 1: Classifying Waste, April 2008.

Sophie Butcher - FW: DGRs Input Request - Narrabri Gas Project (SSD 6456)

From: Geoff Coggins <Geoff.Coggins@fcnsw.com.au>
To: "Sophie.Butcher@planning.nsw.gov.au" <Sophie.Butcher@planning.nsw.gov.au>
Date: 15/04/2014 9:25 AM
Subject: FW: DGRs Input Request - Narrabri Gas Project (SSD 6456)
CC: "jessie.gilbert@planning.nsw.gov.au" <jessie.gilbert@planning.nsw.gov.au>, Jarod Dashwood <Jarod.Dashwood@fcnsw.com.au>, Adam Kirby <Adam.Kirby@fcnsw.com.au>, Conan Rossler <Conan.Rossler@fcnsw.com.au>, Warwick Bratby <Warwick.Bratby@fcnsw.com.au>, Andrew O'Brien <Andrew.O'Brien@fcnsw.com.au>

Hello Sophie,

I have been asked to respond on behalf of Forestry Corporation of NSW (FCNSW) with respect to providing input into the DGR's which are to apply in respect to the above Preliminary Environmental Assessment (PEA) dated March 2014 as submitted by Santos NSW (Eastern) Pty Ltd (Santos).

A significant amount of Coal Seam Gas (CSG) exploration activity is already being conducted by Santos in the Pilliga East and Bibblewindi State forests under an existing agreement assigned by its predecessor (Eastern Star Gas). Given the extent to which that activity might be expanded and matured to a gas production level, FCNSW have undertaken detailed negotiation over many months with Santos to ensure adequate resources are available to review and process the many and varied activities on the forest land.

Nonetheless, FCNSW wishes to comment in relation to some specific provisions of the new PEA that we consider important to be incorporated within the DGR's response from your office. These are:

1. Decommissioning and Rehabilitation (Section 2.5)
   FCNSW continues to work with the NSW Office of Coal Seam Gas in the formulation of rehabilitation planning and revegetation standards specific to the Narrabri Gas Project. As part of Santos' proposed rehabilitation strategy, FCNSW would expect the opportunity to:

   a. Advise on site preparation techniques and the management of resultant regeneration to encourage vegetation communities compatible with FCNSW land use objectives for the area; and
   b. Assess each rehabilitation project area against the agreed quantifiable measures prior to transfer back to FCNSW.

2. Occupation Permit (Section 4.3.3)
   FCNSW is drafting a new Forest Permit in response to the expanding range of operations associated with the Narrabri Gas Project. This new permit will supersede the existing agreement held between FCNSW and Santos.

3. Bush fire planning (Section 5.14)
   As part of the drafting of the new Forest Permit, Santos are required to submit a revised operations bush fire management plan. The new plan will focus on:

   a. bush fire danger ratings and equivalent restrictions to operations which present a risk to fire ignition and spread; and
   b. forest evacuation planning.

Would you please keep me advised of the response which is ultimately provided to Santos in respect to this

PEA. You might also contact me direct if there are any further applications from Santos that require FCNSW consideration.

Regards,

Geoff Coggins I Assets & Estates Manager
Forestry Corporation of NSW
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Heart of the North West

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7 May 2014

Mining Projects
Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Email: sophie.butcher@planning.nsw.gov.au
Email: colin.phillips@planning.nsw.gov.au

Dear Sir / Madam

Re: Director General Requirements – Narrabri Gas Project SUPPLEMENTARY SUBMISSION

Council lodged its' initial submission with the Department on 17 April 2014 and advised of its intention to lodge a second submission after seeking input from the community and no later than 7 May 2014. A meeting has now been held with community representatives, and Council wishes to add the following supplementary submission for consideration by the Director General.

The comments below, while ratified by Narrabri Shire Council at its' Ordinary Council Meeting of 6th May, 2014 as a supplementary submission, do reflect a broader community perspective and concerns raised with Council. The major concern raised at our consultation meeting was whether and what safe guards are in place to ensure that the agreed consent conditions for this project will carry over should the PEL 238 change hands and another operator take over.

Other comments included:

General Requirements

Could details of any fund (and whether to be held "in-trust") to enable any remediation work and compensation payable after the life of the Project is finished, be also included in the EIS.

In relation to job creation, a close estimate of the type, skills and numbers of the jobs (total and local) that will be created by the development during the construction and operational phases of the development would be appreciated. This should include a description of local training options being considered and the expected ratio of locally sourced employees (either by Santos or its subcontractors) that this may achieve.

Can the EIS discuss and describe:

- how the Regional Development Fund is to be managed and distributed to participating landholders, and others, apportion and timing of Fund disbursements;
- measures to be taken including Compensation, should a Contamination event occur and Livestock in an area are affected and cannot be sold and what approach would be taken if stock is refused at the sale yards due to an area wide ban;
- how co-existence between the Development and; a).Graziers, b).Dry Land Farmers and c). Irrigators would work, the benefits and disadvantages; and

- the benefits, short and long term, of using 'treated' produced water to grow food, fibre or pasture, and the types of each sector that could benefit, describe the benefits short and long term to the soil fertility and water security.

Project Gas Usage

In terms of project gas usage, could the EIS include a discussion of any events that might affect the project gas destination (e.g. over supply, Company take overs); and discuss and describe how the gas from the project will be allocated (for example, for NSW use only or more broadly); including the implications, benefits and any disadvantages to NSW or the Company or its partners.

