MAJOR PROJECT ASSESSMENT:
Dalton Power Project
Walshs Road, Dalton
(MP10_0035)

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

May 2012

ABBREVIATIONS AND DEFINITIONS

Abbreviations

Act, the	*Environmental Planning and Assessment Act 1979*
CEMP	Construction Environmental Management Plan
Department	Department of Planning & Infrastructure
Director-General	Director-General of the Department of Planning & Infrastructure
EA	Environmental Assessment
Minister	Minister for Planning & Infrastructure
NoW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
OEMP	Operation Environmental Management Plan
Part 3A	Part 3A of the *Environmental Planning and Assessment Act 1979*
Proponent	AGL Energy Limited

Definitions

AGL Site	The 508 hectare site owned by AGL and shown in figures in red as the "AGL Site Boundary".
Project (the)	Construction and operation of a 1,500 megawatt power station and associated ancillary facility including, but not limited to the lateral natural gas pipeline to the power station and valve station, access road, communications tower and hut, communication tower services and access track, facilities connecting the power station to the existing 330 kilovolt transmission line, and concrete batching plant for Stage 1 of construction.
Project footprint	That land area associated with the construction and operation of the project.
Power station site	The area encompassing the power station, high voltage switchyard, sedimentation and evaporation ponds, buildings (control room, administration, amenities, switchroom and workshop) and facilities for: • gas receiving, metering and conditioning; • fire protection tank; • treatment and storage of process water; • treatment, storage and disposal of wastewater (process, sewage and runoff); and • domestic/rainwater tanks. This area is denoted in figures with a blue boundary as the "Plant Footprint".

Cover Photograph: Photomontage of Proposed Dalton Power Station

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EXECUTIVE SUMMARY

AGL Energy Limited (the Proponent) proposes to construct and operate a 1,500 megawatt open-cycle gas fired power station, approximately four kilometres north-east of Dalton, in south-western New South Wales. The power station would operate as a peak-load facility, providing electricity during periods of peak demand. The project includes the construction of a three kilometre lateral gas pipeline and a valve station which would connect the facility to the Moomba to Sydney Gas Pipeline, a communications tower and hut, and access road.

The project would be constructed in two stages with Stage 1 comprising two to three generating units (turbines) with a nominal capacity of up to 750 megawatts. Stage 2 of the project would see the facility upgraded to a total maximum of six turbines with a nominal generating capacity of 1,500 megawatts.

The capital investment value of the project is $1.5 billion. The project would create 500 full-time equivalent construction jobs over a 24-month period, and five to 10 operational jobs.

Pursuant to clause 2 of Schedule 6A of the *Environmental Planning and Assessment Act* 1979, the project is considered to be a *transitional Part 3A* project as Director-General's environmental assessment requirements were issued prior to the repeal of Part 3A of the *Environmental Planning and Assessment Act* 1979. According to clause 3 of Schedule 6A, Part 3A of the Act (as in force immediately before its repeal) continues to apply to transitional Part 3A projects. Consequently, the project is subject to assessment under Part 3A, and requires the approval of the Minister for Planning and Infrastructure (or his delegate).

The project is also classified as critical infrastructure pursuant to section 75C of the *Environmental Planning and Assessment Act 1979*.

The Environmental Assessment (EA) for the project was placed on exhibition for a period of 34 days from 17 August until 19 September 2011. The Department received eight submissions from public authorities and 11 submissions from the general public (including one special interest group). In addition, 29 persons from the general public forwarded comments on the project post exhibition. In addition, two petitions totalling 196 signatures were received post exhibition along with a submission from NSW Health.

Although none of the pubic authorities objected to the project, they did raise issues for the Department's consideration including noise, air quality, water management, biodiversity, and traffic impacts. Concerns raised by the public related to operational noise, air quality, visual amenity, water supply and usage, traffic, impacts on property values, and construction-related impacts, with a number of the submissions questioning whether the project should be approved.

A Submissions Report was submitted by the Proponent in April 2012 describing amendments made to the project since the exhibition of the EA, and providing additional assessment of relevant environmental impacts in response to issues raised in submissions and amendments made to the proposal. The amendments to the project comprised:

- the use of F class turbines only at the power station;
- siting of the southern portion of the proposed lateral gas pipeline outside of the road easement so as to avoid ten mature, protected White Box and Blakely's Red Gum trees;
- use of groundwater (obtained from on-site bores) as the source of operational water for the power station; and
- establishment of an on-site concrete batching plant during the construction of Stage 1 of the project.

Based on its assessment, the Department is satisfied that project can achieve acceptable amenity, health and environmental standards through the recommended conditions of approval and the Proponent's Statement of Commitments, and can proceed in a sustainable manner with overall benefits to the State.

The Department has assessed the Proponent's EA, Submissions Report and submissions on the project and considers that there are a number of constraints to the project that will need to be carefully managed. These include operational noise and air quality, visual amenity, construction traffic, and operational water management. Consequently, the Department has recommended stringent conditions of approval in regards to these matters to ensure that impacts are effectively managed and mitigated.

The Department therefore recommends that the project be approved, subject to conditions.

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1. BACKGROUND

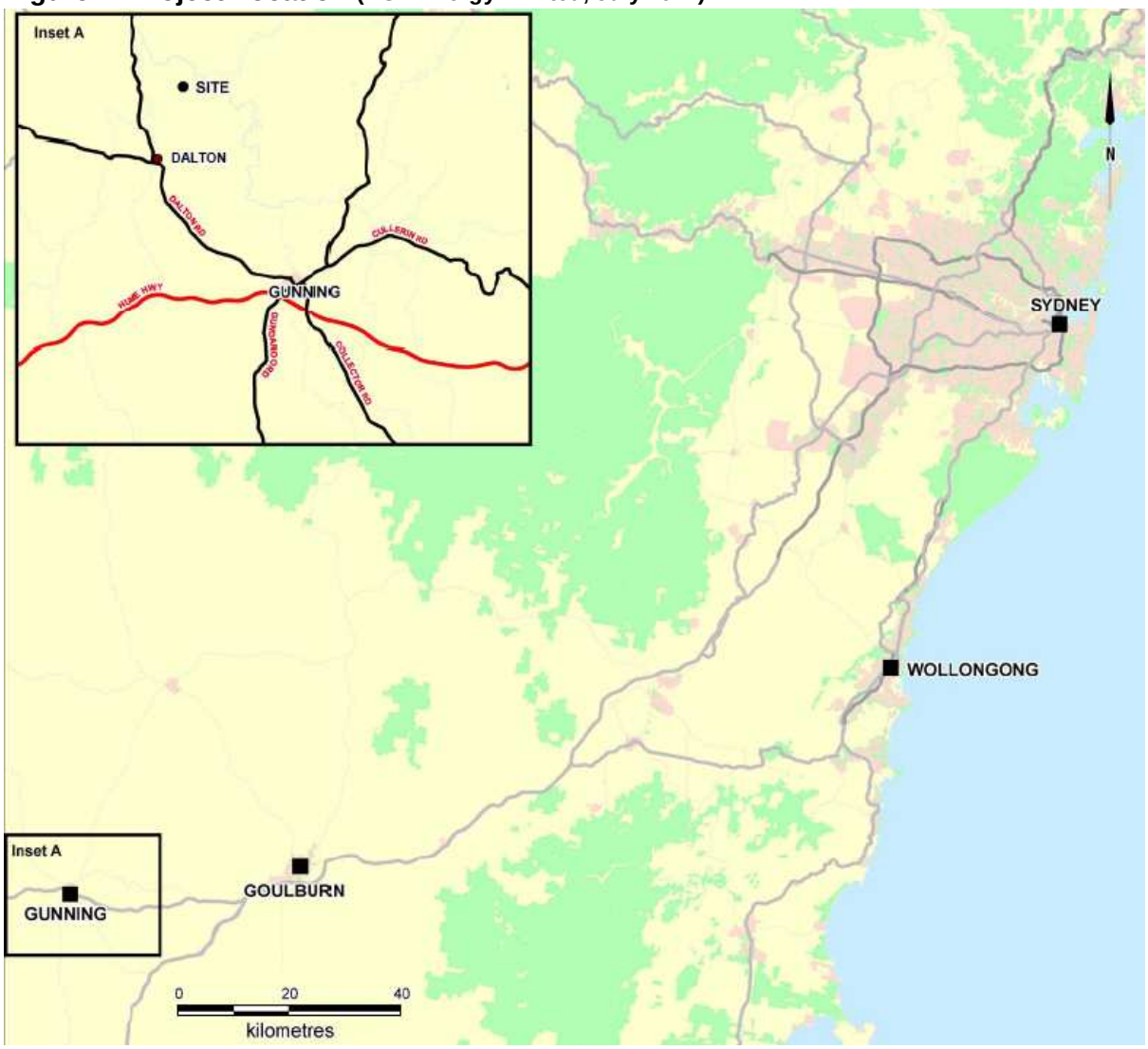
AGL Energy Limited (the Proponent) proposes to construct and operate a peaking open-cycle gas turbine power station with a nominal staged generating capacity of up to 1,500 megawatts station and associated infrastructure on a site north-east of Dalton.

The capital investment value of the project is an estimated $1.5 billion, and the proposal would create approximately 500 full-time equivalent construction jobs and up to 10 full-time equivalent operational jobs.

1.1 Location and Use

The project site is located in the NSW Southern Tablelands, 12 kilometres north-west of Gunning and approximately four kilometres north-east of Dalton, in the Upper Lachlan Shire local government area (see Figure 1).

Figure 1: Project Location (AGL Energy Limited, July 2011)



The power station is proposed to be constructed and operated on an approximate 26 hectare footprint (referred to as the project footprint) within a 508 hectare site area (refer Figure 2) owned by the Proponent. The Lot and DP identifiers for the project are set out in Table 1.

Figure 2: Project Footprint and AGL Site Boundary (AGL Energy Limited, July 2011)

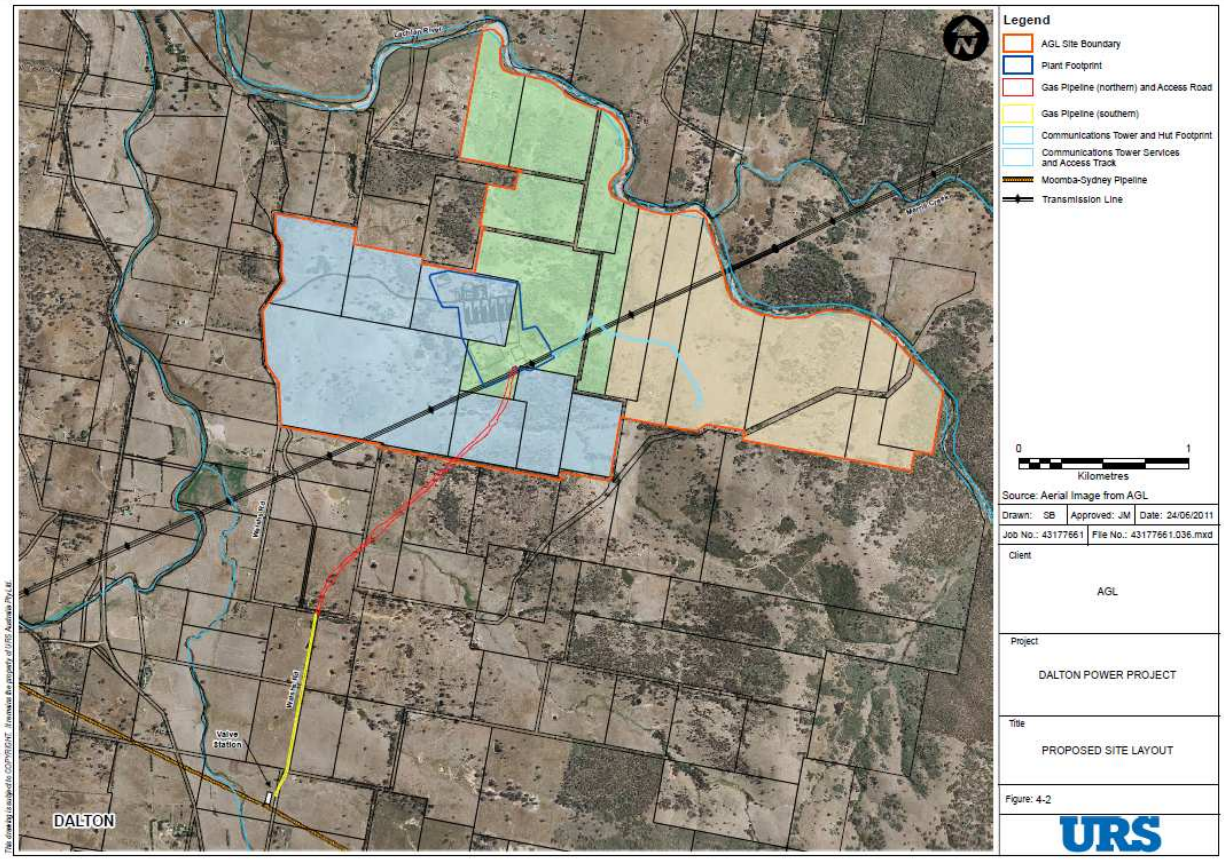


Table 1: Titles for the Project Footprint

Lot Identifier	Proposed Use
Lot 115, 249, 252, 253, 305, 307 DP 754111	Part power station footprint. Part infrastructure – gas pipeline (northern section) and access road, transmission connection. Part access track and underground services to communications tower.
Lots 14, 183, 184, 187, 200, 283, 306, DP 754111 Lots 1 and 2, DP 126122	Part power station footprint. Part infrastructure – gas pipeline (northern section) and access road, transmission connection.
Lots 116, 162, 317, 318, 321, 322, DP 754111	Traversed by transmission line. Communications tower and part access track and underground services.
Lots 21, 186, 251, DP 754111 Lot 1, DP 126119	Part infrastructure – gas pipeline (northern section) and access road.
Walshs Road easement and parts of Lots 23, 27, 30 and 31, DP 754111	Part infrastructure – gas pipeline (southern portion)
Lot 30, DP 754111	Valve station

The power station site and adjoining land owned by the Proponent are predominantly rural in character and comprise three farm holdings (formerly known as Riverview, Holmes and The Elms) with sheep and cattle grazing currently being undertaken on the site. Built elements of the landscape comprise sheds, fences, dams, buildings, access tracks, and a 330 kilovolt transmission line which traverses the site in a northeast-southwest direction.

The landform within the AGL site is undulating and divided by a number of drainage lines that flow to the Lachlan River which forms the northern boundary of the AGL and power station sites. The power station site is on gently sloping land.

The majority of the AGL site is cleared with scattered trees and areas of woodland in the centre. Details on the existing vegetation are set out in Section 5.6.

1.2 Surrounding Land Uses

Land surrounding the power station site is predominantly rural in nature, containing a small number of farm and rural residential properties on medium to large size holdings, as well as agricultural structures, fences, local roads and access tracks and a 330 kilovolt transmission line. The Moomba to Sydney Gas Pipeline is located approximately three kilometres south of the power station site.

The nearest rural residential properties are located 2.3 to 2.4 kilometres southwest and northwest of the power station site.

The nearest urban township is Dalton, which is located approximately four kilometres south west of the power station site.

2. PROPOSED PROJECT

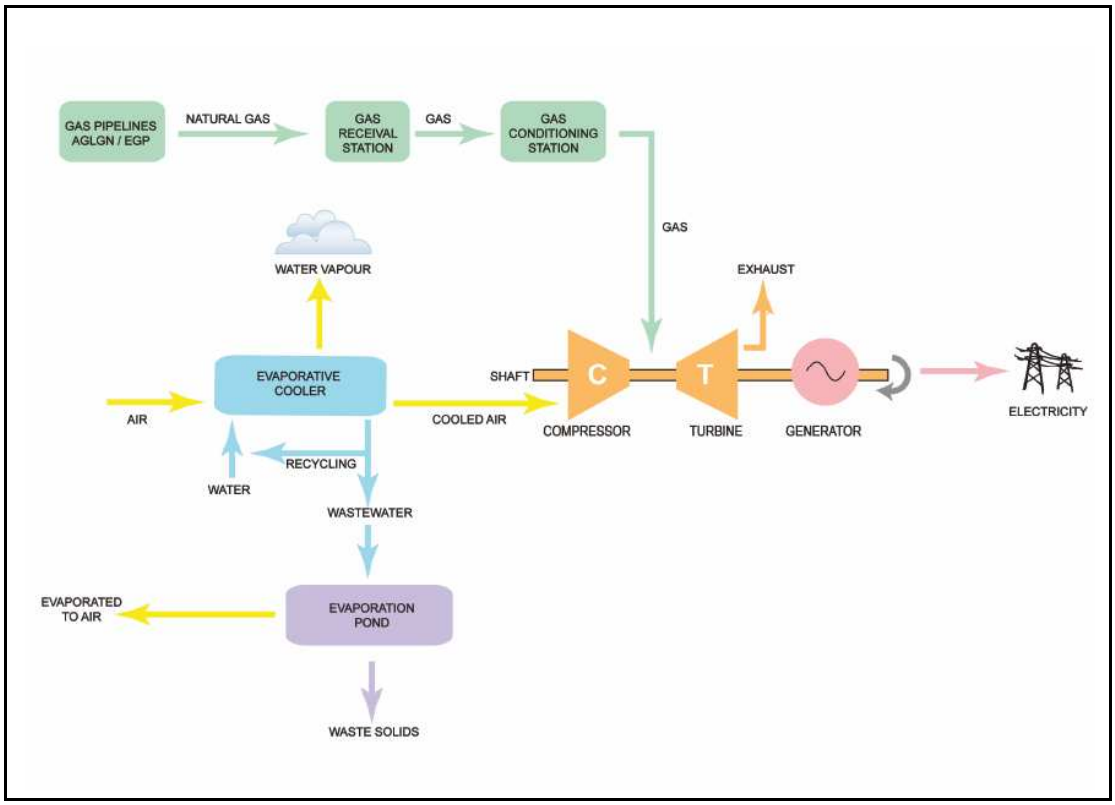
2.1 Project Description

The project involves the construction and operation of an open-cycle gas turbine power station with a nominal generating capacity of 1,500 megawatts. The power station would be constructed in two stages with Stage 1 comprising two to three F Class generating units (turbines) with a nominal maximum capacity of up to 750 megawatts. Stage 2 of the project would see the power station upgraded to a total maximum of six turbines with a nominal generating capacity of 1,500 megawatts.

The open-cycle power station would operate as a peaking facility to supply electricity at short notice during periods of peak demand. This means that the power station would only operate between two and 15 percent of any year. However, when operational, the power station would be available to operate 24 hours a day, seven days a week.

The power station would operate by drawing in cool air through a compressor, with the compressed air flowing into a combustion chamber where natural gas is injected at high pressure and burnt (refer Figure 3). When necessary, the air stream would be cooled with an evaporative cooling system. The combustion reaction produces hot exhaust gases which would be used to drive each turbine which in turn drive a compressor and an electrical generator (attached to each turbine) to produce electricity. The hot exhaust gases would then pass through a silencer before being vented to the atmosphere through exhaust stacks fitted at the end of each turbine. The exhaust stacks would be up to 31 metres above existing ground level. A continuous emission monitoring system would be installed to monitor stack emissions.

Figure 3: Generation Process for an Open-Cycle Gas Turbine



The gas turbines would feature Dry Low nitrogen oxide technology to produce very low nitrogen oxide emissions. Natural gas would be supplied from a three kilometre lateral gas pipeline connected to the existing Moomba to Sydney Gas Pipeline (refer Figure 2). A gas receiving station and gas conditioning station would be constructed on the site (refer Figure 4 for location).

The power station would generate electricity at a voltage in the order of 16 kilovolts with the voltage being increased (through electrical transformers) to 330 kilovolts, prior to being fed via a switchyard to the 330 kilovolt transmission line crossing the site.

The annual water demand required is 12.5 megalitres per annum for Stage 1 and 25 megalitres per annum for Stage 2, assuming a worst-case scenario. Water for operation of the power station and fire fighting would be sourced from groundwater bores located on the power station site. Potable water for drinking and use in the administration and amenities building would be trucked to the site. Section 5.3 addresses the water demands for Stages 1 and 2 of the project.

Other components associated with the construction of the power station include an access road, communication tower and hut, and valve station. Ancillary infrastructure associated with the project is described in Table 2.

Figure 4: Indicative Site Layout (Stages 1 and 2)

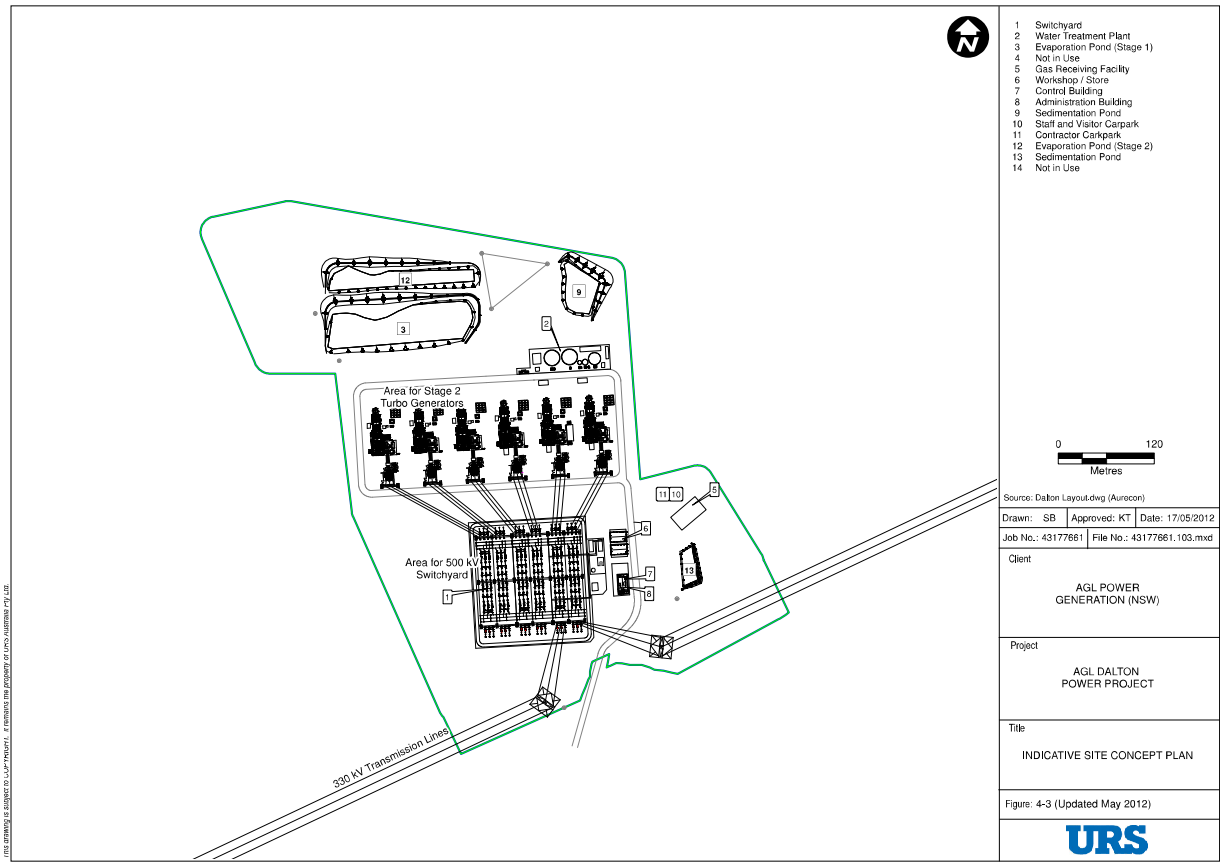


Table 2: Ancillary Infrastructure Components

Aspect	*Description*
Gas Pipeline	An approximate three kilometre underground lateral gas pipeline would be constructed to connect the power station to the Moomba to Sydney Gas Pipeline.
Valve Station	A valve station would be constructed at the connection point to the Moomba to Sydney Gas Pipeline. The station would occupy an area of approximately 0.22 hectares, and would be set back 25 metres from Walshs Road within a fenced off area.
Gas Receiving Station	A gas receiving station would be built on site to regulate the gas entering the power station. Activities would include gas filtration, custody transfer, and flow control and metering. The station would be connected to the gas conditioning station via a pipeline.
Gas Conditioning Station	A gas conditioning station would be constructed at the connection point where gas is supplied into the power station. Infrastructure would include: a header pipeline connecting the conditioning station to each turbine; an actuated isolation valve installed at the inlet facility; gas filtration, heating and pressure regulation equipment; over pressure protection and pressure relief systems; and process control and communications equipment.
Access Road	A new access road would be constructed from Walshs Road to the power station. The access road would be approximately 1.9 kilometres in length, with a width of eight metres, and a maximum footprint of 4.2 hectares. The road would be located in a shared easement (ranging between 10 and 45 metres in width) with the gas pipeline

Table 3 continued

Communications Tower and Hut	A communications tower would be built approximately 1.5 kilometres east of the power station on an elevated area. The tower would be approximately 60 metres in height and be connected to the power station via underground electricity and communication services. Associated with the tower would be a communications hut measuring nine square metres, and a new access track from the tower to the power station. The purpose of the tower is to communicate the status of the power station and switchyard to the nearest Transgrid communication tower. This information is required so that Transgrid is aware of the amount of power generation and stability of the generating system.
Transmission Connection	Electricity generated by the power station would be fed into the high voltage transmission network located on the site via one or two new transmission towers within the existing 330 kilovolt transmission line easement. The structure(s) would be 30 to 40 metres high above ground level.
High Voltage Switchyard	A high voltage switchyard comprising high voltage transformer and switchgear would be located adjacent to the power plant and transmission line traversing the site.
Buildings, Amenities and Other Facilities	A number of buildings will be constructed on site including administration offices, amenities, control room facilities, security gatehouse, workshops, and storage facilities. Other facilities to be constructed as part of the power station site include: sedimentation pond, evaporation pond, domestic/rainwater tanks, process water tanks and facilities for the treatment of groundwater quality.

