REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE *ENVIRONMENT EFFECTS ACT 1978*

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Department of Planning and Community Development (DPCD) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

In completing a Referral Form, the following should occur:

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once DPCD is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
    - a brief description of potential changes or risks to environmental assets resulting from the project;
    - available information on the likelihood and significance of such changes;
    - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.
- A CD or DVD copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 2MB.**

- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address

Minister for Planning
PO Box 500
EAST MELBOURNE VIC 3002

Couriers

Minister for Planning
Level 17, 8 Nicholson Street
EAST MELBOURNE VIC 3002

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@dpcd.vic.gov.au is encouraged. This will assist the timely processing of a referral.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	AGL Energy Limited
Authorised person for proponent:	Evan Carless
Position:	Manager Power Development
Postal address:	Locked Bag 1837, St. Leonards, NSW 2065
Email address:	ecarless@agl.com.au
Phone number:	(02) 9921 2214
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Person who prepared Referral:	Sean Myers
Position:	Senior Principal - Environment and Planning
Organisation:	URS Australia Pty Ltd
Postal address:	Level 6, 1 Southbank Boulevard, Southbank, VIC, 3006
Email address:	sean_myers@urscorp.com
Phone number:	(03) 8699 7661
Facsimile number:	(03) 8699 7550
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	AGL Energy Limited (AGL) is Australia's largest energy retailer, which includes a significant customer base in Victoria. AGL own and operate power stations across Australia including traditional energy sources (gas and coal) as well as renewable sources (hydro, wind, landfill gas and biogas). AGL own and operate the Torrens Island Power station, the largest gas fired power station in Australia. AGL is also the largest private owner / operator of renewable energy assets in Australia. The AGL power development team is responsible for hydro, wind and gas fired power station developments including the Somerton gas fired power station and the Bogong hydro electric power station which are both located in Victoria. URS Australia Pty Ltd (URS) has been commissioned by AGL to prepare and manage environmental approvals for the Tarrone Power Station. URS is an international multi-disciplinary professional services consulting company, with relevant experience in preparing and managing environmental approvals for industrial projects. Other consultancies engaged by AGL are as follows: Biosis Research (flora and fauna, and cultural heritage) Land Design Partnership (Visual Amenity assessment) Planager Pty Ltd (Risk Assessment) SKM (Electrical connection studies, connection enquiries and connection applications) Aurecon (Site layout drawings)

2. Project – brief outline

Project title: Tarrone Power Station

Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context)

The proposed Tarrone Power Station is located in the rural locality of Tarrone, in the Moyne Shire Local Government Area, in south-west Victoria. The project consists of the power station site (including a 500kV substation and two gas pipeline corridors that are under consideration to provide gas from the nearby SEA Gas pipeline.

Refer Figure 1 – Locality.

Power Station Site

The power station site is located within an approximately 75 hectare battle axe land parcel with a western frontage to Landers Lane, Tarrone and a southern frontage to Riordans Road, Tarrone. A narrow on title access (battle axe handle) extends from the north-east corner, east to Tarrone North Road.

The AMG (GDA 94) coordinates of the power station site are as follows:

Point	Easting	Northing
North-west corner	602889	5773985
South-west corner	603697	5773979
South-east corner	603692	5773158
North-east corner	602863	5773159
Eastern end of battle axe handle	604623	5773956

Development within the power station site will consist of the power station development area, a 500kV substation and auxiliary onsite infrastructure with a total development area of approximately 14.3ha, as shown in Figure 3 and described below.

Power Station Plant Area

The main power station plant would be developed within a 4.3 hectare development footprint in the north-west corner of the overall site area, with the following AMG coordinates:

Point	Easting	Northing
North-west corner	602879	5773928
South-west corner	602956	5773761
South-east corner	603099	5773684
South corner	602956	5773683
North-east corner	603099	5773928
West Corner	602881	5773761

500kV Substation

The 500kV substation would be developed within a 6.3 hectare footprint adjacent to the power station plant area and the high voltage transmission line that crosses the site, with the following AMG coordinates:

Point	Easting	Northing
North-west corner	603135	5773970
South-west corner	603135	5773624
South-east corner	603361	5773624
North-east corner	603361	5773970

Auxiliary Infrastructure

Auxiliary infrastructure including an access road from Tarrone North Road, waste water ponds and construction laydown areas would be developed on the site (as shown on Figure 3) with a total footprint of approximately 3.6 hectares.

Gas Pipeline Investigation Corridors

The SEA Gas Pipeline is a high pressure transmission pipeline that transports natural gas from the Otway Basin to Adelaide. The SEA Gas Pipeline corridor passes, in a south-east to north-west direction, close to the proposed power station site. The longest gas pipeline under consideration is approximately 10 kilometres long, and with a 25m wide works area during construction, would have a maximum development of footprint of approximately 25ha. Two corridors are being considered to provide a connection from the SEA Gas Pipeline to the site as shown in Figure 2 and described below:

East-West Investigation Corridor (8km)

The east-west pipeline corridor is approximately eight kilometres in length, generally within the following AMG coordinates marking the pipeline investigation corridor:

Easting	Northing
604271	5774588
610118	5776180
610184	5775875
604815	5773840
602863	5774053

North-South Investigation Corridor (10km)

The north-south corridor is approximately ten kilometres in length, generally within the following AMG coordinates marking the pipeline investigation corridor:

Easting	Northing
603061	5783572
603693	5782964
602856	5779768
602863	5774053
602033	5781426

Short project description (few sentences)**:**

The project is the proposed development of the Tarrone Power Station with an associated substation, onsite infrastructure, underground gas pipeline and local road upgrades. The Tarrone Power Station would be an open-cycle gas turbine peaking power plant consisting of three or four turbines (depending on the turbine type selected), plant area, substation to connect to the high voltage transmission lines that cross the site, and an 8 to 10 kilometre long underground gas pipeline. The gas turbine area would consist of a main enclosure housing the turbines, an exhaust stack and transformer and other miscellaneous plant equipment. The power station would require approximately 10ML of water per year, for which several potential water sources have been identified including groundwater extraction, transport of water to site, and use of recycled water piped to site. The preferred option for water supply is groundwater extraction through the purchase of an existing groundwater licence in accordance with the regulatory and administrative requirements of Southern Rural Water.

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):

New power generation capacity is critical to meeting Victoria's growing demand for electricity. AGL's investment in new power generation will help provide security of supply in Victoria. The 2008 NEMMCO statement of opportunities identifies a requirement for additional capacity for system reliability in Victoria. In addition with the recent release of the Mandatory Renewable Energy Target (MRET) legislation, the additional renewable energy capacity will generally meet requirements for increased energy demand. However additional firm capacity will be required to meet peak demand at times when renewables are not generating sufficient energy capacity, for example during periods of low wind speeds. The proposed peaking power station is ideal in meeting this requirement.

Background/rationale of project (describe the context / basis for the proposal, eg. for siting):

AGL is investigating the development of a peaking power station to utilise Victoria's natural gas resources to increase Victoria's electricity production capacity. The use of natural gas for the production of electricity is consistent with Victorian Government Statement: Energy for Victoria (NRE, 2002) of securing electricity supplies in a manner that reduces greenhouse gas emissions. The Tarrone site is being investigated due to its proximity to critical electricity and gas infrastructure. A 500kV electrical sub-station would be located on the site to provide a connection to Victoria's electricity grid through the high-voltage Moorabool-Portland transmission line that crosses the site and would service the Tarrone Power Station. An underground gas pipeline will provide a connection to the nearby high-pressure SEA Gas Pipeline. The site is relatively isolated providing adequate buffers, with the nearest residence approximately 1500 metres to the north-east. A peaking power station is proposed to enable the provision of electricity into the Victorian electricity grid at times of high electrical demand.

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

The proposed power station plant area is located in the north-west corner of the site, which is currently used for grazing, between the substation to the east and Landers Lane to the west. The 4.3 hectare power station plant area is approximately 225 metres long (north to south) and approximately 210 metres wide (west to east) located close to the northern and western site boundaries.

The development would be an open-cycle gas turbine peaking power station. The capacity of the power station will depend on the type of turbine that is selected for the final design. Option A would consist of four E class turbines (approximately 4 x 180MW = 720 MW) and Option B would consist of three F class turbines (approximately 3 x 280MW = 840 MW). Once developed, both turbine configurations would have a development envelope that is contained within the approximately 4.3 hectare plant area. Where appropriate, this referral will present the likely impacts associated with the worst-case of the scenarios.

The proposed peaking power station development would generally consist of the following components:

Gas Turbine Unit
Each gas turbine unit consists of a main engine building housing the turbine and generators, an exhaust stack, and high-voltage electrical transformer. The process begins with air being drawn through an air intake filter, compressed and injected with natural gas, driving the turbine, which drives the compressor and electrical generator. The gas is then discharged to atmosphere through the exhaust stack. The individual components within the gas turbine units are:

- Main Engine Building containing:
    - Air Intake Filter and Duct.
    - Gas Turbine;
    - Generator; and
    - Auxiliary Block (containing electrical modules and other equipment)
- Exhaust Gas Stack;
- Coolers;

- High-Voltage Transformer Enclosure containing:
    - Unit Auxiliary Transformer;
    - Step-up transformer;
    - Generator Bus Duct;
    - Firewall/fence; and
    - Approximately 130 metre internal transmission line to the 500kV electrical sub-station
- Ancillary Plant including:
    - Fuel Gas Skid;
    - Firefighting Container; and
    - Drain Tank.

Auxiliary Buildings and Plant

- Administration building;
- Control Building;
- Security Building;
- Workshop and Store;
- Balance of Plant; and
- Gas Receiving Facility.

Water Tanks

- Fire Protection Tank;
- Process Water Tank; and
- Domestic Rainwater Tank.

Wastewater Infrastructure

- Bunding;
- Domestic wastewater treatment;
- Stormwater Pond; and
- Evaporation ponds.

Hardstand Area

- Staff Parking;
- Visitor Parking; and
- Access Road.

500Kv Substation

- Circuit Breaker
- Transformers
- Tubular Buswork
- Landing Rack
- Isolators
- Control Building

Ancillary components of the project (eg. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

Gas Pipeline

The proposed power station will require a gas lateral pipeline to source natural gas from the nearby SEA Gas pipeline. There are two investigation corridors are under consideration for the underground gas pipeline:

- an approximately ten kilometre long north-south corridor that runs adjacent to Landers Lane, crossing Woolsthorpe-Heywood Road and Kangertong Road, terminating at the SEA Gas approximately 500 metres north of Kangertong Road; and
- an approximately eight kilometre long east-west corridor that follows the onsite ROW east, then north along Tarrone North Road for approximately 500 metres, then east, north-east to the Willatook Valve Station on the SEA Gas pipeline, crossing Back Creek, Coomete Road and Willatook-Warrong Road.

Upgraded Local Roads
Tarrone North Road from Woolsthorpe-Hamilton Road (C176) to the entrance to the power station site via the ROW (a distance of approximately six kilometres), would be widened by two metres to accommodate construction traffic.

