

## Executive Summary

### Introduction

AGL is seeking Project Approval to construct and operate a gas turbine power plant up to a nominal 1500 megawatt (MW) capacity on a site near Dalton. The proposal is referred to as the 'Dalton Power Project'. The Dalton Power Project would be constructed in two stages, and would involve the installation of up to six gas turbines. AGL are seeking approval for both stages of the Project as part of this current application.

It is envisaged that the power station would operate in open cycle mode during times of peak electricity demand, typically for less than 15 % of the year. The gas turbines would burn natural gas only. The Project also includes construction and operation of a gas pipeline connecting the Moomba to Sydney Gas Pipeline, access road for the Facility and transmission connection within the site.

The Dalton Power Project is proposed by AGL to address the rising peak demand for electricity in NSW and complement the introduction of renewable energy sources such as wind, which often have intermittent output. The objective of the proposal is to generate electricity at peak demand periods, times of reduced renewable energy generation and to allow AGL to manage supply of electricity to its large number of retail, commercial and industrial customers. The Dalton area is favourably suited for gas-fired generation as it has superior transmission access and access to the Moomba to Sydney Gas Pipeline.

The Minister for Planning is the consent authority for the Dalton Power Project as determined by the relevant legislation. This Environmental Assessment has been prepared in accordance with the requirements of Part 3A of the *Environmental Planning and Assessment Act 1979 (EP&A Act)* to provide the Minister for Planning with the required information to determine the environmental impacts and benefits of the Dalton Power Project. As Environmental Assessment Requirements were notified for the Project on 19 April 2010, the Project is a transitional Part 3A Project for the purpose of the Part 3A Repeal Act and Part 3A will continue to apply.

This Executive Summary provides a brief description of the key outcomes of the environmental assessment as detailed in each of the chapters.

### Project Need and Justification

The Dalton Power Project is consistent with NSW Government policy indicating a preference for private investment in electricity generation. Peaking power generation enables AGL to manage its cost of electricity sold to consumers and minimises market exposure along with providing rapid start up generation capacity at times of reduced supply or generation capability from other plants or sources.

The NSW Government's *Energy Directions Green Paper (2004)* and Australian Energy Market Operator (AEMO) *Statement of Opportunities (2010)* predict that over the next decade rising electricity demand from the whole of NSW will exceed existing generation capacity. To meet the immediate growth in demand for electricity, a number of additional power plants will be required.

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The proposed Dalton Power Project would contribute positively to the NSW electricity market by providing a peaking plant to service demand in addition to minimising AGL's market exposure and complementing the introduction of intermittent renewable generation sources into the NSW electricity market.

Other factors that determine the project need and timing include the wholesale supply position of AGL. This is influenced by AGL's ability to hedge market exposure through contracting. As the time approaches where demand equals supply, the wholesale price of electricity to AGL potentially rises, sometimes dramatically, while sales to consumers remain at a fixed, regulated price. This affects the contract market and increases the cost of electricity for AGL that it supplies to consumers. The Dalton Power Project is fundamental to allowing AGL to continue to supply electricity to consumers at a competitive price.

In order to reduce its exposure to electricity price volatility, AGL seeks to construct and operate a gas fired power station to mitigate against potential substantial losses during times of high price. The operating cost of gas peaking generation plant is higher than the other technologies such as coal fuelled power stations meaning that it will be less economic to run at times when prices are not high. For this reason, more cost efficient power plants will be constructed to meet intermediate and base load electricity demand.

The expansion of the Federal Governments Renewable Energy Target (RET) is resulting in increased penetration of renewable energy sources such as wind and solar generation. Most of these renewable sources rely on a variable and uncontrollable natural resource (ie wind and solar energy) and are not assured to be available at times of high electricity demand or price. Complementary and controllable generation sources are needed to support the renewable energy generation sources. Gas fuelled turbines operating in open cycle arrangement are the most efficient and environmentally friendly method of complementing uncontrollable renewable generation sources.

Open cycle gas turbines are able to be quickly started and stopped (typically less than 30 minutes from off to full output) meaning they are not required to operate constantly like thermal power stations, which typically take up to eight hours to start from cold and as a result are rarely turned completely off.

This form of generation allows AGL to meet times of high demand and manage commercial risks associated with high price. If AGL's generation portfolio had only renewable energy sources of electricity and there was a high electricity price, then AGL could be exposed to paying the high prices. The development of the Dalton Power Station is part of AGL's strategy to mitigate commercial risk, so that AGL can supply it's customers at time of high prices.