2.2 Project Need and Justification

On 26 February 2008, the then Minister for Planning declared development for the purpose of energy generating facilities with the capacity to generate in excess of 250 megawatts to be critical infrastructure projects. In making this declaration, the then Minister recognised that additional energy generating development of this scale was necessary to the State for economic and social reasons. The then Minister based this decision on the outcomes of the Owen Inquiry into Electricity Supply in New South Wales (September, 2007) and the 2007 Annual Statement of Opportunities published by the former National Electricity Market Management Company (now the Australian Energy Market Operator). The Australian Energy Market Operator manages the supply of electricity in Australia and each year releases a Statement of Opportunities which provides an analysis of the supply and demand scenario for each region of the National Electricity Market.

The proposed Dalton Power Project meets the definition of critical infrastructure under the then Minister's declaration of 26 February 2008, as the power station would have the capacity to generate greater than 250 megawatts.

Both the Owen Inquiry and the then National Electricity Market Management Company's 2007 Statement of Opportunities recognised that there is a need to provide additional electricity generating capacity in New South Wales to service growing energy demands. At the time the then Minister made the abovementioned critical infrastructure declaration, both the Owen Inquiry and the 2007 Statement of Opportunities predicted that additional generating capacity would be required by 2013/2014 to ensure ongoing energy supply within acceptable reliability standards.

Since the Owen Inquiry Report, Transgrid's Annual Planning Reports have presented a decline in forecast energy demand growth. Although the 2011 report forecasts an increase in energy demand over the next 10 years at an annual average rate of 1.6 percent, and summer and winter 10 percent 'probability of exceedances[*]' energy demand increases over the next 10 years at an annual average rate of two percent (under a medium growth

[*] The projection demand assuming a one in 10 year weather (summer or winter) condition.

scenario) it also indicates that:

- the summer demand projection (10 percent probability of exceedance) would be 559 megawatts or 3.3 percent on average below the 2010 projection; and
- the winter demand projection (10 percent probability of exceedance) would be 788 megawatts or five percent on average below the 2010 projection.

Overall, energy predictions by Transgrid are forecast to be 4,071 gigawatt hours, or five percent on average, lower than the 2010 projections. The differences are due to changes in key assumptions such as higher forecast electricity prices, a revision in generation projections, the incorporation of new and ongoing energy efficiency policies, and a slower than expected recovery from the global financial crisis.

Based on forecast energy demand growth consistent with Transgrid's medium growth estimate, the Australian Energy Market Operator has prepared and published its 2011 Electricity Statement of Opportunities for the National Electricity Market. In its updated report of 2 March 2012, the Australian Energy Market Operator predicts that under a medium economic growth scenario low reserve conditions may occur in New South Wales during 2018-19 (with a predicted shortfall of 104 megawatts), two years later than forecast in the 2010 Electricity Statement of Opportunities. The low reserve conditions point is the time at which the network reliability standard may not be met, and at which point load shedding may be required and brown-outs may occur in some areas. Continued demand growth beyond low reserve conditions without provision of additional generating capacity increases the need for load shedding and exacerbates issues with the quality and reliability of supply. Any load shedding event would have negative economic and/or social impacts and may also affect the extremities of the network, generally rural and regional communities.

At least 104 megawatts of new generation or demand-side investment is required to delay this shortfall until the following year. Based on analysis of historical New South Wales wind contribution factors at times of maximum demand, the 2011 Statement indicates that new wind generation in New South Wales is likely to contribute approximately nine percent of its installed capacity towards meeting the 104 megawatt maximum demand reserve deficit. Consequently, alternative sources such as gas generation power stations, are required. The Dalton Power Project would contribute to ensuring an adequate and reliable supply during times of peak demand, such as summer.

The Department considers that the consequences of reaching the low reserve conditions point in New South Wales, and the consequences of potentially going beyond that point, are fundamental to the justification of the project. The Department considers it highly undesirable for the State to reach or move beyond the low reserve point as the consequences of not doing so could be significant, for example development and investment potential in sectors that rely on a secure energy supply at all times of the year could be impacted.

It should be noted that the low reserve conditions predicted in 2011 are a revision from the 2010 prediction point of 2016-17 principally due to lower than expected economic growth and a decrease in the maximum demand projection for New South Wales, including that arising from the decommissioning of part of the Kurri Kurri Aluminium Smelter. It is not the result of increased energy generation.

In light of the shift in actual and projected energy demands over recent years, and the fact that predicted demands and low reserve conditions do not accommodate any potential significant increases in demand that may be associated with the establishment of major new energy-intensive developments, the Department considers it prudent to take a broad, strategic approach to the timing of additional generating capacity that may be required at any point in the period 2014-2020. That is, additional generating capacity (base load and peaking) should be available for implementation within that period, if required, rather than conclusively determining a time for implementation. This approach is consistent with the Owen Inquiry recommendations.

The NSW Government inquiry into Electricity supply in NSW in May 2007 discusses the importance of open-cycle gas turbines in supplying electricity during peaking times *"Peaking generators can start up at short notice, operate over a wide range of output and respond rapidly to short-term peaks in demand…Open cycle gas turbines are now used for peaking duty."* In addition, the NSW Government's *Energy Directions Green Paper* (2004) identifies gas-fired power stations to be a highly effective measure for meeting peak demand. Further, it is financially more viable to operate infrequently used gas-fired power stations than it is to incur the heavy financial loses associated with buying electricity from wholesalers during times of peak demand.

The Department acknowledges that additional electricity generators will need to be built to meet the expected additional demand to avoid potential power outages and blackouts in peak times. Energy projects such as the Dalton Power Project would assist in providing additional supply capacity which could contribute to addressing the supply/demand shortfalls predicted by the Australian Energy Market Operator. The Department is therefore satisfied that the proposed project is justified as an important and necessary component of a suite of capacity generating measures to secure the State's energy supplies in the medium and longer term. This position is based on the need to address the potential demand-supply imbalances, and avoid the adverse consequences of not addressing the imbalance (e.g. load shedding).

Gas-fired power generation is also seen as an important 'transition' fuel that would provide important greenhouse gas advantages when compared to coal-fired generation. Although the project would generate greenhouse gases, the greenhouse gas emission intensity when compared to coal-fired power stations is low. The estimated emission intensity for the Dalton Power Project plant operating at 15 percent capacity would be 800 metric tonnes of carbon dioxide equivalent per gigawatt hour. On a comparison basis, brown coal-fired power stations in Australia can produce up to 1,500 metric tonnes of carbon dioxide equivalent per gigawatt hour. Black coal-fired power stations in NSW have been shown to produce in the order of 1,000 tonnes of carbon dioxide equivalent per gigawatt hour. The relatively lower emission intensity of the proposed project is compliant with *The National Greenhouse Strategy* (1998) which aims to lower the emissions intensity associated with electricity production.

The project is consistent with the NSW Government's *NSW 2021* plan which sets out goals and strategies for rebuilding and developing NSW and delivering sustainable growth. A key goal of *NSW 2021* is to invest in critical infrastructure as a means of achieving economic growth and improving productivity and competiveness. Ensuring the supply of electricity during periods of peak demand is essential to the growth of communities and industries across the state both now and in the future.

3. STATUTORY CONTEXT

3.1. Major Project

The proposal is a major project under *State Environmental Planning Policy (Major Development) 2005* because it is development for the purpose of a facility for the generation of electricity that has a capital investment value of more than $30 million (clause 24(A) of the then Schedule 1 of *State Environmental Planning Policy (Major Development) 2005)*.

Pursuant to clause 2 of Schedule 6A of the *Environmental Planning and Assessment Act 1979*, the project is considered to be a *transitional Part 3A* project as Director General's environmental assessment requirements were issued prior to the repeal of Part 3A of the *Environmental Planning and Assessment Act* 1979 on 1 October 2011. According to clause 3 of Schedule 6A, Part 3A of the Act (as in force immediately before its repeal) continues to apply to transitional Part 3A projects. Consequently, the project is subject to assessment under Part 3A, and requires the approval of the Minister for Planning and Infrastructure (or his delegate).

3.2. Critical Infrastructure

On 26 February 2008, the then Minister for Planning declared development for the purposes of a facility for the generation of electricity that has a capacity to generate at least 250 megawatts and is the subject of an application lodged pursuant to Section 75E or 75M of the *Environmental Planning and Assessment Act* 1979 prior to 1 January 2012*,* to be critical infrastructure pursuant to Section 75C of the Act.

The Dalton Power Project involves the construction of an open-cycle gas turbine power station with a nominal generating capacity of 1,500 megawatts and therefore meets the criteria for critical infrastructure.

3.3. Permissibility

The project falls within the boundary of the Upper Lachlan Shire Local Government Area. The proposed project site is zoned *RU2 Rural Landscape* and parts of the proposed gas pipeline and access road will be located on land zoned *RU1 Primary Production* under the *Upper Lachlan Local Environmental Plan 2010*. Electricity generating works are permissible with development consent within land zoned RU1 and RU2.

In addition, *State Environmental Planning Policy (Infrastructure) 2007* applies to the project. Part 3, Division 4 of the Policy relates to electricity generating works and under clause 34(1) development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural zone (or equivalent zoning). RU1 and RU2 are prescribed zones and consequently the project is permissible with consent on the subject land.

3.4. Environmental Planning Instruments

There are no other environmental planning instruments that substantially govern the carrying out of the project.

3.5. Objects of the Environmental Planning and Assessment Act

Decisions made under the *Environmental Planning and Assessment Act 1979* must have regard to the objects of the Act, as set out in Section 5 of the Act. The relevant objects are:

5(a) to encourage:

- *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- *(iii) the protection, provision and co-ordination of communication and utility services,*
- *(iv) the provision of land for public purposes,*
- *(v) the provision and co-ordination of community services and facilities,*
- *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats,*
- *(vii) ecologically sustainable development, and*
- *(viii) the provision and maintenance of affordable housing;*

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State; and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

Of particular relevance to the environmental impact assessment and eventual determination of the subject project application are subsections (i), (ii), (iii), (vi) and (vii) (noting that the proposal does not raise significant issues relating to land for public purposes, community

services and facilities or affordable housing). With respect to ecologically sustainable development, the Act adopts the definition in the *Protection of the Environment Administration Act 1991*. This is discussed further in section 3.6.

In addition to the above, the agency and community consultation undertaken as part of the assessment process (see Section 4 of this report), address objects 5(b) and (c) of the Act.

3.6. Ecologically Sustainable Development

The *Environmental Planning and Assessment Act 1979* adopts the definition of Ecologically Sustainable Development found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes and that ecologically sustainable development can be achieved through the implementation of:

(a) the precautionary principle;
(b) inter-generational equity;
(c) conservation of biological diversity and ecological integrity; and
(d) improved valuation, pricing and incentive mechanisms.

The Department has considered the need to encourage the principles of ecologically sustainable development, in addition to the need for the proper management and conservation of natural resources; the orderly development of land considering land use; the need for the project as a whole (which comprises a utility provision) in Section 2.2; and the protection of the environment, including threatened species, in Section 5 of this report.

The Department's assessment of the ecological impacts of the project (Section 5.6) is based on a conservative and rigorous assessment of the likely extent of ecological impacts and likely offset requirements to ensure that appropriate and adequate measures are put in place to prevent the threat of serious or irreversible environmental damage, consistent with the precautionary principle and the principle of conservation of biological diversity and ecological integrity. The majority of potential impacts of the proposal are likely to be localised and would not diminish options regarding land and resource uses and nature conservation available to future generations.

The Department's assessment of key issues has also considered the need to apply mitigation measures to minimise impacts on air quality and groundwater resources.

The Department's assessment of greenhouse emissions (Section 5.7) has considered the benefits of the project in helping to encourage the use of a less-greenhouse gas intensive fuel, and hence limit climate change, which is consistent with the principal of inter-generational equity.

On the basis of the assessed impacts on the environment and their ability to be managed, it is considered that the development would be ecologically sustainable within the context of the above principles.

3.7. Statement of Compliance

In accordance with section 75I of the *Environmental Planning and Assessment Act 1979*, the Department is satisfied that the Director-General's environmental assessment requirements have been complied with, including exhibition requirements (refer Section 4.1).

3.8. Planning Assessment Commission

On 14 September 2011, the Minister for Planning and Infrastructure delegated his approval functions under Section 75J of the *Environmental Planning and Assessment Act 1979*, to the Planning Assessment Commission in those cases where applications have been made by private companies (including reportable political donation applications).

The Proponent is a private company and has provided, with its project application, a statement indicating it has made a reportable political donation (refer Appendix D). Consequently, pursuant to the Minister's delegation of 14 September 2011, the project application is subject to determination by the Planning Assessment Commission.

3.9. Environment Protection and Biodiversity Conservation Act

On 11 June 2010, the project was determined to be a "controlled action" under the *Environment Protection and Biodiversity Conservation Act 1999* by the Commonwealth Department of the Environment, Water, Heritage and the Arts, as it was considered likely that the proposal could have a significant impact on listed threatened species and communities.

On 1 July 2010, the then Department of the Environment, Water, Heritage and the Arts confirmed that the Dalton Power Project would be approved under an accredited assessment process and that the process would be Part 3A of the *Environmental Planning and Assessment Act 1979.* This means that separate assessment processes are not required under both the Act and the *Environment Protection and Biodiversity Conservation Act 1979*. However, the Commonwealth Minister for the Environment maintains an independent approval role, and the Commonwealth provides input at certain stages of the assessment process.

The Department's assessment of Commonwealth matters is detailed in Section 5.6 of this report.

4. CONSULTATION AND SUBMISSIONS

4.1. Exhibition

Under section 75H(3) of the *Environmental Planning and Assessment Act 1979*, the Director-General is required to make the Environmental Assessment (EA) for an application publicly available for at least 30 days. After accepting the *AGL Dalton Power Project Environmental Assessment*, the Department publicly exhibited it from 17 August until 19 September 2011 (34 days) on the Department's website, and at:

- the Department of Planning and Infrastructure, Information centre, Sydney;
- the Nature Conservation Council of NSW; and
- the Upper Lachlan Shire Council.

The Department also advertised the public exhibition in the Sydney Morning Herald, Daily Telegraph, Yass Tribune and Goulburn Post on 17 August 2011, and notified relevant State and local government authorities of the exhibition in writing. Submissions were invited in accordance with Section 75H(4) of the *Environmental Planning and Assessment Act 1979.*

The Department received a total of 19 submissions during the exhibition of the EA. Eight of the submissions were from public authorities and 11 submissions from the general public (with one being a special interest group).

A summary of the issues raised in submissions is provided below.

4.2. Public Authority Submissions

Eight submissions were received from public authorities: Civil Aviation Safety Authority; Department of Defence; NSW Office of Environment and Heritage / NSW Environment Protection Authority; NSW Office of Water; former NSW Roads and Traffic Authority; Department of Trade and Investment, Regional Infrastructure and Services; Land and Property Management Authority; and Upper Lachlan Shire Council. None of the agencies objected to the proposal, however they did raise issues for the Department's consideration including noise, air quality, water supply, biodiversity, and traffic.

The **Civil Aviation Safety Authority** advised that the proposal has been assessed in accordance with its Plume Rise Advisory Circular 139-05(0)2004, and that the assessment indicates that the plume would require mitigation by the establishment of a Danger Area. However, the Advisory Circular is under review and consequently, the Civil Aviation Safety Authority has recommended that the Proponent consult with the Authority six months prior to commencement of operation of the power station regarding required mitigation measures.

The **Department of Defence** advised that it had no comments to make.

The **Office of Environment and Heritage** (OEH) raised concern with regards to:

- the accuracy of the TAPM data used as this method of data analysis is known to underestimate the occurrence of conditions most likely to enhance noise propagation;
- the potential for tonality of noise emissions from the power station;
- the inadequacy of surveys for threatened species that could potentially occur on the project site; and
- the lack of guidance on how proposed biodiversity offsets would be protected in perpetuity.

In regards to the assessment of noise impacts, the OEH indicated that tonality and low frequency noise are likely to arise from the operation of the power station and as such adjustments should be made to the noise limits for the project. Further, C-weighted noise limits should be applied to the project as gas turbines are known to produce low frequency noise. The OEH also recommended that the Proponent demonstrate that the data used in the noise assessment was not under estimating temperature inversions and light winds. In addition, the OEH recommended conditions of approval relating to noise limits, noise monitoring, construction hours, and the establishment of a meteorological weather station.

In regards to air quality, the OEH recommended conditions of approval relating to monitoring of air emissions and emission limits, including the implementation of an air quality verification program and establishment of a long-term air emission benchmark.

In regards to flora and fauna, the OEH recommended that additional surveys for threatened species be undertaken including surveys for the Golden Sun Moth, Striped Legless Lizard and Pink-tailed Worm Lizard. Further, it was recommended that prior to the clearing of vegetation, the Proponent identify the mechanism for the protection of biodiversity offset measures in perpetuity.

In its submission, the OEH indicated that the Aboriginal heritage assessment was consistent with the '*Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*' (DEC, 2005) and concurs with the recommendations made in regards to Aboriginal heritage.

The **NSW Office of Water** (NoW) raised concern that a definitive source of water supply had not been determined or assessed and as such no water licences or agreements have been obtained. It advised that the Proponent is likely to require a water licence(s), and such a licence and the transfer of water entitlements must take place prior to any water extraction or use. The NoW requested that it be consulted during the development of water management plans for the construction and operation of the project.

The **Department of Trade and Investment, Regional Infrastructure and Services** raised no issues in relation to forests, minerals and fisheries. It did note that a variation of the existing Moomba to Sydney Pipeline Licence was likely to be required to construct and connect the project's lateral gas pipeline to the Moomba to Sydney pipeline.

The former **NSW Roads and Traffic Authority** advised that it could not provide an informed comment until further details were received regarding how the Proponent proposed to manage the issues associated with transporting oversized/overmass loads on the classified road network, including the Hume Highway crossing of Paddy's River at Marulan and the Gunning Rail Bridge.

The **Land & Property Management Authority – Crown Lands Division** advised that the main access road and access to the communications tower will have an effect on some Crown land roads and that it does not consent to any party undertaking works, including maintenance, on Crown roads. However, it is understood that the Proponent is negotiating with the Upper Lachlan Shire Council in regards to the transfer of control of these roads pursuant to Section 151 of the *Roads Act 1993*. Once construction is complete, it is the Authority's preferred position that roads no longer required for access be closed and sold to adjoining landowners.

The Authority also indicated that current access points to the Lachlan River and Jerrawa Creek must remain available for public use and any works and operational activities should not impact on the bed and banks of these waterways, or affect the flows to or within the waterways.

The **Upper Lachlan Shire Council** raised the following concerns:

- the proposed location of the gas pipeline (southern portion) will impact on approximately ten protected mature White Box and Blakely's Red Gum trees and suggested that the pipeline be moved to a paddock on the eastern side of the road;
- the lack of consideration of potential sources of water supply and no guidance on the quantities required. Council indicated that the augmentation of Gunning and Dalton water supplies, the use of Gunning Sewage Treatment Plant effluent and groundwater extraction would not be sufficient to supply the water needs of the project;
- there is insufficient detail on the how the residual waste from the wastewater evaporation ponds will be managed;
- the noise levels emanating from the power station when operating at full capacity;
- the ability of the existing road network to satisfactorily and safely accommodate the additional traffic generated by the construction and operation of the project. In particular, concerns were raised regarding the widths over crests and around curves, the need for additional safety signage for motorists, and the repair of roads impacted by construction traffic to their present condition (or better) by the Proponent; and
- the failure to address urban pedestrian safety issues in and around Gunning and Dalton.

The Council also requested that a condition be inserted into the approval requiring the Proponent to provide a contribution in accordance with Section 3.17 of the Upper Lachlan Development Control Plan 2010, if approved.

4.3. Public Submissions

Eleven submissions were received from the public, one of which was by a special interest group "Community for Accurate Impact Assessment of the Dalton Power Station". Table 3 outlines the key issues raised in the submissions.

