Report

Traffic Study

Tarrone Power Station

OCTOBER 2009

Prepared for

AGL Energy Limited

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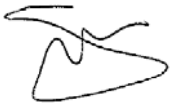

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Date: **October 2009**
Reference: 43283491/TR/01
Status: Final

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Introduction

1.1 Project Background

URS has been engaged by AGL Energy Limited (AGL) to prepare a traffic study for the proposed Tarrone Power Station and associated gas pipeline development (hereafter 'the facility') planned for Tarrone in south west Victoria. This study assesses both the construction and ongoing operation phases of the facility.

This traffic study will form part of a wider referral to be prepared and referred to the Victorian Planning Minister for a determination on whether an Environment Effects Statement (EES) will be required under the *Environment Effects Act 1978*.

This report focuses on those roads identified as the preferred route from both Geelong and Portland to the project site; however additional roads in the local area which may not be utilised as a priority route have also been included in some aspects of this report to give a wider perspective on the surrounding network.

1.2 Objectives and Scope

Outcomes addressed by this study are as follows:

- Describe the existing regional and local road network; including a survey of local roads in the vicinity of the facility that may be used for access (refer Section 3.1 of this report).
- Establish the existing traffic volumes on local roads and arterial routes which may be used by project generated traffic (refer Section 4.1 of this report).
- Collate information regarding existing road users such as school bus routes and milk tanker or freight routes for the road network in the vicinity of the facility (refer Section 3.2 of this report).
- Establish the traffic generated by the facility during the construction and operational phases (refer Section 4.4 of this report).
- Identify possible access points to the facility from adjoining roads (refer Section 7.1 of this report).
- Identify the requirements of VicRoads, Glenelg and Moyne Shire Councils (refer Section 5.2 and 8.2 of this report).
- Assess the predicted traffic impacts on the local road network for both construction and operational phases (refer Section 6 of this report).
- Identify key issues related to traffic and transport for the facility (refer Section 9 of this report).

2

Proposed Development

2.1 Site Location and Proposed Activities

AGL is investigating the feasibility of the development of a gas-fired power station in the rural locality of Tarrone, approximately 6 kilometres north-east of the small town of Orford in western Victoria.

AGL and Meridian Energy are investigating development of the approved Macarthur Wind Farm located approximately 10km north of the proposed power station site.

The proposed power station would supply electricity to the grid via a 500kV substation and connection point to be located immediately to the East of the power station, being a shared connection point with the Macarthur wind farm.

The proposed works are the development of a gas fired peaking power plant. The proposed development consists of:

- Up to four open-cycle gas turbines (OCGT), and
- associated infrastructure including an underground gas pipeline extending either to the north or east from the primary power station site (see Figure 2-1).

The power station site is located on a 75ha site to the north-east of the intersection of Riordans Road and Landers Lane, Tarrone, Victoria (the subject site). A location map is provided in Figure 2-1.

Two potential pipeline corridors exist, one extending north-east to the SeaGas pipeline to the east of Willatook – Warrong Road, Willatook and the other extending directly north from the site, crossing Woolsthorpe-Heywood Road and Kangertong Road.

The traffic analysis is based on the worst case scenario that all four turbines will be constructed in a single stage.

2 Proposed Development

Figure 2-1 Location Map

2.2 Proposed Developments in the Area

In discussion with Moyne Shire Council, it has been identified that there are a number of developments proposed for the surrounding area which may potentially impact on the roads nominated for the facility. The following information regarding proposed developments was obtained from discussion with Moyne Shire Council and the Department of Sustainability and Environment website.

2 Proposed Development

Bluegum Harvesting

Though not a development, harvesting of blue gums throughout the Green Triangle has the potential to yield up to 300 trucks per day travelling between Portland and the Green Triangle – which stretches from the coast and is roughly bound by Colac in the East, Horsham and Stawell in the North, and Naracoorte in the West. This clearly covers all of both Moyne Shire and Glenelg Shire, actual freight routes are not known as yet, indicative routes are retained by Moyne Shire Council however were not available at the time of producing this report. Harvesting was due to commence late in 2008 however has been put on hold due to lack of funding and limited facilities at the port required for harvesting. Council suggested that facilities may be available later in 2010 however no detailed information is available at this time.

