MAJOR PROJECT ASSESSMENT: Munmorah Gas Fired Power Station, Munmorah

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

July 2006

Published July 2006
NSW Department of Planning
www.planning.nsw.gov.au

EXECUTIVE SUMMARY

The Proponent (Delta Electricity) proposes to construct a 600 megawatt open-cycle gas turbine facility and gas pipeline which will connect the facility to the existing Sydney-Newcastle natural gas pipeline. The gas turbine facility would operate as a peak-load power station by providing electricity at short notice during periods of peak demand or as a 'black start' generator in the instance of a state-wide power station shutdown. It is anticipated that the project would cost $382 million and would employ approximately 100 people during construction.

The site is Part Lot 61 DP1065038, located adjacent to the existing (coal-fired) Munmorah Power Station located off Scenic Drive at Munmorah in the central coast region of New South Wales. Land immediately surrounding the existing coal-fired power station and the site of the proposed gas-fired facility was established by the Proponent as a buffer area when the coal-fired plant was first constructed. Over time, land use planning has permitted residential development to encroach on the site, with the buffer area flanked on most sides by residential development

The Proponent has split the project into three project components for the purposes of concept approval assessment. The first project component is for the construction and operation of the open-cycle gas turbine facility. Delta Electricity is seeking project approval for this component. The second project component is for the construction and operation of the natural gas pipeline and for this Delta Electricity is seeking concept approval so that further analysis and consultation regarding the final pipeline route can be undertaken. The third project component is for the subdivision of the existing site such that the new facility will be on its own site, operating under its own Environmental Protection License.

The potential environmental planning implications of the project are several due to the environmental impacts typically associated with electricity generation and the close proximity of this site to residential areas. Concern has been raised by the community in relation to air quality impacts, noise impacts, quality of life and exposure to potential hazards. As a result, the Proponent has undertaken additional noise impact studies, prepared a submissions report addressing each of the concerns raised, and modified some components of the project such that additional consultation and investigation can be undertaken before final approval would be considered.

On balance, the Department considers that the proposed Munmorah Gas Fired Power Station is a project that would be of benefit to the State of New South Wales. This is due to the combined benefits of increased electricity supply during periods of peak use and by providing emergency start capability to the electricity network in the event of a state-wide power station shutdown. It is the opinion of the Department that the environmental impacts identified by the Proponent and through community consultation can be effectively managed by the recommended conditions of approval.

Overall, the proposed Munmorah Gas Fired Power Station project could be approved subject to the effective implementation of the Proponent's Statement of Commitments and the Department's recommended Instruments of Approval.

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1. BACKGROUND

1.1 Location

Delta Electricity proposes to construct and operate a new gas-fired power station, and associated infrastructure, adjacent to the existing (coal-fired) Munmorah Power Station located off Scenic Drive at Munmorah in the central coast region of New South Wales (refer to Figure 1). The site is Part Lot 61 DP1065038.

Figure 1: Site Location (reproduced from the Proponent's Environmental Assessment)

1.2 Existing Site

The project includes three components: the gas-fired power station; a natural gas pipeline; and subdivision of land. The site for the gas-fired power station is located within land currently owned by Delta Electricity to the west of the existing Munmorah Power Station. The land upon which power station is proposed is zoned Zone 5(a) – Special Uses Zone in the *Wyong Local Environmental Plan 1991*. Development for the purpose of a power station is an innominate permissible use on the land.

The final route for the natural gas pipeline is yet to be determined by the Proponent. The original route identified by the Proponent in the Environmental Assessment was the subject of concerns in public submission with respect to potential land use conflicts and environmental constraints. Consequently, the Proponent has identified a pipeline corridor within which a final pipeline route will be investigated and identified after further landholder

consultation and environmental impact studies. The pipeline corridor is described in the Proponent's Submission Report.

The land upon which the corridor is proposed consists of a number of different zonings under the *Wyong Local Environmental Plan 1991*, including: Special Uses 5(b) Railways; Special Uses 5(d) Arterial Road Reservation; Zone 4(e) Regional Industrial and Employment Development; Zone 7(g) Wetlands Management Zone and Zone 10(a) Investigation Precinct Zone. As the local environmental plan adopts the Model Provisions relating to public infrastructure undertakings, the gas pipeline would not constitute prohibited development in any of these zones.

The proposed subdivision is to occur within the existing coal-fired power station site operated by the Proponent. The land is zoned Zone 5(a) – Special Uses Zone in the *Wyong Local Environmental Plan 1991*.

1.3 Surrounding Land Use

Land immediately surrounding the existing coal-fired power station and the site of the proposed gas-fired facility was established by the Proponent as a buffer area when the coal-fired plant was first constructed. Over time, land use planning has permitted residential development to encroach on the site, with the buffer area flanked on most sides by residential development. The San Remo, Buff Point, Budgewoi, Halekulani and Lake Munmorah communities all live within relatively close proximity to the site. Of these, the northern residences of Halekulani are the closest being approximately 900 m distant to the site of the proposed facility.