Water Supply
The power station would require approximately 10ML of water per year, for which several potential sources have been identified including groundwater extraction, transport of water by licensed carrier and water tanker to site, and use of recycled water piped to site. The capacity for water storage on site will be determined following completion of engineering design and confirmation of which water supply will be used.

Key construction activities:

The key construction activities associated with the Tarrone Power Station would commence in the third quarter of 2010 and be completed by the fourth quarter of 2012. Construction would be separated into six phases as follows:

Site Mobilisation
Initially, a construction compound (including offices, amenities, workshop, material laydown and storage area would be established on-site with facilities and equipment to execute the construction phase.

Site Preparation and Earthworks
The site preparation and construction phase of the project will begin with land clearing required for the approved site layout and the removal of topsoil. Removed topsoil would be stockpiled for reuse in landscaping following the completion of construction. A platform level will be established by earthworks with a slight grade to assist site drainage.

Concrete Foundation Works
Once site preparation and earthworks have been completed, concrete foundation works would be established for major plant equipment and structures. This phase would include the installation of internal underground piping and other internal infrastructure.

Building Construction
The major building construction phase will include the transport of pre-fabricated plant equipment to site, the installation of plant equipment and the construction of building enclosures. Electrical equipment and wiring would be installed to connect the plant to the electricity grid.

Gas Pipeline Construction
Following the surveying of a precise gas pipeline alignment, a 25 metre wide works area would be established to allow for pipeline construction to commence. Topsoil and deeper excavated material would be removed and stockpiled at the edge of the construction area. Once the open trench has been established, the gas pipeline would be transported to the site, strung and welded immediately adjacent to the trench, and placed into the trench. Excavated soil would then be reinstated and revegetated. Following detailed geotechnical investigations horizontal directional drilling may be used to install the gas pipeline where necessary (e.g. waterways and public roads). Open trenching would be used if demonstrated to have a lower environmental impact.

Roadworks
Tarrone North Road would need to be widened by two metres from a four metre wide seal to a six metre wide seal within the existing road reserve.

Key operational activities:

Expected annual operation hours are approximately 440 hours per year (approximately 5% of the year). The National Electricity Market is extremely volatile and complex, as a result the distribution of operating hours can vary significantly from year to year and is difficult to predict. However, the expected operating profile would be operating for short periods for 200 days per year. On any day that the powerstation operates, run hours could be less than an hour and up to 24 hours, however more likely to be in the order of 2 – 6 hours. During summer operation is more likely to occur during the heat of the day, whilst in winter operation is more likely to occur during morning and evening peak periods. Overnight running is rare.

In future years it is also possible that operating hours may temporarily increase due to Carbon Pollution Reduction Scheme (CPRS) and the new Mandatory Renewable Energy Target (MRET) legislation. However, sustained increases in demand for gas fired generation would likely be met by newly built combined cycle gas turbine power stations at other locations.

Key decommissioning activities (if applicable):

The timing and nature of decommissioning of the Tarrone Power Station has not been determined. The likely power station life span is at least 30 years. Key decommissioning activities would be compliant with the relevant guidelines and standards applicable at the time and would likely include the following:

Power Station

- all above ground serviceable items will be sold or reused and the remaining above ground plant and equipment demolished and, if possible, recycled. Any above ground material that cannot be reused or recycled will be disposed of at a licensed landfill facility.
- any contamination will be remediated and the site and all areas affected by the decommissioning will be levelled and revegetated so that it is left in a stable, self-sustaining condition.
- submit a post-decommissioning revegetation management plan. It is anticipated that, as a minimum, the site would be rehabilitated to a state suitable for on-going management of the land.
- substation will remain in place and its operation and maintenance would be the responsibility of the network provider.

Gas Pipeline including associated facilities, at time of decommissioning the likely party will:

- test the gas pipeline to determine if it can continue to operate and interest in the gas pipeline will be canvassed.
- if the gas pipeline is no longer required, it will be decommissioned in accordance with AS 2885 (or any subsequent Australian Standard in force at the time of decommissioning) and best practice.
- gas pipeline will be purged of gas, sealed and stabilised.
- all above ground facilities including meter stations, scraper facilities, compressor stations, will be removed and the sites rehabilitated to a standard suitable for ongoing management of the land.

Is the project an element or stage in a larger project?

✕ No ✕ Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

Is the project related to any other past, current or mooted proposals in the region?

No ✕ Yes If yes, please identify related proposals.
The Tarrone Power station and the Macarthur wind farm share the same electrical connection point (the 500kV sub-station) located on the site (neither project is contingent on the other). The 500kV sub-station has already received planning approval (Planning Permit No: PL-SP/05/0283) as part of the Macarthur wind farm project, however consideration is being sought for the substation as part of the Tarrone power station project to allow the flexibility to construct the substation as a part of which ever project proceeds first.

4. Project alternatives

Brief description of key alternatives considered to date (eg. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

AGL have selected the site due its proximity to the SEA Gas Pipeline and the Moorabool-Portland high-voltage transmission line. The power station development area within the site has been selected because it offers the greatest buffers to the nearest residences, and is adjacent to the high voltage Moorabool-Portland transmission line. Prior to selecting the Tarrone site, AGL considered various other locations in Victoria however, the only existing transmission line in Victoria with capacity to accommodate the requirements of the proposed power station is the Moorabool-Portland transmission line. Another key requirement for the power station siting is access to gas which AGL has access to from the existing SEAGas Port Campbell to Adelaide gas pipeline. Minimising extensions to transmission lines is a key consideration due to cost and visual impact, and therefore a site with direct access to the transmission line was selected. Minimising the length of gas lateral required to connect to the site is another key consideration. The site was selected based on the potential to share the 500Kv substation infrastructure with the Macarthur wind farm. A fatal flaws study was undertaken and identified no fatal flaws.

The expected timeframe for the selection of the gas pipeline option would be mid 2010.

Brief description of key alternatives to be further investigated (if known)**:**

AGL are currently investigating two alternative pipeline corridors to connect the proposed Tarrone Power Station to the SEA Gas Pipeline. No further peaking power station site alternatives are being considered.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

N/A

6. Project implementation

Implementing organisation (ultimately responsible for project, ie. not contractor)**:**

AGL Energy Limited would be responsible for the Tarrone Power Station. AGL is currently in discussion with a confidential organisation on the ownership and management of the proposed pipeline to connect to the Tarrone Power Station.

Implementation timeframe:

The following indicative timetable has been scheduled for the development of the Tarrone Power Station:
Finalisation of Concept Design - 2009
Approvals :Q1 2010
Commencement of Construction: Q3 2010
Commission Power Station: Q3 2012
Power Station Completion: Q4 2012

Proposed staging (if applicable):

The power station is proposed to be constructed in two stages. This referral document presents information describing all stages of the development at completion. The first stage is to commence construction in Q3 2010 with proposed completion expected in Q4 2012. The first stage is expected to be the installation of two or three E class gas turbines, or two F class gas turbines. The timing and choice of turbines combination for the second stage of the project is yet to be determined, however, it would result in a final site of four E class gas turbines or three F class gas turbines.

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

× No ✕ Yes If no, please describe area for investigation.
If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

Topography/Landform
The peaking power station site is located within the gently undulating stony rises of western Victoria. The site generally rises from south to north from an elevation of 75m to 83m with a highpoint of 87m. The site features stony rises in the north-east with a number of depressions.

The east-west pipeline investigation corridor (option 1) crosses the broad valley of the Back Creek (a tributary of the Moyne River) and north-south oriented lines of stony rises. The north-south pipeline investigation corridor (option 2) contains undulating terrain, generally increasing in elevation in a northerly direction.

Soil Types/Degradation
The peaking power station site and pipeline investigation corridors are located within the Victorian Volcanic Plain Bioregion and are underlain by the Quaternary aged Newer Volcanics formation, which typically comprises residual clay, frequently with cobbles and boulders, overlying variably weathered basalt rock at relatively shallow depths. Alluvial and swamp deposits may be encountered in the vicinity of waterways.

Drainage/Waterways
The site features one minor watercourse that crosses the site from north to south. The undulating topography with depressions has created several wetlands, the largest of which is located adjacent to the western boundary of the site. The east-west pipeline investigation corridor is crossed by the Back Creek, a modified waterway that is a tributary of the Moyne River. The north-south investigation corridor does not cross any waterways, but contains a number of depressions that become inundated in wet weather.

Vegetation Cover
The majority of the power station site is covered by vegetation that has been modified by farming practices. However, the site does contain scattered patches of native vegetation of the Plains Grassy Woodland EVC and Stony Knoll Shrubland EVC. The pipeline alignments are dominated by significantly modified vegetation associated with agricultural practices, including the grazing of stock, the removal of basalt rocks and degradation of drainage lines by stock access and movements.

Built Structures and Road Frontages
The only built structures on the site are approximately 65 metres high high-voltage transmission line towers. The site has road frontages to Landers Lane, Riordans Road and Tarrone North Road. An approved, but undeveloped 500kV electrical sub-station is located on the site providing a connection to Victoria's electricity grid through the high-voltage Moorabool-Portland transmission line that crosses the site. Consideration is being sought for the substation under this referral to allow the substation to be developed independently of the Macarthur wind farm. The wider pipeline investigation corridors contain several dwellings and roads. The pipeline lateral alignment will be selected to avoid and provide adequate buffers to existing dwellings in addition to other environmental values identified within the corridors.

Site area (if known):

Power Station Site Area: approximately 75ha
Power Station Plant Area: approximately 4.3ha
Electrical Substation Area: approximately 6.3ha
Onsite Auxiliary Infrastructure: approximately 3.6ha
Total onsite development footprint: approximately 14.2ha

Gas Pipeline
Route length (for Gas Pipeline Lateral) 8-10km **and width** 25m: maximum of approximately 25ha

Current land use and development:

The site is currently used for grazing. The only existing development on the site is the pylons associated with the Moorabool-Portland high-voltage transmission line.

Description of local setting (eg. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):
Adjoining Land Use
The land use adjoining the power station site and pipeline corridors is agricultural, mainly the grazing of cattle and sheep. The peaking power station site is also crossed by the high-voltage Moorabool-Portland transmission line.

Proximity to Residences and Urban Centres
There are seven houses within approximately two kilometres of the peaking power station site, the closest being 1500 metres to the north-east. The peaking power station site is located approximately seven kilometres north-east of Orford, seven kilometres west of Willatook, 15 kilometres south-west of Hawkesdale, 16 kilometres north-west of Kirkstall.

Road Access
The peaking power station site adjoins Landers Lane on the western boundary, Riordans Road on the southern boundary and has on title access to Tarrone North Road to the east. Tarrone North Road is a sealed road that provides access to Heywood-Woolsthorpe Road (C176). Road access to the site would be from Tarrone North Road.

Infrastructure
The peaking power station site is being considered due to its proximity to the junction of the high-voltage Moorabool-Portland transmission line and the high pressure SEA Gas pipeline, with electricity and gas connections from the Tarrone Power Station being included within the project. There is currently no water infrastructure in the area that could be utilised by the peaking power station for water supply. Water supply options are discussed in Section 13 of this referral.