Land Resources

It is requested that a baseline (before drilling) relating to a Soil Chemical and Bacterial Analysis from around each drill pad, water gathering or collection point, treatment and disposal point should be done. It is further requested that monitoring should be carried out at least annually at all sites (at 3 depths) for the life of the project and beyond (to ensure no lasting effects should a contamination event occur or a well leak after plugging and abandoning).

Could the EIS also explain how monitoring; including frequency, sampling and analysing of the soil at any treated water discharge or reuse site; will be carried out and what are the expected characteristic changes in soil properties over the life of the project.

Water Resources

It is requested that the EIS include a description of the proposed measures to be taken to monitor and if necessary to repair/remediate any damage to ground or surface waters. This should include the growing capacity of the soil impacted by any damage. The EIS should also discuss:

- The proposed baseline measurement and ongoing monitoring for all surface water, groundwater sources and dependent ecosystems within and adjacent to the development including Stygofauna, their location and depth. Analysis of water should include Water Chemistry, BTEX, Heavy Metals and Hydrocarbons as well as all known Bacteria associated with CSG and Petroleum Industries. It is recommended that information collected can be shown to be independently verified and checked;
- The management of water at both the Bibblewindi Management Facility and the Leewood Produced Water and Brine Management Facility; including how the windblown saline material from the storage ponds will be managed so as not to cause a build-up of saline material on the surrounding areas, causing salinity increase in the soils and waterways and standing waters, damage to the local Flora and how any offensive odours from this windblown action will be neutralise;
- The casing of wells (cementing and steel) that ensures the protection of the integrity of all underground aquifers, prevents gas escape and maintains groundwater quality, in accordance with the *Code of Practice for Coal Seam Gas Well Integrity;* including how the casing cement and steel are protected both internally and externally from any chemical, gas or bacterial attack during the wells productive life and how will this protection be maintained after the well is plugged and abandoned;
- How aquifer cross contamination is prevented after plugging and abandoning; and how the cross contamination between aquifers is prevented while drilling the well and before the drill hole is cased;

- The expected amount of drill fluid interchange with the aquifers at varying depths whilst drilling, and the methods employed to reduce/prevent this interchange from occurring;
- the drilling chemicals and biocides used and how each may interact with the Aquifers during any aquifer/drill fluid interchange, including any effects that could be caused to the Aquifers and the GDE's if the drilling Chemical composition was changed;
- The proposed water management system (including sewage), ongoing water monitoring program and other measures to mitigate surface and groundwater impacts, including:
    - the use of above ground tanks to contain drilling fluids,
    - adequate spill control measures,
    - contingency planning,
    - produced water management (e.g. Reverse Osmosis or reinjection)
    - the disposal methods of the brine and treated water streams, including calculations of the quantities and concentrations of each,
    - expected treated water chemical and bacterial levels in comparison with the existing natural levels, and
    - the treatment and disposal of the drill cuttings, contaminated drill fluid, brine stream and water containing heavy metals.
- an assessment of local flood risks, including appropriate mitigation measures to ensure no well pad, holding ponds and other infrastructure and emergency access are inundated by flood waters or water from meteoric rain events. This assessment is to take in all water courses, flood ways and flood plains within and adjacent to the project area;
- how bacterial transfer contamination of the Aquifers (shallow and deep) by the Drill Rig and associated equipment, the Drill Fluid on-site holding tank, the drill cutting containers and fluid removal vehicles is prevented when a drill rig is moved from one site to another;
- the steps the Operator will take to "make-good" any aquifer contamination during and after the life of the project. At what time after the end of the life of the project will the operator consider their obligation terminated;
- Well configuration including the number of horizontals per well set and also the number of well sets operating at any-one time; and,
- a Hydrogeological Map and report covering the entire Project area to be created, using information from the NSW Department of Water Resources, Seismic Surveys and the drilling records from the Gas well Drillers and from shallow bores driller's logs.

Biodiversity

It is requested that the EIS include impacts on the Pilliga State Forest, including impacts on conservation, commercial and recreational values that may be caused either directly or indirectly by this Development, including a plan of management of on-going recreational uses of the Forest, in the development area, during construction, development and operation of the gas field.

- Could the EIS include a baseline of the Flora and Fauna in the project area, comments in relation to vegetation cover, as well as the location of any additional land purchases proposed to off-set any clearing for roads, well pads, pipelines or other Infrastructure.

The EIS should also cover:

- measures to be taken to avoid, reduce or mitigate impacts on biodiversity; these to include, but not limited to, biodiversity off-set areas of simular fauna and flora as those areas disturbed, connecting wildlife corridors, relocation of any fauna, and rehabilitation of the region;
- an initial accurate count/estimate of each threatened or endangered species of Fauna and Flora, along with the range and location of each within the Development;
- a commitment to ongoing Fauna and Flora studies at least every three years for the life of the project, with the study information to be made publically available and with any decline in population to be reported and investigated; and
- the type of bio-security controls that would be used in case of any non-beneficial outcome from the use of non-indigenous fauna in any 'pasture trail' program involving the 'treated 'produced water.

Greenhouse Gases

Please include in the EIS an accurate estimated value of greenhouse gases to be released during the Construction phase and during the life of the project (including those released from the Wilga Park Power Station), including;

- a quantitative assessment of potential Scope 1, 2 and 3 greenhouse gas emissions;
- a quantitative assessment of the potential impacts of these emissions on the environment; and
- feasible measures to minimise greenhouse gas emissions and ensure energy efficiency.