AGL has demonstrated that it is prepared to invest in low emissions and renewable energy technology through its previous generation activities involving:

- the acquisition of hydro assets from Southern Hydro in Victoria;
- acquisition of the 1280 MW natural gas fired Torrens Island Power Station;
- construction of the 95 MW Hallett wind farm in South Australia;
- construction of the 71.4 MW Hallett II wind farm in South Australia;

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- construction of the 63 MW Oaklands Hill windfarm in Victoria; and
- construction of the 130 MW Bogong Hydro Project in Victoria;
- construction of the 420 MW Macarthur wind farm in Victoria; and
- development of the approximately 150 MW Ben Lomond wind farm in NSW (Site under option; permitting ongoing).

### Project Alternatives

A range of alternatives for plant, proposed location and water sources were considered. Operation of gas turbines in open cycle mode was found to be preferable to combined cycle gas turbines and coal fired generation for meeting peak electricity demand while renewable technologies are not conducive to meeting peak demand requirements. Natural gas is a clean burning fuel and has comparatively low greenhouse gas emissions. In terms of alternate power generation technologies, open cycle gas turbines present the best balance of outcomes between the imperatives of climate change mitigation and meeting peak electricity demand while managing the price of electricity for end use consumers.

NO<sub>x</sub> emissions would be controlled through implementation of Dry Low NO<sub>x</sub> technology, reducing NO<sub>x</sub> emissions by about 88 %. Alternative NO<sub>x</sub> emission control technologies such as catalytic combustion and selective catalytic reactor are not suitable for this application due to technology constraints. Other viable mechanisms for NO<sub>x</sub> offset and reductions would be regulatory policy, namely a NO<sub>x</sub> cap and trade scheme. Given the anticipated introduction of the Emission Trading Scheme to reduce greenhouse gas emissions, a similar framework for NO<sub>x</sub> emissions would allow a consistent approach in addressing emissions reduction and also provide a 'level playing field' for all emission sources.

AGL has undertaken a comprehensive review of existing gas turbine developments in Australia and has also reviewed more than 12 alternative sites for the proposed development in NSW. Network connections, existing land uses and environmental constraints were reviewed as part of the Project's siting investigation, and the Dalton area remains the preferred region due to the proximity of the Site to demand, the existing concentration of infrastructure, and the appropriate site setback from neighbouring properties and communities. Following additional analysis of alternate sites in NSW and existing facilities in Australia, locating a gas turbine peaking power plant in the Dalton region is acceptable based on predicted environmental impacts. Strategically, the Site provides a location for reliable electricity generation at peak times to the key demand centre of NSW.

A number of locations within the AGL Site Boundary were reviewed before a specific location was selected based on providing a balanced outcome mitigating the impact on surrounding landowners and the environment. The Development Site has a rural zoning and the Dalton Power Project is permissible within this land use zone.

The location of the proposed footprint (about 26 ha in size within a total Site area of 508 ha) was determined as a balanced outcome between competing interests of various landowners, environmental considerations and cost considerations. Alternatives were also considered for the location of the access road and gas pipeline, as well as for the communications tower and related hut,

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access track and services easement connecting these elements to the Facility. The proposed location of this infrastructure balances the ecological and engineering constraints.

A number of options are being considered for water sources and water treatment, and as described throughout the Environmental Assessment, further approvals would be sought by AGL as appropriate for any component not fully addressed at this time..

### Project Description

AGL proposes to construct and operate a gas turbine power station with a nominal generating capacity of up to 1500 MW. Each gas turbine unit includes the gas turbine, a generator and a high voltage transformer with air coolers and filters on the inlet. A gas receiving and conditioning station (within the Site) would be required to ensure flow and pressure control, isolation and filtration.

Stage 1 would initially result in the construction of a gas turbine power station with a nominal generation capacity of between 250 and 780 MW. The first stage would consist of the installation of two to four "E" class turbines, or two to three "F" class units. Each "E" class turbine would have a capacity of between 125 and 200 MW each run in open cycle mode, and each "F" class turbine would have a nominal generation capacity range between 200 and 320 MW.

At a later stage (likely to be initiated by the proposed upgrade by TransGrid of the 330 kV transmission line from the Bannaby substation to Yass), Stage 2 of the Project would involve the incorporation of additional open cycle gas turbine units into the power station to bring the maximum number of turbines to six, and the total maximum generating capacity to 1500 MW for the complete Dalton Power Project for which AGL is seeking approval.

The Facility may be operated remotely with staff working during day shifts and on call at other times. During operation, between five and ten staff would be employed. Construction for each stage would occur over a 24 month period. Each gas turbine unit comprises the turbine itself, a generator and a high voltage transformer with air filters on the inlet. A gas receiving and conditioning station would be required for pipeline connection to ensure flow, temperature and pressure control and filtration.

The constituent elements of the Dalton Power Project would include the proposed power station; an approximately 3 km lateral gas pipeline connection from the power station to an existing natural gas supply pipeline located to the south of the Site; access road to the Site, a communications tower and related hut, connected to the Facility via underground services, and an access track and a connection between the power station and the existing high voltage transmission system on Site requiring one or two transmission towers within the existing 330 kV transmission line easement.