Planning context (eg. strategic planning, zoning & overlays, management plans):

The peaking power station and two pipeline corridors are subject to the Moyne Planning Scheme.

Strategic Planning
Under the provisions of the Moyne Planning Scheme, there are several local planning policies that may apply to the proposed development of the Tarrone Power Station and associated pipeline corridors, including: environment, economic development, infrastructure, Aboriginal heritage, rare and threatened species, potential for groundwater recharge, susceptibility to mass movement, hilltop and ridgeline protection and agricultural production.

Zoning and Overlays
The Tarrone Power Station site is zoned Farming Zone under the provisions of the Moyne Planning Scheme. A planning scheme amendment would be required to provide for the use of land for a power station. The gas pipeline corridors are mostly zoned Farming Zone, with small sections of Road Zone 1, under the provisions of the Moyne Planning Scheme. A planning permit would be required for the use and development of an underground gas pipeline within these zones in addition to a pipeline licence. A pipeline licence will be obtained which will negate the need to obtain a planning permit under the Moyne Planning Scheme as depicted at Section 85 of the *Pipelines Act*.

The Tarrone Power Station site and associated gas pipeline corridors are not affected by any overlays under the provisions of the Moyne Planning Scheme.

Management Plans
An environmental management plan for construction and operations would be prepared prior to the development of the Tarrone Power Station and associated gas pipeline that will consider relevant Moyne Shire management plans as appropriate, potentially including the Moyne Aboriginal Cultural Heritage Values, Selected Biodiversity Components – LGA of Moyne, and Salinity Discharge and Potential for Recharge within Moyne Shire.

Local government area(s):

Moyne Shire Council

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity
(cf. general description of project site/study area under section 7)**:**

Air Quality
The existing air quality in the project area is typical of a relatively remote rural area, with low levels of NOX, SOX, particulates and Carbon Monoxide. Based on the closest meteorological weather station (Mortlake Racecourse) prevailing winds are northerly.

Flora and Fauna
The majority of the peaking power station site is covered by pasture, grasslands and vegetation that has been modified by farming practices. However, the site does contain scattered patches of native vegetation of the Plains Grassy Woodland EVC and Stony Knoll Shrubland EVC.

The east-west gas pipeline corridor (option 1) currently consists of predominantly introduced vegetation with only modified patches of Basalt Shrubby Woodland EVC being present within the road reserve of Tarrone North Road.

The north-south gas pipeline corridor (option 2) is also largely covered by modified vegetation with patches of Plains Grassy Woodland EVC, Plains Grassy Wetland EVC and Stony Knoll Shrubland EVC present.

The road reserve of Tarrone North Road contains patches of Basalt Shrubby Woodland.

Landscape/Visual
The landscape of the area is characterised by flat, mainly volcanic plains now predominantly occupied by agricultural pasture and grasslands. The site is dominated by a series of approximately 65m high transmission towers, supporting a 500kV line (the high voltage Moorabool-Portland transmission line). Introduced tree species such as Pinus and Cypressus planted in hedgerows and open pastures often form a dominant landscape feature in addition to shortening views across otherwise open pastures.

Noise Quality
The existing acoustic environment was determined by monitoring at selected noise sensitive receptors, surrounding the peaking power station site. The predominant noise sources are fauna (birds, agriculture and insects) and occasional traffic. There are seven residences located within two-and-a-half kilometres of the peaking power station site, the closest being 1550 metres north-east (refer to Section 11 for detailed information).

Wetlands
The peaking power station site supports one wetland adjacent to the western boundary that is in good condition and two small depressions containing Plains Grassy Wetland EVC.

9. Land availability and control

Is the proposal on, or partly on, Crown land?

× No ✕ Yes If yes, please provide details.

The gas pipeline investigation corridors associated with the Tarrone Power Station cross the road reserves of Heywood-Woolsthorpe Road, Kangertong Road, Tarrone North Road, Coomete Road and Willatook-Warrong Road, which are Crown land. The east-west gas pipeline investigation corridor crosses Tarrone North Road, Coomete Road and Willatook-Warrong Road. The north-south gas pipeline investigation corridor crosses Heywood-Woolsthorpe Road and Kangertong Road.

Current land tenure (provide plan, if practicable):

The peaking power station site and majority of the gas pipeline corridors are privately owned freehold land.

Intended land tenure (tenure over or access to project land):

AGL intends to purchase the freehold power station site after obtaining the necessary government approvals.

Other interests in affected land (eg. easements, native title claims):

An easement associated with the Moorabool-Portland high-voltage transmission lines crosses the site. The easement has been widened slightly at the kink in the transmission line easement to allow for the 500kV electrical sub-station. There are currently no native title claims on the site at the date of this referral.

10. Required approvals

State and Commonwealth approvals required for project components (if known):

Commonwealth Approvals
Environment Protection and Biodiversity Conservation Act 1999 – EPBC Referral

State Approvals
Environment Effects Act 1978 – EES Referral
Planning and Environment Act 1987 – Planning Scheme Amendment for the power station site.
Pipelines Act 2005 – Pipeline Licence
Environment Protection Act 1970 – Works Approval
Flora and Fauna Guarantee Act 1988 – DSE Permit

Have any applications for approval been lodged?

✕ No × Yes If yes, please provide details.

A referral will be submitted to the Commonwealth Department of Environment, Water, Heritage and the Arts to determine whether approval is required under the Environment Protection and Biodiversity Conservation Act 1999.

Preliminary discussions have been held with the Manager Strategic Planning at Moyne Shire Council regarding the planning scheme amendment for the power station site.

AGL has commenced the process for obtaining a Pipeline Licence under the *Pipelines Act 2005* and *Pipelines Regulations 2007*. A pipeline licence will be obtained which will negate the need to obtain a planning permit under the Moyne Planning Scheme as depicted at Section 85 of the *Pipelines Act.*

Preliminary discussions have been held with the Statutory Facilitations Department of the EPA regarding a works approval application.

The land the proposed power station site is located on is privately owned and is not declared 'critical habitat', therefore a permit to 'take' listed flora species is not required under the FFG Act. However, a portion of the study area consists of public land. Landers Lane and Riordans Road reserve, contains Stony Knoll Shrubland, a component of the FFG listed community Western (Basalt) Plains Grasslands Community, therefore, an FFG permit from DSE will be obtained. The proposed development will have regard to the Action Statement prepared under the FFG Act for Western (Basalt) Plains Grassland.

Approval agency consultation (agencies with whom the proposal has been discussed):

Aboriginal Affairs Victoria
Commonwealth Department of Environment, Water, Heritage and the Arts
Department of Planning and Community Development
Department of Primary Industries
Environment Protection Authority
Moyne Shire Council

Other agencies consulted:
Department of Sustainability and Environment
Glenelg Shire Council
Southern Rural Water
VicRoads

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

Air Quality
A local air quality and greenhouse gas assessment was undertaken in June 2009 to assess the impact on ambient air quality with respect to regulatory emission limits and ground level design criteria, specified in the State Environmental Protection Policy for Air Quality Management (SEPP(AQM)) of the primarily gaseous emissions from the proposed gas-fired power station.

The local air quality assessment involved atmospheric dispersion modelling and was conducted in accordance with the SEPP (AQM), where the assessment of the impact of local air quality used a largely conservative approach.

The methodology took into consideration the following influences and factors:

- CALPUFF used as the atmospheric dispersion model, preferred over Ausplume due to:
  - the potential for sea breeze influences on plume behaviour;
  - the ability of CALPUFF to model beyond 10 km from source; and
  - the ability of CALPUFF to model sub-hourly emissions, which is a more accurate representation of the impacts from startup of the peak loading power plant.
- Meteorological Data accounted for:
  - Surface and upper air observations across a model domain of 40 x 40 kilometre area centred on the site;
  - Topographic data; and
  - Land use data.
- Emission rate estimation for Alstom 13E2 and GE9FA turbines;
- Cumulative assessment including potential emissions from proposed Shaw River base load power station;
- Conservative consideration of all emitted oxides of nitrogen as nitrogen dioxide (NO_X as NO_2);
- Inclusion of conservative background concentrations selected from across the Port Phillip Airshed (considered to be higher than at site); and
- Greenhouse Gas Emissions.

<u>Air Quality Modelling Results</u>
Modelling was undertaken to predict ground level concentrations during startup and operation of the two turbine options both separate from and in combination with a proposed nearby combined-cycle gas power station at Shaw River.

The maximum modelled ground level concentration for startup is lower than the maximum modelled ground level concentration for normal operations. This is due to modelling using a sub-hourly data set that allows the lower emissions than normal operations for the first 21 minutes and 9 minutes for the Alstom 13E2 and GE9FA respectively, to be incorporated into the modelling. Over the hour, the emissions during start-up are lower than during normal operations, in addition the variation in temperature and exit velocity means that the emission reaches varying final plume heights throughout the hour. This results in a lower ground level concentration, as the plume is less well formed.

Results for emissions other than NO_X as NO_2 are not modelled during startup, as emissions for these species are lower during startup than during normal operation. Only NO_X as NO_2 has a period when the emission rate is higher during startup than during normal operation.

For all modelled scenarios and emissions, the maximum modelled ground level concentration, including a conservatively selected background and emissions from the proposed Shaw River power station development, are predicted to be below the SEPP(AQM) design criteria. Table 11.1 shows the maximum predicted ground level concentrations, within the modelled area, for

common products of combustion, and considered scenarios. The full results, including volatile organic compounds, polycyclic aromatic hydrocarbons and formaldehyde may be found in the technical report (Appendix A).

Table 11.1 Maximum modelled (99.9th percentile) ground level concentrations for considered scenarios

Species Units Averaging Period	**NO_X as NO_2** ug/m^3 1 hour	**SO_X as SO_2** ug/m^3 1 hour	**CO** ug/m^3 1 hour	**$PM_{2.5}$** ug/m^3 1 hour
Alstom 13E2 Steady State	27.41	0.86	2.19	9.81
GE 9FA Steady State	25.53	0.86	4.47	8.49
Alstom 13E2 Start up	14.45			
GE 9FA Start up	16.1			
Alstom 13E2 Steady State Plus Shaw River	35.75	1.31	3.22	11.01
GE 9FA Steady State Plus Shaw River	34.73	1.32	4.47	10.36
Background Concentration	11.3	0	0.22	7.5
SEPP (AQM) Design Criteria	**190**	**450**	**29,000**	**50**
Exceed SEPP (AQM) Design Criteria	No	No	No	No

Greenhouse Gas Emissions

The National Electricity Market is extremely volatile and complex. Peak loading power plants are used at times when additional electricity is required by the grid, such as during hot summer days or cold winter mornings and evenings. As a result the distribution of operating hours can vary significantly from year to year. It is difficult, therefore, to predict with certainty when the plant will be operating and for how many hours. Typically, however, the expected operating profile for a peak loading power station of the proposed size in Victoria is for approximately 200 days per year, with daily run times varying from less than 1 hour and up to 24 hours, the likely daily rate expected to be within the range of 2 to 6 hours per day. Overnight running is rare. The annual operating hours is expected to be approximately 440 hours.