Traffic and Transport

Could the EIS include a description of the transfer of gas via a pipeline and produced water flow line from any gas well or field via any road or track back to the Bibblewindi Water Management Facility, the Wilga Park Water Management Facility and from both Facilities to the Leewood Treatment Facility.

Also, details of road routes to be used to gain access to the well sites and other infrastructure during all phases of the development. If land owners are to be affected, please explain how access will be negotiated and managed. Please include how any effects will be minimised, including dust suppression.

Waste

Could the EIS describe types of waste, including sewage, generated from the commencement of construction through production and into decommissioning of the project, the handling, storage and trans-shipping, over to life of the project, including:

- estimates of the quantity and nature of the potential waste streams of the development, including well cuttings, unrecoverable as well as 'expired' drilling fluids, brine or salts from the produced water, plastics, fiberglass, rubber metal, paper and general waste, animal carcasses, oils and greases;
- a description of measures that would be implemented to minimise production of 'other waste', and ensure that the waste is appropriately and properly managed; and
- an outline of the experience and qualifications of any waste removal contractor and briefly describe the type and carrying capacity of vehicles used for generated waste removal.

Please outline contingency plans for any event that effects operations over the entire project area that may result in environmental harm.

Hazards

With particular attention to public safety, chemical use and cartage, and bushfires, could the EIS cover:

- Any need to restrict usage of areas to single entity use only;
- how the development is protected from a bushfire, how the personnel are protected, the location of dedicated escape routes, the access routes to and with-in the project area;
- The management plan for land owners in the vicinity of a gas field in the event of an emergency;
- how any Chemical material (waste or otherwise) is to be stored and/or transported as per the relevant Acts, in correctly marked containers suitable for the purpose with accurate signage to be displayed on all vehicles along with cartage of a MSDS; and
- methods showing how vehicle accidents are to be mitigated within the project area.

Social and Economic

Can the EIS discuss the impact of the project on rural and urban lifestyles, including:

- the effects on property values, adjacent too and affected directly by the project, including local towns;
- rental affordability and other housing options, including accommodation Camps;
- costs of living; and
- how a dispute over any of the above points including livelihood income (examples are-stock saleability or deaths or crop damage, soil compaction), will be actioned and resolved.

Describe how the Project could affect the short and long term viability of the established Agricultural Industry, including employment, wages, productivity and Agricultures ability to adapt to a changing employment market both in the short and long term.

Health

The EIS should include a health assessment of the impact of the project to residents of the Shire, including physical and mental health, possible effects of stress as well as any potential direct impacts such as chemical contact, emissions, dust and contamination.

Access Agreements and Payments

It would be useful if the EIS could describe a current access agreement by type and classification, including payment amounts, and how all existing access agreements (of matter of age) will be dealt with. This should include how access and access agreements will be formulated in light of the Memorandum of Understanding of 28-3-14 and cover multiple or single well pad, multiple infrastructure including produced water storage, pipelines and roads; infrastructure and pipelines only.

Please describe how any older (over 3 years) Access Agreements with previous PEL 238 operators will be brought up to current standards and conditions.

In addition to the points originally raised regarding consultation, the community groups consulted believe additional consultation is needed (by Santos), to also cover:

- All affected landowners (including neighbouring landowners);
- Local industry community groups;
- Australia Astronomical Observatory, Siding Springs; and

- Paul Wild Observatory (including CSIRO Australia Telescope, Bureau of Meteorology (Ionosphere Prediction Service – IPS), and Sydney University Stellar Interferometer (SUS)).

These additional points in relation to the consultation process are also forwarded for consideration:

- the consultation process with directly affected landowners should be included; including the frequency and number of the consultations, the location of these landowners within the Project area, the intended number of consultations per affected landowner; and timing of discussions in relation to when a landowner might be told that his property might be required for the project;
- the consultation process with those neighbouring an affected property including the frequency and number of the consultations should be included;
- more detail is requested on the Local Industry Community Consultation Committee, including general make-up of the committee, frequency of meetings, topics to be discussed, and process to address concerns raised;
- more detail is requested on a typical landowner Access Agreement, including conditions, description of payments, any liabilities, and renewals, any other relevant material; and
- it is requested that there is a dedicated, monitored complaint mechanism in place, include ways of contacting, response times and logging methods.

Conclusion

It is recognised that the Director Generals Requirements are an early step in the planning and approval process, however, they are of considerable importance in supporting the assessment. This supplementary submission seeks to ensure community concerns are addressed in the EIS.

Narrabri Shire Council thanks the Department for its consideration of this supplementary submission.

If Council can provide any further advice please do not hesitate to contact Mr Tony Meppem, Manager Strategy and Land Use on ☎6799 6876.

Yours sincerely

Diane Hood

Diane Hood
GENERAL MANAGER

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Narrabri SHIRE
Heart of the North West

Our Reference: Infoexpert 286106 DH:PB:LR
Your Reference:
Contact Name: Paul Bawden
Telephone: (02) 6799 6857

17 April 2014

Mining Projects
Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Email: sophie.butcher@planning.nsw.gov.au

Dear Madam,

Re: Director General Requirements – Narrabri Gas Project

The Council appreciates the opportunity to provide input to the Director General Requirements (DGRs) for the proposed Narrabri Gas Project. The development will be the largest single investment in the Local Government area and has the potential for profound environmental, economic and social implications.

The experiences with current resources sector infrastructure within the Shire and elsewhere in regional Australia have provided a reference when considering the current proposal together with the supporting document lodged by Santos.