The Project would involve the construction and operation of the following infrastructure:

#### ***Gas Pipeline (northern portion) and Access Road***

The Facility would be fuelled by natural gas from a lateral gas pipeline connection to the Moomba to Sydney Gas Pipeline to the south of the Site. The northern portion of this pipeline into the Facility would be developed within a shared easement with a new road to be constructed from the intersection

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of Walshs Road where the road makes a right angle turn west. The length of the gas pipeline (northern portion) and access road would be 1.9 km (to the edge of the Facility footprint) and the maximum area of the easement footprint would be approximately 4.2 ha. The width of this shared easement and ranges between 10 and 45 m in width, and would require the permanent removal of some vegetation.

### ***Gas Pipeline (southern portion) and Valve Station***

The southern portion of the gas pipeline would be constructed within the easement of the existing Walshs Road reserve. The southern portion of the gas pipeline would extend from a proposed valve station adjacent to the Walshs Road easement to the Moomba to Sydney Gas Pipeline, and would connect with the northern portion of the gas pipeline into the Facility where the proposed new road meets Walshs Road. The length of the gas pipeline (southern portion) would be 1.1 km and the maximum area of the easement footprint would be 0.6 ha (or 0.8 ha including the valve station).

The gas pipeline (northern and southern portions) would be an underground line (except at entry and exit points) and would be located within an easement of approximately 5 m.

AGL proposes the construction of a valve station as the connection point from the Moomba to Sydney Gas Pipeline. The valve station would be set back 25 m from Walshs Road and would occupy an area of approximately 0.22 ha. The area would be fenced off from public access.

### ***Communications Tower Infrastructure***

A communications tower would require construction and establishment beyond the Facility footprint. The tower would be approximately 60 m in height, and would be located on an elevated area approximately 1.5 km to the east of the Facility. The tower would be connected to the Facility via underground services and a new access track.

### ***Electrical Infrastructure***

The electricity generated by the Facility would be fed into the high voltage transmission network located within the Site via a new connection facility built in stages. To facilitate this connection, one or two additional transmission towers would require construction within the existing 330 kV transmission line easement. The positioning of the tower(s) would be determined during the detailed design stage. The structure(s) would be in the height range of 30 – 40 m and would be located within the existing transmission line easement which forms part of the southern boundary of the Development Footprint.

### ***Other Project Components***

Some small amounts of chemicals and oil would be required on-site for use in the Dalton Power Project. Chemical storage would comply with statutory requirements. Water would be stored on-site in tanks for process, domestic and fire fighting uses.

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### ***Water and Wastewater Management***

The Facility has a small essential water demand, comprising domestic water, utility water and firewater water. In addition it has a discretionary process water demand to improve turbine efficiency. While the Facility can run without process water, it is desirable that it be supplied to allow the turbines to operate significantly more efficiently.

Water for the Project will be sourced through a number of options including tankering of water to the Site (by road); groundwater extraction; and via the augmentation of the Dalton or Gunning supply and/or from the Gunning Sewerage Treatment Plant if the water quality is suitable and sufficient water quantities are available. It is currently proposed that the site water supply will be offsite tankering to meet the essential base domestic and utility water demands, and some or all of the process water demands (depending upon the development option adopted). AGL also proposes to obtain water from on site groundwater extraction to meet the full nominated site water supply requirements. Water may also be obtained from Upper Lachlan Shire Council water supplies.

During further design and development of the power station, further investigations will be conducted on the additional water supply options, with on-site groundwater extraction and/or Upper Lachlan Shire Council water supplies the current preferred options, to meet the full nominated site water supply requirements. The final arrangements would be subject to further feasibility assessment.

### **Statutory Planning**

The Dalton Power Project is subject to the development and assessment processes and requirements of Part 3A of the *Environmental Planning and Assessment 1979* (EP&A Act) and is also considered to be a “critical infrastructure project” under Part 3A of the EP&A Act. A Project Application was accepted by the DoP on 25 March 2010, including a revised Preliminary Environmental Assessment. On 19 April 2010 the Environmental Assessment Requirements were issued.

The Project also triggers the Commonwealth EPBC Act. The potential impacts to Endangered Ecological Communities were the focus of an EPBC referral submitted for determination by the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities. On 15 June 2010, the Project was determined to be a Controlled Action by the Minister for Sustainability, Environment, Water, Population and Communities. (EPBC 2010/5484). Supplementary Director-General Requirements for the Project were provided on 5 July 2010.

Other licences and approvals required for the Project include:

- Environment Protection Licence under the provisions of the *Protection of the Environment Operations Act 1997*;
- Notification to WorkCover to Keep Dangerous Goods under the *Occupational Health and Safety Regulation 2001* for the storage and handling of notifiable quantities of dangerous goods; and
- Pipeline licence under the *Pipelines Act 1967*.