Based on this potential range of operation, greenhouse gas emissions, expressed as CO_2 equivalent (CO_2-e) per annum are shown in Table 11.2.

Table 11.2 Greenhouse Gas Emissions (expressed as CO_2-e) per annum.

Operating Capacity	**5%**
Alstom 13E2	137,614
GE9FA	156,195

At a 5% usage rate (2 hours per day), the expected gas consumption would result in Scope 1 greenhouse gas emissions of 137,614 tonnes CO_2-e and 156,195 tonnes CO_2-e for the Alstom 13E2 and the GE 9FA designs respectively. This is approximately 0.17% and 0.19% of CO_2-e emitted by stationary energy production in Victoria (Sustainability Victoria, 2009).

Emissions to atmosphere of greenhouse gases likely to be in the range of 100,000 to 200,000 tonnes CO_2-e per annum.

Flora and Fauna

Power Station Site (including substation)

The power station site contains patches of native vegetation and potential habitat for several species within a largely modified environment. The majority of the peaking power station site is covered by pasture, grasslands and vegetation that has been modified by farming practices. However, the site does contain scattered patches of native vegetation of the Plains Grassy Woodland EVC and Stony Knoll Shrubland EVC. The development footprint has been designed to avoid and minimise impacts on native vegetation and habitats and would result in a loss of approximately 3.7ha (for power station, substation and auxiliary infrastructure). This native vegetation clearance consists almost entirely of Stony Knoll Shrubland EVC (which has high conservation significance) with a small (approximately 314m^2) patch of Plains Grassy Wetland EVC (which has very high conservation significance). Where unavoidable native vegetation clearance occurs, appropriate native vegetation offsets will be identified and managed.

Growling Grass Frog Survey
Targeted surveys were undertaken by Biosis Research on 29 October 2009 in order to establish the presence of Growling Grass Frogs at the power station site and/or in adjacent roadside reserves. The roadside reserves being areas bounded by Tarrone North Road, Woolsthorpe – Heywood Road, Hamilton – Port Fairy Road and Tarrone Lane.

The targeted surveys recorded no Growling Grass Frogs as being heard calling or observed within wetland areas on the site or in adjacent roadside reserves. Despite recent above average rainfall for 2009 the onsite wetland areas were found dry suggesting the wetlands are likely to drain rapidly and are unlikely to sustain water long enough to provide breeding habitat for the Growling Grass Frogs.

Gas Pipeline Option 1 (east-west corridor)
The east-west gas pipeline corridor (option 1) currently consists of predominantly introduced vegetation with only modified patches of Basalt Shrubby Woodland EVC being present within the road reserve of Tarrone North Road. The 200m wide corridor has been surveyed for native vegetation and it has been determined that a 25m wide pipeline alignment would result in a worst-case loss of approximately 1.1ha of lower quality native vegetation.

Gas Pipeline Option 2 (north-south corridor)
The north-south gas pipeline corridor (option 2) is also largely covered by modified vegetation with patches of Plains Grassy Wetland EVC and Stony Knoll Shrubland EVC being present. The 800m wide corridor has been surveyed for native vegetation and it has been determined that of the constructable 25m wide pipeline alignment options under consideration, the worst case in terms of native vegetation clearance would result in a loss of approximately 5.1ha of native vegetation, minimising direct impacts on high quality Plains Grassy Wetland EVC. This native vegetation clearance consists of approximately 1ha of Plains Grassy Wetland EVC with a very high conservation significance, and approximately 4.1ha of Stony Knoll Shrubland EVC with a high conservation significance.

Tarrone North Road Reserve
The road reserve of Tarrone North Road contains patches of highly modified Basalt Shrubby Woodland EVC. The road widening of four metres (two metres either side) would not result in the removal of any native vegetation.

Greenhouse Gas Emissions
The long term average operating hours for the power station is expected to be approximately 5% per year which would emit below 200,000 tonnes of carbon dioxide equivalent per year. From time to time, it is possible that the power station may operate in excess of this level due to abnormal circumstances such as drought years where availability of electricity generated from hydro generators is reduced. In future years, it is also possible that operating hours may temporarily increase due to CPRS and the new RET legislation. However, sustained increases in demand for gas fired generation would likely be met by newly built combined cycle gas turbine power stations at other locations. In any event, increased operation of the gas fired peaking power station will most likely be displacing generation from a generator with higher intensity carbon emissions.

Hydrology
A hydrological investigation was conducted to develop a water balance model for the wetland located adjacent to the western (Landers Lane) boundary of the site that contains Plains Grassy Wetland EVC which has been identified by targeted surveys on 29 October 2009 as being unlikely to provide breeding habitat for Growling Grass Frog. A site survey was conducted to determine the extent and parameters of the wetland catchment, and rainfall, evaporation and stream flow data was analysed to model rainfall runoff. The hydrology study also noted that the wetland area along Landers Lane was probably larger than under normal conditions as a result of a blocked culvert under the road immediately abutting the wetland which would allow flow through to the opposite paddock when operating normally.

The encroachment by the development footprint of the power station into the wetland catchment would be between 0 and approximately 172m^2, which represents less than 0.5% of the wetland catchment under worst case. This impact would be insignificant in relation to the water balance

modelling conducted for the wetland. It should also be noted that due to the irregular terrain, the wetland catchment boundary is ill-defined in the area of potential encroachment, and that bunding would prevent potentially contaminated runoff from the power station entering the wetland catchment. Any potential change to the wetland catchment from a small development footprint is unlikely to impact on the frequency, duration or extent of water within the wetland.

Landscape/Visual
The main pasture area of the site is dominated by one of the series of transmission towers, supporting a 500kV line. This particular tower forms a pivot point in a change in the alignment of the powerlines. The site has been heavily modified by agricultural activities since white settlement and the more recent character of the landscape is dominated by pasture dissected by exotic tree hedgerows. To current generations this would culturally be the most memorable image of the western district landscape.

Main roads offer the greatest opportunity for residents and visitors to experience the visual amenity afforded by this rural landscape. The landscape is dissected in a secondary nature by local roads, generally gravel and following a grid layout.

Several vantage points within the public realm from which the proposed power station may potentially be visible from, have been identified in Figure 3 of the Visual Amenity Assessment. Aside from those locations in close proximity to the site, some longer distant views may also allow views to the peaking power station, albeit it in the broader context of a generally open pastoral landscape and expansive sky, with the low horizon fractured by occasional hedgerows and the existing transmission lines.

Based on the height of the existing transmission towers at approximately 65 metres, middle and distant views, where the facility can be seen from are relatively few and easy to identify. The exhaust stack and substation lightning rods, the tallest parts of the proposed facility, will have a height in the range of 35 – 45 metres, approximately one half to two thirds of the height of the existing transmission towers.

The more immediate vantage points surrounding the site all appear to offer views where the facility may be seen nearly in its entirety. Middle distant views of higher portions of the facility appear to be available from vantage points at McGraths Road looking West and at Tarrone Road looking North and North East. More distant views such as vantage points to the south west of the site from the township of Orford and along the Hamilton- Port Fairy Road are obscured by vegetation and topographic change.

Noise
A noise impact assessment was undertaken by URS to determine likely noise issues pertaining to the proposed Tarrone gas-fired power station including noise associated with the construction and operation of the facility. The assessment of potential noise impacts of the proposed construction and operation of the facility, on surrounding noise sensitive receptor locations, has been carried out in accordance with relevant Victoria EPA noise guidelines. Throughout the assessment, typical and 'worst-case' factors have been taken into consideration.

Noise levels for the proposed construction and the operation of the site at the identified noise sensitive receptor locations (see Table 11.3) have been predicted using computer modelling that is used internationally and recognised by regulators and authorities throughout Australia. The noise model took into account:

- sound power levels of each source;
- receptor locations;
- screening effects due to topography;
- meteorological effects and attenuation due to distance; and
- ground and atmospheric absorption.

Table 11.3 - nearest potentially affected noise sensitive receptor locations

Receptor	Address	Approx. Distance from Gas Turbines	Nearest Site Boundary	Status
A	Riordans Road	2250 m	SW	Unoccupied
B	386 Tarrone North Road	1750 m	NE	Unoccupied
C	426 Tarrone North Road	1550 m	NE	Unoccupied
D	473 Tarrone North Road	1700 m	E	Occupied
E	573 Tarrone North Road	2050 m	SE	Occupied
F	589 Tarrone North Road	2250 m	SE	Occupied
G	574 Tarrone North Road	1950 m	SE	Occupied
H	96 Coomete Road	5000 m	NE	Occupancy not known
I	3 Poyntons Road	5900 m	NE	Occupancy not known
J	8 Poyntons Road	7000 m	NE	Occupancy not known
Notes:	Locations H, I and J are only considered for the proposed pipeline construction.			

The noise modelling has been conducted based on likely maximum operating conditions for each turbine option. In setting-up the noise model, all pre-defined sources were positioned according to the proposed site layout in the respective noise model. The precise positioning of the sources was not found to cause any significant uncertainty.

Operational Noise

The noise modelling results using neutral and adverse meteorological conditions are presented in Table 11.4 below (refer to the Noise Assessment in Appendix B Table 5-3 for a summary of each meteorological scenario).

Table 11.4 Predicted Operational Noise Levels

Receptor Location	Predicted Noise Levels (L_{Aeq}) dB(A)		Criterion (L_{Aeq}) dB(A)		Exceedance
	Neutral Met Conditions (Scenario A & B)	Adverse Met Conditions (Scenario C & D)	Day (Scenario A & C)	Night (Scenario B & D)	
A	23 (A) / 24 (B)	18 (C) / 20 (D)	45	32	No
B	29	33 (C) / 30 (D)	45	32	No
C	30	34 (C) / **33 (D)**	45	32	~ 1 dB (Night)
D	26	30	45	32	No
E	23	27	45	32	No
F	< 20	< 20	45	32	No
G	23	28	45	32	No
Notes:	Results in bold represent the exceedance of the respective noise limit. Scenario A: Daytime operation under neutral meteorological conditions. Scenario B: Evening & Night-time operation under neutral meteorological conditions. Scenario C: Daytime operation under adverse meteorological conditions. Scenario D: Evening & Night-time operation under adverse meteorological conditions.				

The results presented in Table 11-4 show that the predicted noise levels generated by the proposed operation would generally be within the established noise criteria at all receptor locations under all conditions. Only marginal exceedance of the noise limit during the night-time period is predicted to occur at Location C under adverse meteorological conditions due to its

proximity to the site. However, it should be noted that the predicted exceedance is only 1 dB which would barely be detectable by human ears. Furthermore, given that the power station is a peaking plant and the meteorological conditions that could adversely affect the noise levels are expected to occur less than 15 per cent of time, the exceedance is predicted to be minor. It is also noted that there is significant wooded area between this location and the site which may provide slight noise reduction. This has not been included in the noise predictions modelling.