The Pacific Highway lies to the west of the site, beyond which is the Main Northern Railway and the F3 Freeway. The proposed gas pipeline would need to cross the Pacific Highway and Main North Railway in order to connect to the Sydney to Newcastle gas pipeline just east of the Freeway.

Lake Munmorah lies to the east of the site and in close proximity to the coast. The Budgewoi Lake lies to the south.

2. PROPOSED DEVELOPMENT

2.1 Project Description

Delta Electricity proposes to construct and operate a gas-fired power station. The project has been split into three component projects: the gas-fired power station; the natural gas supply pipeline; and the subdivision of land.

The first project involves the construction and operation of an open-cycle gas turbine plant, consisting of up to four turbines capable of producing an approximate nominal output of 600 megawatts. The turbine plant would generate electricity by the gas turbine drawing in cool air through a compressor where it would then be mixed with natural gas or distillate fuel and injected at high pressure into a combustion chamber. The combustion reaction would then produce hot exhaust gases which are then used to drive an electrical generator which in turn produces electricity.

Ancillary infrastructure associated with the gas turbine plant includes the construction of two 1,500 kilolitre demineralised water storage tanks, a 1,500 litre distillate fuel storage tank, transmission connection infrastructure, an oil / water separator, back-up diesel generators, and air pollution and fire monitoring systems.

The second component project involves the construction and operation of an underground pipeline which would connect the power station to the existing Sydney-Newcastle natural gas pipeline. The natural gas pipeline would provide the fuel for the plant. An inlet facility near the off-take point to the Sydney-Newcastle pipeline and a delivery facility within the site would also be constructed and operated as part of this project. The final pipeline route and design information for this project is yet to be finalised.

The third project involves the subdivision of a lot of land from the existing coal-fired power station site. The new lot would contain the proposed gas fired power station facility and would permit the Proponent to obtain a separate Environmental Protection License (EPL) for the new facility, separate to the existing EPL for the coal-fired operations.

2.2 Project Need

The purpose of the gas fired power station is to provide additional electricity supply during periods of peak demand and to provide 'black start' capability in the event of a state-wide power station shutdown.

A recent NSW Government discussion paper entitled *Energy Directions Green Paper* identified the need for additional electricity supply, particularly in the supply of peak electricity demand. Peak electricity demand is growing at a rate of 4% per year and is expected to result in peak electricity shortfalls by 2008/09. Peak demand typically occurs when a large amount of users demand electricity at the same time, for example, when a large number of homes use air-conditioning during periods of high temperatures.

The *Energy Directions Green Paper* identifies peak energy demand plants such as gas-fired power stations to be a highly effective measure for meeting peak demand. This is because they have a relatively low capital cost, can be constructed in a relatively short time span, and have notable environmental benefits when compared with alternatives like coal fired or hydro-electric generators.

The need for a 'black start' generator was identified as part of a review of current power system restart ability conducted by Transgrid at the request of Delta Electricity. Black start generators are generators that in the event of a State-wide power station failure or black out, can restart relatively quickly and be used to re-start the power station network.

The review conducted by Transgrid identified that there are insufficient black start sources in New South Wales. It concluded that the addition of a quick-start 600 megawatt gas turbine facility at Munmorah Power Station would reduce the restart time of the Vales Point and Munmorah Power Stations by two hours as well as provide for faster electricity restoration to a significant portion of New South Wales.

3. STATUTORY CONTEXT

3.1 Major Project

The project is declared to be a Major Project under *State Environmental Planning Policy (Major Projects) 2005* because it is development for the purpose of an electricity generation facility for gas fired generation that has a capital investment value of more than $30 million (clause 24(a)). The project will therefore be assessed and determined by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979*.

3.2 Permissibility

The *Wyong Local Environmental Plan 1991* applies to the site of the proposed gas fired power station and zones the land Zone 5(a) – Special Uses. The gas-fired power station is an innominate permissible use in the zone.

The natural gas pipeline corridor is also subject to *Wyong Local Environmental Plan 1991*. The land upon which the corridor is proposed consists of a number of different zonings: Special Uses 5(b) – Railways; Special Uses 5(d) - Arterial Road Reservation; Zone 4(e) - Regional Industrial and Employment Development; - Zone 7(g) - Wetlands Management Zone; and Zone 10(a) - Investigation Precinct Zone. By virtue of the fact that the *Wyong Local Environmental Plan 1991* adopts provisions of the Model Provisions with respect to public utility undertakings, the proposed gas pipeline itself would not be prohibited development in these zones.

3.3 Environmental Planning Instruments

There are no environmental planning instruments that substantially govern the carrying out of the proposal. The Department highlights that other than in relation to zoning and permissibility, the *Wyong Local Environmental Plan 1991* includes no particular provisions that substantially relate to the proposal.

3.4 Minister's Approval Power

The application and environmental assessment were placed on public exhibition from 11 January 2006 to 10 February 2006 and submissions invited in accordance with Section 75H of the Act. The Department has met all its legal obligations so that the Minister can make a determination about the project.