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The Development footprint encompasses and traverses land which is zoned RU2 Rural landscape and RU1 Primary Production under the Upper Lachlan Local Environment Plan 2010. The Dalton Power Project is permissible within these zones with development consent.

### Consultation

Throughout the development of the Dalton Power Project, AGL has been committed to meaningful community and stakeholder engagement. AGL has worked in collaboration with relevant government agencies, Upper Lachlan Council, local landowners and the community since late 2008.

In accordance with the DGRs, consultation for the Project has targeted the following groups:

- State government agencies;
- Upper Lachlan Shire Council;
- Local Aboriginal Land Council;
- affected land owners; and
- other community stakeholders.

AGL is committed to maintaining regular contact with the regulatory authorities, neighbouring land owners, the Dalton community and other interested parties during the exhibition and assessment of the Project. Issues that have been raised by stakeholders to date have been taken into account where possible in the preparation of this Environmental Assessment.

### Air Quality and Greenhouse Gas

#### *Air Quality*

The potential impact on air quality of the Project has been assessed using a largely conservative approach, in accordance with the DECCW (2005) *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW*. The pollutants assessed included nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulphur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and formaldehyde. The dispersion modelling has. In order to assess the cumulative impact of the plant emissions on the local air quality, background concentrations of the criteria pollutants were obtained from the relevant OEH and TMS monitoring stations. The assessment used the Calpuff dispersion modelling package.

Given the quantity, velocity and temperature of the exhaust gases emitted from the exhaust stacks, open cycle gas turbine plumes can travel at high velocities through the atmosphere. Exhaust temperatures upwards of 500 degrees Celsius and exit velocities of around 40 metres per second enhance the dispersion characteristics of the plume and reduce the ground level impacts of pollutants.

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The results of the dispersion modelling showed that the predicted impacts on ground level concentrations of NO<sub>2</sub>, PM<sub>10</sub>, CO and SO<sub>2</sub>, when added to peak background concentrations, were within the OEH regulatory criteria. In addition, the predicted incremental concentrations of formaldehyde were found to be within OEH criteria. This analysis has also assumed that all oxides of nitrogen (NO<sub>x</sub>) exist as nitrogen dioxide.

### **Greenhouse Gas**

A greenhouse gas assessment has been performed for the Facility, and has included scope 1, scope 2 and scope 3 emissions associated with natural gas combustion in the open cycle gas turbine generators, and the consumption of electricity from the electricity grid. The principal greenhouse gas emission from the Facility is carbon dioxide (CO<sub>2</sub>), which is a product of natural gas combustion. Minor quantities of other greenhouse gases may be emitted and have been represented in this assessment, as carbon dioxide equivalent (CO<sub>2</sub>-e). The assessment has considered four potential plant configurations, each with an average of operational time of 15 % of the year.

Total annual emissions were estimated to be in the range of 0.66 to 1.47 Million tonnes of carbon dioxide equivalent (Mt CO<sub>2</sub>-e). The associated emissions intensity of generation was calculated to be approximately 800 kilograms of carbon dioxide equivalent per megawatt hour of electricity generated (kg CO<sub>2</sub>-e/MWh).

Based on a project life of 30 years, the total lifetime emissions were estimated to be between 20.1 and 44.0 Mt CO<sub>2</sub>-e.

A comparison of emissions from the Facility to state and national greenhouse gas inventories was also made. Emissions from the project were estimated to be in the range of 0.41-0.90 % and 0.11-0.25 % of the state and national inventories, respectively. In addition, emissions from the project were estimated to be in the range of 0.85-1.85 % and 0.23-0.49 % of stationary energy emissions from the state and national inventories, respectively.

A plume rise assessment was performed which showed that the peaking power plant would produce exhaust plumes with vertical velocities that exceed 4.3 m/s above the Obstacle Limitation Surface. Due to the predicted plume rise from the stack emissions, an aviation hazard analysis was also conducted. The aviation hazard analysis was compiled in accordance with the Civil Aviation Safety Authority's (CASA) Advisory Circular "*Guidelines for Conducting Plume Rise Assessments*" (June, 2004). A search of CASA registered aerodromes and unregistered landing strips indicated that there are no known landing strips within a 15 km radius of the Project site.

Whilst this assessment is considered conservative with respect to the modelled operating times and operating conditions, the Civil Aviation Safety Authority (CASA) may choose to designate this to be a potential hazard to aircraft operators in the area. Further consultation with CASA would be undertaken to ensure the Project is appropriately recognised as a potential aviation hazard.



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### Soils, Geology and Groundwater

The Site lies within the Lachlan Fold Belt, and the Dalton area falls under the Lachlan Fold Belt Groundwater Management Unit. Previous sampling has indicated that the water table would be at some depth and below the proposed depth of excavation.