Given that the exceedance predicted is negligible and would only occur under adverse meteorological conditions, further noise mitigation measures are not considered necessary. Noise from the proposed operation is constant in nature and therefore, during the night-time period the levels are expected to be significantly below 55 dB(A) LAmax at all receptor locations. Therefore, the operation is not predicted to give rise to sleep disturbance.

Construction Noise

Noise levels generated by the construction activities have been predicted at each receptor location, taking into account that noise generated would vary as construction progresses and considerations for adverse meteorological conditions (refer to the Noise Assessment Appendix B Section 5.4.1 for list of proposed construction activities, equipment/plant required with associated sound power levels).

The results for predicted construction noise levels are presented in Table 11.5.

Table 11.5 Predicted Construction Noise Levels

Location	Predicted Noise Level under Adverse Meteorological Conditions L_{Aeq} dB(A)		Daytime Noise Criterion LAeq dB(A)	Exceedance
	Power Station Construction	Pipeline Construction		
A	28 – 35	31 – 38	55	No
B	32 – 39	37 – 44	55	No
C	34 – 40	42 – 48	55	No
D	32 – 39	49 – **56**	55	~ 1 dB (during Pre-pipeline Construction)
E	29 – 36	42 – 48	55	No
F	< 30	38 – 45	55	No
G	30 – 37	42 – 48	55	No
H	-	50 – **57**	55	~ 2 dB (during Pre-pipeline Construction)
I	-	52 – **59**	55	~ 4 dB (during Pre-pipeline Construction)
J	-	52 – **59**	55	~ 4 dB (during Pre-pipeline Construction)

The predicted construction noise levels presented in Table 11.5 show that no exceedances of the noise limit is expected at Locations A, B, C, E, F and G. A slight exceedance is predicted at Location D which is considered negligible whilst a marginal exceedance is predicted at Location H during the proposed pipeline construction. Exceedances are predicted at Locations I and J due to their proximity to the proposed pipeline. This exceedance would only occur for a limited duration while the pipeline works are in the immediate vicinity of these locations.

It should be noted that the predicted noise levels presented above result from a conservative noise modelling approach where it has been assumed that all equipment would operate continuously and simultaneously during the assessment period. With more realistic operational patterns, it is predicted that the only marginal exceedances of the noise limits would occur at Locations I and J.

Off-Site Traffic Noise

Operation - The ongoing operation of the power station will generate significantly less traffic than the construction phase of the project. During the operational phase, staff levels are expected to average up to five full time persons on site generating approximately ten car trips per day. The increase in traffic from the daily operation of the power station is accounted for in the general growth in traffic for the region. An increase in traffic volumes is expected during periodic maintenance activities which would take place every 2 to 3 years.

Compared to the existing traffic volumes, the proposed traffic volumes generated by the development would be insignificant.

Construction - as the specific duration and start/finish times of construction shifts have not been determined, it is assumed that that all movements would take place during the peak periods for the region. This would produce a conservative worst-case scenario in the event that shifts commence 7.00 am - 8:00 am and conclude 4.00 pm - 5.00 pm and that all personnel, material and equipment deliveries would occur in those periods.

It is expected that the number of construction personnel during the peak construction period would reach 250 personnel per day. The vehicle movements associated with construction personnel assumes a vehicle occupancy rate of 1.2 persons per vehicle. All construction personnel are assumed to arrive to the site in the morning peak hour and leave in the afternoon peak hour.

The Victorian legislation and guidelines listed in Section 4.1 of the Noise Assessment (refer to Appendix B) do not include any criteria to assess off-site traffic noise associated with construction. It is assumed that off-site traffic noise with the proposed construction is minimised as much as is practically possible. by limitations on construction hours and Australian Design Rules which apply to road-registered vehicles.

Noise Mitigation Measures

While the proposed construction activities have limited potential for impact on the local ambient noise environment, the following noise management strategies can be applied which would further reduce the potential for noise issues during the proposed construction period:

- Carrying out all construction works during the approved daytime construction hours;
- Scheduling construction to minimise multiple use of the noisiest equipment or plant items near noise sensitive receptors;
- Strategic positioning of plant items to reduce the noise emission to noise sensitive receptors, where possible;
- Carrying out maintenance work away from noise sensitive receptors, where practicable;
- Ensuring engine covers are closed, maintenance of silencers and mechanical condition. Regular maintenance and noise testing for major items of construction equipment that are significant contributors to construction noise levels;
- Awareness training for staff and contractors in environmental noise issues including;
  - Minimising the use of horn signals and maintaining to a low volume. Alternative methods of communication should be considered;
  - Avoiding any unnecessary noise when carrying out manual operations and when operating plant; and
  - Switching off any equipment not in use for extended periods during construction work;
- Restricting heavy vehicles' entry to site and departure from site to the nominated construction hours;

- Where noise level exceedances cannot be avoided, consideration should be given to applying time restrictions and/or providing quiet periods for nearby residents;
- Community consultation with local residents and building owners to assist in the alleviation of community concerns. Previous experience on similar projects has demonstrated that affected noise sensitive receptors may be willing to endure higher construction noise levels for a shorter duration if they have been provided with sufficient warning in the place of intermittent but extended periods of construction noise at lower levels; and
- Maintaining a suitable complaint register. Should noise complaints be received, undertake noise monitoring at the locations concerned. Reasonable and feasible measures would need to be implemented to reduce noise impacts.

With the implementation of the mitigation measures above, construction noise at all receptor locations is expected to comply with the noise limit.

Noise Assessment Findings

The assessment found that the adopted noise limits can generally be achieved with no further noise mitigation measures beyond those already proposed by AGL (including mitigation measures for the proposed stack). Minimal exceedances are expected only under adverse meteorological conditions where the occurrence would be relatively infrequent. Slight exceedances would only occur for specific short duration construction activities. The proposed operation of the facility is not expected to significantly degrade the existing acoustic environment nor generate community annoyance.

The predicted noise levels should be verified during commissioning, and in the unlikely event of any significant discrepancies from this assessment, there is scope to provide additional attenuation through measures such as acoustic enclosures and silencers.

On the basis of these conclusions, it is the finding of this assessment that the development should be acceptable with respect to noise generation.

Transport

Traffic generated by the construction of the facility is based on worst case scenario that four turbines are built in a single stage. During 24 months of Average Stage there is predicted to be traffic generated of 4650 Cars per month and 1160 Commercial Vehicles (CV) per month. During 6 months of Peak Stage there is predicted to be traffic generated of 9295 Cars per month and 2325 CV's.

The ongoing operation of the power station will generate significantly less traffic than the construction phase of the project (a maximum of ten vehicle movements per day). The primary traffic generated will be cars from employee commuting, which is accounted for in general growth in traffic for the region.

The arterial roads surrounding the site are in adequate condition for utilisation by standard construction vehicles. Riordans Road along the southern boundary of the site and Landers Lane along the western boundary of the site are unpaved and may need to be upgraded or maintained and dust control measures implemented, if utilised. Tarrone North Road is sealed and would provide the best access from the subject site to the nearest arterial road (C176). There is limited road access to the pipeline corridor investigation area, and the access that exists is by unsealed roads that may need to be maintained and dust control measures implemented, if utilised.

A detailed assessment will be required, prior to construction, for the road conditions and suitability of roads when a preferred transport route is selected. Further assessment will also be required prior to construction to assess road conditions and suitability for over dimension vehicles in the vicinity of the site.

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

× NYD × No ✕ Yes If yes, answer the following questions and attach details.

Power Station Site (including substation)
The power station site has previously been modified by agricultural practices and the majority of the site now contains predominantly introduced or modified vegetation such as pasture grasses. However, modified remnants of ecological vegetation classes are present within the power station site and some native vegetation will be impacted by the proposed development. The power station, auxiliary infrastructure and substation layout have been designed to avoid and minimise impacts on patches of native vegetation on the site.

Gas Pipeline Option 1 (East-West Corridor)
The east-west pipeline corridor has been extensively modified by agricultural practices, including in the vicinity of Back Creek. Modified native vegetation is present within the Tarrone North Road reserve, which would be impacted by the installation of the gas pipeline. The only other patch of native vegetation within the east-west investigation corridor is in the Coomete Road reserve, however it can be avoided. The worst case native vegetation clearance requirement if the east-west corridor is selected would be approximately 1.1ha of Basalt Shrubby Woodland with high conservation significance. .

Gas Pipeline Option 2 (North-South Corridor)
The north-south pipeline corridor has been largely modified by agricultural practices and largely devoid of native vegetation. There are several native vegetation patches to the south of Woolsthorpe-Heywood Road and to the south of Kangertong Road. Several 25m wide pipeline alignments within this corridor are under consideration that would require clearance of native vegetation. The worst case native vegetation clearance if the north-south corridor is selected would be approximately 5.1ha, comprising approximately 4.1ha of Stony Knoll Shrubland EVC with high conservation significance, and approximately 1ha of Plains Grassy Wetland with very high conservation significance.

Tarrone North Road
The widening of Tarrone North Road would not result in the clearance of any native vegetation.

What investigation of native vegetation in the project area has been done? (briefly describe)

Ecological consultants Biosis Research Pty Ltd conducted a terrestrial flora and fauna assessment of the project area including the power station site including substation, gas pipeline investigation corridors and local roadsides. The reports conducted a review of previous literature and relevant databases, and field surveys were conducted to identify and map patches of native vegetation. The field surveys were conducted at the proposed gas-fired peaking power station site on 29 and 30 October 2008, Landers Lane and Riordans Road reserves on the 26 February 2009, the Tarrone North Road reserve on the 25 May 2009 and the associated gas pipeline corridor options on the 25 to 28 May 2009. The assessments are titled '*Flora and Terrestrial Fauna Assessment of the Proposed Tarrone Gas-fired Power Station and Associated Road Reserves, Victoria'* and *'Flora and Terrestrial Fauna Assessment of the Proposed Tarrone Gas Pipeline; North-South and East-West Investigation Options, Tarrone, Victoria'*. These reports are appended to this referral document.

What is the maximum area of native vegetation that may need to be cleared?

✕ NYD Estimated area Site – 3.7ha; E-W Pipeline – 1.1ha or N-S Pipeline 5.1ha

The maximum area of native vegetation that would be cleared to facilitate the development of the power station, substation, gas pipeline and roadworks at this preliminary stage and based on the mapping of native vegetation patches that has been conducted in the project area, is 8.8ha (worst-case). This comprises the following native vegetation clearance:

- Power Station Site including power station plant area, substation and auxiliary onsite infrastructure – 36,646m^2 (3.7ha)
    - 314m^2 of Plains Grassy Wetland EVC (very high conservation significance)
    - 36,332m^2 of Stony Knoll Shrubland EVC (high conservation significance)
- East-West Gas Pipeline Option – 10,693m2 (1.1ha)
    - 10,693m^2 of Basalt Shrubby Woodland (high conservation significance)
- North-South Gas Pipeline Option – 51,102m2 (5.1ha)
    - 10,440m^2 of Plains Grassy Wetland EVC (very high conservation significance)
    - 40,662m^2 of Stony Knoll Shrubland EVC (high conservation significance)

This is based on native vegetation clearance of 3.7ha at the power station site associated with the power station plant area, electric substation and auxiliary onsite infrastructure, and 5.1ha on native vegetation clearance through the worst-case (in terms of native vegetation clearance) pipeline option (the north-south option).