The Council formally considered the DGRs at its Meeting of 15 April 2014 and resolved to:

- Lodge a submission raising matters for consideration in the preparation of the Environmental Impact Statement (EIS) for the Project.
- Provide notification of its intention to lodge a second submission within fourteen (14) days after seeking input from the community.

In considering the character of the Narrabri Gas Project and approach identified in the supporting Santos Report the Council provides comment on the following:-

1. Adopted Extractive Industries Policy

Council adopted an Extractive Industries Policy (copy attached) in December 2013 after consultation with the local community and considering numerous submissions from the public. A major focus of the submissions and the resulting policy position adopted by Council related to the impacts of Coal Seam Gas extraction and its potential impacts upon the community and environment.

The Policy objectives include the following outcomes:-

- Ensure that mining and extractive industry does not have an unacceptable impact on the environmental attributes, human health and amenity of the area.
- Ensure key assets and defining values of cultural heritage, native title, biodiversity, communities, ground water, surface water and prime agricultural land are not compromised from the impact of mining and extractive industry.

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The Policy includes the following:-

- Ensure that impacts on Council infrastructure are adequately compensated.
- Financial support for infrastructure needed to deal with additional local mining and extractive industries.
- Encourage and support the local establishment of service industries.
- Nil effect in regard to the quality of surface water and irrigation aquifers used by the community.
- Support individual property rights in regards to unwelcome drilling, exploration and/or extraction.
- Support the ten (10) International Council of Mining and Metal principles.

2. Risk Assessment

The preliminary work undertaken by GHD has identified fourteen (14) key risks as follows:-

- Ecological impact.
- Surface water impact and management.
- Groundwater impact and management.
- Aboriginal heritage impact
- Air quality impacts and greenhouse gas emissions.
- Soils and land suitability impact.
- Waste management.
- Hazards and risk management (gas, chemicals, bushfire and water storage).
- Property and land use impact.
- Agricultural impact.
- Social, community and health impact.
- Economic impact.
- Contaminated land.
- Decommissioning and rehabilitation.

In addition guidance is sought to be included on the source of supply to the remaining 50% of NSW gas market. A risk assessment should be included on its reliability and contingency planning.

Specific comment is provided on the following:-

i. **Ecological:** Work to date appears largely based on desktop assessment in 2013 to identify threatened flora and fauna and then consider responses across the areas of avoidance, mitigation and offsets.

It is considered that the EIS needs to be supported by robust independent survey and assessment of ecological impacts on the ground.

Through proactive means the project needs to identify means to minimise its carbon footprint through such approaches as carbon sequestration. Plantings need to be properly managed and not result in the introduction of any invasive weeds.

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ii. **Surface Water and Hydrology:** It has been recognised that the Namoi Catchment has been used for agricultural activities for over 100 years and supports significant cotton and broad acre cropping in addition to sheep and cattle grazing.

The need to address surface water contamination, disturbance to waterway beds/banks and modification to local waterways or flood prone lands are noted. The Council raises the need for robust work that addresses the local characteristics and longer term management strategy outcomes.

iii. **Groundwater:** Again the supporting work importantly notes that the projects falls within the Namoi River Catchment that includes the Great Artesian Basin aquifers, one of the most important and intensely developed groundwater resources in Australia and supports an irrigation industry worth in excess of $380M as well as being the water supply for many towns such as Narrabri, Wee Waa and Boggabri.

The proposed activities have the potential to impact on groundwater through:-

- Drilling and installation of gas wells.
- Installation of groundwater monitoring wells.
- Management of produced water, permeate and brine.
- Dewatering of ground water aquifers.

This matter has been identified by Council including in its resolution of 1 April 2014 when considering a report on draft Consents/Modifications for Coal Seam Gas Developments in Pilliga area that: "*Prior to the establishment of any further production wells in the PEL238 that the NSW State Government conduct a Cumulative Impact Hydrological Study of the below ground water assets*".

Related to the effects of drilling operations for CSG is that of hydraulic fracture simulation. While it has been advised that approval is not being sought for fracking the option has not been wholly excluded with a statement "if additional geologic data supported the use of the technology in the future a range of additional government approvals would be required and community consulted".

The use of fracking in the region due to the importance of groundwater would be a concern and robust scientific evidence should be required via a separate EIS if proposed to be pursued.

iv. **Socio-Economic:** While Council has been supportive of the regional economic benefits of both direct employment (foreshadowed 1,200 construction jobs and 200 operational phase jobs) together with other benefits to economy, there is a need to carefully address the following:-

- Sufficient housing that can ensure benefits accrue to the towns and avoid any accommodation shortage that could cause inflationary rentals. This needs to be addressed for the separate characteristics of the construction and operational phases. It may necessitate intervention by the proponent to support the construction of additional accommodation.
- Support for training progress and similar to ensure that there is not a loss of trained labour from existing businesses.

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- Support for businesses and local people to be able to bid for supply contracts and construction employment.
- Role expected and justification for fly-in/fly out and drive in/drive out options.
- Scope for access to produced gas for economic benefit of Narrabri Shire businesses and residents.

v. **Regional Development Fund:** The EIS needs to provide further detail and certainty on the provision and any management expectations of Santos. This also should include the contributions referenced from State Government.

vi. **Health risks:** Council has identified health risks as a major concern that links to such aspects as water quality and emission to the community and wider environment.

vii. **Traffic, Transportation and Utilities:** While the project area straddles the Newell Highway, (a State Road) there will be impacts from traffic entering the towns to access the Santos Operations Depot (that should be referenced to Yarrie Lake Road, Narrabri) and other destinations.