Shaw River Power Station – Santos

Santos is developing a power station off Riordans Road, approximately 8km west of the facility. This development is currently at the EES stage with construction expected to commence in the summer of 2011 and continue for approximately 18 months to complete the first stage. Moyne Shire Council has yet to receive detailed traffic studies in relation to this development however, Council has revealed that, if coming from Portland, construction vehicles are likely to travel east on the Princes Highway to Tyrendarra, turning left onto Tyrendarra Ettrick road, right onto Woolsthorpe Heywood Road to Hamilton Port Fairy Road before turning left onto Riordans Road. If materials are to arrive from Geelong, Council is unsure which of the Princes Highway or Hamilton Highway would be used. It may also be noted that Council provided advice that Santos will likely need to transport materials from the Port at Geelong rather than Portland due to the limiting height of an existing overpass encountered close to the exit from the port at Portland. A site inspection undertaken on 11th August 2009 found that the height of the overpass at Bridgewater Road was 5.25m at it's lowest point.

Approved Wind Farms (Not Operational)

The following information sourced from the Department of Sustainability and Environment website provides information on approved wind farm developments in the area:

Proposal	Proponent	No. generators	Max. power (MW)	Location
Hawkesdale	Union Fenosa	31	62	Inland 35km N of Port Fairy
Macarthur	AGL in partnership with Meridian Energy	183	329	Inland (Moyne Shire)
Morton's Lane	NewEn Australia	13	30	Inland 25km East of Hamilton (Moyne Shire)
Portland Wind Energy Project (Nelson/William Grant)	Pacific Hydro	70	46	Coastal
Ryan Corner	Union Fenosa	68	136	Inland 10km North of Port Fairy
Woolsthorpe	Wind Farm Developments	20	40	Inland (Moyne Shire)

The traffic generated by these developments has been considered in our traffic impact assessment.

Planning permits lodged

The following information sourced from the Department of Sustainability and Environment website provides information on planning permit applications for wind farms in the area that have been lodged either with the Minister or with Councils, for Planning (Permit Process Underway).

Proposal	Proponent	No. generators	Max. power (MW)	Location
Mortlake	Acciona	96	300	Mortlake (Moyne Shire)
The Sisters	Wind Farm Developments	15	29.9	Terang (Moyne Shire)

Though these developments may impact on the roads we have proposed for the facility, we maintain our advice regarding the routes nominated (whether coming from Portland or Geelong) as alternative options are limited.

2.3 Construction Vehicles

At the current stage of planning, no information is available regarding the number or dimensions of vehicles required for the construction or operation of the facility. It is proposed that the construction of the facility will occur over approximately 2 years.

The number of predicted construction vehicle movements is detailed in Section 4.2. The predicted construction traffic is based on previous projects similar in size and output capacity, with a 10% contingency allowance. This is considered a reasonable assumption and representation of associated traffic impacts for the proposed development.

2.4 Proposed Site Access

At the current stage of planning, it is envisaged that access arrangements to the site during construction and operation are to be direct from Tarrone North Road. The site is bordered by Landers Lane to the west and Riordans Road to the south. A corridor of property extends from the main area of the site to Tarrone North Road, located approximately 2km to the east and can be used as an access road to the site.

The analysis of the traffic and transport requirements for the facilities assumes that all construction equipment and materials will be transported from Portland unless stated otherwise. The analysis also considers the option of transporting materials from Geelong.

2.5 Location of Quarries

Glenelg Shire Council staff provided a map with three quarries identified in the region, these are all limestone quarries. The table below outlines their locations.

Name of Quarry	Location Description	Material
Argos Pit	Lower Cape Bridgewater / Trewalla - Knights and Parkers Road near the intersection with Bridgewater Road	Limestone
Klatts Pit	Lower Cape Bridgewater / Trewalla - West of Portland at Telegraph Road near the intersection with Bridgewater Road	Limestone
Morton's Pit	Tyrendarra East – on Tyrendarra School Road south of the Princes Highway	Limestone

Moyne Shire Council staff provided a map with eight quarries identified in the region, the table below outlines their locations and the material mined at each.