Table 3: Key Issues Raised in Public Submissions

Issue	Concerns/Issues Raised	Number of Submissions
General Environmental Concerns	• Uncertainty as to the degree of risk to the overall environment posed by the construction of a gas-fired power station of unprecedented size in Australia. • No assessment on the health impacts of pollutants from the project. • Project is inconsistent with the *Upper Lachlan Shire Local Environmental Plan 2010*, which encourages "conservation of natural resources".	2

Fauna and Flora	• Clearing of vegetation along the road corridors will adversely impact on fauna species that utilise this habitat. • Many of the fauna and flora species often seen in the area are not mentioned in the EA, notably black snakes, the black wallaby, frog species, bats and birds, and Serrated Tussock and Bathurst Barr (both weeds). • There is no planned offset for 33 hollow-bearing trees removed for construction – only a proposal to offset with the pre-existing 49 hollow-bearing trees in the offset site.	2
Natural and Environmental Disasters	• Seismologists from Geoscience Australia and the Australian National University predict that the Dalton-Gunning area is due for a very large earthquake. There is a concern that the Proponent has not factored an earthquake scenario into the proposal and has not been in contact with Geoscience Australia.	1
Operation of Project	• Inconsistent detail regarding the type of turbines to be installed. • Average operating hours will potentially be significantly increased over time. • Operational hours need to be quantified and are based on economic factors, which are likely to change. • Any exceedence of the 15 percent operational timeframe should be subject to a separate environmental assessment.	7
Water	• Lack of information on the proposed water sources, in terms of both quality and quantity. • Water usage is underestimated in the modelling. • Potential for significant impacts to arise in the event of water being trucked on to the site. • Local bore water is not adequate for machinery due to its high mineral contamination. • Requests that a review of groundwater and Lachlan River water availability be undertaken. • Concern regarding possible pollutants emitted by the project entering the drinking water supplies, notably harvested rain water. • Request that Proponent be required to harvest rainwater as the only sustainable water supply option. • Request that contaminant levels be monitored by an independent agency and financed by the Proponent.	10
Roads and Traffic	• Concern regarding the impact of road usage and alterations on the visuals/aesthetics of the area and on access to local facilities. • No assessment of the traffic impacts on Dalton and Gunning. • Disagrees with the Proponent's report suggesting that numerous overtaking opportunities exist on the Gunning-Dalton road. • Construction detours will negatively affect the residents and workers of Gunning and Dalton.	7
Noise and Vibration	• Potential for construction and operation to adversely impact on acoustic amenity. • Concern that sensitive receiver locations are not representative of village residences and that the Dalton Public School has not been included as a sensitive receiver. • Noise exceedences are predicted at three receptor locations close to Dalton village. • Absence of a vibration assessment. • Worst case noise modelling is underestimated.	6

	• Request that noise monitoring be conducted pre development to determine background levels and during operation of the power station, • Lack of noise mitigation measures identified in the EA. • The assessment of low-frequency noise proposed by the Proponent was rejected by the OEH when it was proposed in the EA of the power station at Leafs Gully	
Air Quality	• Lack of site-specific background monitoring data used in the assessment and a request that the Proponent provide pre-development background air quality monitoring data. • Concern relating to the effect of dust particles on air quality and on dust levels in wool. • Concern that no specific plant design criteria have been identified (including definitive stack heights), leading to several possible outcomes for air pollution levels. • Need for additional data regarding greenhouse gas emissions likely to result from traffic during construction and operation. • Concern that plant retrofit options will only be considered if cost effective. • Request that emissions be adequately monitored on a daily basis and that plans be in place to reduce emission levels if they approach unacceptable levels for human health. • Request that the Proponent be required to implement Greenhouse Gas retrofitting options as new technologies become available. • Dust abatement measures are not satisfactory.	9
Visual Impacts	• Concerns relating to the impact of the project on the landscape once roadside clearing is conducted. • Concerns regarding night lighting and sun glare from exhaust stacks. • Inadequate (if any) artists impressions and elevation drawings of the proposed development.	2
Socio-Economic	• No positive impacts for Dalton identified, as jobs created through construction are only likely to be short-term and workers are most likely to be sourced from Goulburn. • No details about community contributions schemes.	4
Property Values	• Potential reduction of local property values and associated requests for compensation.	3
Community Consultation	• Insufficient community consultation including no consultation with Dalton Public School and the Department of Communities and Education. • Failure to identify the closest neighbour to the east of the site.	3
Easements	• There is a need for the Proponent to closely consult with landowners with respect to obtaining any easements for the augmentation of existing gas pipelines and high voltage electricity infrastructure.	1

The Department has considered the issues raised in submissions in its assessment of the project.

4.4. Proponent's Response to Submissions

Following the completion of the formal exhibition period, the Department directed the Proponent to prepare a Submissions Report to address each of the issues raised. As part of this process, the Proponent reviewed each submission and made specific comment on each of the issues. A copy of the Submissions Report is attached as Appendix C.

The Proponent's response to submissions led to changes to the project. Consequently, a Preferred Project Report was prepared as part of the Submissions Report. The changes to the project included:

- only F Class turbines being used at the power station – the EA proposed the use of either E or F Class turbines;
- use of groundwater from on-site bores for process water – the source of water was not confirmed in the EA which addressed a number of options including the Upper Lachlan Shire Council water supply, Lachlan River offtake, delivery of water by truck, and harvesting and recycling water on site;
- siting of the southern portion of the proposed lateral gas pipeline outside of the western side of the existing road reserve along Walshs Road so as to avoid ten mature, protected White Box and Blakely's Red Gum trees; and
- establishment of an on-site concrete batching plant during Stage 1 construction.

The Submissions Report was forwarded to the OEH, Upper Lachlan Shire Council and Office of Water for comment in light of the outstanding issues regarding operational noise, air quality, water supply and traffic.

4.5. Post-Exhibition Submissions

Twenty nine persons from the general public submitted comments on the project post exhibition. In addition, two petitions totalling 196 signatures were received post exhibition along with a submission from NSW Health.

In its submission, NSW Health raised concern over the adequacy of the noise assessment and buffer distances, and the lack of background air quality monitoring and recommended that air quality monitoring should be conducted prior to construction of the project. In addition, concern was raised over the uncertainties relating to hazards analysis, water supply, risk of flooding and domestic wastewater treatment.

The submissions from the public raised concerns similar to those detailed in the public submissions during the exhibition period. The key issues raised were potential impacts on air quality in the local region, noise generation and the impact on the acoustic amenity of sensitive receivers, visual amenity impacts, impacts of construction traffic on the local road network and road users, and potential impacts on land values.

Subsequent to the Submissions Report, the Department has sought clarification and/or further information on a number of issues in particular, predicted noise levels, construction traffic volumes, water usage and treatment, and the operation of the proposed concrete batching plant for Stage 1.

The Department notes that representations have been made for the Planning Assessment Commission to hold a public meeting with respect to the project, to facilitate greater consultation on the project, and to allow the community to raise its concerns directly with the Commission.

5. ASSESSMENT

After consideration of the EA (Appendix A), submissions received (Appendix B), Submissions Report (Appendix C), and Statement of Commitments, the Department considers the key environmental issues associated with the project to be:

- noise (Section 5.1);
- air quality (Section 5.2);
- water demand and supply (Section 5.3);
- traffic and transport (Section 5.4);
- visual amenity (Section 5.5); and
- biodiversity (Section 5.6).

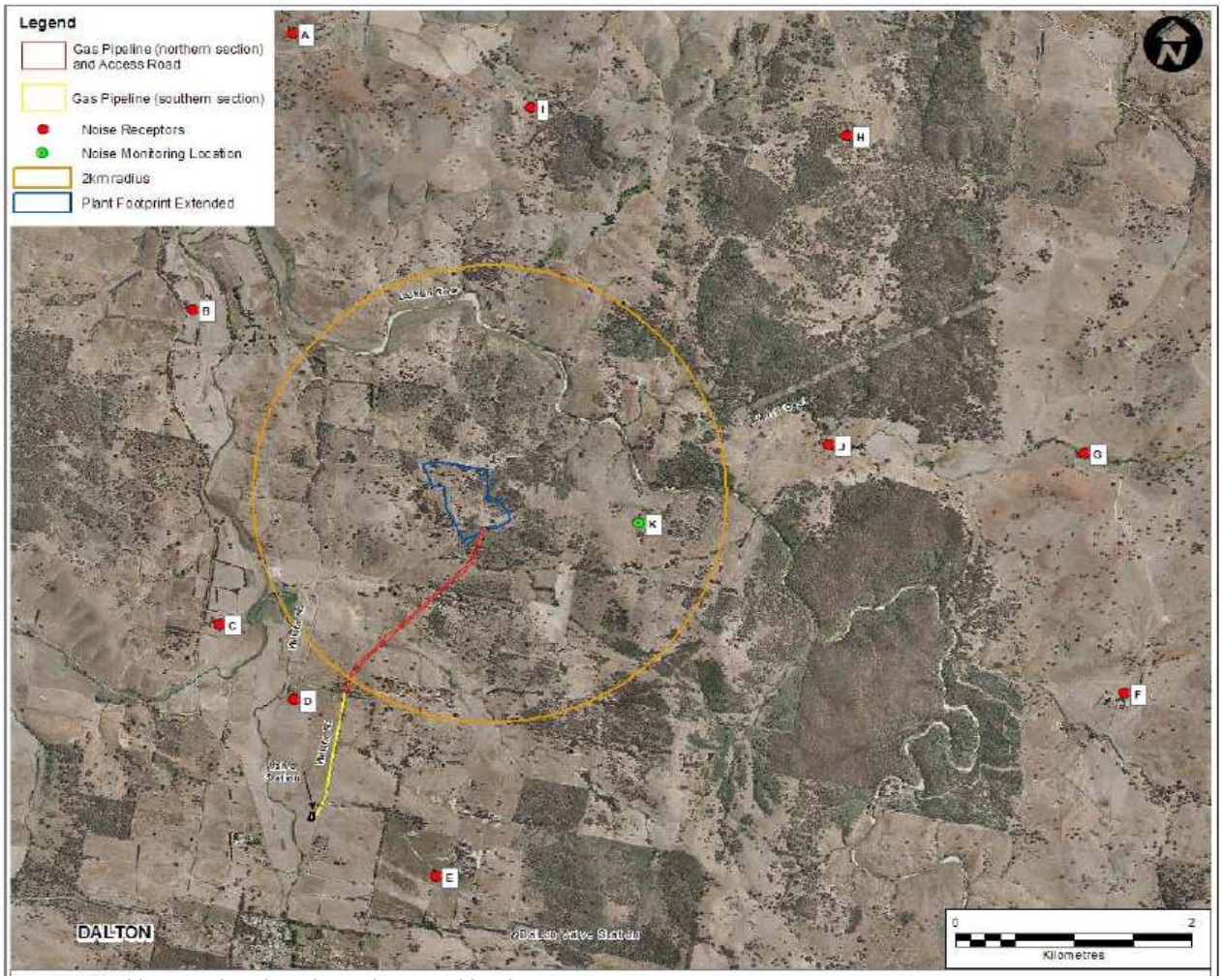
The Proponent has also assessed the potential impacts of the project in relation to Aboriginal cultural heritage, aviation impacts, greenhouse gases, socio-economic issues, soils (including erosion and sedimentation) and considered the impacts associated with various waste streams and potential risks and hazards. These issues, which are considered in Section 5.7 of this report, are considered to be minor for the project. Specific conditions of approval, where relevant, have been proposed to address residual impacts

5.1. Noise

A noise impact assessment was conducted by the Proponent as part of the EA to determine the potential noise impacts associated with the operation of the project. The assessment of was conducted in accordance with the *NSW Industrial Noise Policy* (Environment Protection Authority, 2000). Construction noise impacts were assessed against the *NSW Interim Construction Noise Guidelines* (Department of Environment and Climate Change, 2009) with construction traffic noise assessed in accordance with the *NSW Environmental Criteria for Road Traffic Noise* (Environment Protection Authority, 1999). The noise assessment considered the worst-case scenarios, assuming that all equipment and plant were operating simultaneously and continuously.

The assessment of construction and operational noise involved the prediction of noise impacts at 10 rural residential sensitive receivers surrounding the power station site (refer Figure 5).

Figure 5: Rural Residential Sensitive Receiver Locations



Note: Sensitive receiver location K is owned by the Proponent.

Construction Noise and Vibration

The main construction activities that would generate noise are:

- removal of vegetation and levelling;
- bulk earthworks including site grading and excavation work;
- establishment of concrete foundations for plant and buildings;
- construction of buildings and plant and installation of equipment and machinery;
- concrete batching;
- transmission line installation; and
- construction of the pipeline.

The Proponent's predicted noise levels for construction activities within the power station site are presented in Table 4 and indicate that noise levels would not exceed the relevant noise management levels as specified in the *Interim Construction Noise Guidelines*. However, predicted noise levels for the construction of the gas pipeline would exceed the recommended noise management level for standard construction hours (i.e. 7:00 am and to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm on Saturdays) at the nearest sensitive receiver location to the proposed pipeline (D) by up to 12 dB(A) and be at the limit at sensitive receiver location C (refer Table 5). No audible construction activities are expected to be undertaken outside of the standard hours of construction and hence exceedances of noise management levels during such hours have not been considered.

Table 4: Predicted Power Station Construction Noise Levels

Receptor	Predicted Noise level $L_{Aeq,15min}$ dB(A)	Noise Management Levels $L_{Aeq,15min}$ dB(A)		Exceedance
		Standard Construction Hours	Outside of Standard Construction Hours	
A	<20	Noise affected: 40 Highly Noise Affected: 75	35	No
B	24-27			No
C	23-26			No
D	24-27			No
J	Up to 22			No
E,F,G,H and I	<20			No

Table 5: -Predicted Pipeline Construction Noise Levels

Receptor	Approximate Distance from Pipeline Alignment (KM)	Predicted Noise Level $L_{Aeq,15min}$ dB(A)	Noise Management Levels $L_{Aeq,15min}$ dB(A)		Exceedance
			Standard Construction Hours	Outside of Standard Construction Hours	
A	4.2	<20	40	35	No
B	2.5	22-28			No
C	1.3	32-40			No
D	0.5	43-52			Up to 12dB(day) and 17db (evening and night)
E	1.3	31-39			Up to 4db (evening and night)
F	6	<20			No
G	6.5	<20			No
H	3.6	<20			No
I	3.6	<20			No
J	2.8	20-26			No

At the request of the Department, the Proponent undertook additional noise modelling for the construction of the gas pipeline at four sensitive receivers located within an approximate one kilometre distance to the south of the sensitive receiver location D, as part of its response to submissions. The results of the assessment are presented in Table 6.

Table 6: Predicted Pipeline Construction Noise Levels – Southern Locations

Receptor	Approximate Distance from Pipeline Alignment	Predicted Noise Level, $L_{Aeq,15min}$ dB(A)	Daytime Construction Noise Criterion $L_{Aeq,15min}$ dB(A)		Exceedance	
			Noise Affected	Highly Noise Affected	Noise Affected	Highly Noise Affected
D	400	43-52	40	75	Up to 12	No
R12	380	43-52			Up to 12	No
R13	630	39-48			Up to 8	No
R14	680	38-47			Up to 7	No
R17	860	36-45			Up to 5	No

The modelling results indicated that construction of the pipeline would exceed the noise management levels for standard construction hours at all four sensitive receiver locations (R12, R13, R14 and R17) by between 5 dB(A) and 12 dB(A).

The Proponent has advised that construction of the valve station is not predicted to generate noise levels at nearby sensitive receivers (R12, R13, R14) in excess of those predicted for the pipeline construction.

The Proponent has advised that there would be no activities (such as blasting or drive piling) that would result in vibration impacts at nearby sensitive receivers during construction. Further, due to the relatively large distance of the project site to the nearest sensitive receivers, the Proponent concluded that the potential for vibration impacts is negligible and accordingly, a vibration impact assessment was not undertaken.

Traffic Noise – Construction and Operation

Noise generated by construction traffic was raised as an issue in a number of public submissions. The Proponent's traffic noise assessment considered the main roads to be used during construction – Walshs Road, Dalton Road, Warrataw Street, Gundaroo Street and Collector Road. The Proponent has compared predicted construction traffic noise levels to existing noise levels and also o relevant noise goals under the *Environmental Criteria for Road Traffic Noise* (Environment Protection Authority, 1999). The daytime (7:00 am to 10:00 pm) goals are 60 dBA($L_{Aeq,1\ hour}$) for Collector Road and Gundaroo Street being "collector roads" and 55 dBA($L_{Aeq,1\ hour}$) for Walshs Road, Dalton Road and Warrataw Street being "local roads". The assessment concluded that the increased road traffic noise levels due to the proposed construction of the project would be within the criteria specified by *Environmental Criteria for Road Traffic Noise*. However, there would be a 2 dB(A) increase in noise levels at sensitive receivers.

The operational traffic associated with the project would be limited to occasional deliveries, 8-12 water truck deliveries per annum and up to 20 vehicle movements per day associated with operational staff. Due to the low number of vehicle movements, the Proponent did not undertake a noise assessment of operational traffic as the incremental increase in noise levels would unlikely to be audible.

Operational noise

The dominant noise sources associated with the operation of the power station are the exhaust stacks, air intake, turbines and transformers. All of these components exhibit noise spectra that have a significant low frequency content, which attenuates at a slower rate than the higher frequencies and can persist over longer distances.

The operational noise assessment for the power station considered both intrusive noise impacts and the impact on local noise amenity during the day (7:00 am to 6:00 pm), evening (6:00 pm to 10:00 pm) and night-time (10:00 pm to 7:00 am) periods under neutral and adverse meteorological conditions for both Stages 1 and 2 of the project. Long-term unattended noise monitoring was undertaken at three sensitive receiver locations (B, C and K - see Figure 5) considered representative of the most potentially affected noise receptors. Short-term attended noise monitoring was also undertaken at two locations (B and C) to supplement the long-term noise monitoring.

The Proponent's EA addressed four operating scenarios – A, B, C and D. Scenarios A and C related to the operation of E Class turbines and are not further discussed since the Proponent has committed to using F Class turbines. The relevant operating scenarios, as assessed in the EA, are B (Stage 1) and D (Stage 2) and set out in Table 7.

Table 7: Operational Scenarios

Scenario*	Stage	Machine Type	Quantity of Machines	Maximum Power Generation of Each Machine	Total Power Generation
B	1	9FA Class	3	250 MW	750 MW
D	2	9FA Class	6	250 MW	1500 MW

The results of the background monitoring determined the rating background level was less than 30 dB(A). Pursuant to the *NSW Industrial Noise Policy*, where the rating background level is determined to be less than 30 dB(A), then the background level is set to 30 dB(A) for the purposes of impact assessment. Intrusive noise levels are set at 5 dB(A) above the rating background level. Hence, the intrusive noise level for the project was set at 35 dB(A) at all locations for the day, evening and night-time periods. The amenity criteria (as adopted from the *NSW Industrial Noise Policy*) for the project are:

- daytime – 50 dB(A);
- evening – 45 dB(A); and
- night time – 40 dB(A).

The *NSW Industrial Noise Policy* specifies that for projects, the more stringent of the intrusive or the amenity criteria sets the project specific noise levels. Consequently, the project specific noise levels adopted for the project were based on the intrusive criterion of 35 dB(A) and set at this level for the day, evening and night-time periods.

The EA and Submissions Report predicted that noise levels associated with the operation of the power station would comply with the project specific noise level at all sensitive receivers under both neutral and adverse meteorological conditions during the day, evening and night-time periods. However, noise modelling undertaken subsequent to the Submissions Report indicates that the project specific noise level would be exceeded in the evening/night-time period, under adverse meteorological conditions at sensitive receiver location D by 1 dBA and would be at the limit at location B for Stage 2.

Tables 8 and 9 set out the predicted noise levels for Stages 1 and 2 of the power station, respectively. The predicted noise level contours for Stages 1 and 2 are shown in Figures 6 and 7.

Further noise assessment was undertaken at seven additional sensitive receivers located to the south of sensitive receiver location D (R12, R13, R14, R15, R16, R17 and R21) in response to concerns raised in submissions and the results presented in the Submissions Report. The assessment predicted noise levels at the seven sensitive receivers would comply with the project specific noise levels for both Stages 1 and 2. The modelling undertaken subsequent to the Submissions Report also predicted that noise levels at sensitive receivers R12, R13, R14, R15, R16, R17 and R21 would comply with the project specific noise level (refer Tables 8 and 9).

Table 8: Predicted Operational Noise Levels for Scenario B (Stage 1) Under Neutral and Adverse Meteorological Conditions (CONCAWE calculation method used)

Receptor Location	Predicted Noise Levels (L_{Aeq}) dB(A)				Criterion (L_{Aeq}) dB(A)	Exceedance
	Neutral Met Conditions		Adverse Met Conditions		All Periods	
	Day	Evening / Night	Day	Evening / Night		
A	< 20	< 20	< 20	< 20	35	No
B	27	29	30	32	35	No
C	26	28	30	31	35	No
D	28	29	31	33	35	No
E	< 20	21	23	24	35	No
F	< 20	< 20	< 20	< 20	35	No
G	< 20	< 20	< 20	20	35	No
H	< 20	< 20	< 20	< 20	35	No
I	< 20	< 20	21	22	35	No
J	23	25	27	29	35	No
R12	20	22	24	26	35	No
R13	< 20	21	23	25	35	No
R14	21	23	25	27	35	No
R15	< 20	< 20	21	23	35	No
R16	21	23	25	27	35	No
R17	23	25	27	29	35	No
R21	22	24	26	28	35	No

Table 9: Predicted Operational Noise Levels for Scenario D (Stage 2) Under Neutral and Adverse Meteorological Conditions (CONCAWE calculation method used)

Receptor Location	Predicted Noise Levels (L_{Aeq}) dB(A)				Criterion (L_{Aeq}) dB(A)	Exceedance
	Neutral Met Conditions		Adverse Met Conditions		All Periods	
	Day	Evening / Night	Day	Evening / Night		
A	< 20	< 20	< 20	< 20	35	No
B	30	32	33	35	35	No
C	29	31	32	34	35	No
D	31	32	34	**36**	**35**	**Yes**
E	22	24	25	27	35	No
F	< 20	< 20	< 20	20	35	No
G	< 20	< 20	21	23	35	No
H	< 20	< 20	< 20	< 20	35	No
I	21	22	24	25	35	No
J	25	28	29	31	35	No
R12	23	25	27	29	35	No
R13	22	24	26	28	35	No
R14	24	26	28	30	35	No
R15	20	22	24	26	35	No
R16	24	26	27	29	35	No
R17	26	28	29	32	35	No
R21	25	27	29	31	35	No

The Proponent also undertook noise modelling to determine the highest predicted noise levels using the ISO calculation method. The modelling undertaken for the EA and post the Submissions Report indicated that the night-time noise levels would be within the project specific noise levels at all sensitive receivers under moderate meteorological conditions. The Department is of the opinion that the assessment of noise should be based on the worst-case scenario. Consequently, the results of the ISO calculations are not further discussed as they only address noise levels under moderate rather than adverse meteorological conditions.