A full impact assessment needs to be part of the EIS that details the impacts on Council's road assets due to increased traffic and means of compensation for maintenance/upgrades.

The project is expected to utilise electricity from the grid – there is a need to identify network upgrades and potentially betterment for community access to power.

This means to compensate for impacts on community infrastructure needs to be quantified and a funding mechanisms identified.

viii. **Regional Airports:** The EIS needs to recognise the significant investment being made to Narrabri Airport (including recently announced State Resources for Regions funding) and address making this the preferred entry for air services that support the Project.

ix. **Noise and Vibration:** The EIS needs to ensure that current data is collected and integrates with EPA on baseline information. This should include the supply of information reference in S5.9.1 of the supporting document.

x. **Air Quality:** Address pollutants including dust impacts that reference back to EPA on baseline data.

xi. **Waste Products:** The documentation to date has not quantified the volumes of waste and the re-use/specific disposal options. Recent efforts to recycle drilling fluids are recognised. Matters to be addressed in the EIS need to include:

- Processing of product water and its beneficial use in the local economy.
- Technology to manage whole of life brine/salt generation. An approach based on end markets for these products needs to be identified or if disposal is the only option the facility to be utilised.
- Central gas processing facility and generation of CO_2 together with its treatment.

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- Volumes of general municipal waste needs to be identified together with the recycling/disposal facilities identified (if Councils Management Centre is to be utilised, funding of additional airspace needs to be recognised).
- Waste water/sewerage: Linking to housing options – a viable approach needs to be identified.

xii. **Decommissioning and Remediation:** These aspects need to be fully anticipated in the EIS. There is a need to address such matters as:-

- Long term integrity of the wells and capping.
- Impacts of drilling fluid on aquifer.
- Management of gas emissions when insufficient for commercial production.
- Methods proposed to be utilised to remediate the wells and maintenance of Gas Field as sectors are decommissioned. Regrowth after decommissioning needs to be supported.

xiii. **Hazards and Risks:** The EIS needs to provide definitive information on:-

- Management of hazardous materials together with potential spills and the like.
- Responses to natural hazards and in particular bushfire.
- Security and responses to antisocial actions.

A related matter that warrants attention in the EIS is the approach to consultation during the investigative and implementation phases of the Narrabri Gas Project. While the Council is recognised as a stakeholder and there have been a number of presentations and work with the Community Consultation Committee there is considered a need for formal liaison during the preparatory phase. Similarly the EIS should clarify the approach to access ongoing monitoring data.

Conclusion

It is recognised that the Director Generals Requirements are an early step in the planning and approval process however, they are of considerable importance in supporting the assessment. This submission seeks to ensure a robust process as the Project approval is developed.

As discussed with your office on the phone today, Narrabri Shire Council will be following up with a supplementary submission as it wishes to consult more widely with community groups to assist in enabling community consultation on this matter. This supplementary submission will be forwarded to the Department no later than 7 May 2014.

If Council can provide any further advice please do not hesitate to contact Mr Tony Meppem, Manager Strategy and Land Use on ☎6799 6876.

Yours sincerely,

Diane Hood

Diane Hood
GENERAL MANAGER

EXTRACTIVE INDUSTRIES POLICY

Heart of the North West

Responsible Department: Planning and Development Services
Responsible Section: Strategy and Land Use Management
Responsible Officer: Manager Strategy and Land Use Management

Objective

To ensure outcomes pertinent to the community's economic, environmental, social and civic leadership wellbeing are in harmony with the community's wishes.

To ensure that the mining and extractive industry does not have an unacceptable impact on the environmental attributes, human health and amenity of the area in which the mining and extractive industry is to operate.

To ensure that private and public decisions relating to the mining and extractive industry exploration, development and operation are guided by careful evaluation to avoid adverse impacts to human health.

To ensure quadruple bottom line considerations of environmental, social, economic and civic leadership cumulative impact of mining and extractive industry exploration and development within the Shire of Narrabri are beneficial to the community at large.

To ensure key assets and defining values of cultural heritage, native title, biodiversity, communities, ground water, surface water and prime agricultural land are not compromised from the impact of the mining and extractive industry.

Preamble

Narrabri Shire Council recognises that the mining and extractive industry exploration and development has the potential to deliver substantial benefits to the Narrabri Shire, the region, the state and the nation during and after the life of the mining and extractive activity, such as:

- Provision of energy;
- Direct and indirect employment leading to;
    - Regional prosperity and wealth creation;
    - Retention of young people and population growth in the shire; and
    - Improved infrastructure.
- Increased local expenditure on goods and services;
- Private sector funding for community development;
- Increased gross regional product;

- Increased gross state and national product; and
- Tax revenue streams to government;

Narrabri Shire Council recognizes that the mining and extractive industries are not sustainable in the long term and that they compete for a wide range of resources including (but not limited to) the natural resources of land, air and water and in particular may:

- Make a significant contribution to greenhouse gas emissions;
- Impact on the natural landscape, with rehabilitation resulting in lower value natural habitat;
- Alter geological structure resulting in land use change;
- Impact on groundwater flows due to subsidence of landform or the interception of aquifers;
- Impact on community health;
- Impact on the availability of affordable housing; and
- Result in other social impacts.

All of which must be assessed as part of the state based (and if applicable commonwealth) planning approval process.