There is variation in soil depth and characteristics across the Site. Variations relate to the underlying geology, slope, position on the slope and ground water level and variations in ground water levels. Soils should be regarded as erodible and management measures would be implemented to limit erosion and off site sedimentation.

At present the Site is unmined. In the past the area around Gunning has been mined for gold, however the last recorded mining activity was in 1956. Therefore it is deemed unlikely that mine subsidence would affect the Site. However, Commissioners Gold hold an exploration permit over the area. No issues were raised by Commissioners Gold during consultation with them.

The mitigation measures and safeguards would ensure that soils and groundwater are satisfactorily managed using suitable design, construction and management.

### Landscape and Visual Assessment

For the proposed Power Station layout, an assessment of the visibility rating for each potential view location indicated the following:

- a **NIL** visibility rating for 16 of the 34 view locations has been determined, while a **LOW** visibility rating has been determined for 18 view locations;

For the proposed Communication Tower infrastructure, an assessment of the visibility rating for each potential view location indicated the following:

- a **NIL** visibility rating for 15 of the 34 view locations has been determined, while a **LOW** visibility rating has been determined for 19 view locations; and

For the proposed Valve Station:

- a **NIL** visibility rating for 22 of the 34 view locations has been determined, while a **LOW** visibility rating has been determined for 12 view locations.

Given the extent and combination of existing natural and cultural character surrounding the Project, the capability of the landscape to absorb the key components of the Project is considered to be high.

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There are unlikely to be any significant views toward 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. All 19 view locations likely to be impacted by views towards the communications tower have been determined as having a low visibility rating for this feature. A significant consideration in the assessment has been that distant views toward the tower are likely to be influenced by atmospheric conditions which would tend to reduce the visibility of the tower.

External to the AGL Site boundary, the proposed valve station would be set back approximately 25m from Walshs Road. The assessment has concluded that 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. Appropriate mitigation measures would reduce the visual contrast of the infrastructure and therefore reduce the visual impact of this infrastructure from passing traffic and the nearest residential view locations.

The access road, control building, ancillary infrastructure and constructed gas pipeline would generally not be visible from most view locations.

Appropriate mitigation measures would reduce the visual contrast of the Project and associated infrastructure and therefore reduce the visual impact upon passing traffic and the nearest residential view locations.

### Traffic and Transport

Access to the Site would be via a new access road to be developed from Walshs Road where the road takes a 90 degree turn west. The 1.9 km access road would extend from Walshs Road in a north east direction to the Site, and would be a shared easement with the northern portion of the proposed gas pipeline. The road would be built to comply with requirements for the purposes of constructing and operating the proposed power plant.

The traffic and transport assessment found that the arterial road network could satisfactorily and safely accept the additional traffic generated by the development during the construction, operational and maintenance phases.

Over-mass and over-dimensional loads such as the gas turbines, towers, generators and transformers would be transported to site under RTA and NSW Police permit conditions and along approved routes. Further assessment and planning is required during the detailed design phase to identify and cater for any necessary temporary remedial treatments to facilitate passage of over-mass and over-dimensional loads once the actual weight and dimensions of the proposed plant equipment is known.

Management by experienced haulage contractors and liaison with the permit section of the RTA, NSW Police and local governments would be undertaken to ensure the safety and amenity of the greater community. AGL would continue liaison and engagement with the RTA and relevant Councils responsible for the infrastructure that may require upgrade. Once details are confirmed about widening and re-grading works required to facilitate the movement of over-mass, over-dimension vehicles, AGL would implement or pay for required temporary improvements, pending project approval.

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### Noise Assessment

The noise assessment for operation of the Facility addressed general continuous operations, potential for sleep disturbance and low frequency and tonal noise. The noise assessment for construction addressed construction activities for the Facility, gas pipeline and access road, communications tower infrastructure and off site traffic noise on public roads generated during construction. Vibration impacts of the proposed construction and operation have not been assessed in detail given the substantial distances from the Facility to the nearest residential receptors.

The predicted noise impacts of the proposed development upon the nearest potentially affected noise sensitive receptor locations have been assessed with consideration of the following guidelines:

- NSW Office of Environment and Heritage (OEH) *Industrial Noise Policy* (INP, EPA 1999) for the assessment of the operational noise of the proposed development;
- NSW OEH *Environmental Criteria for Road Traffic Noise* (ECRTN, EPA 1999) for the assessment of the off-site traffic noise on public roads; and
- NSW OEH *Interim Construction Noise Guidelines* (ICNG, DECC, 2009) for the assessment of the noise from construction of the proposed development.

The adopted noise limits are the lowest permissible noise limits as specified in the NSW *Industrial Noise Policy*.