Name of Quarry	Location Description	Material
Cemex - Tarrone Lane	Tarrone Lane, approximately 1km east of Torbuk Road (~0.6km south of site)	Crushed bluestone
Mt. Napier (Boral)	Approximately 14km North of Macarthur (~2.8km north of site)	Crushed bluestone and scoria
Davidsons	Southeast of Koroit, off Tower Hill Road (~2.4km south of site)	Tuff
Haberfields	South of Koroit, near intersection of Princes Highway with Lakeview Road (~2.5km south of site)	Tuff
Mt. Shadwell	Off Mortlake-Ararat Road, near Steeles Lane (~6km East of site)	Scoria
Watsons	West of intersection Sheehans Rd and Port Fairy Road (~2km South of site)	Limestone
Mt. Rouse	Within Southern Grampians Shire (3.6km North of Site)	Scoria
Codrington	Approximately 1km West of Yambuk, South of the Princes Highway near Fergusons Road (~2km Southwest of site)	Limestone

Access to a quarry will be necessary for materials required during the construction of the project.

2.6 Project Timelines

Based on similar sized projects, it is estimated that the facility may have a construction period of 24 months with a peak period of up to 6 months.

For traffic analysis purposes, it is assumed that the project will commence construction in 2014. In the event that the project should commence earlier, it is likely that traffic impacts will be less significant than those analysed as background traffic volumes have been calculated at 2014 growth rates. However, this does not take into account the growth in traffic due to other developments in the region which may commence before, or at the same time as the Tarrone Power Station (see section 2.2).

2.7 Project Employment

Limited information is available to predict the size of the workforce required to build and operate the facility at the current stage of planning. Based on projects of similar size and nature, an estimate of possible workforce requirements is outlined in Table 2-1. The employment levels are shown as a proportion of full time jobs over a full year. Maximum figures are based on the peak construction period

Table 2-1 Estimated Employment Generation

Phase	Employment Generation	
	Annual Full Time Equivalent – Maximum	*Annual Full Time Equivalent - Average*
Construction	300 construction jobs	100 construction jobs
Operation	Up to 5 full time staff on site Up to 10 full time staff off site	
Scheduled Maintenance: Minor	Up to 10 contractors for 5 days every 6-7 years	
Scheduled Maintenance: Major	Up to 50 personnel for 2 months, every 2 to 3 years	

It should be noted that the location of accommodation for the workforce is yet to be established.