3.5 Nature of the Recommended Approval

On application from the Proponent, the Minister has authorised the submission of a concept plan for the project. At the time of making this decision, the Proponent was unsure whether sufficient detail would be available with respect to the proposal in its entirety to enable a full project approval (as opposed to a concept approval) to be granted.

Since that time, the Proponent has managed to complete a detailed environmental impact assessment of the proposed gas-fired power station facility project, and has included this information in the Environmental Assessment submitted in support of the application. The Department considers that the Proponent has provided sufficient information such that an adequate level of assessment of this component project could be undertaken, and subsequently recommends that the Minister form the view that no further environmental assessment of the proposed gas-fired power station component is necessary.

The Department, on review of the information included in the Environmental Assessment of the proposal, is of the opinion that further information and assessment is required in relation to both the natural gas pipeline and subdivision of land component projects. In this instance, it is recommended that further assessment be undertaken under Parts 5 and 4 of the Act (respectively) because the outstanding issues relating to these projects do not raise matters of State or regional environmental planning significance and therefore do not necessitate further Ministerial involvement in the assessment and approvals processes.

The Department therefore recommends that the Minister exercise his power under the *Environmental Planning and Assessment Act 1979* to:

1. grant concept approval to the proposal in its entirety;
2. grant project approval for the gas fired power station facility;

3. require further assessment and approval of the natural gas pipeline under Part 5; and
4. require further assessment and approval of the subdivision of land under Part 4.

The Department highlights that with respect to the gas pipeline, the Minister for Energy, Utilities and Sustainability would be the (only) relevant determining authority under the *Pipelines Act 1967*. It is appropriate for the pipeline to be assessed under Part 5 as the principal outstanding issues associated with this project component are pipeline design, safety and operational licensing aspects.

For the subdivision project component, the local council would be the relevant consent authority.

To reflect this approach, the Department has drafted two recommended instruments of approval. An instrument of concept approval has been created which grants approval to the proposal in its entirety and describes the subsequent assessment and approval requirements for each of the component projects of the proposal. In the instance of the natural gas pipeline, this also includes specific conditions that require the Proponent to conduct further consultation regarding the final pipeline route with existing landholders and to undertake further detailed studies in relation to environmental impact and hazards management.

An instrument of project approval has also been created. This instrument grants full project approval to the gas fired power station component project and details conditions that establish stringent environmental standards, mitigation measures, environmental controls and monitoring requirements for the facility.

4. CONSULTATION AND ISSUES RAISED

4.1 Introduction

The Department received 435 submissions during the exhibition of the application, the majority (416 or 95.6%) of which were a form-type submission that listed identical issues (noise, air, land use conflicts and socio-economics). A further 19 unique submissions were received from the public, private companies and groups. The key issues raised through the consultation process will be identified in this section. Consideration of the issues raised in submissions and assessment of the environmental impacts of this proposal will occur in section 5 of this report.

4.2 Submissions from the Public

The key issues identified in submissions from private companies and the public included:

1. Noise impacts
   - noise level exceedance of adopted noise targets under adverse conditions;
   - inadequate noise assessment of the area identified in the Environmental Assessment as Noise Catchment Area B;
   - relative noise merits of Site A compared to preferred Site E for the facility; and
   - 500 operation hours per year limit would change to allow continuous operation.

2. Air quality impacts
   - heat emissions from power station exhaust and impacts on local amenity;
   - use of distillate fuel for facility operation; and
   - start-up emissions levels and controls.

3. Land use impacts associated with the natural gas pipeline
   - effect on property values; and
   - restrictions on future land use options due to pipeline easement requirements.

4. Social and economic impacts
   - the proposal will have an adverse impact on local amenity and quality of life.

4.3 Submissions from State Government

Five submissions were received from public agencies: the Department of Environment and Conservation; Department of Natural Resources; Roads and Traffic Authority; Transgrid; and the Mine Subsidence Board. None of the agencies objected to the proposal, but raised a number of key issues for further consideration, including in relation to noise impacts; air quality impacts; and the level of detail provided on the pipeline design and hazards management. Comments made by each agency are summarised below.

In addition to submissions from public agencies, a submission was received from the local member. The local member made representations on behalf of local constituents and requested that the Minister give ensure that concerns raised by the public were fully addressed.

Department of Environment and Conservation (DEC)

- ensure that the plant is a peak-load facility only with annual operation limited to 500 hours only, 75 of which can be using distillate as the fuel source;
- predicted noise levels are reasonable and predicted noise exceedance is minimal provided the operation limit of 500 hours per year is maintained;
- air quality impact assessment demonstrates that the predicted emissions will meet statutory emission limits and that it satisfies the DEC's air impact assessment criteria;
- photochemical pollution assessment demonstrates that emissions will not exceed air quality goals and standards for NO_2 and O_3 and will have a negligible impact on NO_2 and O_3 concentrations in the Sydney basin;

- concurs with impact assessment and proposed environmental management and mitigation measures in regards to wastewater disposal, flora and fauna, and aboriginal cultural heritage

Department of Natural Resources (DNR)

- in the event that the construction works associated with the facility or the pipeline intercepts groundwater, DNR must be consulted regarding licence requirements.