The following provides a summary of the outcomes of the assessment of potential acoustic impacts:

- Operation:
  - Noise levels generated by the proposed operation would be within the established noise limits at all receptor locations under neutral and the prevailing meteorological conditions at the Site.
- Sleep Disturbance:
  - Predicted noise levels are within the sleep disturbance noise limits established taking into consideration in accordance with the INP, ECRTN and WHO guidelines.
- Low Frequency and Tonal Noise:
  - The assessment indicates that low frequency noise may exceed the INP Low Frequency Noise criteria at three residences.
  - An alternative assessment of low frequency and tonal noise impacts based on international research suggests that the predicted low frequency noise would not be at a level to cause annoyance to residential receptors. Accordingly, no adjustment to the A-weighted predicted operational noise levels would be required.
  - Notwithstanding this, AGL will commence discussions with receptors B, C and D regarding this assessment as consistent with other developments.

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- Construction Noise:
  - No exceedance of the noise limit is expected at any residential locations during the proposed construction phase of the power station.
  - During pipeline construction, some exceedances may be experienced at Receptor D.
- Off-Site Traffic Noise:
  - Construction: The predicted increases in road traffic noise levels are up to 2 dB at the most potentially affected dwellings. The resulting levels remain within the off-site traffic noise criteria.

On the basis of this assessment, it is concluded that noise impacts of the proposed construction and operation of the plant and proposed gas pipeline and access road are not expected to degrade the existing acoustic environment nor create annoyance to the residential receptor locations surrounding the Facility.

## Flora and Fauna

The Flora and Fauna assessment found that there are important ecological values on the site. Preliminary surveys indicated that the Project had the potential to result in a significant impact to two Commonwealth listed Endangered Ecological Communities (EECs); Natural Temperate Grassland and Box Gum Woodland.

The Project was the subject of an EPBC Referral to the Minister of the Department of Environment, Water, Heritage and the Arts (DEWHA, now the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC)). As a result of the Referral, the Project was declared a Controlled Action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Since this declaration, subsequent surveys have determined that Commonwealth listed Box Gum Woodland would not be impacted by the Project. A revised Commonwealth Significant Impact Criteria assessment suggests that there would only be a significant impact on the EEC Natural Temperate Grassland.

The proposed works would involve the clearing of approximately 5.94 ha of Box-Gum Woodland as listed under the New South Wales *Threatened Species and Conservation Act 1995* and 9.07 ha of Natural Temperate Grassland listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

The results of the NSW Assessments of Significance indicate that the Dalton Power Project has the potential to result in a significant impact to the TSC Act listed EEC Box Gum Woodland, but would not result in a significant impact to any other threatened species or populations listed under the TSC Act assessed within the Flora and Fauna Assessment.

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To minimise the potential impact of this project, detailed recommended mitigation measures would be implemented. These measures include management plans for the construction and operational stages of the project, clearing strategies, habitat replacement plans and rehabilitation and land management strategies. In addition to these measures, in order to offset the potential impact of the Project on Box Gum Woodland and Natural Temperate Grassland, AGL propose an offset area within the AGL owned lands adjoining the development footprint comprising:

- 77.57 ha of Box Gum Woodland,
- 80.71 ha of Native Temperate Grassland; and
- 24.97 ha of exotic pasture which has the potential to become Natural Temperate Grassland within the AGL owned lands adjoining the development footprint if managed appropriately.

The Flora and Fauna assessment has detailed the potential impacts and mitigation measures for each matter of NES as well as State (TSC Act) listed species that have been identified, or are considered as having the potential to occur within the Project Area. With AGL's commitment to the biodiversity offset strategy and mitigation measures for the project, it is considered that the overall biodiversity of the local area would be 'maintained or improved' as is required under biodiversity assessment guidelines under Part 3A of the EP&A Act. The offset arrangements are also consistent with the Commonwealth's principles for environmental offsets established under the EPBC Act.

### Water Management

The water requirements, wastewater production, stormwater management and flooding potential have been assessed for both construction and operation of the Dalton Power Project. The Facility has a small essential water demand, comprising domestic water, utility water and firewater water. In addition it has a discretionary process water demand to improve turbine efficiency.

Site water will be sourced from a range of sources including via the augmentation of the Dalton or Gunning supply and/or from the Gunning Sewerage Treatment Plant if the water quality is suitable and sufficient water quantities are available; tankering (by road) water to the Site, and groundwater extraction. Further investigations will be undertaken to confirm the final water supply arrangement, and AGL will progress additional approval for the final supply option.

The main water demand for the Facility is process water, for supply of gas turbine inlet air evaporative cooling and, if installed, high fogging systems. Deionised water is required for the high fogging demand, and deionised water or high quality (low salinity) potable water can be used to supply the evaporative coolers. A process water treatment plant would be expected to be required on site, regardless of the water supply source, although the level of complexity would change depending upon the source(s) water quality. A potable water supply would be required for domestic purpose, as well as a utility water supply for miscellaneous plant uses. Fire fighting water requires dedicated storage tanks. Landscaping water would be sourced from rainwater, although this may need to be supplemented during flora establishment. There would be provision on site for the delivery of bulk water via tanker trucks.