3

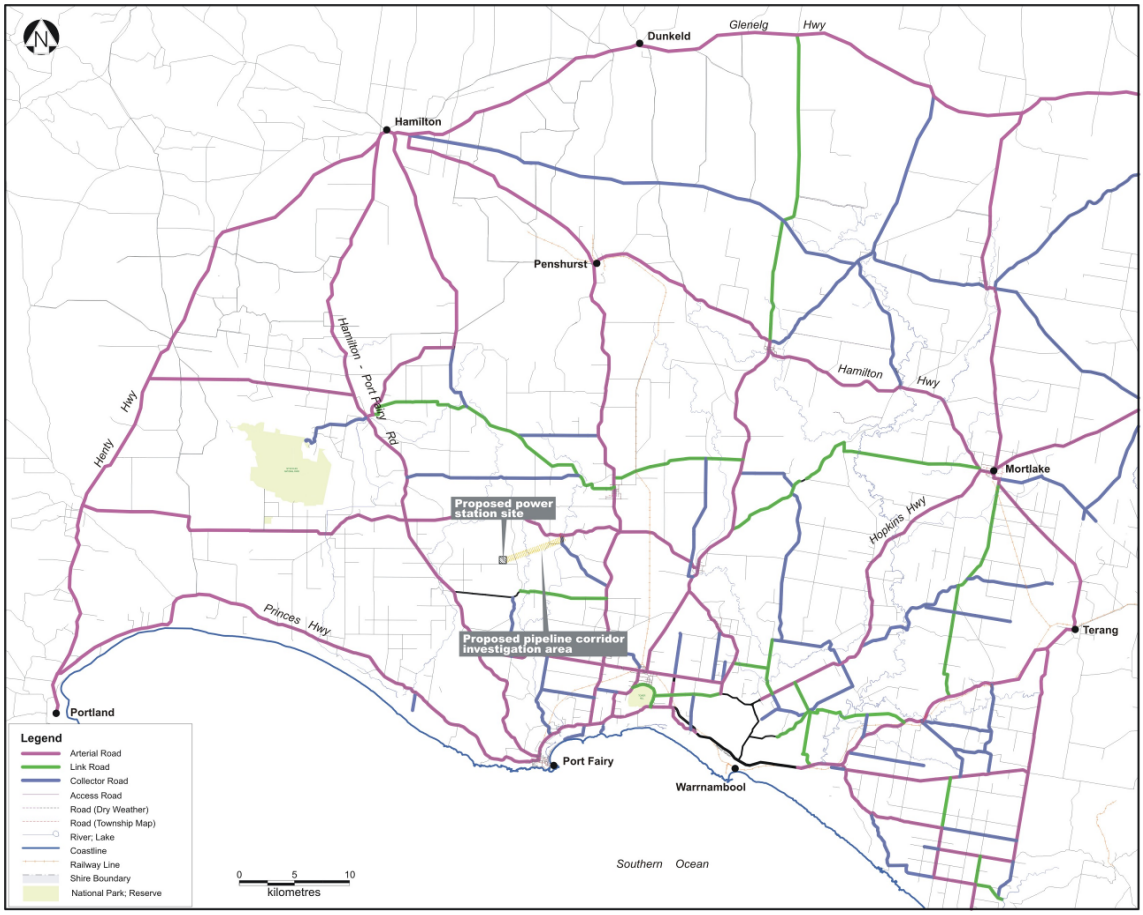
Existing Conditions

3.1 Existing Road Network

An outline of relevant information on road conditions in the vicinity of the subject site and pipeline corridor investigation area is presented in this section.

The south-west region of Victoria is serviced by a network of highways that provide connections to Geelong to the east, Ballarat to the north-east, Horsham to the north and Portland and Mt Gambier to the west. A map of the regional road network is provided in Figure 3-1.

Figure 3-1 Regional Road Network



Advice from the Glenelg Shire Council and VicRoads recommends that the most appropriate and efficient route from Portland to the local area for large trucks follows the Henty Highway, then Princes Highway to Tyrendarra then turns left onto Tyrendarra Ettrick Road north to Woolsthorpe Heywood Road. A description of the relevant regional roads is provided below. The regional roads are managed by VicRoads, while local roads are managed by Moyne Shire Council.

Advice from the Moyne Shire Council recommends that the most appropriate and efficient route from Geelong to the local area for large trucks follows the Hamilton Highway to either Caramut or Penshurst. A description of the relevant regional roads is provided below.

URS is aware that a route survey report has been provided to AGL for transporting oversized cargo to the local area by BLIS Equipment Hire Pty Ltd. This report has been read by URS, with roads outlined by the report included in this investigation, however no comment is made on the accuracy of the BLIS report.

3 Existing Conditions

URS has previously conducted several road traffic and transport studies for renewable energy projects in the region. In addition to these studies, URS undertook a site visit to the local area surrounding the subject site on January 12th and 13th 2009 to assess the Geelong route and August 11th and 12th 2009 to assess the Portland route.

3.1.1 VicRoads Declared Roads

It is assumed that all VicRoads declared roads are maintained to an appropriate standard to allow safe usage by B-double trucks.

Princes Highway (A1)

The Princes Highway (A1) is a B class highway which links Portland in the west to Geelong in the east via Port Fairy, Koroit, Warrnambool, Terang, Camperdown, Colac and Winchelsea. At its closest point, the Princes Highway (A1) is approximately 20km south west of the subject site. From Portland, the Princes Highway extends north to Heywood and then west towards the South Australian border.