Roads and Traffic Authority (RTA)

- insufficient information regarding pipeline design, route location and interaction with the road network;
- require the development of a Transportation Management Plan which clearly identifies haulage routes, route constraints, haulage timing, traffic volume profiles and contingency plans for emergency situations or breakdowns;
- require a Road Dilapidation Report to evaluate road conditions for roads proposed to be used for haulage and whether road upgrades may be required prior to haulage;
- requirements regarding construction traffic associated with the pipeline; and
- requirements for pipeline crossings and interaction of pipeline with road network.

Transgrid

- analysis must address ground currents due to transmission line power faults may affect pipeline;
- appropriate management of pipeline construction and maintenance workers safety regarding earth potential rise during power faults and electrostatic induction associated with unearthed pipes and transmission line needs to be considered;
- ensure adequate pipeline protection against corrosion due to proximity to AC transmission lines;
- analysis must address safety hazards due to longitudinal induction and pipeline explosion; and
- understand technical challenges associated with pipelines and direct current railway systems.

Mine Subsidence Board

- final design plans in relation to the proposal must be submitted to the Board for approval prior to construction.

4.4 Submissions from Local Government

A submission was received from Wyong Shire Council stating its support for the proposal. Council did, however, raise a number of matters that it considered should be carefully considered as part of the assessment of the proposal, as follows:

1. Future land use impacts
   - pipeline impact on future urban land use and provision of large scale infrastructure such as coal washeries or rail loops.

2. Flora and fauna impacts
   - pipeline impact in relation to threatened species, specifically *Angophora inopina*, the Wallum Froglet (*Crinia tinnula*) and the Squirrel Glider (*Petaurus norfolcensis*);
   - pipeline construction and impact in relation to wetlands and wetland buffer zones; and
   - additional information for inclusion in the proposal's Flora and Fauna Management Plan, particularly in relation to Squirrel Glider habitat.

3. Noise impacts
   - noise levels must comply with all relevant guidelines, even during adverse weather conditions;
   - predicted noise level exceedance has been rationalised against the 500 hours of operation per year, implying reduced impact because the nuisance will be negligible because it is not continuous;
   - as peak demand increases so will demand for the operation of the facility, hence the potential for nuisance is likely to increase over the life of the proposed facility;

4. Emissions
   - mitigation measures described in Environmental Assessment must form part of the conditions of consent and a copy of the Air Quality component of the project's Operational Environmental

Management Plan for the operational phase should be forwarded to Council for consideration prior to commencement of use of the facility; and
- results of on-going monitoring during peak usage and 'black starts' should be forwarded to Council for consideration and action, if required.

5. Distillate fuel transport
   - haulage of distillate fuel will increase public road dilapidation. A dilapidation report prior to construction of the proposed facility should be undertaken; and
   - costs of any damage to public road system during either construction or operation should be borne by the Proponent.

6. Waste water discharge
   - no detail given regarding the impact of waste water discharge on Lake Munmorah, additional studies are required prior to determination.

7. Restrictions on use
   - in the event that conversion of the facility to a closed-cycle gas turbine facility occurs to cater for intermediate or base-load demand, must require a separate application to be submitted to and approved by the relevant authority.

4.5 Submissions Report

On review of the issues identified in submissions, the Department required the Proponent to prepare a submissions report to address each of the issues raised in those submissions. As part of this process, the Proponent undertook further community consultation to clarify and resolve concerns, and conducted additional noise impact assessment studies.

The submissions report was submitted to the Department and this was reviewed by the Department, the DEC and Council. The report contained a detailed response to submission issues, the findings of the additional noise assessments and a description of minor modifications to the proposal.

Additional Noise Impact Studies

The additional noise assessments examined background noise levels for Noise Catchment Area B and compared the noise impacts of Site A and Site E (alternative locations for the gas-fired power station component). The findings identified that the noise impact conclusions made in the Environmental Assessment with regards to Noise Catchment Area B were appropriate. Further, it was concluded that Site A does not provide environmental benefits over Site E, rather it would potentially serve to increase noise impacts in alternate catchment areas.

Modifications to the Proposal

A number of minor modifications were made to the proposal by the Proponent as a result of consideration of the submissions, further consultation with landowners and further design information becoming available. The following modifications to the proposal were made by the Proponent:

- approval sought for a pipeline corridor instead of a specific pipeline route, such that further surveys and consultation with existing landholders can be undertaken;
- altering the power output of the proposal from the original 600 MW described in the EA to an indicative range of 540 MW to 660 MW which better reflects the potential variation between the nominal figure quoted and the actual power output of the preferred equipment;
- provide some flexibility in the prescribed 500 hours of operation because the actual number of operation hours may vary from year to year based on the energy supply-demand conditions at a particular point in time;
- operation in response to a system emergency or security situation should be exempt from inclusion in the approved operation hours;
- amendment to the DEC's recommended conditions of approval with regard to 100 percentile concentration limits for firing of the facility on distillate; and
- amendment to the DEC's recommended conditions such that they specify that emission concentration limits apply to 'normal' operating conditions only.