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

☒ N/A …… approx. percent (if applicable)

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

☒ NYD ☒ Preliminary/detailed assessment completed. If assessed, please list.

The following four EVCs have been identified in the study area:

- Power Station site and Landers Lane/Riordans Road: Stony Knoll Shrubland and Plains Grassy Wetland;
- Tarrone North Road reserve: Basalt Shrubby Woodland (highly modified);
- Gas Pipeline Corridor options:
    - East-West – Basalt Shrubby Woodland.
    - North-South - Stony Knoll Shrubland and Plains Grassy Wetland.

Have potential vegetation offsets been identified as yet?

☒ NYD ☒ Yes If yes, please briefly describe.

The flora and fauna assessments conducted thus far have identified patches of native vegetation present within the project area, identified the EVC that each patch belongs to, and determined a habitat hectares and habitat scores. Once the design of the project has been finalised, potential native vegetation offsets will be identified, under the provisions of the Native Vegetation Management Framework.

Other information/comments? (eg. accuracy of information)

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done?
(provide overview here and attach details of method and results of any surveys for the project & describe their accuracy)

Biosis Research were commissioned to conduct flora and fauna surveys of the peaking power station site, adjacent road reserves and associated gas pipeline corridors. The surveys have been undertaken in October 2008, February 2009 and May 2009. Biosis Research reviewed and searched relevant ecological databases and previous assessments conducted in the area. The site surveys were undertaken in stages on 30 October 2008, 26 February 2009 and from 25 to 28 May 2009. The assessments concentrated on areas that support native vegetation remnants and other areas with potential to support threatened species. General observations were made, lists of flora and incidental terrestrial fauna were compiled, and the condition and conservation significance of the sites were documented.

Power Station Site (including substation)
The survey of the peaking power station site found that due to previous agricultural activities, the site mostly contains introduced pastures with several patches of native vegetation present within the EVCs Stony Knoll Shrubland and Plains Grassy Wetland. While the majority of the site has been highly modified by stock grazing, a patch of EVC Plains Grassy Wetland adjacent to the western (Landers Lane) boundary is in good condition, and potentially provides habitat for frogs and water birds. Targeted surveys conducted on 29 October 2009 found the wetland unlikely to sustain water long enough to provide breeding habitat for Growling Grass Frog. One flora species of state significance, the Wavy Swamp Wallaby-grass was observed growing abundantly in two wetlands on the site.

The survey of the road reserves identified that the road reserves of Landers Lane and Riordans Road contain remnant native vegetation, native grasses and an ephemeral wetland (connecting to a wetland on the peaking power station site). Introduced plants are common particularly immediately adjacent to the road formation. The dense cover of tussock grasses and rocky areas provide foraging habitat for native fauna such as birds, reptiles and small mammals such as the Fat-tailed Dunnart. The ephemeral wetland provides habitat for frogs and some water birds during wet seasons, however, targeted surveys found the wetland unlikely to provide breeding habitat for Growling Grass Frog. Damp depressions and drainage lines within the road reserves are potential habitat for the Wavy Swamp Wallaby-grass and Purple Blown-grasses.

Tarrone North Road Reserve
The survey of the road reserve of Tarrone North Road indicated that the area no longer supports an EVC due to Basalt Shrubby Woodland EVC being highly modified and dominated by an overstorey of Black Wattle. The native and exotic trees within the road reserve are likely to be used by a variety of bird species for foraging, nesting and roosting, and as a habitat corridor for movements within the local area.

Gas Pipeline Option 1 (East-West Corridor)
The east-west corridor contains patches of highly modified Basalt Shrubby Woodland EVC, within the section of the corridor that is located within the road reserve of Tarrone North Road. The remainder of this corridor is highly modified and of low ecological value. There was no native vegetation identified during surveying in the vicinity of Back Creek, however, at this stage, aquatic studies have not been undertaken within Back Creek. The pipeline corridor could contain potential habitat for the Brolga and Eastern Great Egret. The Brolga predominantly feed on wetland plants, and can also forage in grain and potato crops and improved pasture. During wet seasons, the pasture areas may provide potential foraging habitat for Brolga and the species may visit on occasions.
In the event that this corridor is selected, the gas pipeline would be installed by horizontal bore to minimise any impact on Back Creek, and the Moyne River. From our desktop geotechnical investigations to date, directional drilling can typically be successfully carried out through the Newer Volcanics. Open trenching would be used if demonstrated to have a lower environmental impact with favourable geotechnical conditions.

Gas Pipeline Option 2 (North-South Corridor)
The north-south gas pipeline corridors contain modified remnants of three ecological vegetation classes. Numerous small modified patches of Stony Knoll Shrubland and Plains Grassy Wetland within the north-south corridor have ecological significance. The remainder of the study area is highly modified and of low ecological value. The widespread historical use of agricultural practices has largely reduced habitat values within the gas pipeline corridors, however, the pipeline corridor contain potential habitat for the Brolga and Eastern Great Egret. The Brolga predominantly feed on wetland plants, and can also forage in grain and potato crops and improved pasture During wet seasons, the grassy wetland areas may provide potential foraging habitat for Brolga and the species may visit on occasions. The Wavy Swamp Wallaby Grass and Purple Blown-grasses may occur within the investigation corridor, however, would occur in small numbers only due to the extensive modification of Plains Grassy Wetland areas in the corridors.

The mapping undertaken by Biosis Research was conducted using hand held GPS units with an accuracy of up to 7 metres.

The Biosis Research terrestrial flora and fauna (and targeted Growling Grass Frog survey) assessment is appended to this document.

Have any threatened or migratory species or listed communities been recorded from the local area?

× NYD × No ✕ Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

Flora

The DSE Flora Information System (FIS) listed flora species of state or regional significance that have been recorded or predicted to occur within 5 kilometres of the study area are listed in the following table.

Common Name	Scientific Name	Status	Likelihood of Occurrence
Wavy Swamp Wallaby-grass	*Amphibromus sinuatus*	Vulnerable	Species recorded on power station site
Purple Blown-grass	*Lachnagrostis punicea* subsp. *filifolia*	Rare	Species or species habitat likely to occur within are
Purple Blown-grass	*Lachnagrostis punicea* subsp. *punicea*	Rare	Species or species habitat likely to occur within area

Fauna

Flora and Fauna Guarantee Act 1988 (FFG) listed fauna species of state or regional significance that have been recorded within 10 kilometres of the study area are listed in the following table.

Common Name	Scientific Name	Status	Likelihood of Occurrence
Brolga	*Grus rubicunda*	Threatened	Species or species habitat may occur within area
Magpie Goose	*Anseranas semipalmata*	Threatened	Species or species habitat may occur within area
Bibron's Toadlet, Brown Toadlet	*Pseudophryne bibronii*	Threatened	Species or species habitat may occur within area

Migratory and Marine Species

EPBC Act identifies the following migratory and marine listed species under Matters of National Environmental Significance.

Common Name	Scientific Name	Status	Likelihood of Occurrence
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Migratory	Species or species habitat likely to occur within area
White-throated Needletail	*Hirundapus caudacutus*	Migratory	Species or species habitat may occur within area
Rainbow Bee-eater	*Merops ornatus*	Migratory	Species or species habitat may occur within area
Satin Flycatcher	*Myiagra cyanoleuca*	Migratory	Breeding likely to occur within area
Rufous Fantail	*Rhipidura rufifrons*	Migratory	Breeding may occur within area
Great Egret, White Egret	*Ardea alba*	Migratory	Species or species habitat may occur within area
Cattle Egret	*Ardea ibis*	Migratory	Species or species habitat may occur within area
Latham's Snipe, Japanese Snipe	*Gallinago hardwickii*	Migratory	Species or species habitat may occur within area

Painted Snipe	*Rostratula benghalensis s. lat.*	Migratory	Species or species habitat may occur within area
Fork-tailed Swift	*Apus pacificus*	Migratory	Species or species habitat may occur within area
Magpie Goose	*Anseranas semipalmata*	Overfly marine area	Species or species habitat may occur within area
Swift Parrot	*Lathamus discolour*	Overfly marine area	Species or species habitat may occur within area

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (eg. loss or fragmentation of habitats) Please describe briefly.

Habitat Loss, degradation and modification
The power station footprint may encroach into the catchment of a wetland, which has been identified by targeted surveys on 29 October 2009 as being unlikely to provide breeding habitat for the Growling Grass Frog. However, the maximum extent of encroachment would constitute less than 0.5% of the wetland catchment, which is considered to be an insignificant amount in relation to the water-balance modelling of the catchment. The potential small development encroachment is unlikely to impact on the inflows of water into the wetland.

Any direct impact on potential habitats utilised on occasions by the national and state significant species including Australian Painted Snipe, Brolga and Eastern Great Egret, are not likely to be significant because the corridors do not provide important habitat for an ecologically significant proportion of any of these species.

Fragmentation
The project area contains patches of native vegetation and potential habitats that are largely fragmented. The project is unlikely to fragment or isolate any populations further than the existing conditions.

Introduced Predators and Disease
A project Environmental Management Plan (construction and operation) would be prepared by AGL that outlines how the risk of the introduction of disease, such as chytridiomycosis disease resulting from the introduction of Amphibian Cytrid Fungus, to the site will be managed and minimised.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

× NYD ✕ No × Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing) Comment on likelihood of effects and associated uncertainties, if practicable.

Although there is habitat and there is potential for the Australian Painted Snipe to utilise the north-south corridor on occasions, it is unlikely the development would have a significant impact on the species or its habitat.

Is mitigation of potential effects on indigenous flora and fauna proposed?

× NYD × No ✕ Yes If yes, please briefly describe

The project mitigation measures of potential effects on indigenous flora and fauna are as follows:

Design Mitigation (Avoidance of Impacts)
The plant layout has been designed to minimise impacts on native vegetation patches within the subject site. The gas pipeline lateral route will be identified from within the two pipeline corridors based on avoidance of native vegetation impacts.

Construction Mitigation
Areas of retained native vegetation will be protected by temporary fencing during construction
The Construction Environmental Management Plan would include environmental management issues relating to flora and fauna and would be incorporated into the workforce induction programme.
Growling Grass Frog
The following mitigation measures will be implemented specifically for Growling Grass Frog:

- Avoid and minimise the loss of all known and possible habitats, including ephemeral and perennial water bodies;
- Potential growling grass frog habitat areas will be fenced off during the construction and operation phases.
- If animals are detected within construction area, a specific capture and release protocol would be followed;
- Specific measures to prevent the spread of Amphibian Chytrid Fungus;
- Implement Management Plan to protect habitats that may support the Growling Grass Frog during construction;
- Ensure that the vegetation, topography and habitat features of water bodies will be returned to a condition at least equivalent to their original condition after the construction phase is completed; and
- At construction sites where Growling Grass Frogs are captured and later released, monitoring of population will continue beyond the completion of construction.