The Princes Highway splits just north of Portland into northern and eastern routes.

The Princes Highway (A1) is an approved Over Dimension (OD) route, however, vehicles exceeding the OD mass and dimension standards will require approval from VicRoads.

Princes Highway was not assessed by URS because it is a declared over dimension route and is maintained and managed by VicRoads. Princes Highway is suitable for standard dimension commercial vehicles. Refer to Section 4, Table 4-1 for existing traffic volumes on the Princes Highway.

It should be noted that the northern route of the highway runs from Portland directly through the town centre of Heywood with reduced speed limits and signalised intersections, as such, the local council favours the use of alternative freight routes if possible for safety reasons.

The eastern route of the highway passes through the township of Narrawong, located between Portland and Tyrendarra-Ettrick Road. This town has a local primary school, which operates a 40km/h speed zone during school drop of and pick up times.

Tyrendarra-Ettrick Road (C191)

Tyrendarra-Ettrick Road provides a north-south link from Tyrendarra in the south to Homerton in the north and then continues in an east-west direction to Heywood (the section is commonly known as the Ettrick Road). The Princes Highway (A1) is the terminus of Tyrendarra-Ettrick Road in the south. At its closest point, Tyrendarra-Ettrick Road is approximately 40km west of the subject site.

The road is a sealed single carriageway, with a single lane in each direction. The road is in good condition with minor patching and rutting and some sections showing signs of recent resealing. Lane widths are approximately 3.5 metres and have line marking along both the centreline and outer edges. There are no sealed shoulders, however grassed shoulders extend either side of the sealed carriageway including guide posts approximately 1 metre from the edge of the seal.

The speed limit is 100km/h with a reduction to 80km/h as the road approaches the intersection with the Princes Highway in the south and a reduction through 80km/h to 60km/h as the road enters Heywood to the west.

3 Existing Conditions

The intersection with the Princes Highway has been upgrade to accommodate large commercial vehicles with wide shoulders and weight activated warning signs to mitigate poor sight distance when approaching the intersection from Tyrendarra-Ettrick Road.

The road also intersects with Woolsthorpe-Heywood Road. This intersection allows room for large turning movements, with additional sealed widenings on Tyrendarra-Ettrick Road. However, concrete median islands separate each turning movement which may need to be considered for over dimension vehicles.

The surrounding land is primarily rural residential and farm properties, with private access directly onto the road.

Tyrendarra-Ettrick Road is maintained and managed by VicRoads and is suitable for standard dimension commercial vehicles.

Woolsthorpe – Heywood Road (C176)

The Woolsthorpe – Heywood Road (C176) provides an east-west link from Woolsthorpe in the east (at the junction of the Warrnambool – Caramut Road (C174)) to Tyrendarra-Ettrick Road in the west. The section of road extending west from this junction to Heywood is commonly known as the Ettrick road and has been discussed above.

The Woolsthorpe – Heywood Road (C174) crosses the north-south Penshurst – Warrnambool Road (C178) to the north-east of the subject site and crosses the north-south Hamilton – Port Fairy Road (C184) to the north-west of the subject site.

At its closest point, the Woolsthorpe – Heywood Road is approximately 5km north of the subject site and approximately 1km north of the proposed pipeline corridor investigation area and is the northern terminus of Tarrone North Road (which provides direct access to the site).

Woolsthorpe-Heywood Road was assessed form the intersection of Penshurst-Warrnambool Road to the intersection of Tyrendarra-Ettrick Road.

Where the road crosses the Hamilton-Port Fairy road, Woolsthorpe-Heywood Road is a staggered T-intersection so that vehicles must negotiate a right, then left turn to proceed. This is a common treatment in rural environments to avoid vehicles negotiating the crossing at an unsafe speed. The intersection with Tyrendarra-Ettrick Road is described above.

Woolsthorpe-Heywood Road is a single carriageway road which varies intermittently from approximately 3.5-4 metre one lane width (two way traffic) to approximately 6 metre two lanes width (one lane of traffic each way). The two lane sections are primarily positioned on horizontal and vertical curves with low sight distance. The one lane sections have approximately 1.5-2 metre gravel shoulders to allow passing.