Figure 6: Predicted Operational Noise Contours Stage 1

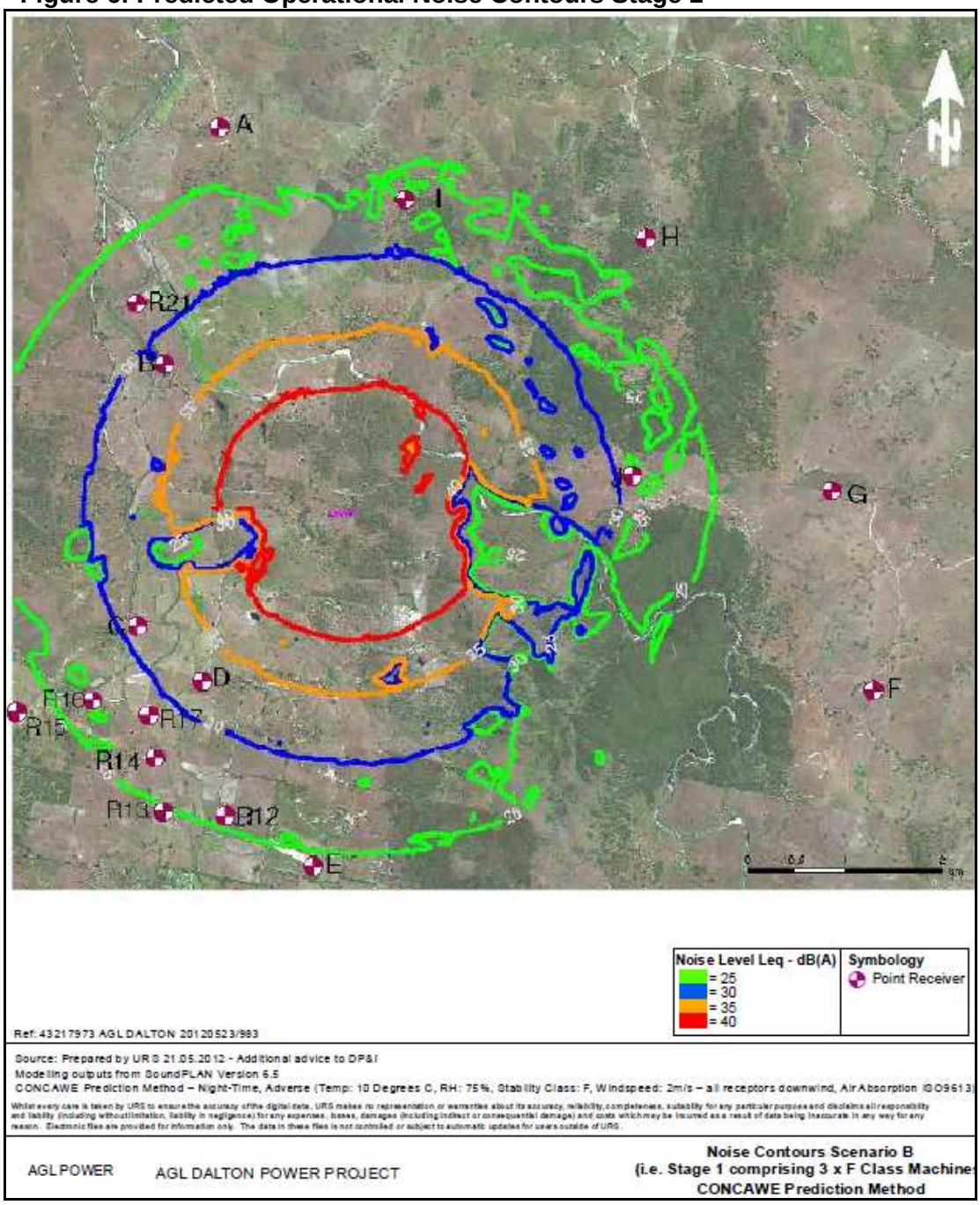
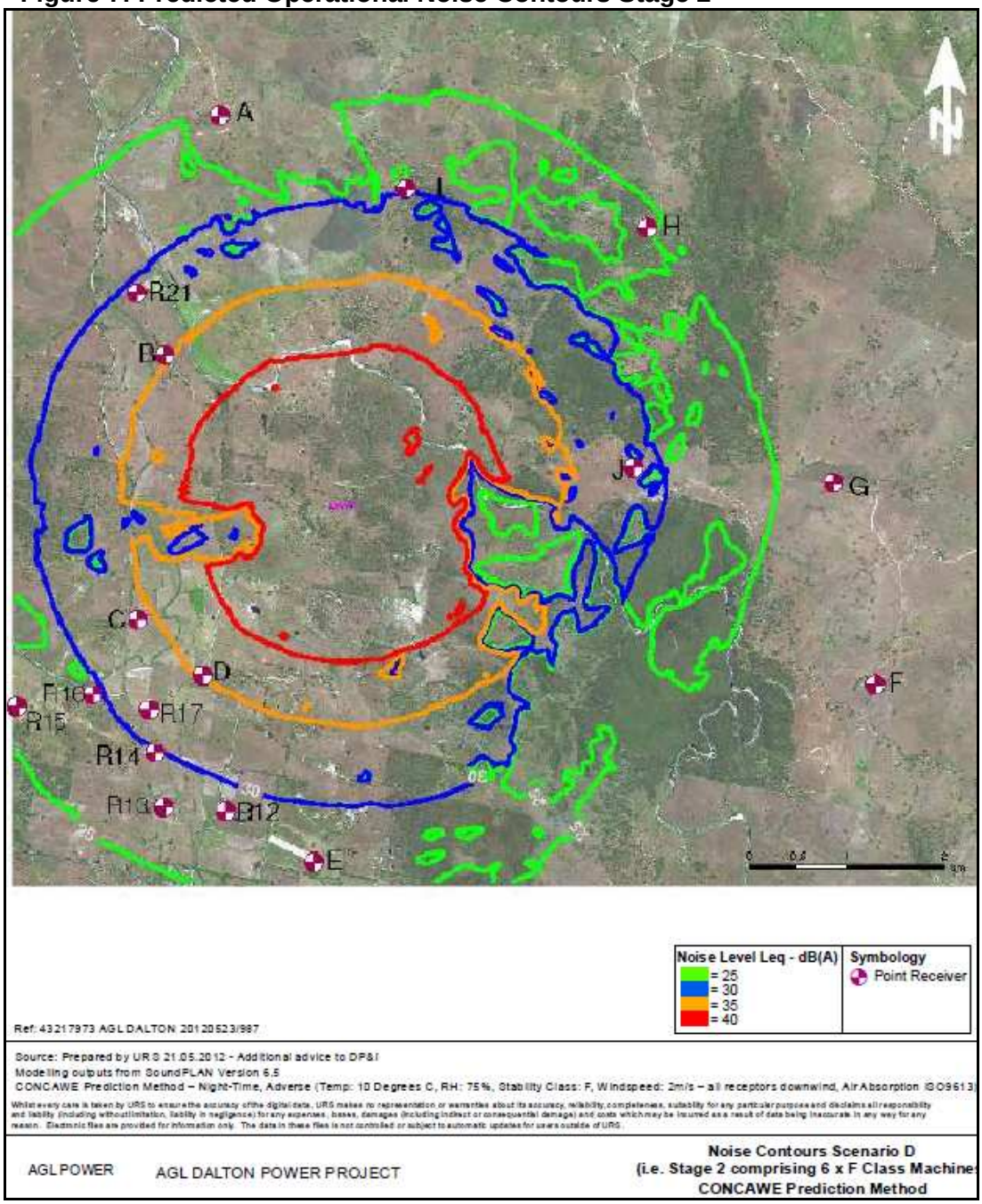


Figure 7: Predicted Operational Noise Contours Stage 2



Although the Proponent's original noise assessment predicted that the project would comply with the project specific noise levels, a large number of the submissions received both during and post exhibition raised concern over the potential operational noise impacts of the project. In particular, there was expressed concern that actual noise levels could be well above predicted noise levels especially considering no local meteorological data was available for the noise modelling, nor were details on the sound power levels of the proposed turbines. A number of submissions cited the example of the Uranquinty power station where the actual operating noise is well above predicted noise levels and expressed concern that the same situation could arise with the Dalton Power Project.

Low Frequency Noise

Low frequency noise contains major components within the low frequency range of the frequency spectrum (20 Hertz to 250 Hertz), and evidence exists that it can cause greater annoyance than other noise at the same noise level. To compensate for the annoying characteristics of a noise source, the *NSW Industrial Noise Policy* recommends a correction

factor of 5 dB be applied to the source noise level at the receptor where there is a difference of 15 dB or more between the C- and A-weighted levels over the same time period.

The noise modelling in the EA indicated that the difference between the C- and A-weighted noise levels, under the worst-case scenario, exceeded the difference criterion of 15 dB at every sensitive receiver location. Consequently, the Proponent included a 5 dB low frequency correction factor to the predicted noise levels resulting in an exceedance of the project specific noise level by 1 dB(A) at location D for Stage 1 and by 2-3 dB(A) at locations B, C and D during Stage 2.

Additional noise modelling was undertaken by the Proponent, post the preparation of the Submissions Report, based on an updated data set for the 9FA turbine type. It should be noted that the SoundPLAN model used to determine the C-weighted noise levels does not provide prediction results for octave band frequencies below 31.5 Hertz. The levels in the tables are controlled by conservative calculations for the 16 Hertz octave band. A 5 dB adjustment was applied to account for adverse meteorological conditions.

The predicted C-weighted noise levels for Stages 1 and 2 are shown in Tables 10 and 11, respectively, and were demonstrated to be below those predicted by the OEH. Revised calculations of the difference between the C- and A-weighted noise levels, under the worst-case scenario, also predicted a difference of 15 dB or greater.

Table 10: Predicted C-weighted Noise Levels Stage 1

Receptor Location	Predicted Noise Levels (L_{eq}) dB(C)				Night-time Criterion (L_{eq}) dB(C)	Exceedance
	Neutral Met Conditions		Adverse Met Conditions		All Periods	
	Day	Evening / Night	Day	Evening / Night		
A	46	46	51	51	60	No
B	52	52	56	56	60	No
C	52	52	56	56	60	No
D	52	52	57	57	60	No
E	48	48	52	52	60	No
F	43	43	48	48	60	No
G	45	45	50	50	60	No
H	46	46	51	51	60	No
I	49	49	53	53	60	No
J	50	50	54	54	60	No
R12	48	48	53	53	60	No
R13	48	48	53	53	60	No
R14	49	49	54	54	60	No
R15	47	47	52	52	60	No
R16	49	49	54	54	60	No
R17	50	50	55	55	60	No
R21	49	49	54	54	60	No

The modelling results indicate that predicted C-weighted noise levels would be within the noise limits for the project at all sensitive receivers under the considered meteorological conditions for Stage 1. However, the noise limit is predicted to be exceeded at sensitive receiver location D and be at the noise limit at sensitive receiver locations B and C for Stage 2.

Table 11: Predicted C-weighted Noise Levels Stage 2

Receptor Location	Predicted Noise Levels (L_{eq}) dB(C)				Night-time Criterion (L_{eq}) dB(C)	Exceedance
	Neutral Met Conditions		Adverse Met Conditions		All Periods	
	Day	Evening / Night	Day	Evening / Night		
A	49	49	54	54	60	No
B	55	55	59	60	60	No
C	55	55	59	60	60	No
D	56	56	60	**61**	60	Yes
E	51	51	55	56	60	No
F	46	46	51	52	60	No
G	48	48	53	53	60	No
H	49	49	54	54	60	No
I	52	52	56	57	60	No
J	53	53	57	57	60	No
R12	51	51	56	56	60	No
R13	51	51	56	56	60	No
R14	52	52	57	57	60	No
R15	50	50	55	55	60	No
R16	52	52	57	57	60	No
R17	53	53	58	58	60	No
R21	53	53	57	57	60	No

The revised predicted A-weighted operational noise levels with a 5 dB low frequency correction factor applied are set out in Tables 12 (Stage 1) and 13 (Stage 2). The revised modelling indicated that with the inclusion of a 5 dB low frequency correction factor, predicted operational noise levels would exceed the project specific noise levels at:

- locations B, C and D in Stage 1 by between 2 and 3 dB(A); and
- locations B, C, D, J, R17 and R21 in Stage 2 by between 1 and 6 dB(A).

The Proponent's noise assessment offered an alternate approach for use in the assessment of low frequency noise when the noise levels are low, since the low frequencies may be below the threshold of hearing levels. Rather than the dB(C)-dB(A) difference approach, the Proponent proposed a noise criteria of L_{eq} 65 dB(C), and a 5 dB correction only to be applied to the measured/predicted levels if the overall noise level is greater than the L_{eq} 65 dB(C). As the overall dB(C) noise levels are not predicted by the Proponent to exceed this level at any sensitive receiver locations, the Proponent stated that the predicted low frequency noise is considered not to be at a level to cause annoyance to residential receptors. The Proponent therefore deemed no adjustment to the A-weighted predicted operational noise is required, however it would undertake discussions with receptors B, C and D with a view to reaching a noise management agreement.

In its submission, the OEH noted that while the predictions in the EA of C-weighted noise levels included estimates down to 20 Hertz, C-weighted levels may be underpredicted if there was significant noise in frequencies lower than 20 Hertz. In addition, the OEH suggested that consideration be given to the imposition of C-weighted noise limits as gas turbines are known to produce low frequency noise emissions.

Table 12: Revised Predicted Adjusted A-weighted Operational Noise Levels with 5 dB(A) Correction Factor – Stage 1

Receptor Location	Predicted Noise Levels (L_{Aeq}) dB(A)				Criterion (L_{Aeq}) dB(A)	Exceedance
	Neutral Met Conditions		Adverse Met Conditions		All Periods	
	Day	Evening / Night	Day	Evening / Night		
A	< 20	< 20	< 20	< 20 (25)	35	No
B	27	29	30	32 (**37**)	35	**Yes**
C	26	28	30	31 (**36**)	35	**Yes**
D	28	29	31	33 (**38**)	35	**Yes**
E	< 20	21	23	24 (30)	35	No
F	< 20	< 20	< 20	< 20(<25)	35	No
G	< 20	< 20	< 20	20 (25)	35	No
H	< 20	< 20	< 20	< 20 (<25)	35	No
I	< 20	< 20	21	22 (27)	35	No
J	23	25	27	29 (34)	35	No
R12	20	22	24	26 (31)	35	No
R13	< 20	21	23	25 (30)	35	No
R14	21	23	25	27 (32)	35	No
R15	< 20	< 20	21	23 (28)	35	No
R16	21	23	25	27 (32)	35	No
R17	23	25	27	29 (34)	35	No
R21	22	24	26	28 (33)	35	No

Table 13: Revised Predicted Adjusted A-weighted Operational Noise Levels with 5 dB(A) Correction Factor – Stage 2

Receptor Location	Predicted Noise Levels (L_{Aeq}) dB(A)				Criterion (L_{Aeq}) dB(A)	Exceedance
	Neutral Met Conditions		Adverse Met Conditions		All Periods	
	Day	Evening / Night	Day	Evening / Night		
A	< 20	< 20	< 20	< 20 (<25)	35	No
B	30	32	33	35 (**40**)	35	**Yes**
C	29	31	32	34 (**39**)	35	**Yes**
D	31	32	34	**36** (**41**)	35	**Yes**
E	22	24	25	27 (32)	35	No
F	< 20	< 20	< 20	20 (25)	35	No
G	< 20	< 20	21	23 (28)	35	No
H	< 20	< 20	< 20	< 20 (<25)	35	No
I	21	22	24	25 (30)	35	No
J	25	28	29	31 (**36**)	35	**Yes**
R12	23	25	27	29 (35)	35	No
R13	22	24	26	28 (33)	35	No
R14	24	26	28	30 (35)	35	No
R15	20	22	24	26 (31)	35	No
R16	24	26	27	29 (34)	35	No
R17	26	28	29	32 (**37**)	35	**Yes**
R21	25	27	29	31 (**36**)	35	**Yes**

Subsequent to this, the Proponent provided the OEH with one-third octave band data for 7FA class turbines as data for F9A Class turbines was not available. Overall dB(A) and dB(C) levels were not provided. Using the available data, the OEH predicted that the dB(C) levels at receptors B, C and D are likely to be 63-64 dB. Further, dB(A) levels at sensitive receiver locations B and D were likely to be 37 dB, indicating a difference of up to 27 dB between the A and C weighted noise levels. Consequently, the OEH proposed that in addition to the 35 dB(A) noise limit, upper limits of 65 dB(C) and 70 dB(C) be applied to the night and day time periods, respectively.

Tonal Noise

In its submission on the EA, the OEH indicated that the Proponent had not demonstrated whether there is a potential for tonality of noise emissions from the power station and therefore a 5 dB(A) penalty may have to be applied to the predicted noise levels. Consequently, as part of its response to submissions, the Proponent provided 1/3 octave band frequency data for a 7FA type turbine running in simple cycle outdoor operation, over centre frequencies 16 kHz to 6 kHz, to the OEH for review. This data is considered to give a more detailed description of the frequency content of the noise than the octave band frequency data utilised in the preparation of the EA and therefore more accurate for the prediction of noise.

Whilst the additional analysis indicated no tonality effects at the closest receptors (B, C and D) for the 7FA type turbine, the OEH has indicated that tonality cannot be discounted for the preferred 9FA type turbine, and therefore a precautionary approach would be to maintain the 5 dB(A) penalty for tonality, should it be present.

The Proponent has indicated that use of the 9FA type turbine is not expected to emit noise containing tonality or impulsiveness. Further, the tender for the manufacture of the turbines would contractually bind the turbine manufacturer to ensuring that the L_{aeq} 35 dB(A) limit, with consideration of tonality, is achieved.

Sleep Disturbance

The emission of instantaneous, short-duration, high-level noise events has the potential to cause sleep disturbance to residents if occurring during night-time hours. The Proponent has stated that there will be no sources that would produce instantaneous or short duration high noise levels. If a turbine begins or ceases operation in the night-time hours, the process is a gradual one, free of instantaneous events without the use of a gas compressor as the mains pressure from the gas line would be adequate.

Further, any repairs or maintenance work would also be scheduled during the daytime period.

Consideration

Construction Noise and Vibration

The Department concurs with the Proponent's assessment that construction of the project is unlikely to pose a significant noise impact to existing receptors due to the distance of the project site from the nearest existing sensitive receivers. However, it is acknowledged that under the worst-case scenario, construction of the gas pipeline would result in a predicted noise level of up to 12 dB(A) above the construction noise management level for the project at five sensitive receivers (D, R12, R13, R14 and R17). The Proponent has advised that the day-time noise exceedances will be expected to occur for no longer than one week whilst construction of the southern portion of the gas pipeline is undertaken. The Department is of the opinion that the level of noise exceedance is acceptable due to the relatively short duration of construction activity in this location.

Greater exceedances (up to 17 dB(A)) of the noise management level have been predicted for the construction of the southern portion of the gas pipeline by the Proponent for the evening and night-time periods. However the Proponent has advised that construction activities would be limited to the day time. In order to ensure that construction noise is limited to the daytime period, the Department has recommended as a condition of approval

restrictions on the hours and days of audible construction to 7:00 am and to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm on Saturdays.

To ensure that construction noise is minimised with the objective of meeting the construction noise management levels for the project, the Department has recommended a condition of approval requiring the Proponent to prepare a Construction Noise and Vibration Management Plan detailing measures for minimising and managing construction noise, and the monitoring of noise. Further, the Department has recommended that the Proponent be required to implement a complaints handling procedure which includes measures for responding to construction noise complaints.

In regards to construction traffic noise, the Department acknowledges that increases in noise levels of 2 dB(A) are predicted to occur at sensitive receivers located adjacent to or nearby the roads to be used by construction traffic. Considering that this level of change is generally not perceptible, the Department is of the opinion that the increase in noise resulting from construction traffic will not adversely impact on the acoustic amenity of sensitive receivers.

Notwithstanding, to allay concerns raised in submissions regarding the construction traffic noise impacts, including those arising from the proposed installation of traffic lights on Warrataw Street, Gunning near the Gunning rail bridge, the Department has recommended that the Construction Noise and Vibration Management Plan include requirements whereby the Proponent shall identify feasible and reasonable measures to manage construction traffic noise impacts and undertake an assessment of construction traffic noise near the Gunning rail bridge. The assessment is to include the identification of feasible and reasonable measures to be implemented where noise levels exceed the applicable noise management level.

In regards to vibration, the Department has recommended a condition of approval prohibiting blasting and driven piling during construction of the project so as to ensure adverse vibration impacts are not experienced at nearby sensitive receivers. Although the Department agrees with the Proponent's conclusion that vibration should not be an issue, to ensure that this is the case, the Department has recommended that the Construction Noise and Vibration Management Plan detail procedures and mitigation measures to minimise any potential vibration impacts.

Operational Noise

The Department is satisfied that the assessment approach undertaken by the Proponent with respect to noise impacts is consistent with the requirements of the *NSW Industrial Noise Policy* (Environment Protection Authority, 2000).

The Proponent has proposed a project specific noise level of 35 dB(A) at sensitive receivers for the day, evening and night-time periods. The Department is of the opinion that such levels are appropriate based on the methodology set out in the *NSW Industrial Noise Policy* and, as such, has recommended a maximum allowable noise limit of 35 dB(A) for the operation of the project. The Department notes that noise levels, under the worst-case scenario, are predicted to comply with the recommended noise limit at all but one sensitive receiver location - D. At this location, the noise level is predicted to be 36 dB(A). Noise levels at location B are predicted to be at the maximum noise limit. To confirm the operational noise levels, particularly in light of the variation in predicted noise impacts since the exhibition of the EA, the Department has recommended a condition of approval requiring the Proponent to undertake an Operational Noise Review to confirm the noise emission performance of the project and assess the noise impacts at sensitive receivers and re-evaluate the Stage 2 noise predictions. If the Review indicates noise levels in excess of the recommended noise limits, it is recommended that the Proponent be required to implement source controls to mitigate noise levels. Further, the Department has also recommended that if noise limits are exceeded at sensitive receivers following the implementation of source controls, the Proponent be required to provide at-receiver mitigation measures, including land acquisition where noise is predicted to exceed the 35 dB(A) noise limit by more than 5 dB(A).

Notwithstanding, as the noise level at sensitive receiver location D has been assessed as exceeding the noise limit, the Department has recommended a condition of approval requiring the Proponent to provide at-receiver mitigation measures, and issue a letter of notification indicating the landowner's eligibility for such measures within 21 days of the project approval.

As demonstrated in the Proponent's noise assessment, operation of the power station would result in the generation of low frequency noise. The application of a 5 dB(A) correction factor (to the revised operational noise levels set out in Tables 12 and 13) to account for the annoying characteristics of low frequency noise would result in noise levels in excess of the project specific noise levels at sensitive receivers B, C and D in Stage 1 and at B, C, D, J, R17 and R21 in Stage 2.

The EPA has advised that alternative approaches to low frequency noise are being investigated. However, they have not sufficiently progressed to an agreed industry standard. Once finalised, it is expected that an Application Note to the *NSW Industrial Noise Policy* will be prepared to guide the assessment of low frequency noise. Discussions have been held between the Department and the EPA Noise Policy Branch regarding the assessment of low frequency noise for the proposed Dalton Power Project. The agreed outcome was that low frequency noise from gas-fired power stations should be regulated on a case-by-case basis until the Application Note to the *NSW Industrial Noise* Policy is finalised by the EPA. Further, it was considered that the C-A weighting plus 5 dB(A) penalty approach as defined in the *NSW Industrial Noise Policy*, was not a good measure of annoyance, and could result in the application of measures that would not improve environmental outcomes.

Consequently, following consultation with the OEH, the Department formed the opinion that the most appropriate criteria for the measurement of noise, and in particular low frequency noise, should be the addition of a dB(C) criteria, rather than the *NSW Industrial Noise Policy* penalty approach. In this respect, the Department has recommended a condition of approval limiting noise levels at the nearest sensitive receivers to 65 dB(C) during the day and 60 dB(C) during the evening and night, in addition to the maximum allowable noise limit of 35 dB(A) during the day, evening and night. The EPA has agreed to this approach which is more stringent than that recommended by the OEH in its response to the Submissions Report.