Policy

In line with the roles and responsibilities of Narrabri Shire Council on behalf of the local community, the community at large and in line with our obligations to the state and federal governments, the Narrabri Shire Council has a responsibility to:

- Assume a leadership role in negotiating outcomes that provide benefit to our community;
- Acknowledge that the minerals in the Shire belong to the people of NSW and that exploration for minerals, gas and energy resources will continue;
- Ensure that impacts on Narrabri Shire Council infrastructure are adequately compensated for in the immediate and future life of that asset;

Adopt a position requiring that mining proposals are designed to have no final void.

- Effectively lobby state and federal government to financially support the infrastructure needed to adequately deal with additional local mining and extractive industries;
- Actively encourage and support the local establishment of service industries to the mining and extractive industries operating in our shire;
- Ensure, in regard to the community's environmental assets, that the appropriate oversight body, whether government or private, is engaging effectively and is communicating with Council and that processes are put in place to independently obtain baseline date on air and water quality

- Demand a 'Nil' effect position in regard to the quality of surface water, domestic, stock and irrigation aquifers used by our community.

- Demand a 'Nil' net effect on above ground environmental assets.

- Ensure Health and Environmental Impact Assessments are conducted for all significant Mining and extractive industries during the approval process.

- Support individual property rights in regards to unwelcome drilling, exploration and/or extraction activities; and

- Support the ten (10) International Council of Mining and Metals(ICMM) principles that are:

    - **Implement and maintain ethical business practices and sound systems of corporate governance;**

        - develop and implement company statements of ethical business principles, and practices that management is committed to enforcing
        - implement policies and practices that seek to prevent bribery and corruption
        - comply with or exceed the requirements of host-country laws and regulations
          work with governments, industry and other stakeholders to achieve appropriate and effective public policy, laws, regulations and procedures that facilitate the mining, minerals and metals sector's contribution to sustainable development within national sustainable development strategies

    - **Integrate sustainable development considerations within the corporate decision making process;**

        - integrate sustainable development principles into company policies and practices
        - plan, design, operate and close operations in a manner that enhances sustainable development
        - implement good practice and innovate to improve social, environmental and economic performance while enhancing shareholder value
        - encourage customers, business partners and suppliers of goods and services to adopt principles and practices that are comparable to our own provide sustainable development training to ensure adequate competency at all levels among our own employees and those of contractors
        - support public policies and practices that foster open and competitive markets

    - **Uphold fundamental human rights and respect for cultures, customs and values in dealings with employees and others who are affected by our activities;**

        - ensure fair remuneration and work conditions for all employees and do not use forced, compulsory or child labour
        - provide for the constructive engagement of employees on matters of mutual concern
        - implement policies and practices designed to eliminate harassment and unfair discrimination in all aspects of our activities
        - ensure that all relevant staff, including security personnel, are provided with appropriate cultural and human rights training and guidance
        - minimize involuntary resettlement, and compensate fairly for adverse effects on the community where they cannot be avoided

- respect the culture and heritage of local communities, including Indigenous Peoples.

- **Implement risk management strategies based on valid data and sound science;**

  - consult with interested and affected parties in the identification, assessment and management of all significant social, health, safety, environmental and economic impacts associated with our activities
  - ensure regular review and updating of risk management systems
  - inform potentially affected parties of significant risks from mining, minerals and metals operations and of the measures that will be taken to manage the potential risks effectively
  - develop, maintain and test effective emergency response procedures in collaboration with potentially affected parties.

- **Seek continued improvement of our health and safety performance;**

  - implement a management system focused on continual improvement of all aspects of operations that could have a significant impact on the health and safety of our own employees, those of contractors and the communities where we operate
  - take all practical and reasonable measures to eliminate workplace fatalities, injuries and diseases among our own employees and those of contractors
  - provide all employees with health and safety training, and require employees of contractors to have undergone such training
  - implement regular health surveillance and risk-based monitoring of employees
  - rehabilitate and reintegrate employees into operations following illness or injury, where feasible.

- **Seek continued improvement of our environmental performance;**

  - assess the positive and negative, the direct and indirect, and the cumulative environmental impacts of new projects – from exploration through closure
  - implement an environmental management system focused on continual improvement to review, prevent, mitigate or ameliorate adverse environmental impacts
  - rehabilitate land disturbed or occupied by operations in accordance with appropriate post-mining land uses
  - provide for safe storage and disposal of residual wastes and process residues
  - design and plan all operations so that adequate resources are available to meet the closure requirements of all operations.

- **Contribute to conservation of biodiversity and integrated approaches to the land use planning;**

  - respect legally designated protected areas
  - disseminate scientific data on and promote practices and experiences in biodiversity assessment and management
  - support the development and implementation of scientifically sound, inclusive and transparent procedures for integrated approaches to land use planning, biodiversity, conservation and mining.

- **Facilitate and encourage responsible product design, use, re-use, recycling and the disposal of our products;**

    - advance understanding of the properties of metals and minerals and their life-cycle effects on human health and the environment
    - conduct or support research and innovation that promotes the use of products and technologies that are safe and efficient in their use of energy, natural resources and other materials
    - develop and promote the concept of integrated materials management throughout the metals and minerals value chain
    - provide regulators and other stakeholders with scientifically sound data and analysis regarding our products and operations as a basis for regulatory decisions
    - support the development of scientifically sound policies, regulations, product standards and material choice decisions that encourage the safe use of mineral and metal products

- **Contribute to the social, economic and institutional development of the communities in which we operate; and**

    - engage at the earliest practical stage with likely affected parties to discuss and respond to issues and conflicts concerning the management of social impacts
    - ensure that appropriate systems are in place for ongoing interaction with affected parties, making sure that minorities and other marginalized groups have equitable and culturally appropriate means of engagement
    - contribute to community development from project development through closure in collaboration with host communities and their representatives
    - encourage partnerships with governments and non-governmental organizations to ensure that programs (such as community health, education, local business development) are well designed and effectively delivered
    - enhance social and economic development by seeking opportunities to address poverty

- **Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.**

    - report on our economic, social and environmental performance and contribution to sustainable development
    - provide information that is timely, accurate and relevant
    - engage with and respond to stakeholders through open consultation processes

Measure of Success

The success of this policy will be measured in terms of its effectiveness in achieving its goals and objectives.