Line marking on the carriageway is inconsistent with the upgraded two lane sections generally marked, while the single lane sections have no markings. The sealed carriageway condition varies from poor on some single lane sections, to very good on some upgraded two lane sections.

Warning signs are in place on most curves and crests and some curves with poor sight distance have not yet been upgraded to a two lane carriageway.

3 Existing Conditions

A number of bridges and culverts exist along the alignment, for none of which load ratings have been obtained. Additionally, a number of low overhead powerlines cross the road and trees exist close to the road reservation may impact on over dimension commercial vehicle access.

Surrounding land use is primarily rural residential and farming, with stock crossings and private access directly onto the road. Forestry plantations also exist on the abutting land.

Woolsthorpe-Heywood Road is currently utilised by B-Doubles and other commercial vehicles. Refer to Section 4, Table 4-1 for existing traffic volumes on Woolsthorpe – Heywood Road.

Hamilton – Port Fairy Road (C184)

The Hamilton – Port Fairy Road (C184) provides a north-south link from Hamilton in the north (at the junction with the Henty (A200), Hamilton (B140) and Glenelg (B160) Highways) to Port Fairy in the south (at the junction with the Princes Highway (A1). The Hamilton – Port Fairy Road (C184) passes through the township of Macarthur.
The Hamilton – Port Fairy Road (C184) is the terminus of the east-west Spencer Road (C183) to the south-west of the subject site and crosses the east-west Woolsthorpe – Heywood Road to the north-west of the subject site.

At its closest point, the Hamilton – Port Fairy Road (C184) is approximately 5km west of the subject site and is the western terminus of Riordans Lane (which provides access to the subject site).

Hamilton-Port Fairy Road was not assessed by URS because it is a declared over dimension route and is maintained and managed by VicRoads. Hamilton-Port Fairy Road is suitable for large vehicles.

Hamilton Highway (B140)

The Hamilton Highway (B140) is a B class highway which links Hamilton in the west to Geelong in the east via Penshurst, Caramut and Mortlake. At its closest point, the Hamilton Highway (B140) is approximately 30km north of the subject site and is northern terminus of the major north-south local roads in close proximity to the site.

The Hamilton Highway (B140) is an approved Over Dimension (OD) route, however, vehicles exceeding the OD mass and dimension standards will require approval from VicRoads.

Hamilton Highway was not assessed by URS because it is a declared over dimension route and is maintained and managed by VicRoads. Hamilton Highway is suitable for large vehicles. Refer to Section 4, Table 4-1 for existing traffic volumes on the Hamilton Highway.

Penshurst – Warrnambool Road/Penshurst – Port Fairy Road (C178)

The Penshurst – Warrnambool Road/Penshurst – Port Fairy Road (C178) provides a north-south link from Penshurst in the north (at the junction with the Hamilton Highway (B140) to the Princes Highway (A1) in the south, between Port Fairy and Warrnambool. The road is known as Penshurst – Warrnambool Road to the north and east of the junction with Spencer Road/Penshurst – Warrnambool Road and as Penshurst – Port Fairy Road to the south.

3 Existing Conditions

The Penshurst – Warrnambool Road (C178) passes through the townships of Hawkesdale (to the north-east of the subject site) and Kirkstall (to the south-east of the subject site). To the south-east of the subject site, at the junction with the east-west Spencer Road (C183), the Penshurst – Warrnambool Road becomes the continuation of Spencer Road (C183) to the east of the junction, providing more direct access to Warrnambool via Koroit. To the south of this junction, the road is known as the Penshurst – Port Fairy Road (C178) and continues to its termination at the junction with the Princes Highway (A1) between Warrnambool and Port Fairy. The Penshurst – Warrnambool Road (C178) also crosses the east-west Woolsthorpe – Heywood Road (C176) to the north-east of the subject site.