The Department acknowledges that the results of the more recent modelling for the 9FA turbine predict that the C-weighted criteria would be achieved at all sensitive receivers for Stage 1 of the project with the exception of location D. The predicted C-weighted noise level at this location is 61 dB(C) for Stage 2 indicating a potential exceedance of 1 dB(C) during the evening and night-time periods. The Proponent has advised that the potential for this exceedance would be limited as experience would be gained from the performance of Stage 1 regarding noise levels and effective mitigation measures are available such as controlling noise at the source via the use of best available technology, controlling the transmission of noise through the use of noise barriers, and controlling noise at the receiver.

As previously noted, the Department has recommended a condition of approval that requires the Proponent to investigate and implement at-source mitigation measures to minimise the generation of noise at sensitive receivers where noise levels exceed the noise limits for the project, including C-weighted limits, and implement at-receiver mitigation measures where the limits are still exceeded following implementation of source controls. The recommended measures include land acquisition if the C-weighted noise limit is exceeded by 3 dB(C).

To assess the ongoing compliance of the power station against the recommended operational noise limits, the Department has recommended a condition of approval requiring the Proponent to implement an ongoing operational noise monitoring program. In addition, the Department has recommended that the Proponent be required to re-evaluate the noise predictions for the Stage 2 worst-case scenario following 12 months of operation of Stage 1 using actual noise data collected from operations and on-site meteorological data. Where predictions show that noise levels will exceed the maximum noise limits, the Department has

recommended that the Proponent provide written notice to affected landholders that they are entitled to at-receiver mitigation measures.

Operational noise (tonality)
Although the Proponent claims that the noise emanating from the proposed power station should not contain tonality, the EPA has recommended that a precautionary approach should be taken as the Proponent has not adequately demonstrated whether or not there is a potential for tonality of noise emissions. Consequently, the Department has recommended a condition of approval which requires the Proponent to add a 5 dB(A) penalty to measured noise levels in the event that the noise generated by the power station is found to be substantially tonal, intermittent or impulsive in nature. Should the addition of the correction factor result in noise levels above the recommended noise limits, the Department's conditions regarding noise mitigation at source and at receivers would apply.

Sleep Disturbance
The Proponent has indicated that operation of the power station would not result in sleep disturbance as there would be no sources that produce instantaneous or short duration high noise levels. Nevertheless, to minimise potential impacts associated with start up and shut down processes and their consequent potential for sleep disturbance, the Department has recommended a night-time L_{Amax} noise limit of 45 dB(A) at sensitive receivers. To ensure that sleep disturbance is not an issue, the Department has recommended that the Operational Noise Review included monitoring of L_{Amax} noise levels.

Overall, the Department is satisfied that the operation of the power station will not have a significant adverse impact on the acoustic amenity of sensitive noise receivers provided that the Department's recommended conditions of approval are adopted.

5.2. Air Quality

Issue
Construction Impacts
The Proponent has indicated that during the Stage 1 and Stage 2 construction phases there is potential for dust to be generated as a result of excavation, site grading and vehicle movements. A number of public submissions raised concern over potential dust generation during construction. The Proponent has indicated that dust emissions during construction would be managed through the implementation of standard dust mitigation measures such as wetting of disturbed surfaces, covering of stockpiles and cessation of dust generating activities under adverse wind conditions. Given these measures and the distance to the nearest residential dwelling is approximately 2.3 kilometres, a sufficient buffer zone is considered to exist from the construction area to neighbouring land uses to prevent nuisance dust impacts.

The Proponent has also committed to the temporary sealing of Walshs Road and Loop Road during construction and permanently sealing these roads following the construction of Stage 1 as a means of minimising dust generation.

The potential exists for the emission of dust from the handling and storage of the raw materials associated with the operation of the concrete batching plant. The Proponent has indicated that fugitive emission sources from the batching plant would be managed through covering or enclosure of materials, dampening of raw materials and minimising drop heights at transfer points between conveyors.

Local Operating Impacts
The primary atmospheric pollutants emitted from the turbines would be nitrogen, oxygen, oxides of nitrogen, carbon monoxide, carbon dioxide, water vapour, and low concentrations of sulphur dioxide, particulate matter (PM_{10}) and formaldehyde. The Proponent has assessed the local air quality impacts of the project in accordance with the *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales* (Department of Environment and Conservation, 2005). The scope of the assessment was based on the key pollutants generated by an open-cycle gas turbine power station –

nitrogen dioxide, carbon monoxide, sulphur dioxide, particulate matter and formaldehyde – as these are of principal concern in terms of health impacts.

The modelling assumed that the turbines would operate continuously, under all meteorological conditions. Background air quality data was obtained from Monash (ACT) and Chullora (NSW) as no local data were available. These two sites were considered to have a higher pollution potential (as a function of population, industrial emissions, meteorology and topography), and were therefore considered to provide maximum background concentrations and provide a highly conservative approach in demonstrating compliance with regulatory criteria. Notwithstanding, a number of submissions raised concern over the lack of site-specific air quality background data and the potential for under or over-estimation of pollutant concentrations and their dispersion.

The modelling predicted the worst-case short-term (hourly average) concentrations for nitrogen dioxide, carbon dioxide, sulphur dioxide and formaldehyde, and annual average concentrations for nitrogen dioxide and sulphur dioxide. In addition, 24-hour concentrations were predicted for sulphur dioxide and particulate matter. The results of the modelling for F Class turbines are detailed in Table 14, and indicate that the worst-case emission concentration levels predicted to occur would not exceed the relevant impact assessment criteria (as set out in the *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales*) at any nearby sensitive receptors or Dalton village for all of the modelled air pollutants.

Table 14: Maximum Ground Level Concentration Modelling Results (ug/m^3)

Air Pollutant	Averaging Period	Stage 1 Start up	Stage 1 Operation	Stage 2 Start up	Stage 2 Operation	Background	Maximum Cumulative	NSW DEC (2005) Criteria
NO_2	I hour	46.5	64.6	100.8	150.7	90	240.7	246
	Annual	0.2	0.1	0.3	0.2	37	37.4	62
CO	15 minute	282	25	798	59	6,270	7,987	100,000
	1 hour	214	19	605	45	4,750	6,051	30,000
	8 hour	29	3	64	8	2,880	3,300	10,000
SO_2	10 minute	4.4	6	9.9	14.1	61	75.1	712
	1 hour	3.1	4.2	6.9	9.8	43	52.8	570
	24 hour	0.4	0.2	0.7	0.6	11	11.7	228
	Annual	0.01	0.01	0.02	0.01	3	3.0	60
PM_{10}	24 hour	0.8	0.5	1.4	1.1	45.3	46.9	50
	Annual	0.03	0.01	0.05	0.02	16.9	16.9	30
Formaldehyde	1 hour	1.5	0.1	3.2	0.1	NA	3.2	20

Note: The concentrations are maximum incremental concentrations. The maximum cumulative results are presented for all compounds except formaldehyde which has been assessed on an incremental basis in accordance with the *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales* (Department of Environment and Conservation, 2005).

In regards to nitrogen dioxide, locations to be most affected by incremental increases in the one-hour maximum nitrogen dioxide concentration were predicted to occur some 10 kilometres southwest and 30 kilometres west of the power station. In these locations, maximum cumulative concentrations are predicted to approach the impact assessment criteria. It should be acknowledged that the result has been calculated using conservative assumptions (in particular, high background concentrations).

The modelling results showed that the maximum cumulative hourly predicted concentrations of sulphur dioxide and carbon monoxide at sensitive receivers were well below the impact

assessment criteria. Although the 24-hour maximum cumulative concentration for particulate matter approaches the impact assessment criteria, this is due to the high assumed background level.

Although the modelling results predict that pollutant concentration levels would be below the impact assessment criteria, a number of public submissions raised concern over the predicted emission levels and their potential effect on the receivers in Dalton village and its surrounds, including students at the Dalton Public School.

Photochemical Smog and Regional Impacts

The project would be located over 100 kilometres from the south-western extremities of the Sydney airshed, and combined with the relatively small scale of emissions and intermittent operation of the power station, the potential for photochemical smog and/or interregional impacts is considered to be negligible. Consequently, regional scale photochemical modelling was not undertaken. The OEH accepted this position.

Consideration

Construction

The Proponent has committed to implementing standard on-site measures (as detailed above) to minimise the potential for fugitive dust emissions during construction, and incorporating these measures into the Construction Environmental Management Plan (CEMP) for the project. The Department notes that the proposed measures are consistent with other projects of this scale. Notwithstanding, it has recommended conditions of approval requiring the Proponent to:

- undertake all works with the objective of preventing visible dust emissions;
- implement control measures, including the cessation of works, in the event of visible dust emissions, including traffic-generated dust and dust emissions associated with concrete batching;
- detail the measures to manage dust in a Construction Air Quality Management Plan, including a monitoring program to assess compliance with identified dust management objectives; and
- implement a Construction and Operational Complaints Management System which records information on all complaints received and the means by which they were addressed. This includes complaints relating to dust.

In regards to concerns raised over the lack of background air quality data, the Proponent has committed to the preparation of an Air Quality Monitoring Plan that would detail the air quality monitoring strategy to be implemented during construction.

The Department has also recommended a condition of approval requiring the Proponent to temporarily seal Walshs Road and Loop Road prior to the commencement of construction and permanently seal these roads following the construction of Stage 1, with the aim of minimising dust generation (and ensuring safe access).

The Department considers that provided the Proponent's mitigation measures are implemented and the recommended conditions of approval adopted, the project can be managed to minimise fugitive dust emissions, and minimise impacts on air quality which was raised as a concern in public submissions.

Operation

The Department is of the opinion that the Proponent has undertaken an adequate assessment of the potential impacts of the project on local air quality. Whilst ideally the ambient monitoring data used to generate background concentrations of pollutants should be collected at a project site, or within the local region, the Proponent has used background data obtained from Monash (ACT) and Chullora (NSW). The Department concurs with the Proponent that the background data used provides for maximum cumulative concentrations as it is from areas that are developed (urban, residential and industrial areas) and hence characterised by relatively high pollution concentrations. This provides for a conservative modelling approach and is appropriate for the purposes of demonstrating compliance with

the impact assessment criteria set out in *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales*.

In this regard, the Department notes that although nitrogen dioxide concentrations are not expected to exceed the impact assessment criteria, the modelling predicts maximum cumulative concentrations approaching the criteria. This is due to the assumed high background concentration of 90 micrograms per cubic metre for nitrogen dioxide.

To ensure that emissions of nitrogen dioxide remain below the impact assessment criteria, the Proponent has committed to undertaking constant emission monitoring (i.e. real time). This commitment has been reinforced through the Department's recommended conditions of approval and addresses the request in public submissions for the Proponent to monitor emissions during the operation of the power station. The system will continuously measure the concentration of nitrogen dioxide (and other parameters) at each of the turbine stack discharge points. The Department has also recommended limits for nitrogen dioxide at each turbine stack discharge point, in accordance with the recommendation of the OEH.

The Department's recommended conditions of approval also require the Proponent to undertake a program of air quality performance verification using actual emission data and on-site meteorological data. Where modelling indicates that the point source emissions of nitrogen dioxide (or other pollutants) or predicted ground level concentration limits are being exceeded, the Proponent is to provide details of the remedial measures to be implemented to reduce point source emissions or ground-level concentrations to levels no greater than predicted in the EA and to meet impact assessment criteria.

The air quality modelling undertaken by the Proponent used meteorological data from Goulburn Airport. The lack of site-specific data was raised as a concern in public submissions. To overcome this concern and provide a more accurate prediction of the dispersion of pollutants, the Department has recommended that the Proponent install a meteorological station on site within one month of the project being approved, and that the data collected from the station be used in the air quality performance verification program.

The air quality assessment was based on a stack height of 46 metres above ground level. The Proponent has since advised that the stacks would be no more than 31 metres high. The Proponent has advised that the effect of the change in stack height would have only a very minor (if not negligible) effect on the dispersion of emissions and consequent impacts on air quality. This would be confirmed through the air quality performance verification program.

The Department has also adopted the recommendation of the OEH to include a condition of approval which requires the Proponent to establish an annual average nitrogen oxides emission benchmark for the turbine stacks as a means of limiting nitrogen oxide emissions. If the benchmark is exceeded, the Proponent is required to prepare and submit a report to the Director-General (and OEH) describing the measures to be implemented to reduce emissions of nitrogen oxides.

The Department is satisfied that the emissions of other pollutants generated by the power station are unlikely to adversely affect the air quality of the surrounding area (local and regional) to any significant degree, as the worst-case emission concentration levels are not predicted to exceed the air quality impact assessment criteria established for the protection of the environment and human health. Consequently, the recommended conditions of approval do not require monitoring of particulate matter, carbon dioxide, sulphur oxides and formaldehyde. This is consistent with the advice provided by the OEH which indicated that given the only permitted fuel for the turbines will be natural gas, predicted emissions of particulate matter, carbon dioxide and sulphur oxides are considered to be negligible and so no requirement for these concentrations to be monitored is recommended.

The air quality impact assessment only took into consideration the use of natural gas as a fuel. The use of diesel in the event of failure of the gas supply was not assessed. Pollutant emission concentrations from diesel-fired turbines are higher than those from gas-fired

turbines. Consequently, the Department has recommended a condition of approval stipulating that natural gas is the only fuel approved for use at the power station.

The Department is satisfied that with the implementation of the recommended conditions of approval and the Proponent's commitments, the air quality impacts of the project can be managed in compliance with regulatory standards.

5.3. Water Management

For efficient operation, the power station will require water for gas turbine inlet evaporative cooling (or air densification), especially during warmer weather. A secure water supply is also required for fire fighting and some utility (e.g. turbine compressor wash water and dilution of pre-treatment dosing chemicals) and domestic uses (e.g. drinking, wash basins and toilets).

An assessment of water demands for the project was undertaken as part of the EA and indicated that the maximum annual volume of water required for the operation of the power station with F Class turbines was 22.6 megalitres (refer Table 15). However, the assessment did not provide a definitive water supply source. Rather, it identified a range of potential water sources including water from the Upper Lachlan Council water supply, extraction from the Lachlan River, groundwater, delivery of water to the site by trucks, recycled water (treated effluent), and water harvesting and recycling on site.

Table 15: Water Demands

Type of Water Use	Annual Volume of Water Use (megalitres) Stage 1	Annual Volume of Water Use (megalitres) Stage 2
Evaporative cooling	10.0	20.0
Potable water	0.2	0.3
Gas turbine compressor wash	0.4	0.8
Other utility water (e.g. fire)	1	1.5
Annual Water Demand	**11.6**	**22.6**

Consequent to concerns raised by government agencies and in public submissions regarding the lack of a definitive water supply source, and impacts that supply would have on existing water users, the Proponent undertook further investigations into water supply options as part of its response to submissions. Subsequent to these investigations, the Proponent advised that groundwater would be used as the supply for process water. In addition, based on refinements to the water requirements of the project and the type of turbine to be used, the Proponent has adopted a maximum water use volume of 12.5 megalitres per annum for Stage 1 and 25 megalitres total per annum for Stage 2.

As part of the investigations undertaken in response to submissions, the Proponent undertook a hydrogeological assessment of the on-site extraction of groundwater. This assessment included drawdown and recovery pumping tests. The hydrogeological assessment concluded that the bores are capable of sustaining a combined annual groundwater extraction of 60 megalitres per annum, supported by a significant level of available drawdown, and multiple aquifers with an extensive recharge zone. Further, impacts to water levels were not identified in user bores within a four-kilometre radius of the site during or immediately after the testing. In fact, monitoring data demonstrated no drawdown impacts beyond approximately 380 metres from the production bores. Consequently, the Proponent has concluded that extraction of 25 megalitres of groundwater per annum is not expected to result in significant measurable impact on groundwater resources and adjoining groundwater users.

An Order issued under Section 113A of the *Water Act 1912* and dated 22 December 2008 places an embargo on any new applications for a Part 5 water licence (including groundwater) on waters in the vicinity of the project site. However, the embargo does not prevent an application for a licence for a bore to produce water that has been obtained through the transfer of a volumetric entitlement. The Proponent has commenced discussions with existing licence holders to permanently transfer unused groundwater allocations so that it can apply for water access and use licences.

A small amount of water would still be required for turbine compressor washing and domestic uses (kitchen and amenities) and this would be supplied by trucking water to the site. The volume to be trucked would be in the order of 200 to 300 kilolitres per annum, which would equate to approximately 8-12 truck movements per annum. Both the Gunning and Dalton potable water supplies would be suitable for these needs.

Consideration

The Department considers that the Proponent, through the preparation of the additional investigations included in its Submissions Report and additional consultations with the NoW, has undertaken an adequate assessment with respect to the source and quantity of water for the project.

The Proponent has significantly reduced the potential water requirements of the project from a potential 105 megalitres per annum by removing the use of the E-Class turbines and the associated installation of high fogging required for such turbines. Although the proposed F Class turbines can operate without evaporative cooling, this will be utilised to improve turbine efficiency (refer Section 2.1) and is the major water use at the power station.

The Proponent will no longer be placing significant demands on the Dalton or Gunning potable water supplies as the majority of water for the operation of the power station will be sourced via groundwater extraction. Sourcing from potable water supplies was a major concern raised in submissions. Although a small amount of potable water is proposed to be trucked to the site from one of these water supply sources, the volume will be limited to a maximum of 300 kilolitres per annum. The Department acknowledges that the use of groundwater will significantly reduce the number of truck movements to the site during the operation of the project, hence allaying some concerns raised in submissions regarding traffic impacts associated with this activity.

The Proponent has advised that potable water would also be used for turbine compressor washing. However, groundwater could be used depending on its specific ion chemistry following treatment. This would be further investigated during the detailed design phase. Groundwater would be used for fire fighting purposes.

To ensure that process water is only obtained from groundwater extraction and not local town water (or other) supplies, the Department has recommended conditions of approval requiring process water to be sourced from groundwater bores located on the power station site, and limiting the trucking of water to 300 kilolitres per annum.

In regards to potential impacts associated with the extraction of groundwater, the NoW has completed a review of the hydrogeological assessment, and advised that the requirement of 25 megalitres per annum can be sourced via groundwater extraction from on-site bores provided water quality and quantity remain consistent with the results of the 24 hour pumping test undertaken by the Proponent. In addition, the NoW does not anticipate significant impacts to the Lachlan River arising from the extraction of groundwater.

Notwithstanding, to minimise potential impacts on groundwater resources, the Department has recommended a condition of approval requiring the Proponent to prepare an Operational Groundwater Management Plan in consultation with the NoW. The Plan is to detail measures to monitor and manage impacts of groundwater extraction on local groundwater quality and hydrology, including the measures outlined in the hydrogeological assessment. These include detailing "trigger levels" and actions to be taken if threshold levels are reached or exceeded, including cease-to-pump conditions. The importance of limiting drawdown by

excessive pumping is acknowledged as important in maintaining water quality consistency and pumping efficiency and ensuring that the utilisation of groundwater for the project will be managed to protect the groundwater resource and limit interference with existing or future bore users.

The Department has also recommended that the Proponent prepare a water balance detailing water sources, consumption volumes and uses, domestic and operational wastewater volumes generated on site, volumes of wastewater reused on site and the nature of the reuse operations, and wastewater volumes disposed of offsite. This will ensure that all water sources (and wastewaters) are managed effectively, and water losses minimised.

To assist in ensuring the long-term sustainable management of groundwater resources, the Proponent has committed to the long-term monitoring of groundwater water levels. The Department has reinforced this commitment through the recommended conditions of approval which require the Proponent to undertake ongoing monitoring of groundwater quality, depth and flow.

The Department is of the opinion that provided the Proponent implements the nominated commitments and the Department's recommended management measures defined in the conditions of approval, the operation of the project should avoid significant impacts on water resources.

5.4. Traffic and Transport

Construction

Construction of the project would involve the mobilisation and demobilisation of construction plant and equipment to the project site and the delivery of materials. This would involve heavy vehicles accessing the site predominantly from the east off the Hume Highway, via Collector Road, Gundaroo Street, Old Hume Highway, Warrataw Street, Dalton Road, Loop Road and Walshs Road, with direct access to the site via a 1.9 kilometre newly constructed road off Walshs Road (see Figures 8 and 9). The route from the west would be via the Hume Highway, Gundaroo Road, Old Hume Highway, Grovenor Street, Warrataw Street, Dalton Road, Loop Road and Walshs Road.

The Proponent has proposed an alternative route for over-dimensional / over-mass sized loads. This route would utilise Gundaroo Road, the Old Hume Highway and Grovenor Street and require crossing of the railway line by creating a low-level crossing to the west of the existing rail bridge. The Proponent has advised that it is likely that a temporary layby would be created in the town of Gunning along the route. The over-dimensional /over-mass sized vehicles would wait in the layby whilst waiting for permission from the railway authority to allow access over the level crossing during suitable possession times. As such, the main streets in the town of Gunning would be bypassed.

The estimated existing average weekday traffic flows on local roads that would be used by construction traffic are:

- Walshs Road - 23 vehicle movements;
- Dalton Road - 287 vehicle movements;
- Warrataw Street - 230 movements;
- Collector Road - 543 movements; and
- Hume Street - 710 vehicle movements.