DEC and Council Review of Submissions Report

The response of the DEC and Council to the submissions report and proposed modifications to the proposal are detailed as follows:

Department of Environment and Conservation

The DEC has no objection to the following requested amendments:

- installation of a gas turbine plant rated within the range of 540 MW to 660 MW;
- inclusion of a condition that permits the Proponent to extend hours of operation for as long as required to respond to a system emergency; and
- further assessment, consultation and variation to the exact pipeline route within the defined pipeline corridor.

The DEC amended its recommended discharge concentration limit for distillate fuel firing from 65mgm^{-3} to 90 mgm^{-3}.

Wyong Shire Council

Council was generally supportive of the modifications proposed by the Proponent, and further highlighted that:

- Council prefers pipeline option 2A in terms of limiting potential land use conflicts and environmental impacts; and
- Council reiterates the recommended conditions submitted to the Department as part of its submission to the Environmental Assessment for this proposal.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the Environmental Assessment, submissions, Submissions Report and the response of both Council and the DEC to the Submissions Report, the Department has identified the following key environmental issues associated with the proposal:

- air quality impacts;
- noise impacts;
- potential land-use conflicts; and
- hazards and risk impacts (land use safety planning).

All other issues are considered to be minor and have been adequately addressed as part of the Proponent's Statement of Commitments.

5.1 Air Quality Impacts

Issues

An air quality assessment was undertaken as part of the Environmental Assessment. The assessment was conducted in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005)*. The key contaminants that were considered are those that are typically associated with gas fired power stations, that is, carbon monoxide, nitrogen oxides, sulphur dioxide and particulates.

Dispersion modelling of predicted site emissions was conducted as part of the assessment. The modelling evaluated four different scenarios of facility operation. The operating scenarios evaluated were:

1. natural gas under normal operation;
2. natural gas under start-up conditions of operation;
3. distillate under normal operation; and
4. distillate under start-up conditions of operation.

The modelling was conducted on the basis that the facility would be operating continuously under the scenarios described above. However, it should be noted that the Proponent is not seeking approval for continuous operation, rather, the Proponent is seeking peak demand operation with additional hours permitted only as may be necessary to respond to an electricity network emergency.

The results from dispersion modelling are presented in the table below. It can be noted that the predicted air pollutant concentrations at the nearest sensitive receptors comply with the ambient air quality goals described by the DEC (i.e. the predicted maximum concentration of pollutants generated by the facility are below the 'relevant air quality goal' criteria). Further, the facility is predicted to comply with these goals for the worst-case scenario of continuous operation with distillate fuel under start-up conditions.

Table 1: Summary of Dispersion Modelling Results (reproduced from the Proponent's Environmental Assessment)

Pollutant	Gas-Fired Power Station (μgm^{-3})	Existing Background (μgm^{-3})	Cumulative Impact (μgm^{-3})	Relevant Goal (μgm^{-3})
Natural Gas – Normal Operations				
Carbon monoxide (1-hour)	3	-	3	30,000
Carbon monoxide (24-hour)	0.6	-	0.6	10,000
Nitrogen oxides (1-hour)	51	197	248	246
Nitrogen oxides (annual)	0.2	15	15	62
Sulfur dioxide (10-minute)	5	400	405	712
Sulfur dioxide (1-hour)	3	226	229	570
Sulfur dioxide (24-hour)	0.2	49	49	228
Sulfur dioxide (annual)	0.01	6	6	60
Particulates (24-hour)	0.2	133	133	50

Particulates (annual)	0.01	25	25	30
Natural Gas – Start-up Conditions				
Carbon monoxide (1-hour)	1063	-	1063	30,000
Carbon monoxide (24-hour)	237	-	237	10,000
Nitrogen oxides (1-hour)	140	197	337	246
Nitrogen oxides (annual)	0.4	15	15	62
Sulfur dioxide (10-minute)	4	400	404	712
Sulfur dioxide (1-hour)	3	226	229	570
Sulfur dioxide (24-hour)	0.2	49	49	228
Sulfur dioxide (annual)	0.01	6	6	60
Particulates (24-hour)	0.4	133	133	50
Particulates (annual)	0.02	25	25	30
Distillate – Normal Operations				
Carbon monoxide (1-hour)	22	-	22	30,000
Carbon monoxide (24-hour)	5	-	5	10,000
Nitrogen oxides (1-hour)	70	197	267	246
Nitrogen oxides (annual)	0.3	15	15	62
Sulfur dioxide (10-minute)	6	400	406	712
Sulfur dioxide (1-hour)	4	226	230	570
Sulfur dioxide (24-hour)	0.3	49	49	228
Sulfur dioxide (annual)	0.01	6	6	60
Particulates (24-hour)	0.5	133	133	50
Particulates (annual)	0.02	25	25	30
Distillate – Start-up Conditions				
Carbon monoxide (1-hour)	2027	-	2027	30,000
Carbon monoxide (24-hour)	453	-	453	10,000
Nitrogen oxides (1-hour)	192	197	389	246
Nitrogen oxides (annual)	0.6	15	16	62
Sulfur dioxide (10-minute)	22	400	422	712
Sulfur dioxide (1-hour)	16	226	242	570
Sulfur dioxide (24-hour)	1	49	50	228
Sulfur dioxide (annual)	0.05	6	6	60
Particulates (24-hour)	0.9	133	134	50
Particulates (annual)	0.03	25	25	30