At its closest point, the Penshurst – Warrnambool Road (C178) is approximately 10km east of the subject site and 5km east of the proposed pipeline corridor investigation area and is the eastern terminus of Tarrone Lane and Willatook – Warrong Road.

Penshurst-Warrnambool Road is a single sealed asphalt carriageway with one lane in each direction. There are no shoulders along the majority of the alignment, with wide grassed land reserves either side. The speed limit is 100km/hr.

Line marking is consistent with VicRoads guidelines for rural arterial roads.

The road surface condition is good to very good, with some minor patching evident. The alignment is undulating, with gradual vertical crests and curves suitable for commercial vehicles.

Penshurst-Warrnambool Road is a designated school bus routes with bus stops off the main alignment and is also currently utilised by B-Doubles and other commercial vehicles. Refer to Section 4, Table 4-1 for existing traffic volumes on Penshurst-Warrnambool Road.

3.1.2 Local Road Network

The subject site is surrounded by an extensive network of local roads ranging from main roads providing linkages from Hamilton and Penshurst in the north to Port Fairy and Warrnambool in the south to unsealed local access roads.

The Moyne Shire Council Road Management Plan defines a link road as ‘part of a major truck route and/or passenger vehicle route through the Shire, which is not an “arterial” road as defined under the *Road Management Act 2004*, with traffic volumes generally exceeding 150 vehicles per day’. A collector road is defined as ‘providing a connection between traffic generators and destinations, or providing a connection between arterial roads, link roads and destinations, with traffic volumes generally exceeding 70 vehicles/day’.

Local road conditions are managed by the Moyne Shire Council. A site inspection of the following roads was undertaken on January 12th-13th 2009 by URS and the following conditions were encountered.

In general, all local and rural roads are within rural private property areas and do not have speed limit signs, unless otherwise specified. All rural roads assessed were single lane roads with two way traffic utilising the single lane with passing vehicles utilising the shoulders or road reserves.

Portland-Woolsthorpe Road

The Portland-Woolsthorpe Road provides a north-south link between the Princes Highway at Tyrendarra East in the south to Woolsthorpe-Heywood Road at Bessiebelle in the north.

3 Existing Conditions

The road is a single carriageway, single lane road with a seal width of approximately 3.7 to 4 metres. The seal is in average to poor condition with some potholes and rutting evident. Unformed grassed shoulders extend from the edge of the seal to create a wide road reservation with guide posts located approximately 1 metre from the edge of the seal. There is insufficient width on the seal for two vehicles to pass in opposing directions and the grassed shoulders would need to be used in this instance. There are no line markings on the seal.

The alignment has a number of horizontal curves, most with poor sight distance and encroaching vegetation, with little warning signage.

The northern section of the road passes through forestry plantations and farming land, with large trees close to the edge of the seal and canopied over the carriageway.

This road is suitable for light vehicles or commercial vehicles requiring access to the local area, however is not recommended for use as a thoroughfare by commercial vehicles.

Tarrone North Road

Tarrone North Road is a 'Sealed Rural Access Road' that provides a connection between the Woolsthorpe – Heywood Road (C176) in the north to Tarrone Lane in the south. Tarrone North Road is the eastern terminus of Riordans Lane. Tarrone North Road provides direct access to the subject site and access to the part of the pipeline corridor investigation area west of Back Creek.

Tarrone North Road was assessed from the intersection of Tarrone Lane through to the intersection with Woolsthorpe-Heywood Road.

The general cross section of Tarrone North Road is a 3.7 metre wide sealed carriageway. The shoulders vary in width from 0 metres to 1 metre and are a mix of compacted gravel and native vegetation. The road reserve extends a number of metres either side of the carriageway and contains a number of low hanging trees.

There is no line marking on Tarrone North Road and the sealed road surface is in good condition with some minor patching and rutting.

The alignment of the road is very poor, with numerous horizontal curves which provide poor sight distance for a single lane road. The horizontal alignment contains a number of crest and sag curves.

A number of culverts exist under the carriageway for which load ratings could not be obtained.

The intersection of Tarrone North Road and Riordan's Road is an uncontrolled T-intersection. This intersection would require upgrading if it was required for access into the site.