Figure 8: Proposed Vehicle Access Through Gunning

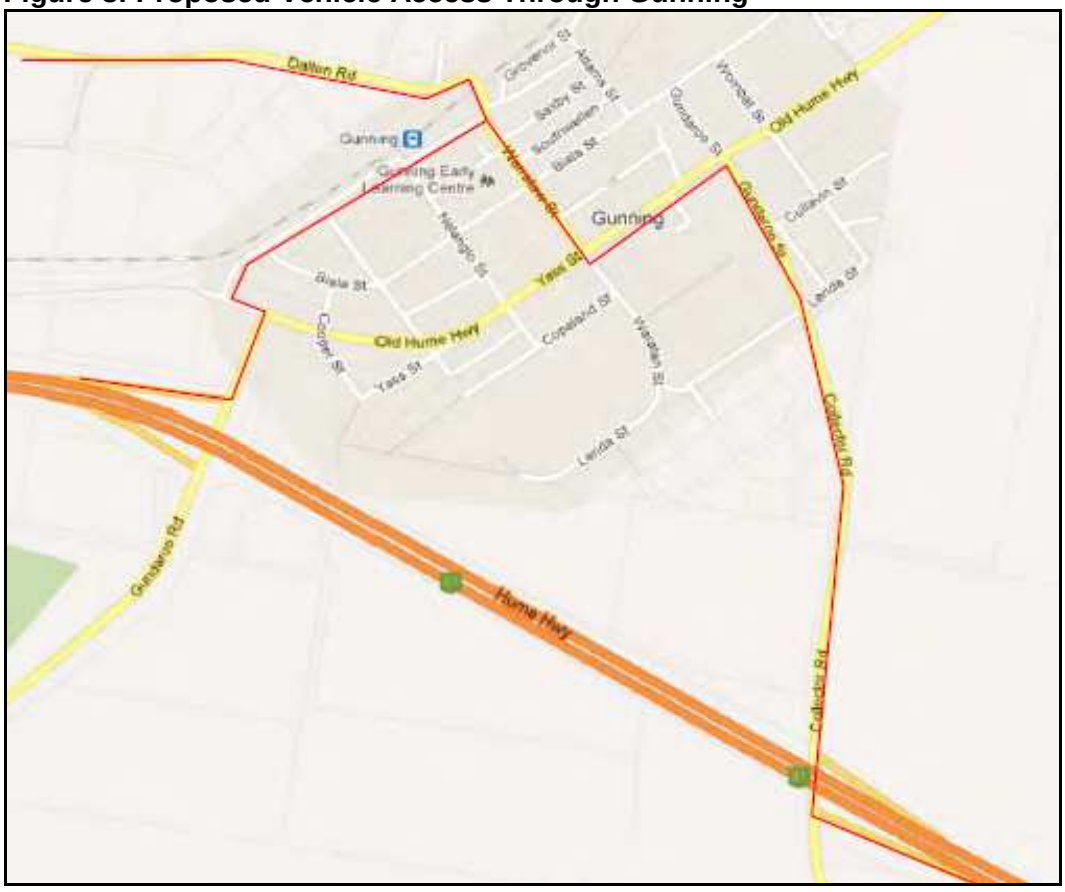
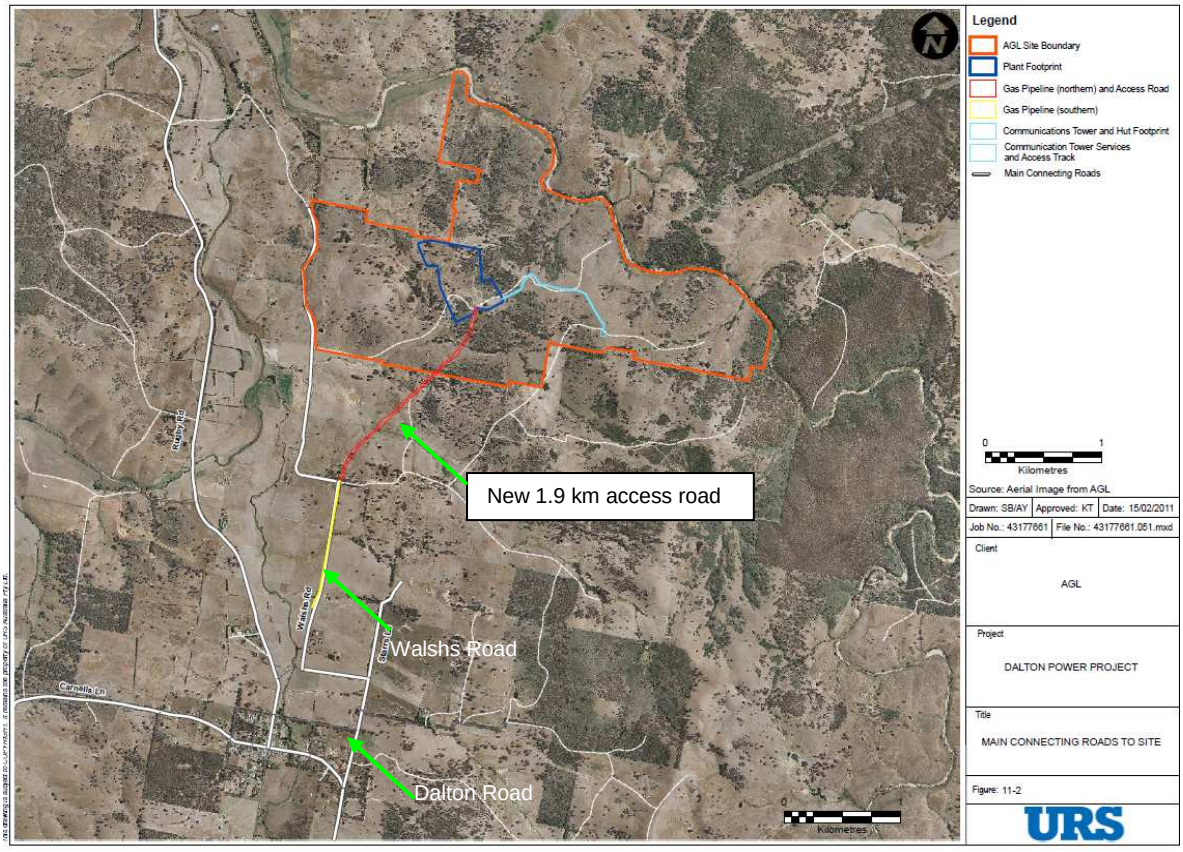


Figure 9: Site Access



The Proponent estimates that there would be approximately 4,600 truck deliveries of construction equipment and materials over the course of construction of the project. The average number of heavy vehicle movements per day during each construction stage would be 12, with an average 28 light vehicle movements per day. Typical peak hourly construction workforce traffic generation is estimated to be 70 vehicle trips. Once workers have arrived on site, the vehicles would remain for the day. The EA estimated a peak construction traffic volume of 160 vehicle movements, of which 18 vehicle movements would be heavy vehicles. During times of major concrete pours, estimated worst-case traffic volumes would be 190 vehicle movements which includes 48 heavy vehicle movements (of which 30 movements would be associated with deliveries of materials for major concrete pours).

In regards to the delivery of materials to the concrete batching plant, the Proponent estimated an average of eight semitrailer deliveries per week (or 1.6 truck movements per day). Subsequent to this information provided in the Submissions Report, the Proponent has advised that, under a worst-case scenario, the total number of truck deliveries would be 15 per day. The worst-case traffic impacts would be associated with scheduled large concrete pour events (up to 500 cubic metres) and would likely be required eight times during the Stage 1 construction period. Each pour would typically be completed within six to seven hours.

A total of 24 over-dimensional / over-mass escorted truck convoys would occur throughout the construction phase. The over-dimensional and/or over-mass sized convoys would consist largely of pre-assembled gas turbines, generators and transformer units and assume six convoys of up to four over-dimensional / over-mass vehicles towing one multi-wheel transport unit as the maximum for both Stages 1 and 2.

A traffic impact assessment was undertaken by the Proponent to assess the construction (and operational) traffic impacts of the proposal on the surrounding road network and access arrangements to the power station site. The Proponent's assessment concluded that the road network is capable of accommodating the projected vehicle movements during the construction (and operation) of the project.

Conditions within a traffic stream (including for example, speed, travel time and driver manoeuvrability) are defined in terms of "Level of Service". There are five Levels of Service, designated from A to E, relevant to rural local roads with Level of Service A representing the best operating condition and Level of Service E, the worst. The Proponent's assessment concluded that the level of service along the roads and at key intersections that would be utilised by construction traffic would remain the same, which are all currently at A.

The Proponent has indicated that the majority of heavy plant items would be transported from Port Kembla during the construction stage. No improvements or temporary upgrades of the State road network are envisaged for the route between Port Kembla and Gunning. However, the Proponent has advised that works may be required between Gunning and the project site to accommodate over-dimensional / over-mass sized vehicles. Potential constraints include:

- Hume Highway crossing of Paddy's River at Marulan;
- Gunning rail bridge; and
- 90 degree corners and floodway along Walshs Road, Dalton.

The Proponent has advised that remedial options to overcome these constraints would be determined during the detailed design phase in consultation with the Roads and Maritime Services and Upper Lachlan Shire Council. Trimming of trees within the road verges would also likely occur along certain lengths of the route used by over-dimensional / over-mass sized vehicles.

A number of public submissions raised concern over potential construction traffic impacts, in particular the traffic (and associated noise – refer Section 5.1) impacts of trucks utilising local roads, safety implications arising from heavy and over-dimensional and over-mass sized

vehicle movements on local roads and through Gunning, and the need for local roads to be upgraded to accommodate construction traffic.

Operation

The operational traffic associated with the project would be limited to occasional deliveries, 8-12 water truck deliveries per annum, and up to 20 vehicle movements per day associated with operational staff. As such, operation of the power station would not have a significant impact on the local road network.

Major maintenance of the power plant would only be expected to occur once every three years and require up to 100 personnel for a four to eight week period.

The Proponent's traffic assessment concluded that the level of service for the local traffic network would not be affected by operational and maintenance traffic associated with the project and would remain at A.

Consideration

Construction

The Proponent's traffic impact assessment has indicated that the estimated average daily traffic flow during peak construction would be 160 vehicle movements. Operation of the concrete batching plant would increase the estimated average by 30 movements, under the worst-case scenario.

The traffic impact assessment undertaken by the Proponent indicated that, even with the increase in traffic volumes on Walshs Road, Dalton Road and Warrataw Street, construction traffic would not affect the current Level of Service of the these roads. The Proponent has also confirmed that the additional traffic movements associated with the concrete batching plant would not impact on the Level of Service. Nevertheless, the local community has indicated considerable concern over construction traffic-related impacts, as expressed in the public submissions on the project.

Although the increase in traffic will not impact on the Level of Service, the Department acknowledges that an increase in vehicle movements, particularly heavy vehicles, has the potential to impact on the safety and operation of the traffic system, the safety of pedestrians and cyclists, and condition of the roads if not managed appropriately. To mitigate potential impacts, the Proponent has included a commitment to consult with the relevant road authorities during the detailed design phase regarding haulage routes and prepare and implement a Traffic Management Plan. Notwithstanding, the Department has recommended a condition of approval requiring the Proponent to prepare and implement a Construction Traffic and Access Management Plan. The Plan is to include details on construction traffic volumes and haulage routes and the management measures that would be implemented to minimise construction traffic-related impacts including traffic control measures, restrictions on haulage routes, responses to construction traffic incidents and procedures for notifying the public in regards to road modifications (e.g. upgrades, detours or part road closures).

The Proponent has indicated that a key issue associated with the proposed haulage routes is increased traffic along Grovenor Street, Old Hume Highway through Gunning, and Loop Road due to the proximity of local schools and children in the nearby area. The Gunning Primary School is located in Yass Street, Gunning and the Gunning Early Learning Centre is in Biala Street, near Warrataw Street. To minimise potential impacts to pedestrian safety, the Proponent has advised that construction traffic routes will avoid Yass Street. Further, the Proponent has proposed that bulk deliveries would occur outside of periods when the area is occupied by children. To ensure that these measures are implemented, the Department has recommended conditions of approval which:

- prohibit the movement of construction traffic along Yass Street, Gunning; and
- require the Proponent to ensure that heavy vehicle movements through Gunning are outside the morning and afternoon school peak periods, and outline the measures that will be implemented to ensure this in the Construction Traffic and Access Management Plan for the project.

To ensure safe pedestrian and cycle access, the Department's recommended conditions of approval also require the Proponent to identify the measures that would be implemented to ensure safe passage by pedestrians and cyclists in Gunning in the Construction Traffic and Access Management Plan for the project.

The Proponent's traffic impact assessment only considered access to the project site via the township of Gunning. No assessment was undertaken in regards to accessing the project site from Dalton. Consequently, the recommended conditions of approval prohibit access to the site via Jerrawa and Coolaie Roads or Walshs Road west of the new access road to the project site.

The Upper Lachlan Shire Council raised concern in regards to the widths of roads over crests and around curves and the crossing of the Gunning rail bridge by construction traffic as this is relatively narrow. The RTA also raised the issue of the Gunning rail bridge as a potential constraint along with the Hume Highway Crossing of Paddy's River at Marulan. To ensure that these issues are resolved prior to the commencement of construction, the Department has recommended a condition of approval requiring that the Construction Traffic and Access Management Plan detail the measures that would be implemented to ensure the safe crossing of these structures by construction traffic and other road users, and manage potential traffic conflicts.

The Department has also recommended that the Construction Traffic and Access Management Plan assess alternative options to construction traffic traversing through the centre of Gunning as a means of overcoming the constraints identified with the Gunning Rail Bridge and potential impacts on the safety of pedestrians.

The proposed haulage route for over-dimensional / over-mass sized loads presents a number of constraints including, access arrangements from the Hume Highway to Gundaroo Road, creation of a new low-level rail crossing, and establishment of a layby area in Gunning to accommodate over-dimensional / over-mass vehicles waiting to cross the railway line at Gunning. No details are available regarding the exact location or dimensions of the layby and low-level rail crossing. Consequently, the Department has recommended a condition of approval requiring this information to be included in the Construction Traffic Access and Management Plan, including details on the how the crossing would be managed to ensure it is not accessed by other traffic, and removal of the crossing and layby area once they are no longer required for Stage 1 haulage. The Department has also recommended that the Proponent be required to liaise with the relevant road and rail authorities in the design of the crossing and layby area.

In regards to over-dimensional / over-mass sized vehicles, the Department has also recommended that the Proponent assess whether the roads to be used can accommodate the vehicles. Where modifications or improvements to the road(s) are required, these shall be implemented in consultation with the relevant road authority prior to the commencement of construction, and would require further assessment and approval if not consistent with the project approval.

The Department also acknowledges that the movement of construction vehicles to and from the site has the potential to generate noise. The Department's consideration of this issue has been addressed in Section 5.1.

The Department acknowledges that the use of local roads by construction traffic could result in their dilapidation. As such, the Department has recommended a condition of approval for road dilapidation reports to be prepared and for the Proponent to restore any damage. The Department has also recommended that the Proponent be required to repair any road pavement failures arising from construction traffic movements in accordance with the relevant road authority's specifications no later than 48 hours following notification by the authority, to ensure that the safety of other road users is not compromised.

The Department has also recommended a condition of approval requiring the Proponent to temporarily seal Walshs Road from the intersection of Loop Road to the proposed entrance

of the power station site, and Loop Road from the intersection of Gunning/Dalton Road to the intersection of Bevendale Road prior to use of the roads by construction traffic, and for these roads to be permanently sealed upon completion of construction of Stage 1. This will have the dual benefit of reducing potential dust emissions and ensuring safe, all-weather access to the power station site.

A concern raised in the submissions was clearing of the vegetation along haulage routes to accommodate over-dimensional / over-mass sized vehicles. The Proponent has advised that haulage would not require the clearing of vegetation. However, some tree trimming may be required along the local road network between Gunning and Dalton. To ensure only trimming takes place, the Department has recommended a condition of approval which prevents the clearing of vegetation along the local road network between Gunning and Dalton.

Although the Proponent is yet to finalise the construction traffic routes and any measures that may be required to safely navigate over bridges and crossings as well as manage conflicts between construction traffic and other road users, the Department is of the opinion that construction traffic could adequately access the site subject to the implementation of management measures. The Department's recommended conditions of approval adequately require for these matters to be addressed and appropriate management measures resolved and implemented prior to the commencement of construction. Further, implementation of the recommended conditions of approval will minimise the potential for construction traffic to have an unacceptable level of impact on the safety and operation of the road network and on the safety of pedestrians and other road users.

Operation

The Department acknowledges that traffic volumes associated with the day-to-day operation of the project would be minor and easily accommodated within the capacity of the existing local road network. Further, the Department notes that the Level of Service would remain at 'A' for all local roads used to access the project site during operations, including periods of major maintenance. Consequent to the minimal potential for significant adverse operational traffic impacts to arise, the only condition of approval recommended by the Department is for the Proponent to detail the measures to monitor and manage operational traffic and access in the Operation Environmental Management Plan (OEMP) for the project.

5.5. Visual Impact

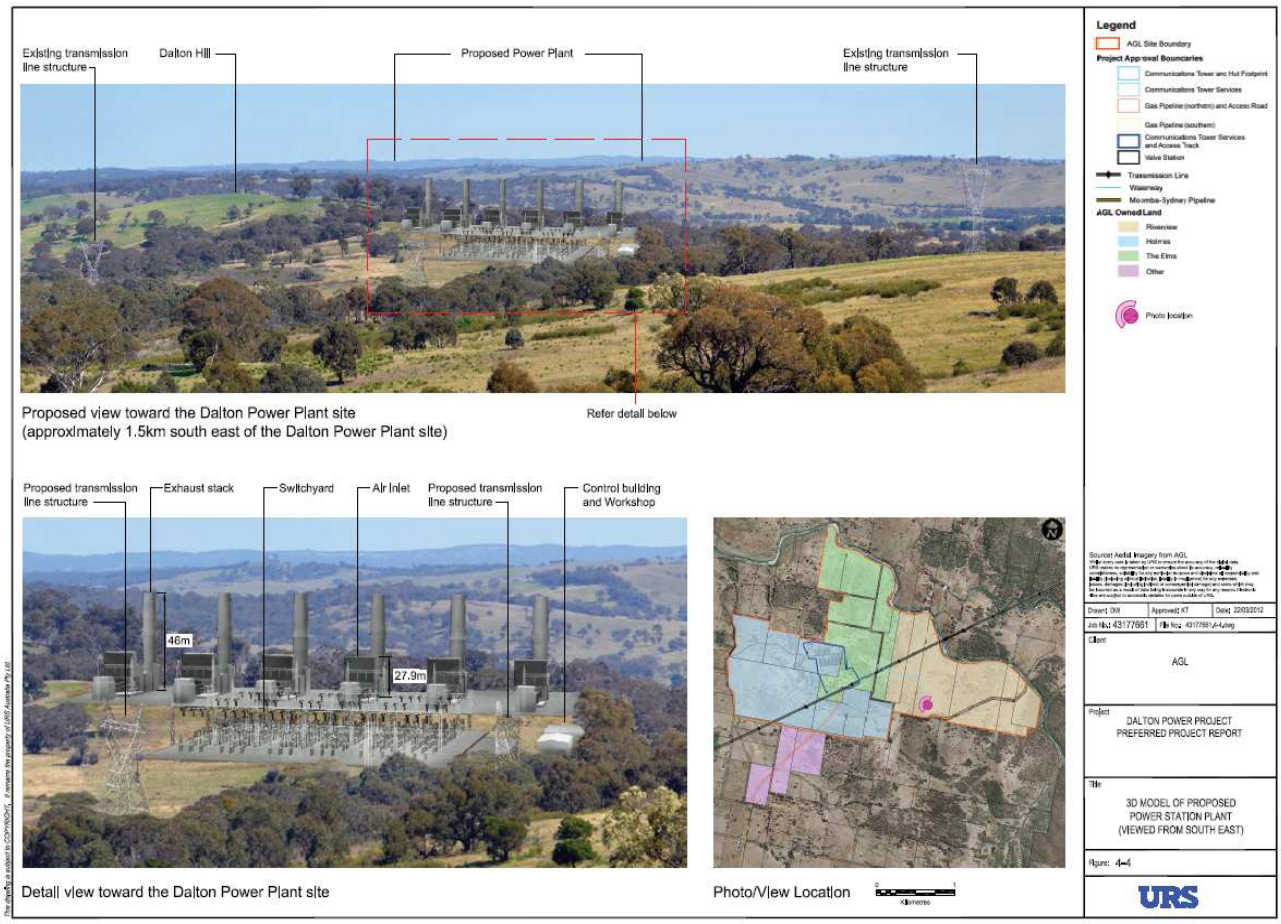
The landscape surrounding the project site is predominantly rural in nature and generally cleared for arable and livestock production, although timbered areas have been retained along a number of gullies and on surrounding hilltops and ridge lines. The power station would be located on a saddle between a north-south ridgeline extending to the west of the Lachlan River and a small hill rising to around 615 metres Australian Height Datum (AHD) to the south west of the site.

Although the surrounding landscape contains a number of constructed elements that contribute to the local visual character, including a 330 kilovolt transmission line, local roads and access tracks, and agricultural structures, a number of public submissions expressed concern that the project is of an industrial appearance and as such conflicts with the existing rural landscape.

Structures with the potential to impact on the visual environment include the building housing the gas turbines and ancillary plant, the high voltage switchyard, gas receiving station, water tanks, control building, and communications tower. The most visually prominent structures would be the exhaust stacks which are the tallest component of the power station and the 60 metre high communications tower supporting antenna dishes. The proposed valve station would be setback approximately 25 metres from Walshs Road and therefore has the potential to impact on visual amenity. One or two additional electrical transmission towers would also be constructed within the existing 330 kilovolt transmission line easement.

The Proponent undertook a visual assessment of the project as part of the EA to establish the visual impact of the project. This assessment was based on a worst-case scenario with stack heights at 46 metres above ground level. The assessment considered both the degree of visual modification resulting from the construction of the project and the visual sensitivity of the surrounding areas, including rural residences and local roads. In addition, visual simulations were developed to present the possible visibility of the project from potential view locations. Further visual analysis was undertaken in response to issues raised in submissions regarding the lack of elevation plans and images of the project. This included preparation of a 3D model of the power station within the landscape, and the preparation of elevation plans and additional photomontages which were presented in the Submissions Report. Figure 10 illustrates proposed views of the project with 46 metre high stacks, noting that these are now approximately 31 metres high.

Figure 10: Proposed Views of the Dalton Power Station



The visual assessment included the preparation of a visibility matrix for 34 residential view locations located within 10 kilometres of the proposed project site. The matrix addressed the potential visual impact of the power station, communication tower and valve station based on the relative number of viewers, distance from the project elements, estimated period of view and viewer sensitivity. According to the Proponent, the majority of the power station would be obscured from view from surrounding receptors by the undulating nature of the terrain and existing vegetation. However, the mid to upper portion of the stacks (at 46 metres high) would be visible from a number of receptors and surrounding vantage points. The communications tower would be visible from most locations, and the valve station would be visible from Walshs Road and surrounding receptors. However, the valve station is unlikely to result in significant visual impacts due to its location within an area of low density population as well as the small number of motorists travelling along Walshs Road on a daily basis.

The Proponent's assessment for each of the three components concluded the following:

- power station – nil visibility rating for 16 of the 34 view locations and a low visibility for 18;
- communications tower - nil visibility rating for 15 of the 34 view locations and a low visibility rating for 19 view locations; and
- valve station – nil visibility rating for 22 of the 34 view locations and a low visibility rating for 12 of the view locations.

Consequently, the Proponent concluded that there are unlikely to be any significant views towards the power station from local roads or access tracks. Views are likely to be restricted to portions of the exhaust stacks and would be generally for a short duration where visible. In addition, the access road, control building, ancillary infrastructure and gas pipeline would generally not be visible from most view locations.

Based on the outcome of the visual assessment, the Proponent concluded that given the extent and combination of the existing and cultural character surrounding the project, the capability of the landscape to absorb the key components of the project is high and as such the overall potential visual impact of the project is assessed as low. Further, the Proponent argues that given the significant buffer separating the power station from surrounding landowners, visual impacts would be limited. Nevertheless, as indicated in submissions, a number of members of the public do not agree with the Proponent's conclusion and believe that the power station would be obtrusive and adversely impact upon their visual amenity.

A number of the public submissions also raised concern over night lighting and sun glare from the exhaust stacks and other elements of the project, siting examples of other power stations in NSW where this has resulted.

In regards to the visibility of plumes, the Proponent has advised that these would not be visible during the operation of the power station. The nature of the emissions from open-cycle gas turbines are such that the plumes emitted are extremely hot and fast. The exhaust moisture content is also lower than for traditional combustion sources due to the relatively high amount of excess air present in the combustion process. These factors collectively mean that moisture within the plume is unlikely to condense into a visible vapour in the vicinity of the power station. As such, only a heat haze would potentially be visible.

Consideration

The Department has assessed the visual impact assessment undertaken by the Proponent as part of the EA and Submissions Report and considers that an adequate level of assessment has been undertaken.

At its closest point, the power station is located approximately 2.3 kilometres from the closest visual receptor, which combined with topography, results in the majority of the power station being largely obscured from view. The communications tower is approximately 2.1 kilometres from the closest visual receptor, whilst the valve station is approximately 290 metres from the closest visual receptor. Based on the analysis provided in the EA (including the additional assessment undertaken for the Submissions Report), the Department believes that the visual impact of the power station and associated infrastructure on the surrounding receptors would not be an impediment to approval. Notwithstanding, the Department acknowledges the concern raised in submissions regarding the perceived impact that the project would have on the visual amenity of residents, in particular the exhaust stacks.