Further Studies
It is proposed that during preliminary design and prior to construction further flora and fauna studies would be undertaken where appropriate:

- Targeted Flora Survey for Swamp Fireweed, Wavy Swamp-Wallaby-grass and Purple Blown-grasses within the Riordans Road and Landers Lane road reserves if these areas are likely to be impacted; and
- Net Gain assessment of pipeline lateral (once determined) and road reserves (once determined).

Other information/comments? (eg. accuracy of information)

13. Water environments

Will the project require significant volumes of fresh water (eg. > 1 Gl/yr)?

× NYD ✕ No × Yes If yes, indicate approximate volume and likely source.

It is anticipated that the peaking power station would require approximately 10ML of water per year. Options for the provision of water supply are being investigated, including groundwater, transport of water to the site by a licensed carrier and water tanker and recycled water. The preferred option for water supply is groundwater extraction through the purchase of an existing groundwater licence in accordance with the regulatory and administrative requirements of Southern Rural Water.

Will the project discharge waste water or runoff to water environments?

× NYD ✕ No × Yes If yes, specify types of discharges and which environments.

The volume of wastewater that would be generated by the peaking power station will vary depending upon the plant runtime. The maximum annual wastewater production is predicted to be approximately 4 ML per annum. The main wastewater source will be the blowdown from the turbine air inlet cooling system. Rainfall runoff collected within the bunded process areas of the plant, where there is potential for the quality to be impacted eg traces of oil, will be collected and treated as wastewater unless it is verified as being unimpacted. Stormwater from non-process areas of the site will runoff as surface water via a site drainage system. As outlined in the previous sections of this referral, a wetland with potential habitat for nationally significant species is located on the site. The peaking power station layout has been designed to minimise development encroachment into the wetland catchment. Unimpacted stormwater could be redirected into the wetland catchment to offset any impact on hydrological flows into the wetland catchment by potential development encroachment. The wastewater is proposed to be stored in onsite storage/evaporation ponds, suitably lined to prevent adverse impacts on surface water and underlying soil and groundwater. The ponds will be designed with adequate capacity and freeboard, to ensure that there is no potential for overtopping, even in the event of an extreme rainfall or storm event. The ponds , which will be fenced to deter frogs from in-habiting them, will be designed to provide for tanker loading of the wastewater in the event that they need to be emptied or the inventory reduced. Solids within the evaporative pond would be periodically removed and disposed as prescribed waste.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

× NYD ✕ No × Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

The east-west pipeline corridor crosses the Back Creek, a tributary of the Moyne River. In the event that this corridor is selected, the gas pipeline would be installed by horizontal bore to minimise any impact on Back Creek, and the Moyne River. From our desktop geotechnical investigations to date, directional drilling can typically be successfully carried out through the Newer Volcanics. Open trenching would be used if demonstrated to have a lower environmental impact with favourable geotechnical conditions.

A small wetland with potential habitat for nationally significant species is located on the power station site. The site layout has been designed to minimise development encroachment in the catchment area of the wetland. Uncontaminated stormwater runoff from the site could be directed into the wetland catchment to offset any reduction in wetland catchment water yield from potential development encroachment.

Are any of these water environments likely to support threatened or migratory species?

× NYD × No ✕ Yes If yes, specify which water environments.

The small ephemeral wetland located on the site is a Plains Grassy Wetland EVC.

The targeted survey for Growling Grass Frog conducted on 29 October 2009 revealed the wetland to be dry despite recent rainfall suggesting the wetland drains rapidly and is unlikely to sustain water long enough to provide breeding habitat for the threatened species, Growling Grass Frog.

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

× NYD ✕ No × Yes If yes, please specify.

Could the project affect streamflows?

× NYD ✕ No × Yes If yes, briefly describe implications for streamflows.

The encroachment of the development footprint into the catchment of the onsite wetland may potentially impact on inflows into the wetland. This would be offset by directing uncontaminated stormwater runoff into the wetland to ensure there is no net loss of inflows. Development on the site is not expected to affect any other streamflows.

In the event that the east-west pipeline corridor, which crosses Back Creek (a tributary of the Moyne River), is selected, the gas pipeline could be installed by horizontal directional boring, however other construction techniques could be utilised if demonstrated to have a lesser environmental impact. Therefore, it is considered unlikely that the gas pipeline would have any impact on stream flows.

Could regional groundwater resources be affected by the project?

× NYD ✕ No × Yes If yes, describe in what way.

The last published information shows that the Hawkesdale GMA is not over allocated, however, it is understood that there are concerns with over allocation in some areas and as a result Southern Rural Water (SRW) is currently re-assessing the Permissible Consumptive Volume (PCV). Until a decision has been made on the PCV no new Groundwater Extraction Licences (GEL) will be issued by SRW.

The transfer of a GEL, or part of a GEL, to a new owner remains an option to anyone within the Hawkesdale GMA. The process of transfer requires an application to SRW. If this option is selected, AGL will undertake the level of assessment required to determine the potential impacts to other groundwater users.

Could environmental values (beneficial uses) of water environments be affected?

× NYD ✕ No × Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies)

Could aquatic, estuarine or marine ecosystems be affected by the project?

× NYD ✕ No × Yes If yes, describe in what way.

The east-west corridor crosses the Back Creek waterway, a tributary of the Moyne River. There is no native vegetation present in the corridor in the vicinity of Back Creek, and the pipeline could be bored underneath to avoid direct impacts. Mitigation of potential impacts during construction would be identified, if this corridor is selected, prior to the commencement of construction.

Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term?

✕ No × Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable.

Is mitigation of potential effects on water environments proposed?

× NYD × No ✕ Yes If yes, please briefly describe.

In the event of any impact on hydrological flows into the wetland being impacted, uncontaminated stormwater could be redirected into the wetland catchment to offset any loss of catchment flows resulting from the encroachment of the development into the wetland catchment.
Where the selected alignment of the underground gas pipeline crosses a waterway, the pipeline would be installed by horizontal directional drilling to minimise impacts on waterways. Open trenching would be used if demonstrated to have a lower environmental impact.

Other information/comments? (eg. accuracy of information)
A catchment hydrology assessment of the onsite wetland was conducted by URS Australia Pty Ltd. This report is included at Appendix E.

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared?
× No ✕ Yes If yes, please attach.

Is the project to be located either within or near an area that is:

- **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?**
  × NYD ✕ No × Yes If yes, provide plan showing footprint relative to overlay.

- **Identified as of regional or State significance in a reputable study of landscape values?**
  × NYD ✕ No × Yes If yes, please specify.

- **Within or adjoining land reserved under the *National Parks Act 1975* ?**
  × NYD ✕ No × Yes If yes, please specify.

- **Within or adjoining other public land used for conservation or recreational purposes ?**
  × NYD ✕ No × Yes If yes, please specify.

Is any clearing vegetation or alteration of landforms likely to affect landscape values?
× NYD ✕ No × Yes If yes, please briefly describe.

Is there a potential for effects on landscape values of regional or State importance?
× NYD ✕ No × Yes Please briefly explain response.

Is mitigation of potential landscape effects proposed?
× NYD × No ✕ Yes If yes, please briefly describe.

The Visual Amenity Assessment conducted for the project has concluded that although a power station and electrical substation would be a foreign feature within the rural landscape, the existing topography and conditions and proposed mitigation measures will lead to a low level of impact. Mitigation of the visual impacts of the proposed facility would be undertaken through the planting of vegetation. The project would be screened through planting of avenues as this type of planting is common in the area and would provide sufficient screening from identified receptors.

Other information/comments? (eg. accuracy of information)

The Visual Amenity Assessment conducted by Land Design Partnership is included at Appendix G.

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils

Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?
× NYD × No ✕ Yes If yes, please briefly describe.

Residual volcanic clays are typically of high plasticity, which has the potential to become erodible and can be unstable due to fissuring within the clay. Land stability and erosions would be further assessed prior to construction and potentially managed through construction environmental management plans. Acid sulphate soils are unlikely to be present at the peaking power station site or within the gas pipeline investigation corridors.(refer to Department of Primary Industries

Map 1 Far South West Coast – Prospective Land: land that has the potential to contain Coastal Acid Sulphate Soils). Basaltic clay or basalts are unlikely to contain elevated levels of metal sulphides and therefore the risk of acid generation from these soils is minimal.

Are there geotechnical hazards that may either affect the project or be affected by it?

× NYD × No × Yes If yes, please briefly describe.

The variability of basalt rock depth and weathering and default patterns within the basalt rock could be problematic, and accordingly, detailed geotechnical investigations would be undertaken prior to any earthworks being undertaken.

Other information/comments? (eg. accuracy of information)

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

× NYD ✕ No × Yes If yes, provide estimate of traffic volume(s) if practicable.

The project would generate increased traffic volumes of road traffic during construction, however the impact is not considered to be significant, due to the capacity of the existing road network to absorb the additional traffic and the proposed road upgrades that would be constructed as a part of the project.

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

× NYD × No ✕ Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

The construction of the peaking power station has the potential to generate dust. Dust control measures would be a part of a Construction Environmental Management Plan to be prepared prior to construction. The operation of the peaking power station is unlikely to emit odour, or significantly change visual, noise or traffic conditions.

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

× NYD ✕ No × Yes If yes, briefly describe the hazards and possible implications.

The modelled air emissions for the power station indicate that emissions to air of NO_X, SO_X and particulates are well below EPA criteria (SEPP (AQM)), and would not pose a health or safety risk to human communities. Modelled likely noise emissions indicate that the adopted noise limits can generally be achieved with no further noise mitigation measures beyond those already proposed by AGL and in accordance with SEPP (Control of Noise from Commerce, Industry and Trade) No. N-1 and Interim guidelines for control of noise from industry in Country Victoria N3/89).

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

× NYD ✕ No × Yes If yes, briefly describe potential effects.

Are non-residential land use activities likely to be displaced as a result of the project?

× NYD × No ✕ Yes If yes, briefly describe the likely effects.

The existing farming activities on the site would be displaced by the development of the peaking power station. There may be temporary displacement of farming during the construction of the gas pipeline.

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

× NYD ✕ No × Yes If yes, briefly describe the potential effects.

Is mitigation of potential social effects proposed?

× NYD × No ✕ Yes If yes, please briefly describe.

A traffic management plan, such as identification of heavy-vehicle and construction traffic routes to the site and local road upgrades, would be prepared to mitigate potential traffic impacts.

Other information/comments? (eg. accuracy of information)

Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

☐ No If no, list any organisations that it is proposed to consult.
☒ Yes If yes, list the organisations so far consulted.

The relevant local Aboriginal organisations are the Gunditj Mirring Traditional Owners Corporation and Framlingham Aboriginal Trust, both of which have been consulted.