Exceedances of the DEC's air quality goals can be observed when the cumulative impact of the facility is examined. The cumulative impact of the facility is the impact of the facility when considered in conjunction with the existing air quality of the local area (including the existing coal-fired power station). Exceedances can be noted for all modelling scenarios for both NO_x under 1-hour maximum criteria and PM_{10} under 24-hour maximum criteria.

PM_{10} exceedance under 24-hour maximum criteria is believed to be due to artificially high background levels of PM_{10} pollutants in the data used for the assessment. This the Proponent attributes this to bushfires over the summer months with several days within the PM_{10} data collection period exhibiting notably higher values than that generally observed throughout the remainder of the year. Further, review of the predicted maximum concentration of PM_{10} due to the facility demonstrates that the facility would contribute less than 1% of the total PM_{10} concentrations under all operating scenarios. The impact of the facility on total PM_{10} concentrations is therefore argued to be negligible.

Exceedance of NO_x 1-hour maximum criterion is predicted to occur. The Proponent argues that this exceedance is due to the conservative assumption taken in the assessment that all NO_x produced by the facility is in the form NO_2.[1] Subsequently, the Proponent conducted further analysis to quantify NO_2 concentrations from the modelled NO_x levels. The assessment specifically examined the scenario in which the facility would operate continuously on distillate fuel. This scenario was chosen as it was viewed to be the worst case scenario because it demonstrated higher NO_x concentrations that the continuous operation on natural gas fuel scenario. Both start-

[1] DEC air quality goals specify targets for NO_2 concentration levels and do not specify NO_x concentration levels.

up scenarios were discounted because start-up typically lasts only 30 minutes and therefore are an overestimate of a 1-hour average by a factor of two.

The further analysis of NO_x was undertaken in accordance with DEC guidelines for estimating NO_2 concentrations for model predictions of NO_x. Using the Ozone Limiting Method the estimated maximum 1-hour average ground level NO_2 concentration was predicted to be 173 μgm^{-3}, which is below the DEC air quality goal for NO_2 of 246 μgm^{-3}.

Consideration

The Department is satisfied that the assessment undertaken of potential air quality impacts from the proposal is adequate. Predictive air dispersion modelling was undertaken, examining scenarios which all involved the operation of the facility on a continuous basis. The proposal was found to meet the relevant DEC air quality goal for each of the key contaminants. The exceptions to this were NO_x 1-hour concentration cumulative impacts and PM_{10} 24-hour maximum concentration cumulative impacts, with both demonstrating exceedances of the relevant goals. Further investigation was subsequently undertaken by the Proponent to clarify the reasons for the exceedance.

The Department is satisfied with the additional assessment and the conclusions drawn by the Proponent regarding NO_x and PM_{10} cumulative concentration levels. The cumulative impact of both of these contaminants has been shown to be within the relevant DEC air quality goal, upon reconsideration of modelling assumptions to establish realistic, rather than overly conservative modelling inputs.

Further to this, it should be remembered that the air quality assessment examined the impact of the proposal under continuous operating conditions whereas the proposal would be limited to approximately 500 hours of operation with additional hours permitted only in the event of an electricity network emergency. Therefore any air quality impact, even that which has been shown to comply with the DEC's ambient air quality goals, will be considerably less than that described in the Environmental Assessment. The Department's recommendation to limit the hours of operation has been based on advice provided by the DEC. It aims to provide a suitable balance between ensuring continuity of electricity supply during periods of peak demand and protecting local amenity.

The Department believes that provided all the nominated environmental commitments are implemented during the construction and operational phases of the project that the resultant air quality impacts from the proposal would be negligible. Notwithstanding this, the Department believes the Proponent should be required to undertake regular emissions testing to ensure that air contaminants from the site remain well below the nominated criteria. The Department has also recommended that an air quality monitoring program be established and maintained throughout the construction and operation of the project with annual reports detailing the results required to be submitted to the Department as detailed in the conditions of approval.

5.2 Noise Impacts

Issues

A noise impact assessment was conducted as part of the Environmental Assessment to determine the potential noise impacts associated with the operation of the proposal. The assessment was conducted in accordance with the requirements of the NSW *Industrial Noise Policy* and considered both intrusive noise impacts and the impact on local noise amenity. It should be noted that assessment was based on the continuous operation of the proposal.