The Department notes that the mid to upper portion of the exhaust stacks would be visible from multiple receptors and vantage points located largely north-west to south of the site if constructed to a maximum stack height of 46 metres (approximately 621 Australian Height Datum). Since the exhibition of the EA, the Proponent has advised that lower stacks could and would be constructed to minimise the visual impact of the stacks on visual receptors. To ensure that this commitment is implemented, the Department has recommended a condition limiting the height of the stacks to no more than 606 metres Australian Height Datum (approximately 31 metres above ground level). This equates to 15 metres less than the

maximum stack height proposed in the EA. Figure 11 provides a 3D image of the power station with reduced stack heights. Figure 12 shows a comparison of the view from approximately 4.9 kilometres from the power station under both stack height scenarios. As illustrated by the figures, the reduced stack height would significantly lessen the visual impact of the project.

In response to the concerns raised in submissions, the Department has recommended a condition of approval enabling owners of residences or businesses located within five kilometres of the project who have views of any elements of the power station to request landscaping measures on their property. The landscaping works would be undertaken at the cost of the Proponent and should include advanced plantings. This condition is in keeping with the Proponent's commitment to minimise the impact of views towards the power station through establishing screen planting at affected visual receptors.

Figure 11: 3D Image of Power Station with Reduced Stack Height

The Department has also recommended that the Proponent prepare and implement a Design and Landscape Plan for the project in consultation with the Upper Lachlan Shire Council and the community. The Plan would identify the design objectives and principles, describe the design features and built elements of the project, detail the design measures to be implemented to minimise the visual impact of the project, and detail the proposed landscaping measures to be employed both at the power station and on visual receptors' properties to reduce the visibility of the power station.

The Proponent has committed to a number of visual amenity mitigation measures to further reduce the impact of the power station on local visual amenity including:

- the use of building materials and treatments that would minimise the potential contrast between the natural landscape and the facility. Materials would generally be dark in tone and where possible non-reflective;
- lighting would avoid direct line of sight towards homesteads beyond the site;
- top of the stacks would not have lighting unless required for aviation safety;
- large floodlights not to be used other than for emergency lighting; and
- security lighting would not spill onto neighbouring residences and would be achieved through the use of down lights and motion sensor lighting.

The Department has reinforced these measures through recommended conditions of approval to address the concerns raised in public submissions regarding lighting impacts and materials reflection.

In regards to the valve station, the Department concurs with the Proponent's assessment that with screen planting around the station, the valve station will not have a significant visual impact.

The Department accepts that the communications tower will have a visual impact. Although the structure is up to 60 metres high, it is however consistent in form with the transmission lines which form part of the visual landscape. Further, the structure is lattice in form and does not present a solid obstruction and, in most cases, its visibility would be moderated by distance and intervening vegetation.

Figure 12: Views of the Proposed Power Station Site

Photo Location Wayne Apps Residential Dwelling - Existing view north to north east from Dalton South

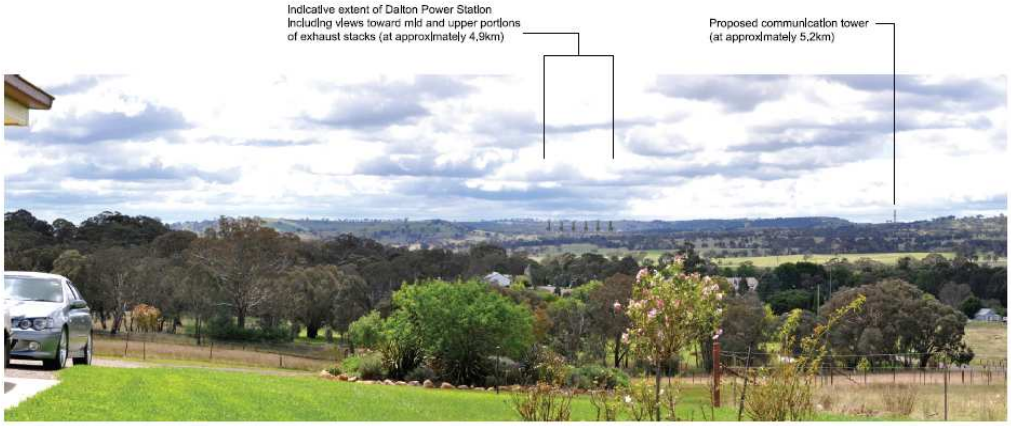


Photo Location Wayne Apps Residential Dwelling - Proposed view north to north east from Dalton South

Photo Location Wayne Apps Residential Dwelling - Proposed view north to north east from Dalton South (exhaust stacks at 28m high)

Although the project would affect the visual amenity of a number of residents with views of the site, the Department considers that the level of impact is acceptable and would be reduced through the implementation of the mitigation measures committed to by the Proponent and the Department's recommended conditions of approval.

5.6. Biodiversity

Issues

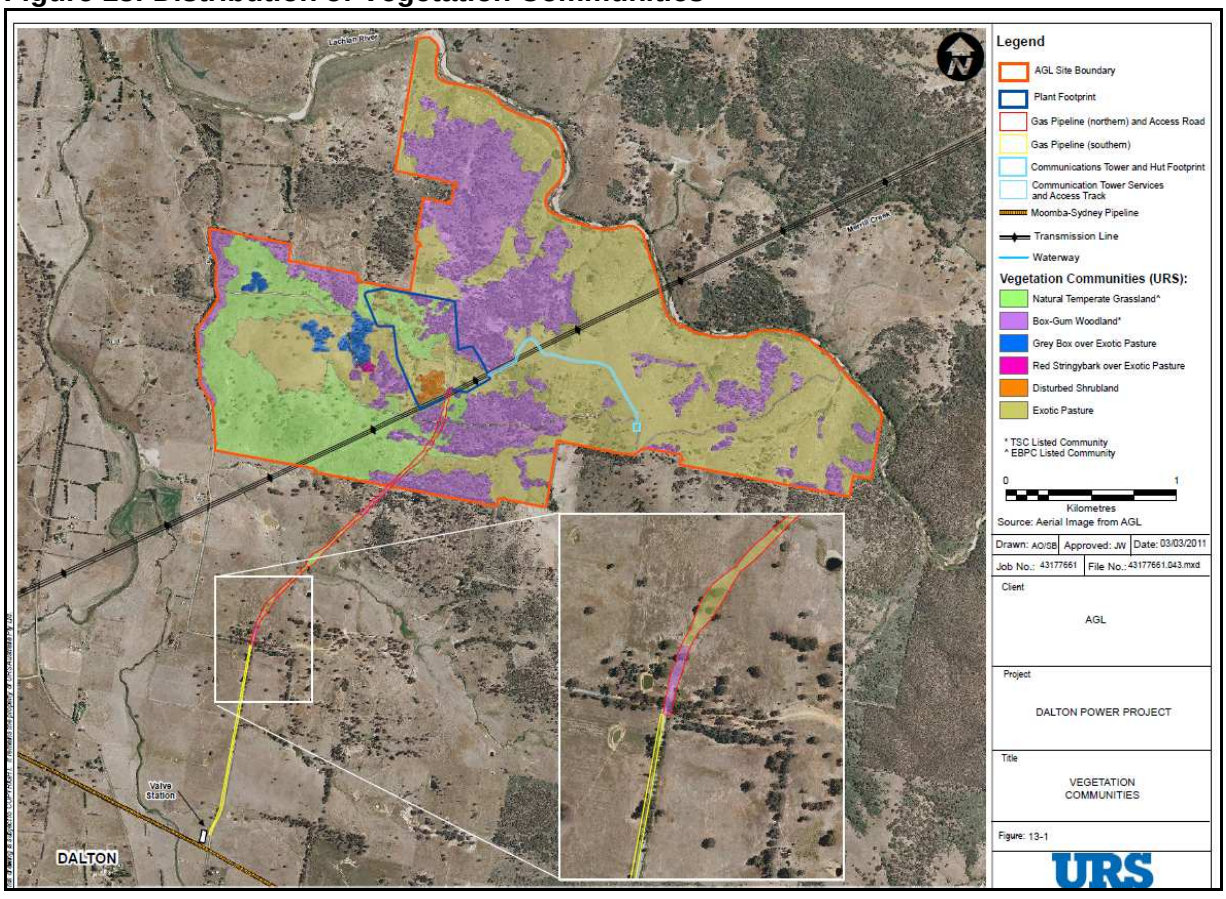
Flora

To assess the impacts of the project on ecological values, the Proponent undertook an ecological impact assessment, which included detailed flora and fauna surveys, targeted threatened species surveys and vegetation mapping. Targeted surveys for specific threatened flora and fauna species were also undertaken following the exhibition of the EA.

Six vegetation communities were recorded within the AGL site (refer Figure 13):

- Grey Box over exotic pasture – this is mostly degraded due to past land use including intensive grazing;
- Red Stringybark over exotic pasture – this is degraded with fairly low structural diversity;
- Exotic Pasture;
- White Box Yellow Box Blakely's Red Gum Woodland (referred to as Box Gum Woodland) – largely degraded remnants with moderate structural diversity;
- Natural Temperate Grassland of the Southern Tablelands of NSW and the ACT (Natural Temperate Grassland) - this is of moderately low condition with low species diversity and no significant habitat trees; and
- Disturbed Shrubland.

Figure 13: Distribution of Vegetation Communities



Natural Temperate Grassland is listed as an endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999*. Box Gum Woodland is listed as an endangered ecological community under both the *Environment Protection and Biodiversity Conservation Act 1999* and *Threatened Species Conservation Act 1995*. However, the Proponent has identified that the Box Gum Woodland on the site does not meet the definition of an endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999* in terms of patch size or understory diversity.

The Proponent has identified that the construction and operation of the project would require the clearing of approximately 32.4 hectares of potential habitat for native flora and fauna, including approximately 5.9 hectares of Box Gum Woodland and 9.1 hectares of Natural Temperate Grassland (refer Table 16). A breakdown of the amount of vegetation clearing required for the key components of the project is set out in Table 17.

Table 16: Existing Vegetation Communities and Clearance Areas

Vegetation Community	Environment Protection and Biodiversity Conservation Act Status	Threatened Species Conservation Act Status	Total area mapped within AGL land (hectares)	Total area to be cleared (hectares)
Grey Box over Exotic Pasture	Not listed	Not listed	6.20	0.00
Red Stringybark over Exotic Pasture	Not listed	Not listed	0.49	0.00
Exotic Pasture	Not listed	Not listed	258.75	15.23
Box Gum Woodland	Not applicable	Endangered ecological community	147.24	5.93
Natural Temperate Grassland	Endangered ecological community	Not listed	92.58	9.07
Disturbed Shrubland	Not listed	Not listed	2.19	2.19
Total			**507.43**	**32.42**

Table 17: Vegetation Clearing for Project Components (hectares)

Project Component	Grey Box over Exotic Pasture	Red Stringybark over Exotic Pasture	Exotic Pasture	Box Gum Woodland	Natural Temperate Grassland	Disturbed Shrubland
Gas Pipeline and Access Road	0	0	1.73	1.20	1.76	0
Communications Hut and Tower	0	0	1.33	0	0	0
Power Station	0	0	12.17	4.73	7.31	2.19

A significant impact criteria assessment was undertaken by the Proponent for the Natural Temperate Grassland pursuant to the requirements of the *Environment Protection and Biodiversity Conservation Act 1999,* in accordance with the *Environment Protection and Biodiversity Conservation Act 1999 Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (Department of Environment, Water, Heritage and the Arts, 2009). The assessment concluded that the project is likely to have a significant impact on the Natural Temperate Grassland community and was consequently referred to the former Commonwealth Department of Environment, Water, Heritage and the Arts which determined the project to be a Controlled Action.

An assessment of significance of the project on the Box Gum Woodland concluded that the project is not likely to result in a significant impact on the endangered ecological community.

However, the community is an important potential habitat resource for a number of threatened and common native fauna species and provides a number of additional habitat resources including coarse woody debris, a high density of hollow bearing trees, rocky outcrops and stags. The Proponent has identified that it is also likely to provide resources for local wildlife such as foraging, nesting and feeding resources.

No threatened flora species were identified within the project footprint or in the general locality during the initial field surveys. However, based on the results of data base searches and various site characteristics, the Proponent concluded that the site provides potential habitat for four threatened flora species:

- Yass Daisy (*Ammobium craspedioides*) – listed as 'vulnerable' under the *Threatened Species Conservation Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999*;
- Silky Swainson-peas (*Swainsona sericea*) - listed as 'vulnerable' under the *Threatened Species Conservation Act 1995*;
- Button Wrinklewort (*Rutidosis leptorrhynchoides*) - listed as 'endangered' under the *Threatened Species Conservation Act* 1995 and *Environment Protection and Biodiversity Conservation Act 1999*; and
- Hoary Sunray (*Leucochrysum albicans var. tricolor*) – listed as 'endangered' under the *Environment Protection and Biodiversity Conservation Act 1999*.

Additional surveys for the threatened flora species undertaken in the spring of 2011 did not identify any of the species on the project site or in the locality.

Assessments of significance and a significant impact criteria assessment were undertaken for the threatened flora species and concluded that the project would not have a significant impact on any of these.

Five declared noxious weeds were recorded on site - Scotch Thistle (*Onopordum acanthium*), Sweet Briar (*Rosa rubiginosa*), Fireweed (*Senecio madagascariensis*), St Johns Wort (*Hypericum perforatum*) and Patterson's Curse (*Echium lantagineum*).

In order to offset the impacts on biodiversity arising from the clearing of native vegetation and endangered ecological communities, the Proponent has committed to implementing a biodiversity offset strategy. Consequent to concerns raised by the OEH regarding the lack of commitment by the Proponent to protect any offsets in perpetuity, the Proponent has committed to entering into a conservation agreement with the Minister for the Environment to secure the dedication of offsets in perpetuity.

Fauna

A total of 107 fauna species, comprising 69 birds, 19 reptiles and 19 mammals were identified within the project footprint or on land immediately adjacent to the site.

Only nine threatened species were identified during field surveys. These were all birds listed as 'vulnerable' under the *Threatened Species Conservation Act 1995*:

- Gang Gang Cockatoo (*Callocephalon fimbriatum*);
- Speckled Warbler (*Pyrrholaemus saggitatus*);
- Brown Treecreeper (*Climacteris picumnus victoriae*);
- Diamond Firetail (*Stagonopleura guttata*);
- Flame Robin (*Petroica phoenicea*);
- Little Eagle (*Hieraaetus morphnoides*);
- Varied Sittella (*Daphoenositta chrysoptera*);
- Scarlet Robin (*Petroica boodang*); and
- White-fronted Chat (*Epthianura albifrons*).

Whilst online databases indicate the potential for 42 threatened fauna species to occur within the project footprint, the Proponent has assessed the project footprint as providing potential habitat for the above nine identified species and a further 14 threatened fauna species:

- Reptiles – Pink-tailed Worm-lizard (*Aprasia parapulchella*) and Striped Legless Lizard (*Delma impar*);
- Birds – Swift Parrot (*Lathamus discolour*), Superb Parrot (*Polytelis swainsonii*), Turquoise Parrot (*Neophema pulchella*), Little Lorikeet (*Glossopsitta pusilla*), Spotted Harrier (*Circus assimilis*), and Barking Owl (*Ninox connivens*);
- Mammals – Spotted-tail Quoll (*Dasyurus maculatus maculates*), Eastern False Pipistrelle (Falsistrellus *tasmaniensis)* and Squirrel Glider (*Petaurus norfolcensis*); and
- Insects - Golden Sun Moth (*Synemon plana*).

All of the above species are listed as 'vulnerable' under the *Threatened Species Conservation Act 1995* with the exception of the Swift Parrot and Golden Sun Moth which are listed as 'endangered' and 'critically endangered', respectively. The Pink-tailed Worm-lizard (vulnerable), Striped Legless Lizard (vulnerable), Swift Parrot (endangered), Superb Parrot (vulnerable), Spotted-tail Quoll (endangered) and Golden Sun Moth (critically endangered) are also listed as threatened species under the *Environment Protection and Biodiversity Conservation Act 1999*.

One migratory species listed under the *Environment Protection and Biodiversity Conservation Act 1999* was also recorded – the Rainbow Bee-eater (*Merops ornatus*).

Assessments of significance conducted by the Proponent concluded that the project would not have a significant impact on any fauna species listed under the *Threatened Species Conservation Act 1995*. The results of the significant impact criteria assessments indicated that the project would not significantly impact on any fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999*, provided recommended mitigation options are adopted.

No endangered terrestrial populations, as listed under the *Threatened Species Conservation Act 1995,* of any fauna species are noted to occur within the project site or as occurring within a radius of 10 kilometres.

The initial surveys undertaken by the Proponent for the Pink-tailed Worm-lizard, Striped Legless Lizard and Golden Sun Moth were considered to be insufficient by the OEH. Consequently, additional targeted surveys were undertaken following exhibition of the EA. None of the three species were identified within the project footprint during the subsequent surveys.

Consideration

The Department has considered the Proponent's ecological assessment and the results of the supplementary targeted threatened species surveys undertaken for the project and is satisfied that the level of assessment is sufficient to enable the Department to form a view of the existing biodiversity values within the project footprint and likely extent and significance of impacts associated with the construction and operation of the project.

Flora

In regards to predicted impacts to Natural Temperate Grassland, the Department notes that the project would result in the clearing of approximately 9.07 hectares of this community, including all the community within the plant footprint (approximately 7.31 hectares). The total area of Natural Temperate Grassland to be cleared equates to approximately 10 percent of the community within the AGL site, within which the project would be sited. The proposed gas pipeline and access road would slightly increase the fragmentation of a patch of Natural Temperate Grassland that is already partly fragmented by a road and grazing activities.

The Department acknowledges that the vegetation to be impacted is of a moderately low condition, with low species diversity and a general lack of herbs and forbs commonly associated with the community. This is the result of past agricultural practices on the site, including moderate to high levels of grazing pressure. In addition, the vegetation to be cleared has a moderate level of weediness.

In regards to impacts on biodiversity values arising from the clearing of Box Gum Woodland, all of the community within the plant footprint would be cleared (approximately 4.72 hectares). The total area of Box Gum Woodland to be cleared (5.93 hectares) equates to about four percent of the community within the AGL site. In order to minimise impacts on the Box Gum Woodland, the Proponent has amended the location of the southern portion of the gas pipeline to avoid the Box Gum Woodland along Walshs Road, Dalton. This amendment has resulted in a reduction of the amount of woodland to be cleared under the original proposal by 0.106 hectares. The Department concurs that the clearing of the Box Gum Woodland is not likely to result in a significant impact on this endangered ecological community in that the habitat to be impacted is not considered to be important for the long-term survival of the community in the locality, and the vegetation to be impacted is fragmented and largely degraded.

The Department accepts that the configuration identified by the Proponent would likely represent the worst-case level of clearing that would be required for the project. To compensate for the loss of biodiversity values associated with the clearing of the two endangered ecological communities, the Proponent has committed to providing an offset area encompassing approximately 80.7 hectares of existing Natural Temperate Grassland and 77.6 hectares of existing Box Gum Woodland on land owned by the Proponent adjacent to the plant footprint. The offset area also comprises approximately 25 hectares of Exotic Pasture that, with appropriate management, has the potential to become Natural Temperate Grassland. The Proponent has indicated that the offset area would be conserved in perpetuity (under a proposed conservation agreement with the Minister for the Environment) and be of a higher quality than the area to be cleared, and have a higher species diversity.

The Department accepts that the project would, if not offset, represent a net loss of biodiversity values with respect to endangered ecological communities. Consequently, to ensure that the biodiversity values lost as a result of the project will be offset in perpetuity, and offset measures are consistent with the principles of "improve and maintain", the Department has recommended conditions of approval that require the Proponent to:

- develop a Biodiversity Offset Strategy;
- develop and implement a Biodiversity Offset Package which describes the final suite of offset measures to be implemented as well as ongoing management and monitoring strategies; and
- develop and implement an Ecological Monitoring Program to monitor the effectiveness of the ecological mitigation measures employed.

The significant impact criteria assessment for Natural Temperate Grassland recommended that mitigation measures for the grassland should include a number of actions set out in the *National Recovery Plan for Natural Temperate Grassland of the Southern Tablelands (NSW and ACT) – an Endangered Ecological Community* (Environment ACT, 2006). To ensure that the measures are implemented, the Department has recommended a condition of approval requiring the Proponent to address the implementation of the measures in the OEMP for the project.

In order to maintain or improve biodiversity levels, the Proponent has also committed to developing and implementing:

- a Grazing Management Plan to exclude cattle and sheep from offset areas in order to improve the floristic diversity of vegetation (unless otherwise agreed to by the OEH);
- an Edge Effect Strategy to manage and reduce edge effects and fragmentation;

- a Complementary Planting and Rehabilitation Plan which includes strategies to utilise species to replicate Natural Temperate Grassland and Box Gum Woodland floristic composition;
- a Habitat Corridor and Connectivity Plan with the objective that remediation works would increase the value of the site in regards to connectivity with other remnants in the landscape, through the revegetation of habitat corridors within the offset area; and
- A Weed and Pest Management Strategy to control noxious and environmental weed species and feral animals.

The Department is of the opinion that such measures would assist in mitigating biodiversity impacts and ensuring that the values of offset areas are maintained and/or improved.

Although no threatened flora species were identified, there is the potential for their occurrence within the project site. Subsequently, the Department has recommended a condition of approval requiring the Proponent to develop a procedure for dealing with unexpected finds of threatened species during construction, including stopping works and notification procedures, and updating of biodiversity offset requirements.

To ensure that impacts to native vegetation are limited during construction, the Department has also recommended that the Proponent:

- develop and implement a Construction Flora and Fauna Management Plan comprising plans of the location of all native vegetation communities, endangered ecological communities, and potential threatened flora habitat; fencing of sensitive areas; measures for maintaining existing habitat features; seed harvesting measures; top soil management; and construction worker education;
- minimise the clearing of native vegetation;
- undertake pre-clearing surveys;
- limit the clearing of Box Gum Woodland to 5.93 hectares and Natural Temperate Grassland to 9.07 hectares;
- reduce the width of the pipeline construction corridor, where possible, to avoid endangered ecological communities; and
- implement measures for the progressive re-vegetation of areas temporarily disturbed construction.

The Department considers that with the measures outlined above, any impacts on flora can be adequately mitigated and/or offset, and do not pose a constraint to approval of the project.

Fauna

The Proponent's ecological assessment indicates that the vegetation communities to be impacted by the project are likely to comprise suitable habitat for 23 fauna species listed under the *Threatened Species Conservation Act 1995* and/or *Environment Protection and Biodiversity Conservation Act 1999*.

Clearing of the land within the project footprint would result in the removal of 39 hollow-bearing trees which were found to support over 73 hollows. The key threatened species on the site that are dependent on hollow-bearing trees are the Brown Treecreeper and Gang Gang Cockatoo. The proposed biodiversity offset site would conserve 49 hollow bearing trees with over 108 hollows and comprises a more diverse range of hollows when compared to those found in the project footprint. Consequently, the Proponent has concluded that the proposed offset area would provide more valuable hollow-bearing tree resources for threatened species in terms of number and diversity of hollows, compared to those found in the project footprint. Notwithstanding, the Department has recommended that the Biodiversity Offset Strategy address measures for offsetting the loss of hollows.

To compensate for the loss of rocky outcrops and bush rock, which also provide valuable habitat for fauna such as reptiles and small mammals, the Department has recommended a condition of approval requiring the Proponent to undertake all feasible and reasonable measures to minimise their clearance and place them in adjacent areas to provide habitat for fauna such as reptiles and small mammals.