What investigations of cultural heritage in the project area have been done?
(attach details of method and results of any surveys for the project & describe their accuracy)

A surface survey of the peaking power station site area and gas pipeline corridors was carried out between 25 and 29 May 2009 with representatives of the two relevant indigenous organisations present. No new Aboriginal archaeological sites were recorded during the survey, however several areas of Aboriginal sensitivity were identified, mainly near waterways and in areas of stony rises.

Is any Aboriginal cultural heritage known from the project area?

☐ NYD ☒ No ☐ Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby
- Sites or areas of sensitivity identified by representatives of Indigenous organisations

Seven Aboriginal archaeological sites (three earth mounds, two isolated artefacts and one artefact scatter) have been previously recorded within five kilometres of the peaking power station site area and gas pipeline corridors, however none have been identified within the project area.

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

☐ NYD ☒ No ☐ Yes If yes, please list.

Is mitigation of potential cultural heritage effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

In accordance with the regulations under the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007*, a Cultural Heritage Management Plan would be prepared for the works associated with the Tarrone Power Station. The Cultural Heritage Management Plan would include recommendations for the management of any culturally significant sites that may be found.

Other information/comments? (eg. accuracy of information)

The Cultural Heritage Assessment of the project is included at Appendix F.

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

✕ Electricity network. If possible, estimate power output up to 840MW

✕ Natural gas network. If possible, estimate gas requirement: up to 2,800 GJ/turbine/hour of operation.

✕ Generated on-site. If possible, estimate power output up to 840MW

✕ Other. Please describe.

Please add any relevant additional information.

What are the main forms of waste that would be generated by the project facility?

✕ Wastewater. Describe briefly.

- Blowdown from cooling of the turbine intake air (main source). Elevated total dissolved solids (TDS) relative to the water supply, with possible inclusion of water treatment chemicals (anti-scalants, etc)
- Compressor condensate (via an oil/water separator). May contain traces of oil.
- Bund water - may contain traces of oil
- Utility wash-water (wash-down/hoses) - may contain traces of oil (detergent/degreaser use not generally anticipated)
- Occasionally turbine wash-water. Will contain detergents - will probably be disposed of as prescribed waste.
- Domestic wastewater - will be collected separately in an inground tank for offsite tankering.

✕ Solid chemical wastes. Describe briefly.

The prevalence of solids chemical wastes generated at the facility is expected to be minimal. The main wastes that could be expected to be generated include:

- Empty oil, cleaning, coolant and possibly water treatment chemical drums/containers - expected to be returned to suppliers or alternatively disposed of appropriately as prescribed waste.
- Maintenance wastes including scrap parts, oil filters, oily rags, etc will be disposed as scrap metal and prescribed waste, as appropriate. Some larger quantities of maintenance waste could be generated during a major shutdown/turbine generator overhaul but these would be managed as part of the maintenance activity.
- Waste oil will be disposed of as a prescribed waste for recycling/energy recovery, as appropriate.
- Although not expected, it is possible that occasionally some offspec oil/chemicals may require offsite disposal as a prescribed waste.
- All solid/liquids will be stored in appropriate primary containers in buildings and/or within adequately and appropriately bunded areas.

✕ Excavated material. Describe briefly.

Some excavation is expected to occur during construction. Excavated material will be used initially, if necessary as fill material for plant site levelling and/or landscaping. Any excess spoil will be removed from site for disposal as clean fill (subject to appropriate quality testing to confirm that it meets the classification criteria for this use).

During construction, any stockpiles of excavation material will be managed appropriately to minimise dust, sediment runoff and erosion, particularly in relation to any potential impacts on the identified wetland. This would be addressed in a construction phase Environment Management Plan.

✕ Other. Describe briefly.

Please provide relevant further information, including proposed management of wastes.

The main waste generated by the power station is exhaust gas as further described within the air emissions and greenhouse gas emission sections. Some process wastewater will also be generated, but this will be a relatively small quantity, with relatively low contaminant level (oil traces and elevated TDS relatively to potable water). The saline process wastewater is primarily produced by evaporative cooling of the inlet air under some operating conditions. Relatively small quantities of other wastes are expected to be generated, including turbine wash-water (periodic campaign), waste oil, empty oil and chemical containers, and maintenance wastes.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

- × Less than 50,000 tonnes of CO_2 equivalent per annum
- × Between 50,000 and 100,000 tonnes of CO_2 equivalent per annum
- ✕ Between 100,000 and 200,000 tonnes of CO_2 equivalent per annum
- × More than 200,000 tonnes of CO_2 equivalent per annum

Please add any relevant additional information, including any identified mitigation options.

The National Electricity Market is extremely volatile and complex. Peak loading power plants are used at times when additional electricity is required by the grid, such as during hot summer days or cold winter mornings and evenings. As a result the distribution of operating hours can vary significantly from year to year. It is difficult, therefore, to predict with certainty when the plant will be operating and for how many hours. Typically, however, the expected operating profile for a peak loading power station of the proposed size in Victoria is for approximately 200 days per year, with daily run times varying from less than 1 hour and up to 24 hours, the likely daily rate expected to be within the range of 2 to 6 hours per day. Overnight running is rare. The annual operating hours is expected to be approximately 440 hours.

Based on this potential range of operation, greenhouse gas emissions, expressed as CO_2 equivalent (CO_2-e) per annum are shown in Table 11.2.

Table 11.2 Greenhouse Gas Emissions (expressed as CO_2-e) per annum for the Range for Typical Operation

Operating Capacity	5%
Alstom 13E2	137,614
GE9FA	156,195

At a 5% usage rate (2 hours per day), the expected gas consumption would result in Scope 1 greenhouse gas emissions of 137,614 tonnes CO_2-e and 156,195 tonnes CO_2-e for the Alstom 13E2 and the GE 9FA designs respectively. This is approximately 0.17% and 0.19% of CO_2-e emitted by stationary energy production in Victoria (Sustainability Victoria, 2009).

Emissions to atmosphere of greenhouse gases are likely to be in the range of 100,000 to 200,000 tonnes CO_2-e per annum.

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

✕ No × Yes If yes, briefly describe.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects? (if not already described above)

✕ Siting: Please describe briefly

The siting of the peaking power station has taken into account the location of native vegetation patches, and the catchment areas of sensitive wetlands. Investigations within the gas pipeline corridors have identified environmental constraints that would be avoided by the final pipeline lateral alignment.

✕ Design: Please describe briefly

The peaking power station design will include landscaped screening to minimise visual impacts and will provide for the redirection of uncontaminated stormwater to be pumped into an onsite wetland to offset any inflows caused by the development.

× Environmental management: Please describe briefly.

Where appropriate, environmental impacts will be addressed and managed through specific mitigation measures contained within an Environmental Management Plan. The risk of introducing the disease amphibian chytrid fungus, which is a threatening process for the nationally significant Growling Grass Frog, will be managed through a Species Management Plan being prepared for the Commonwealth Department of Environment, Water, Heritage and the Arts.

× Other: Please describe briefly

Add any relevant additional information.

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

× NYD × No × Yes If yes, briefly describe.

Air quality modelling was undertaken to predict ground level concentrations during startup and operation of the two turbine options both separate from and in combination with a proposed nearby combined-cycle gas power station at Shaw River.

The model predictions indicate that there is a potential for cumulative effects, with relation to local air quality. However, for all modelled scenarios and emissions the maximum modelled ground level concentration, including a conservatively selected background, are predicted to be below the SEPP(AQM) design criteria.

Table 11.1 shows the maximum predicted ground level concentrations, within the modelled area, for common products of combustion, and considered scenarios. The full results, including volatile organic compounds, polycyclic aromatic hydrocarbons and formaldehyde may be found in the technical report (Appendix A).

Table 11.1 Maximum modelled (99.9th percentile) ground level concentrations for considered scenarios

Species	NO_X as NO_2	SO_X as SO_2	CO	$PM_{2.5}$
Units	ug/m^3	ug/m^3	ug/m^3	ug/m^3
Averaging Period	1 hour	1 hour	1 hour	1 hour
Alstom 13E2 Steady State	27.41	0.86	2.19	9.81
GE 9FA Steady State	25.53	0.86	4.47	8.49
Alstom 13E2 Start up	14.45			
GE 9FA Start up	16.1			
Alstom 13E2 Steady State Plus Shaw River	35.75	1.31	3.22	11.01
GE 9FA Steady State Plus Shaw River	34.73	1.32	4.47	10.36
Background Concentration	11.3	0	0.22	7.5
SEPP (AQM) Design Criteria	**190**	**450**	**29,000**	**50**
Exceed SEPP (AQM) Design Criteria	No	No	No	No

Any release of additional greenhouse gas to the atmosphere will result in higher concentrations, and will therefore have a cumulative effect. Construction of a combined-cycle gas power station is proposed at Shaw River. Greenhouse gas emissions from Shaw River will combine, in the atmosphere, with emissions from the proposed power station, along with all other sources of

greenhouse gases globally, It is not possible to quantify the effects of the cumulative effect of greenhouse gas emissions from the proposed development and other sources in the vicinity, as this would require global climate modelling.

It is known, however, that the proposed emissions of greenhouse gas are expected to be between 0.17% and 0.19% of the emission produced by stationary energy sources in Victoria (dependant on the engine chosen).

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

☒ No ☒ Yes If yes, please list here and attach if relevant.

SPECIALIST STUDIES TO BE INCLUDED WITH REFERRAL

- Appendix A - Air Quality and Greenhouse Gas Assessment
- Appendix B - Noise Assessment
- Appendix C - Flora and Fauna (site and roadsides) Assessment
- Appendix D - Flora and Fauna (pipeline corridors) Assessment
- Appendix E - Hydrology Assessment
- Appendix F - Cultural Heritage Assessment
- Appendix G - Visual Amenity Assessment
- Appendix H - Targeted Survey for Growling Grass Frog

Has a program for future environmental studies been developed?

☒ No ☒ Yes If yes, briefly describe.

Several future environmental studies have been identified within the referral that would be undertaken, where necessary.

Consultation program

Has a consultation program conducted to date for the project?

☒ No ☒ Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

AGL have a consultation program for the project. Consultation activities that have occurred for the project thus far are:

Moyne Shire Council Consultation
A briefing to the Moyne Shire Council was conducted in December 2008.

Community Information Day
A Community Information Day was conducted at the Willatook Community Hall on February 28 2009.

Gas Pipeline Corridor Landowners
AGL has consulted with all landowners within the gas pipeline investigation corridors.

Has a program for future consultation been developed?

☒ NYD ☒ No ☒ Yes If yes, briefly describe.

AGL would continue to conduct consultation with the community and relevant stakeholders in the future.

Authorised person for proponent:

I, Evan Stewart Carless,

Manager Power Development confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature

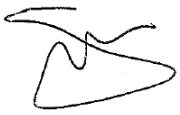
Date 8 December 2009

Person who prepared this referral:

I, Sean Myers,

Senior Principal – Environment and Planning, confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature



Date 8 December 2009