History

MINUTE NUMBER	MEETING DATE	DESCRIPTION OF CHANGE
932/2013	December 2013	Adopted

From: David Durrheim <David.Durrheim@hnehealth.nsw.gov.au>
To: Craig Dalton <Craig.Dalton@hnehealth.nsw.gov.au>, "Philippe G. Porigneau...
CC: Carolyn Herlihy <Carolyn.Herlihy@hnehealth.nsw.gov.au>, "Fidelis G.Jarav...
Date: 29/04/2014 7:10 pm
Subject: RE: for action please: DGRs Input Request - Narrabri Gas Project (SSD 6456)

Dear Sophie

In relation to: Santos NSW (Eastern) Pty Ltd request for Director General's Requirements (DGRs) for its Narrabri Gas Project (SSD 6456).

It is recommended that the Environmental Impact Statement (EIS) includes a human health risk assessment that considers the potential adverse effects from human exposure to project-related environmental hazards. This assessment should be conducted in accordance with the approach described in the enHealth document Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards (2012).

The assessment should include, but not be limited to, assessment of the risks associated with human exposure to noise, air pollution and contamination of ground and surface water. The assessment should consider risks during both the construction and operational phases.

When assessing health risks, both incremental changes in exposure from existing background pollutant levels and the cumulative impacts of project specific and existing pollutant levels should be addressed at the location of receptors.

Exposure should be assessed at the location of the most affected receptors and also for other sensitive receptors such as childcare centres, schools, hospitals and aged care facilities. Consideration should also be given to the size of the population exposed to environmental hazards.

Further detail could be discussed with the proponent. They should contact our Tamworth Office on 67678630 and request to speak to Fidelis Jaravani.

Kind regards

Professor David Durrheim
DrPH, MPH&TM, MBChB, FACTM, FAFPHM
Director Health Protection- Population Health
and Conjoint Professor of Public Health Medicine, University of Newcastle
Locked Bag 10, Wallsend NSW, AUSTRALIA, 2287

Tel 02 4924 6395 | Fax 02 4924 6215 | David.Durrheim@newcastle.edu.au

Sophie Butcher - RE: DGRs Input Request - Narrabri Gas Project (SSD 6456)

From: Alan Bawden <Alan.Bawden@rfs.nsw.gov.au>
To: Sophie Butcher <Sophie.Butcher@planning.nsw.gov.au>
Date: 11/04/2014 11:28 AM
Subject: RE: DGRs Input Request - Narrabri Gas Project (SSD 6456)
CC: John Ball <John.Ball@rfs.nsw.gov.au>, Michael Brooks <Michael.Brooks@rfs.nsw.gov.au>, David Boverman <David.Boverman@rfs.nsw.gov.au>

Good Morning Ms Butcher

The NSW Rural Fire Service (RFS) has received and reviewed your request for DGR's for the above State Significant Development project.

Please accept this email as the RFS formal response to your request.

The RFS understands the project consists of the construction and operation of:

- *Exploration and appraisal activities including approximately 30 coreholes, approximately ten chip holes and approximately ten sets of four-well pilots.*
- *Installation and operation of up to 850 individual production wells from a maximum of 425 well sets (refer Section 2.4). A single well may be vertical or lateral; the latter may include several horizontal connections sometimes referred to as a multi-lateral. The target production peak rate is approximately 200 terajoules (TJ) per day.*
- *Gas and water gathering systems and in-field compression.*
- *A central gas processing facility for the compression, dehydration and treatment of the gas to commercial quality.*
- *Water management, treatment and beneficial reuse facilities.*
- *Supporting infrastructure such as power generation and distribution, communications, roads and operational management facilities.*

Further the Preliminary Environmental Assessment states:

> *Key potential environmental risks include: ecological impact, surface water impact and management,*
>
> *groundwater, aboriginal heritage impact, air quality impact, waste management and disposal, hazards*
>
> *and risk management, property and land use impact, agricultural impact, economics, contaminated*
>
> *land risk, decommissioning and rehabilitation, social, community and health*

impacts, and soil and land

suitability impacts.

The RFS requests that the required and final Environmental Assessment to accompany the SSD proposal include the following documentation:

A Bush Fire Management Plan that addresses the following components of fire that may impact on the proposal or the surrounding environment:

1. The impact of Bush Fire on the gas recovery and transport system and the proposed fire fighting operation required to protect the development, suppress fire and minimise the risk of danger to fire fighting agencies and personal , the safety of fire fighters must be specifically addressed;

2. The prevention and/or suppression of fire ignition generated by the construction and operation of the gas recovery and transport system including operating procedures during declared total fire ban days.

The RFS, along with other government agencies, currently has an active information and discussion forum (Mining Industry Fire Safety Committee), of which the proponent attends. The RFS would prefer this forum be a lead source of discussion with respect to the preparation of a development based bush fire management plan.