The noise impact assessment results are outlined in the table below. The assessment found that under all neutral weather conditions the predicted noise levels would meet the adopted noise criteria at all residential areas. Under adverse conditions a marginal exceedance of 1 dBA over the adopted criteria at one residential area to the east is anticipated. The Proponent has suggested that the frequency of operation under these conditions would be less than 10% and that the exceedance is minimal, and therefore the overall impact of the exceedence would be negligible.

Table 2: Predicted Operational Noise Levels (reproduced from the Proponent's Environmental Assessment).

Catchment Reference	Receiver Location	Adopted Noise Criterion (dB(A))	Predicted Noise Impacts	
			Neutral Weather	Adverse Weather
A	Lakeside Village	40	21	23
	Kamilaroo Drive	40	19	22
B	Sunnylake Caravan Park	37	27	29
	Macleay Street	37	35	38
C	Woolana Road	37	34	37
	Ulana Road	37	32	35
D	Barega Close	38	28	31
E	Baker Street (South)	38	18	21
	Baker Street (North)	38	30	32
F	Denman Street	38	24	29

Detailed analysis of extreme adverse meteorological conditions was also conducted. This assessment indicated exceedances of up to 4 dB(A) of the adopted criteria at three residences in Noise Catchment Areas B and C. Subsequently the Proponent undertook a statistical analysis of historical meteorological data to determine the frequency of which the exceedance would occur. The study found the worst-case of frequency of exceedence of the adopted night-time criterion to be less than 2 % of the time.

Additional noise impact assessment of Noise Catchment Area B was undertaken in response to submissions. Noise Catchment Area B had not been physically tested for noise impacts; rather it was assumed that this area would exhibit similar noise characteristics to Noise Catchment Area C (which was tested). The additional assessment found that the proposed facility can be expected to be generally inaudible in Area B. Further, the assessment concludes that the findings do not alter the noise impact conclusions drawn from the original noise impact assessment included in the Environmental Assessment.

Consideration

The Department is generally satisfied that the assessment approach employed by the Proponent with respect to noise impacts is appropriate and consistent with the requirements of the NSW *Industrial Noise Policy*.

While the Department notes that the project would meet the self-imposed noise limits placed on the project by the Proponent in most circumstances, the Department has received advice from the DEC that these limits are not entirely appropriate in this instance. The limits described in the table below have been provided by the DEC. They have been determined based on consideration of the noise impact assessment presented by the Proponent in the EA and the Submissions Report, and are consistent with the requirements of the *Industrial Noise Policy*. Within this context, the Department is of the opinion that the proposal would be able to operate while still preserving local amenity.

Table 3: Maximum Allowable Noise Contribution

Location	Day	Evening	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Sunnylake Caravan Park	35	35	35
Macleay Avenue	41	41	41
Woolana Avenue, Halekulani	40	40	40
Ulana Avenue, Budgeoei	38	38	38
Barega Close, Buff Point	35	35	35
Barker Avenue, San Remo	35	35	35
Denman Street, Colongra	35	35	35

The Department also recommends that a comprehensive noise audit be undertaken with respect to the project within 90 days of the commencement of operation, to confirm that the project is operating within the bounds of the project approval and predicted noise outcomes. The noise audit would provide the Proponent with the opportunity to identify and apply additional noise management measures where divergence from predicted noise impacts is measured under actual operating conditions.

5.3 Potential Land-use Conflicts

Issues

The main issue raised in submissions regarding potential land-use conflicts focused on the pipeline route and concerns that use of the proposed electricity easement would sterilise future land development in the vicinity of the pipeline.

The Proponent had selected the preferred pipeline route after consideration of two alternatives. The preferred route involved locating the pipeline underground along an existing electricity transmission easement owned and operated by Transgrid. This route was selected by the Proponent because the pipeline would be in an existing easement and therefore would have fewer environmental impacts and create fewer potential land-use conflicts than the other alternative considered.

The RTA and Wyong Shire Council had expressed concerns regarding the alternate route which would utilise existing road reserves, because it could impact on future road expansions. Wyong Shire Council also raised concern regarding how the preferred pipeline route could impact on future local road network expansions in the area.

Consideration

While the Department concurs with the Proponent's reasons for selecting the preferred pipeline route, it was evident in submissions that there was considerable disagreement with the Proponent's conclusion that the preferred route would serve to minimise potential future land-use conflicts. As such, the Department required the Proponent to undertake further consultation with existing landowners/ occupiers regarding the preferred route and potential land-use conflicts.

The Proponent has since conducted consultation and has concluded that further detailed assessment and consultation regarding a broader pipeline corridor rather than a specific route would be beneficial. The Department agrees with this conclusion, believing that course of action described would allow for a more thoroughly considered final pipeline route to be determined. The Department is therefore willing to recommend concept approval for the proposed natural gas pipeline corridor with a requirement that further consultation and assessment be undertaken.