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Process wastewater would be generated at the Facility by the process of blow down from evaporative air inlet coolers which cool the gas turbine air intake. Blow down water would be collected in evaporation ponds lined with a synthetic liner (such as high density polyethylene) to minimise the risk of the saline blow down water escaping into the natural groundwater system.

Clean rainwater collected from the Facility catchment area would be directed to a sedimentation pond. The outlet of the stormwater system would be designed to maximize the dispersion of these high flows and thereby minimise their potential to cause soil erosion downstream.

Surface water from potentially impacted process areas and bunded areas would discharge to the sedimentation pond via a sediment and oil trap. Bunds would only be drained (manually) after confirmation that the contents are uncontaminated. In the event of contamination, the bund contents would be educted by vacuum truck and transported offsite to a licensed disposal facility.

All construction works for the Project would be undertaken in a manner to minimise the potential for soil erosion and sedimentation. Wastewater volumes have been estimated and management strategies developed to effectively maintain zero discharge from the site except for natural surface flows.

### Heritage

A heritage assessment of the potential impacts of construction of the Facility, gas pipeline and access road was conducted. Subsequent assessment was also carried out across the area of the proposed Communication Tower and Hut, and the proposed route of the services trench and access road connecting these features to the Facility.

The assessments addressed the local and regional archaeology and Aboriginal and European cultural heritage, and were prepared in accordance with the draft *Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation* (DECCW 2010).

- Six sites (Dalton 2, Dalton 3, Dalton 4, Dalton 5, Dalton 7 and DGP3), and two areas of potential archaeological deposits (DPAD1 and DPAD2) would be directly impacted by the plant footprint.
- Sites Dalton 1 and Dalton 6 would not be impacted by the Project.
- DGP4 and DGP5 is within the footprint of the gas pipeline and access road and would be directly impacted by the Project.
- DGP6 is within close proximity of the pipeline and access road footprint.

Where impacts cannot be avoided then the artifacts should be collected or relocated away from the area of impact. The following management strategies would be implemented:

- Disturbance to Aboriginal archaeological sites Dalton 2, Dalton 3, Dalton 4, Dalton 5, Dalton 7 and DGP3 should be avoided if possible. If impact is unavoidable, the artefacts would be collected or relocated away from the area of impact.

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- If impact to Aboriginal site Dalton 5 and potential archaeological deposits DPAD1 and DPAD2 cannot be avoided, then a program of archaeological subsurface testing would be conducted to ascertain the presence, extent and integrity of cultural material that may be present in these areas. It is noted that the majority of the identified DPAD 2 area is located external to the Facility boundary, and detailed design will aim to avoid disturbance to the portion which has been identified within the boundary.
- The artefacts exposed at DGP5 should be collected and/or relocated away from the area of impact.
- A limited program of salvage excavation should be conducted at sites DGP4 and DGP6 with the aim of recording and analysing a larger and more representative sample of artefacts

No further action is required for the DGP1, which is situated outside of the impact area.

The Dalton gas pipeline study area is located within a broad area included in an active Native Title Claim by the Gundungurra Tribal Council Aboriginal Corporation.

No European sites were located as occurring within either the power station footprint, or within the gaspipeline easement area.

### Land Use and Property Impacts

Land use in the immediate surrounds of the Development Site is predominantly rural enterprises on medium size holdings and smaller rural home sites. The Development Site is located in an area that is zoned RU2 Rural Landscape, with parts of the Gas Pipeline (northern section) and Access Road, as well as the Gas Pipeline (southern section) zoned RU1 Primary Production. Zoning RU1 Primary Production and RU2 Rural Landscape, provide that “power generation” facilities are permissible with consent.

The proposal would result in changes to the land use of the development footprint itself as it is currently used primarily for agricultural purposes. An area of 183.26 ha (approximately 36 % of the Site) would form part of the Offset Area which would be conserved and managed appropriately (refer to **Chapter 13** for further details). The remainder of the Site would also be managed appropriately (refer to **Chapter 13** for further details). Therefore AGL considers that the land use change would be an overall positive one due to the higher conservation outcomes of the land use change from agricultural use and production to conservation.

Consideration was given to cumulative impacts with other major projects being undertaken or considered in the Upper Lachlan Shire Council area. The current major projects listed on the DoPI register of major projects in the Upper Lachlan Shire Council area are all windfarms. The dominance of electricity generation projects is due to the presence of wind resources and infrastructure associated with electricity generation in the region.

## Executive Summary

These projects are located between 5 km and more than 20 km from the Dalton Power Project. These projects are in a range of stages from consideration of DGRs to operation having commenced. Timing of the projects for construction and operation (for those not having already commenced) is unknown and dependant on the respective proponents. Based on the distance between Dalton Power Project and other windfarm projects, potential differences in timing of construction between projects, and differences in key environmental impacts between gas fired generation and wind generation, there would not be a negative cumulative impact from the Dalton Power Project.