Should you require any further information please do not hesitate to contact me

regards

Alan Bawden
Team Leader - Development Assessment and Planning
NSW RURAL FIRE SERVICE
Customer Service Centre - Coffs Harbour
Suite 1, 129 West High Street
Coffs Harbour NSW 2455

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From: Sophie Butcher [mailto:Sophie.Butcher@planning.nsw.gov.au]
Sent: Friday, April 04, 2014 12:10 PM
To: bruce.brown@cma.nsw.gov.au; council@narrabri.nsw.gov.au; Customer Service Centre; david.durrheim@hnehealth.nsw.gov.au; development.western@rms.nsw.gov.au; Heritage@heritage.nsw.gov.au; info@fcnsw.com.au; landuse.enquiries@industry.nsw.gov.au; mahani.taylor@environment.gov.au; planning.matters@environment.nsw.gov.au
Cc: Alan Bawden; Andrew.MCINTYRE@rms.nsw.gov.au; Jarod.Dashwood@fcnsw.com.au; jessica.creed@epa.nsw.gov.au; Jessie Giblett; Katrina.Stankowski@heritage.nsw.gov.au; Liz.Mazzer@environment.nsw.gov.au; Mitchell.Isaacs@water.nsw.gov.au; paulb@narrabri.nsw.gov.au;

rachel.connell@industry.nsw.gov.au; steve.cozens@industry.nsw.gov.au
Subject: DGRs Input Request - Narrabri Gas Project (SSD 6456)

Dear all,

Santos NSW (Eastern) Pty Ltd has requested Director General's Requirements (DGRs) for its Narrabri Gas Project (SSD 6456).

The proposal involves the construction and operation of:

1. a gas field with production and appraisal wells, including up to 850 individual production wells from a maximum of 425 well sets with a target production peak rate of 200 terajoules per day;

2. gas and water gathering systems and supporting infrastructure;

3. a central gas processing facility; and

4. water management, treatment and reuse facilities.

Please find a copy of the Preliminary Environmental Assessment **on Planning and Infrastructure's website** (http://majorprojects.planning.nsw.gov.au).

It would be greatly appreciated if you would please provide your input into the DGRs by **Thursday 17th April 2014**.

If you require any further information, please contact me on 9228 2093 or Jessie Giblett on 9228 6419.

Yours sincerely

Sophie Butcher| **Planner**
Mining Projects | Department of Planning & Infrastructure
23-33 Bridge Street SYDNEY 2000 | GPO Box 39 SYDNEY 2001
t: 02 9228 2093 | f: 02 9228 6466 | e: sophie.butcher@planning.nsw.gov.au

Transport Roads & Maritime Services

WST14/00034

Manager
Mining Projects
Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Sophie Butcher

Dear Ms Butcher

SSD13_6456: Narrabri Gas Project; Request for Director General Requirements

Thank you for your email on 4 April 2014 referring a request for Director General Requirements for the proposed Narrabri Gas Project to Roads and Maritime Services.

The project covers a large area of land which extends over the Newell Highway (HW17) and is in close proximity to the Kamilaroi Highway (HW29) The Newell and Kamilaroi Highways are state classified roads which, under Section 64 of the *Roads Act 1993*, are under the care and control of Roads and Maritime.

Following a review of the request, the following key issues have been identified which require inclusion in the Director General Requirements:

- A traffic impact study prepared in accordance with the methodology set out in Section 2 of the *RTA Guide to Traffic Generating Developments* including details of, but not limited to:
    - Road transport volumes and types broken down into origin and destination, travel routes, vehicle types, times of access and peak hours for construction, operation and decommissioning stages of the project. In accordance with Clause 101(2)(a) of *State Environmental Planning Policy (Infrastructure) 2007*, where practical, vehicular access should be obtained by a road other than a classified road
    - An assessment of conditions that may affect road safety during construction, operation and decommissioning of the project (eg access outside of daylight hours, fog) and proposed mitigation measures to provide for safe and efficient vehicle movements
    - Internal traffic movements, parking facilities and the impacts (both direct and cumulative) on local and classified roads during construction, operation and decommissioning stages. Cumulative impact assessment shall specifically address cumulative impacts of gas project traffic, driller's camp accommodation traffic, forestry harvest traffic, agricultural seasonal traffic and existing background traffic on local and classified roads.

- Temporary and permanent staff numbers (including employees and contractors) during construction, operation and decommissioning of the project. Modes and volumes of transportation of staff to and from the sites and measures to improve commuter safety shall also be included

- Any oversize and over-mass vehicles and loads expected for the construction, operation and decommissioning of the project

- Intersection treatments and mitigation measures to cater for predicted traffic impacts. Intersections shall cater for all heavy and over dimensional vehicles required to access the development. Concept plans for any proposed intersection upgrades shall be included in the study

- The shortest and least trafficked route having been given priority for the movement of construction materials and machinery to minimise the risk and impact to other motorists so far as is reasonably practicable

- The impact of generated traffic and measures employed to ensure efficiency and safety on the public road network during construction, operation and decommissioning of the project

- Consideration of local school bus routes and times. Peak staff commuter related traffic movements and haulage operations during school bus times should be avoided

- Proposed access treatments should be identified and be in accordance with Austroads Guide to Road Design 2010 and Roads and Maritime Supplements including safe intersection sight distance. Any access to the classified road network needs to provide a high level of safety and traffic efficiency in all weather and traffic conditions.

Please forward a copy of the Director General requirements to Roads and Maritime at the same time as they are sent to the applicant.

Should you require further information in relation to this matter, please contact Andrew McIntyre on (02) 6861 1453.

Yours faithfully

Susie Mackay
Network & Safety Manager
Western

17 APR 2014