Although the project will result in the clearing of potential fauna habitat, the Department concurs with the conclusion of the Proponent that the project is unlikely to result in significant habitat fragmentation or loss of habitat corridors because the development will not insect/isolate any substantial areas of native vegetation. Nor is it likely to impact on the movement of native fauna within the region due to existing habitat fragmentation and isolation within the region. Further, the Department considers that the measures outlined above, and the recommendation for the Proponent to develop and implement a Biodiversity Offset Strategy and Package will ensure that biodiversity values are maintained and suitable habitat provided to offset the loss of fauna habitat within the project footprint.

The Department has also recommended that the CEMP for the project include measures to minimise impacts on fauna species including:

- pre-clearing surveys and a two-stage clearing strategy;
- timing construction to be outside the breeding season of threatened species with the potential to occur on site;
- developing and implementing measures to minimise the incidence of fauna being trapped in trenches and deal with trapped or injured fauna; and
- developing a protocol for the relocation of fauna prior to commencing construction.

With respect to impacts on the Striped Legless Lizard, Pink-tailed Worm-Lizard, and Golden Sun Moth, the Department considers that whilst individuals of these species were not recorded during targeted surveys, there is a likelihood that areas with suitable attributes could provide habitat for these species. Consequently, the Department has included a condition of approval recommending that should these species be identified on site, all work in the vicinity of the sighting shall cease and management measures implemented to minimise risks to the species.

In regards to the Rainbow Bee-eater, the Department acknowledges that although the project will result in the removal of a small amount of potential foraging habitat for the species in the form of grassland and woodland, given the highly mobile nature of the species, its ability to undertake large scale seasonal movements, and the presence of suitable habitat outside of the project footprint, construction and operation of the project is unlikely to have an adverse impact on the habitat and lifecycle of the species.

The Department is of the opinion that provided the recommended conditions are adopted, and that the Proponent implements the mitigation measures outlined in the EA and Submissions Report, as well as the actions described in the Proponent's Statement of Commitments, impacts on fauna and their habitat can be effectively managed and duly compensated through offsetting.

The Department has consulted with the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) throughout the biodiversity assessment process. The DSEWPC has indicated that it is satisfied that its concerns have been adequately addressed.

5.7. Other Issues

The Proponent has also assessed the potential impacts of the project in relation to aviation safety, soils (erosion and sedimentation), greenhouse gas emissions, waste generation and socio-economic issues, along with potential hazards and risks associated with the operation of the project. The Department is of the opinion that in most cases the Proponent has undertaken an adequate assessment of the issues. However, conditions are required to ensure that residual impacts are appropriately mitigated and managed. The Department's consideration of these issues is provided in Table 18.

Table 18: Department's Consideration of Other Environmental Issues

Issue	Department's Consideration
Aviation Safety	Stack exhaust emissions from gas-fired power stations have the potential to impact on aviation safety by causing air turbulence which in turn can affect aircraft handling. Consequently, the Proponent undertook a plume rise assessment for a range of scenarios including plumes generated by the operation of a single turbine and multiple turbines, to assess the potential impacts on aviation safety in air space above the power station. The assessment was undertaken in accordance with the Civil Aviation Safety Authority's Advisory Circular *Guidelines for Conducting Plume Rise Assessments* (June, 2004). The Guideline requires that where a plume rise exceeds a critical velocity of 4.3 metres per second (i.e. the velocity that is likely to affect aircraft) at heights which are frequented by aircraft (i.e. the obstacle limitation surface or at approximately 110 metres above ground level outside of an aerodrome), it must be assessed for potential hazards to aircraft operations. The results of the assessment indicated that under the worst-case scenario (Stage 2 with exhaust stacks at 46 metres above ground level) the predicted maximum vertical critical plume extent would be 2,119 metres above ground level and would be 959 metres wide. The height at which point the critical velocity criterion is exceeded less than 1 percent of the time is 1,484 metres, and 1,863 metres for an exceedance of less than 0.1 percent. There are no known registered airports or unregistered landing strips within a 15 kilometre radius of the power station site. The nearest regional airport is at Goulburn which is located approximately 40 kilometres east of the site. Canberra Airport is located some 50 kilometres south of the site. Based on the results of the Proponent's plume rise assessment, the Civil Aviation Safety Authority deemed that the plume would require mitigation by the establishment of a "Danger Area" of dimensions one nautical mile radius from the surface to 6,700 feet above mean sea level. However, the Authority also noted that the Advisory Circular is currently under review and is likely to result in a reduced upper limit and consequently recommended that the project be reviewed six months prior to the power station becoming operational. At that stage, the Authority would also advise as to any aviation hazard lighting requirements. Although the plume may be classified as a Danger Area, it does not pose such an unacceptable risk that construction and operation of the power station should be prohibited. The Proponent has advised that the proposed reduction in stack height would not have a significant impact on extent of the plume rise or width. The Department is satisfied that the Proponent has undertaken an adequate assessment of the potential impacts of plume rise on aviation safety. In accordance with the requirements of the Civil Aviation Safety Authority, the Department has recommended a condition of approval requiring the Proponent to consult with the Authority and Airservices Australia six months prior to the commencement of power plant operations. The Department has also recommended that the exhaust stacks be marked and lit in accordance with any requirements of the Authority.

Hazards and Risks	The operation of the power station is potentially hazardous, the main hazards arising from the potential loss of containment of the gas supply to the power station (e.g. through rupture of the gas pipeline). The storage and handling of dangerous goods also has the potential to result in hazards. A preliminary hazard analysis was undertaken by the Proponent to identify whether off-site impacts are likely to occur. The assessment involved the identification and analysis of hazards and risks for operational processes where there is a potential for offsite impacts to occur and whether the proposed safeguards would be adequate to control the hazard. Based on the outcomes of the assessment, the Proponent determined that four hazards had the potential for offsite impacts: • gas leak from the pipeline; • leak from the pipeline resulting from operational error; • leak of gas inside the turbine housing; and • leak of natural gas from on-site gas pipes. A detailed consequence and frequency analysis was conducted for the four hazards and concluded that such hazards would only have the potential to cause injury or damage if there was ignition, which resulted in a fire or explosion. The risk however was considered low with the risk of fatality at the nearest residential area being well below the criterion for new installations of one chance in a million per year and the risk contour for this criterion not extending beyond the site boundary. The Proponent also determined that the maximum tolerable risk for residential developments is exceeded for a distance of 22 metres either side of the centreline of the gas supply pipeline. As there are no residences within 22 metres of either side of the pipeline, the Department considers the risk acceptable. The Proponent has committed to implementing a number of mitigation measures to reduce the potential for hazards to arise including: implementation of a safety management system; high and low pressure monitoring of the lateral gas pipeline; fire protection inside the turbine housing, gas monitoring alarm systems; and further assessment of bushfire impacts during the detailed design phase. The Department's Hazards specialists have reviewed the preliminary hazards analysis report and indicated that the report adequately addressed the potential for offsite impacts. Further, the incident risk for the four key site hazards would not exceed the risk criteria specified in the *Hazardous Industry Planning Advisory Paper No. 4: Risk Criteria for Land use Safety Planning.* Consequently, the Department considers that the project can operate under acceptable safety levels. Nevertheless, the Department has recommended conditions of approval requiring the Proponent to prepare the following studies prior to the commencement of construction, to ensure that the project caters for the safe management of hazards: • Hazard and Operability Study; • Fire Safety Study; • Final Hazard Analysis; and • Construction Safety Study.

	The Department has also recommended that the Proponent prepare an Emergency Plan and Safety Management System covering all on-site operations and associated transport activities involving hazardous materials, prior to commissioning of the project. Further, the Department has recommended that the Proponent be required to prepare a Hazard Audit consistent with the Department's *Hazardous Industry Planning Advisory Paper No. 5 – Hazard Audit Guidelines* 12 months after the commencement of operation and every three years thereafter.
Greenhouse Gas Emissions	The EA included an assessment of the greenhouse gas emissions associated with the operation of the project including emissions from combustion and indirect emissions associated with the extraction, production and transport of natural gas to the site, as well as emissions associated with electricity imported from the grid for use in the production of electricity. The assessment was based on the methodology detailed in the *Greenhouse Gas Protocol* (World Business Council for Sustainable Development/ World Resource Institute, 2004) with calculations of greenhouse gas emissions based on the relevant emission factors in the *National Greenhouse Accounts Factors* (Department of Climate Change and Energy Efficiency, 2009). The greenhouse gas emissions during construction and decommissioning, and from the embodied energy of construction materials, were considered insignificant and were not incorporated into the assessment. The primary greenhouse gas to be emitted by the project is carbon dioxide. The Proponent concluded that based on an operating duty of 15 percent per annum, the power station would emit between approximately 0.7 metric tonnes (Stage 1) to 1.5 metric tonnes (Stage 2) of carbon dioxide equivalent (using F Class turbines) at an emissions intensity of approximately 791 kilograms carbon dioxide equivalent per megawatt hour. In the context of the 2009 greenhouse gas emissions reported in the *Australian National Greenhouse Account: Quarterly Update of Australia's National Greenhouse Gas Inventory September Quarter 2009 (Department of Climate Change, 2010)*, this represents an approximate increase of 0.25% in the total Australian greenhouse gas emissions, assuming the worst-case scenario. The estimated greenhouse gas emissions on a project lifetime basis of approximately 30 years would be in the order of 44 metric tonnes per carbon dioxide equivalent. The Proponent also assessed the emission intensities against the NSW Pool Coefficient which is an indicator of the average emissions intensity of electricity sourced from the NSW electricity grid. It represents the emission of greenhouse gases in kilograms of carbon dioxide equivalent per megawatt hour of electricity supplied from the pool of major power stations serving the NSW electricity grid and stands at 967 kilograms of carbon dioxide equivalent per megawatt hour. The estimated emission intensity for the Dalton power station is approximately 800 kilograms of carbon dioxide equivalent per megawatt hour. For comparison purposes, the greenhouse gas emissions intensity for the existing Bayswater and Liddell power stations are 960 and 980 kilograms of carbon dioxide equivalent per megawatt hour, respectively.

	To minimise greenhouse gas emissions, the Proponent has committed to installing technology that achieves a thermal efficiency that is consistent with current best available technology, and utilising evaporative cooling which offers efficiency benefits thereby reducing greenhouse gas emissions when operating during hot conditions. The Proponent has indicated that further greenhouse gas mitigation strategies may also become more feasible during the operation of the facility. These would likely be based around improved technologies and componentry that would lead to efficiency improvements, which could be implemented during routine maintenance and refurbishment of the facility. Such additional measures would be explored via efficiency audits of the operation of the power station. While there would be a slight increase in total greenhouse gas emissions in NSW as a result of the operation of the project, the Department believes that impact of these emissions must be balanced against the risks associated with the predicted shortfall in energy generation, particularly during times of peak demand and, as such, the generation of greenhouse gases should not be an impediment to project approval.
Aboriginal Heritage	Five Aboriginal sites were located within the power station site along with two areas of potential archaeological deposits. The sites comprised isolated finds and artefact scatters (refer table below). The artefacts found at D1-D4, D6 and D7 were assessed as having low archaeological significance. DPAD1, DPAD2 and D5 were assessed as having a moderate to high likelihood of containing further subsurface archaeological deposits. **Aboriginal Site Locations within the Power Station Site** In addition, six Aboriginal sites comprising one isolated find and five artefact scatters were located in or near the proposed gas pipeline and access road easement (refer table below). These sites were assessed by the Proponent as having moderate to low archaeological significance. **Aboriginal Site Locations in Proximity to the Gas Pipeline and Access Road Easement**

Recording Code	Recording Type	Location Relative to Development
Dalton 1 (D1)	isolated find	Outside facility footprint area
Dalton 2 (D2)	artefact scatter	Directly impacted by facility footprint and potentially by gas pipeline and access road easement
Dalton 3 (D3)	isolated find	Directly impacted by facility footprint
Dalton 4 (D4)	isolated find	Directly impacted by facility footprint
Dalton 5 (D5)	artefact scatter and PAD	Directly impacted by facility footprint
Dalton 6 (D6)	artefact scatter	Outside facility footprint area
Dalton 7 (D7)	artefact scatter	Directly impacted by facility footprint
Dalton PAD1 (DPAD1)	potential archaeological deposit	Directly impacted by facility footprint
Dalton PAD2 (DPAD2)	potential archaeological deposit	Directly impacted (in part) by facility footprint

Recording Code	Recording Type	Location Relative to Development
Dalton 2 (D2)	artefact scatter	Directly impacted by power plant facility footprint and potentially by gas pipeline and access road easement
Dalton PAD1 (DPAD1)	potential archaeological deposit	Directly impacted by power plant facility footprint and potentially by gas pipeline and access road easement
Dalton Gas Pipeline 2 (DGP2)	artefact scatter	Outside pipeline and access road easement - no impact
Dalton Gas Pipeline 3 (DGP3)	isolated find	Outside pipeline and access road easement
Dalton Gas Pipeline 4 (DGP4)	artefact scatter	Directly impacted by gas pipeline footprint
Dalton Gas Pipeline 5 (DGP5)	artefact scatter	within close proximity of gas pipeline footprint
Dalton Gas Pipeline 6 (DGP6)	artefact scatter	Located on the south-eastern edge of proposed gas pipeline footprint; would potentially be impacted by construction of the pipeline.

Sites D2, D3, D4, D5, D7 and DGP4 and areas of potential archaeological deposit (DPAD1 and 2) would be directly impacted by the construction of the power station and gas pipeline. Sites DGP5 and DGP6 have the potential to be impacted by construction of the gas pipeline.

In its assessment, the Proponent indicated that consultation was undertaken in accordance with the document *Aboriginal Cultural Heritage Consultation Requirements for Proponents* 2010 (Department of Environment, Climate Change and Water, 2010). However, post the completion of the Submissions Report, it has been confirmed that a registered Aboriginal stakeholder (Buru Ngunawal Aboriginal Corporation) has not been consulted in regards to the project.

Although the Proponent has undertaken an adequate assessment of the potential impacts of the project on Aboriginal heritage (as supported by the OEH in its submission) it is acknowledged that not all stakeholders have been consulted. Consequently, the Department has recommended a condition of approval requiring the Proponent to consult with the Buru Ngunawal Aboriginal Corporation prior to the commencement of construction. The outcomes of the consultation are to be addressed in the Construction Heritage Management Plan for the project.

The Proponent has included a number of commitments relating to the management of identified Aboriginal sites including avoidance of sites where possible, and where not possible recording and collection or relocation of the artefacts. The Proponent has also committed to a program of archaeological subsurface testing if impacts to D5, DPAD1 and DPAD2 cannot be avoided so as to ascertain the presence, extent and integrity of cultural material that may be present in these areas. The Department considers this a satisfactory approach and has reinforced these commitments through recommended conditions of approval which require the Proponent to develop site-specific management measures to ensure that known sites, and any other objects uncovered during construction, are not impacted by construction of the project. If impacts are unavoidable, management measures are to be implemented in accordance with a Construction Heritage Management Plan for the project.

The Department has also recommended that should ground disturbance be proposed in the vicinity of D5, DPAD1 and DPAD2, a program of archaeological subsurface testing must be undertaken in consultation with relevant Aboriginal stakeholders prior to the commencement of

	construction. The Department considers that the Proponent's commitments in regards to the management of Aboriginal sites in conjunction with the recommended conditions of approval would ensure that the project would not significantly impact on Aboriginal cultural heritage.
Socio-Economic	*Agricultural Land Use* The project footprint and AGL site are classified as Class 4 land under the NSW Agriculture's agricultural land classification system. However, the land is not ideal for cultivation and as such has been used for sheep grazing (wool production). The AGL site has been owned by the Proponent since 2008 who has allowed neighbouring farms to use the site for grazing. The proposal would result in changes to the land use of the project footprint (approximately 26 hectares). In addition, an estimated area of 195 hectares (approximately 38 percent of the AGL site) would form part of a proposed biodiversity offset area for the project. In order to maintain or improve the biodiversity values of the offset area, grazing would be largely excluded to minimise the impacts resulting from sheep grazing which is listed as a threat to the two endangered ecological communities that occur on the site. Although the available area of land currently utilised for sheep grazing would be reduced by an estimated 221 hectares, the Department considers that the biodiversity values gained through the management of the offset area would be a positive outcome. In addition, with the exception of the power station site and offset area, grazing would continue on the remainder of the AGL site throughout the operational phase of the project. *Community Enhancement Fund* In its submission, the Upper Lachlan Council sought development contributions for the purposes of community enhancement totalling 1.5 percent of the proposed capital cost (equivalent to approximately $22.5 million). Consequent to the Council's adopted Section 94A Development Contributions Plan of 27 March 2012 (prepared under the *Environmental Planning and Assessment Act 1979*), Council sought one percent of the proposed cost of development (equivalent to $15 million). In May 2012, the Proponent entered into a Voluntary Planning Agreement with the Upper Lachlan Shire Council where it agreed to pay the Council's Community Enhancement Fund the amount of 0.833 percent of Stage 1 capital expenditure over a period of 40 years. Should the development proceed to Stage 2, the Proponent would pay the Fund 0.833% of the Stage 2 capital expenditure over a period of 40 years. To ensure that the agreed contribution is remitted, the Department has recommended a condition of approval to this effect.
Erosion and Sedimentation	Construction of the project will require excavation and clearing of vegetation, both of which have the potential to result in erosion and sedimentation until such time that exposed surfaces are stabilised. The Proponent has committed to implementing standard erosion and sediment controls consistent with the principles set out in Landcom's *Managing Urban Stormwater: Soils and Construction* to manage and mitigate this impact. The Department considers this an appropriate

	measure which has been reinforced in the recommended conditions of approval. In addition, the Department has recommended that the Proponent prepare and implement a Construction Soil and Water Quality Management Plan for the project.
Operational Wastewater Management	Process wastewater streams associated with the operation of the power station include backwash water from the pre-treatment/pre-filtration of groundwater, concentrate wastewater from desalination processes, blowdown water from the evaporative cooler, and regeneration wastewater from ion exchange processes. The total volumes of process wastewater to be generated by the project are estimated to be approximately 5.4 megalitres per annum for Stage 1 and 10.7 megalitres per annum for Stage 2. The Proponent has indicated that process wastewater generated from the project would be collected in lined evaporation ponds located on the site. The NoW supports the Proponent's proposed use of an impermeable liner to mitigate the potential impact of seepage of contaminants into the groundwater from the evaporation ponds. This mitigation measure has been reinforced in the Department's recommended conditions of approval. At times when the evaporation ponds contain water with high to very high salinity, this would be controlled by annual disposal by tanker to a facility licensed to accept the wastewater. The Department accepts this as an appropriate management option. The Proponent has advised that wastewater from cleaning and maintenance activities would be collected on site and transported off-site for treatment and disposed of at a licensed facility along with oily wastes from bunded areas. In regards to stormwater flows, the Proponent proposes to construct a series of vegetated swales and table drains to separate clean and dirty water flows and divert runoff from disturbed areas of the site to a sedimentation pond. To ensure that wastewater is appropriately treated and disposed of, the Department has recommended a condition of approval requiring the Proponent to prepare an Operational Water and Wastewater Management Plan detailing the types, sources and volumes of wastewater generated on site, and wastewater treatment and management practices. In regards to stormwater, the Plan is to identify clean and dirty water flows and the procedures for managing such flows. The Proponent has indicated that domestic wastewater would be treated and disposed of on site. However, no details are provided on the type of treatment system to be installed or the proposed management of effluent and biosolids. Consequently, the Department has recommended that the Proponent provide details of the proposed processes for sewage treatment and effluent and biosolids management as part of the Operational Surface Water Runoff and Wastewater Management Plan for the project.
Solid Waste	The construction and operation of the project would result in the generation of waste. Construction waste streams would include demolition waste, green waste (from clearing) and general construction

	waste. Operational wastes would include sewage, used oils, packaging, oil drums, and office wastes. The Proponent has committed to managing all wastes in accordance with the relevant guidelines and the principles of waste avoidance, reduction, reuse and recycling and developing a Waste Management Plan. The Department is satisfied with this approach and has recommended a condition of approval to ensure that this commitment is implemented.
Hydrology	The power station would be located immediately south of the Lachlan River on a subcatchment boundary between two first order unnamed creeks. The distance from the southern boundary of the site to the southern creek is approximately 200 metres and the site lies at an elevation of about 15 metres above the creek. The northern creek rises immediately adjacent to the northern boundary of the power station site falling away sharply to a well defined creek line at an elevation substantially more than 15 metres below the proposed power station elevation. Based on rainfall data obtained from Parkes, the Proponent has concluded that peak flows through the southern creek are unlikely to encroach on the power station site for any event less than the 100 year Average Recurrence Interval flood. Due to the topography, no flooding is expected to occur from the northern creek. To ensure that the Proponent addresses potential local flooding from the Lachlan River, the Department has recommended a condition of approval requiring the Proponent to undertake hydrologic and hydraulic studies as part of the detailed design phase. In addition, the Department has recommended that the project be designed and constructed so that it is not subject to inundation by floodwaters up to or at a level of the Probable Maximum Flood.

6. RECOMMENDATION

The Department has undertaken a detailed assessment of the proposed Dalton Power Project, having regard to the Proponent's EA, Submissions Report and Statement of Commitments. In assessing the project, the Department has also considered the views of local and State authorities and the public as raised in their submissions during and post exhibition of the EA.

Based on this assessment, the Department considers the key environmental issues associated with the project to be noise, air quality, traffic, water supply, visual amenity and biodiversity. To minimise potential impacts which may arise with respect to these issues, the Department has recommended stringent conditions of approval which require not only mitigation measures to be implemented, but also place limits on construction and operational noise, air quality emissions and clearing of endangered ecological communities. In addition, the Department has imposed strict monitoring requirements in regards to noise and air quality, and has recommended that the Proponent be required to implement an ecological monitoring program. The Department has also recommended that impacts on biodiversity values be offset through the implementation of a Biodiversity Offset Package. Further, the Department has recommended that the construction and operational management plans for the project address the management measures that would be implemented in respect to each of the issues.

Although some residual impacts may result, the Department considers that on balance the project is justified in terms of providing a reliable source of electricity to the State's energy supply system in times of peak demand and therefore approval of the project is in the public interest . The Proponent has undertaken an adequate assessment of the impacts of the project, and demonstrated that it can be constructed and operated within acceptable environmental limits.

Overall the Department is satisfied that with the implementation of the Proponent's proposed mitigation measures and the measures outlined in the recommended conditions of approval, the potential impacts would be appropriately mitigated and/or managed to an acceptable level of environmental performance.

The Department therefore recommends that the Planning Assessment Commission consider the findings and recommendations of this report and determine to approve the project, subject to the recommended conditions.

29/5/12

A/Director
Infrastructure Projects

29.5.12

Executive Director
Major Projects Assessment

30/5/12

Deputy Director-General
Development Assessment & Systems Performance

Director-General

1/6/2012.

APPENDIX A ENVIRONMENTAL ASSESSMENT

See the Department's website at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3820

APPENDIX B SUBMISSIONS

See the Department's website at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3820

APPENDIX C PROPONENT'S RESPONSE TO SUBMISSIONS

See the Department's website at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3820

APPENDIX D POLITICAL DONATION DISCLOSURES

See the Department's website at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3820

APPENDIX E RECOMMENDED CONDITIONS OF APPROVAL