Mitigation measures detailed in this Environmental Assessment relate to the control of the development's impact on noise levels, air and water quality, traffic and transportation, visual amenity and other environmental matters. These mitigation measures would be implemented to ensure that the proposed Project is managed in an effective and efficient manner, with minimal impact on existing or possible future surrounding land uses.

### Socio Economic

The estimated economic impacts for the Project show positive economic and social benefits at a national level in terms of contribution to GDP, income and employment resulting from the plant construction and operation. It is believed however, that a large proportion of the benefits from the Project would eventuate in the local or state regions. Some of the local impacts likely to be generated by the Project include:

- labour is likely to come from the Upper Lachlan and Goulburn-Mulwaree region, as the construction and manufacturing industries are both strong in terms of the proportion of the workforce employed in these industries, and the local region has a comparative advantage to the rest of NSW in the number of tradespersons working in the area; and
- the local population is not expected to be impacted by the Project as the employment numbers during operation are not significant.

AGL is committed to continuing its active community engagement and implementing its philosophy whereby AGL supports particular community initiatives.

The mitigation measures for social impact broadly relate to the mitigation measures relating to the control of noise levels, air and water quality, traffic and transportation, visual amenity and other environmental matters. These measures are detailed in **Chapter 7** through **Chapter 18**, and would be implemented to ensure that the proposed Project is managed in an effective and efficient manner, with minimal impact on existing or possible future surrounding land uses.

### Preliminary Hazard Analysis

The preliminary hazard analysis (PHA) assessment has been undertaken in accordance with the DoP's Hazardous Industry Advisory Papers (HIPAP) No 6 (*Guidelines for Hazard Analysis*) and HIPAP No 4 (*Risk Criteria for Land Use Planning*). The main hazard associated with the proposed project is associated with the handling of natural gas (predominantly composed of methane gas), which is a flammable gas held under pressure. Other, less significant hazards are associated with the handling of flammable and combustible liquids.



## Executive Summary

The risk assessment carried out in this study assumed that the safety assessment process would continue throughout the design, construction and commissioning of a potentially hazardous facility to refine and update the outcome of the development approval / environmental risk process.

Despite the conservatism built into the risk assessment, the results show that the risk associated with this development is very low. The most stringent risk criteria, as required by the Department of Planning, are adhered to. The results show that the  $1 \times 10^{-6}$  per year individual risk contour does not extend beyond the site boundary for the power station. This risk contour does extend by 22 m in either direction of the centreline of the pipeline, implying that future residential developments (if ever an option) would be restricted within this buffer.

### Draft Statement of Commitments

The Draft Statement of Commitments has been prepared in accordance with section 75F (6) of the *EP&A Act*. The inclusion of appropriate environmental management measures into the detailed design and construction of the project would minimise adverse impacts on the environment. The proposed adoption of the relevant measures identified in the Draft Statement of Commitments into a Construction Environmental Management Plan (CEMP) and Operation Environmental Management Plan (OEMP) would be an important component of the proposal and reiterate the commitment of AGL and its contractors to mitigation of environmental impacts identified in this assessment.

The Draft Statement of Commitments describes the environmental management and monitoring to be undertaken during the construction and operation of the Dalton Power Project.

### Conclusion

As Environmental Assessment Requirements were notified for the Project on 19 April 2010, the Project is a transitional Part 3A Project for the purpose of the Part 3A Repeal Act and Part 3A will continue to apply. Hence, Project Approval under Part 3A of the *EP&A Act* is being sought by AGL for the construction and operation of a gas fired power plant at Dalton, NSW. The power plant would use natural gas as its primary fuel and have a fully developed nominal generating capacity of up to 1500 MW, built over two stages. The proposed design and layout of the power plant would enable AGL to meet peak demand requirements for power generation in NSW.

The use of natural gas for the Project results in efficient use of resources for electricity generation as electricity production with gas is at a lower greenhouse intensity than the NSW average. Natural gas is a clean burning fuel and has comparatively low greenhouse gas emissions. In terms of alternate power generation technologies, open cycle gas turbines present the best balance of outcomes between the imperatives of climate change mitigation and meeting peak electricity demand while managing the price of electricity for end use consumers.

The Project is expected to have positive economic and social impacts during both construction and operation phases with potential for a positive effect on the regional economy through contribution to GDP, income and employment.

## Executive Summary

The Environmental Assessment provides a comprehensive assessment of the Project and includes investigations regarding all relevant environmental issues. Potential adverse impacts have been assessed and strategies to avoid, minimise and mitigate those impacts form a key part of the Environmental Assessment. Mitigation measures to ensure impacts to both the bio-physical and socio-cultural environment remain at an acceptable level throughout the planned lifespan of the proposed power plant have been factored into the proposal.