In recommending concept approval, the Department has included specific conditions that would have to be met prior to the Proponent seeking approval from the relevant determining authority or authorities. These conditions include a requirement that each landowner or occupier within the proposed pipeline corridor be formally written to and invited to make a submission to the Proponent regarding the final route selected for the pipeline or any other assessment documentation prepared by the Proponent for submission to the determining authority or authorities. Further, the Proponent would be required to demonstrate to the determining authority/ authorities how it has adequately addressed any issues raised by landowners or occupiers.

The Department believes that the provision of these conditions encourage the Proponent and existing landowners/ occupiers to address any potential land-use conflicts that may exist. This approach would assist in facilitating a thorough examination process which would identify a final pipeline route that would be mutually beneficial to all parties.

5.4 Hazards and Risks Impacts

Issues

The primary land use safety hazard associated with the project is the construction and operation of the natural gas pipeline and ancillary infrastructure. A preliminary hazard analysis was prepared by the Proponent in

accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* and *Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning*.

The analysis identified the main issue of concern to be gas releases from the pipeline which may result in the generation of jet fires and heat radiation impacts. The assessment found that the proposal would comply with the land use safety criteria provided that the mitigation measures described in the assessment were to be undertaken.

A key mitigation measure described is a 30 m buffer zone from the centreline of the pipeline to restrict future residential land use developments along the entire length of the proposed pipeline route. This, the assessment suggests, could be contained within the existing high voltage transmission easement owned and operated by Transgrid. It is suggested that from a hazards perspective the benefit of this approach is that ground activities within this easement would be restricted, and closely monitored and controlled by Transgrid.

Transgrid was invited to make a submission on the proposal and the contents of this submission are described in section 4.3 of this assessment report. Although not objecting to the proposal, concern was raised regarding potential adverse interactions between the pipeline or natural gas and the high voltage transmission line within the easement (induced current effects). Transgrid recommended additional studies be undertaken to ensure that these hazards would be successfully mitigated.

Consideration

The Department has considered the preliminary hazard analysis and risk assessment presented in the Environmental Assessment and is satisfied with the methodology and outcomes of the assessment.

While the risk assessment presented by the Proponent suggests that the proposal meets the Department's land use safety criteria, it is evident that consideration needs to be given to the issues identified by Transgrid. Hence an assessment in this regard would need to be undertaken once detailed pipeline design and route information is available.

In response, the Department has recommended strict conditions that would require the Proponent to conduct an updated preliminary hazard analysis once this information is available. The Department would require the Proponent to submit to the Director-General for approval prior to construction all detailed design and layout information in relation to the pipeline, including details of how the Proponent has resolved the issues identified by Transgrid. As part of this, the Proponent would be required to consult directly with Transgrid on this matter. In the event that the Director-General is not satisfied with the Proponent's submissions, he could request additional information or further studies to be undertaken.

The Department also recommends a condition that would require the Proponent to demonstrate to the determining authority/ authorities that the natural gas pipeline project is consistent with all relevant Australian Standards, published natural gas safety requirements and land use safety criteria as detailed in *Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning* (DoP, 2002).

With these detailed design measures in place, the Department is satisfied that the project could be undertaken within acceptable environmental and public safety limits.

6. CONCLUSION

The Department has assessed the EA, Statement of Commitments, submissions on the proposal and the submissions report, and is satisfied that the impacts of the proposal can be mitigated and/ or managed to ensure an acceptable level of environmental performance.

The potential environmental planning implications of the project are several due to the environmental impacts typically associated with electricity generation and the close proximity of this site to residential areas. Concern has been raised by the community in relation to air quality impacts, noise impacts, quality of life and exposure to potential hazards. As a result, the Proponent undertook additional noise impact studies, prepared a submissions report addressing each of the concerns raised, and modified some components of the project such that additional consultation and investigation can be undertaken before final approval would be considered. The Department and the DEC are satisfied with this approach, and agree with the conclusions that have been drawn from these studies.

The Department has therefore formed the opinion that the proposed Munmorah Gas Fired Power Station is a project that would be of benefit to the State of New South Wales. This is due to the combined benefits of increased electricity supply during periods of peak use and by providing emergency start capability to the electricity network in the event of a state-wide power station shutdown. The Department believes that the environmental impacts identified by the Proponent and through community consultation, can be effectively managed by the recommended conditions of approval.

Overall, the proposed Munmorah Gas Fired Power Station project could be approved subject to the effective implementation of the Proponent's Statement of Commitments and the Department's recommended Instruments of Approval.

7. RECOMMENDATION

The Department recommends that the Minister for Planning consider the findings and recommendations of the Departments report and grant consent to the proposal, subject to the recommended conditions of approval.

APPENDIX A – RECOMMENDED CONDITIONS OF (CONCEPT) APPROVAL

APPENDIX A – RECOMMENDED CONDITIONS OF (PROJECT) APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX D – SUBMISSIONS

APPENDIX E – ENVIRONMENTAL ASSESSMENT