In its current condition, there would be a number of safety concerns with the width of the carriageway on Tarrone North Road for use by heavy and over dimension vehicles. Localised upgrades such as road widening and/or strengthening would be required in sections deemed unsafe.

Riordans Road

Riordans Road is an east-west 'Formed Unpaved Road' to the west and south of the site and the section that forms the southern boundary of the subject site is unpaved. Riordans Road provides a connection between Tarrone North Road in the east and Hamilton – Port Fairy Road (C184) in the west.

3 Existing Conditions

The road varies in width, but is approximately 3.2 metres wide across the majority of the alignment, with wheel tracks either side of a grassed central section. Long grass and vegetation surround the road alignment.

The road surface is in very poor condition with rutting, uneven gravel surface and large potholes. The alignment of the road is extremely poor, with many closely spaced steep crest and sag curves and winding horizontal alignment. The vertical curves are steep enough that any long wheel based vehicle would 'bottom out' when crossing the crests.

Riordan's Road intersects Tarrone North Road at an uncontrolled T-intersection.

The intersection of Riordan's Road and Landers Lane is an uncontrolled T-intersection positioned on a crest vertical curve.

In its current condition, Riordan's Road is not suitable to use as access to the site due to its vertical and horizontal alignment, width and surface condition.

Landers Lane

Landers Lane is a north-south 'Formed Unpaved' road that forms the western boundary of the subject site. It is a no through road and terminates at Riordans Road in the south.

Landers lane is an unpaved semi-formed road. The road width is 3 metres with vegetation on either side. Wheel tracks have formed on the road surface with a grassed central section. The road surface is in very poor condition.

In its current condition Landers Lane is unsuitable for access into the site due to its vertical and horizontal alignment, width and surface condition.

Poyntons Road

Poyntons Road is a 'Formed Unpaved Rural Access Road' that forms an "L" shape link to the south-west of the intersection of Woolsthorpe – Heywood Road (C176) and Willatook – Warrong Road (Rural Collector Road). Poyntons Road provides access to Coomete Road and would be utilised to access the pipeline corridor investigation area between the Moyne River and Back Creek.

Poyntons Road is a single lane formed unpaved gravel road. The carriageway width is approximately 4 meters with wide grassed reserves either side between the carriageway and private property fences. The grassed reserves contain natural vegetation including tall grasses abutting the carriageway in some sections. The road surface is generally in poor to reasonable condition with some sections containing pot holes and corrugations. The western end of the road is in good condition for use by cars.

The alignment of the road contains both horizontal and vertical curves, which in addition to the single lane carriageway width presents some safety issues for large vehicles accessing the pipeline easement. A number of at grade stock crossings exist on the road.

Poyntons Road intersects Woolsthorpe-Heywood Road at an unsignalised T-intersection. The intersection is positioned in-between two horizontal curves on Woolsthorpe-Heywood Road. This intersection is controlled by a stop sign on Poyntons Road. Poor safety due to low sight distances have been improved with localised widening of Woolsthorpe-Heywood Road.

3 Existing Conditions

At the intersection of Willatook-Warrong Road, Poyntons Road bifurcates to allow two way traffic on both forks, with a grassed median separator in-between the carriageways. The northern fork is controlled by a stop sign and the southern fork by a give way sign on Poyntons Road. A crest vertical and horizontal curve exists to the north of the intersection on Willatook-Warrong Road. This type of intersection is undesirable as it creates a number of conflict points. With the current volumes of traffic utilising the intersection, the intersection can operate relatively safely, however if the road usage increases significantly, the current intersection layout would be considered unsuitable.

Tarrone Lane (East)

Tarrone Lane provides an east-west link from Penshurst – Warrnambool Road (C178) in the east to Hamilton – Port Fairy Road (C184) in the west and is the southern terminus of Tarrone North Road (Access Road) and the northern terminus of Faulkners North Road (Collector Road). Tarrone Lane is designated as a “Link Road” from the junction with Tarrone North Road, east to the junction with Penshurst – Warrnambool Road (C184).

Tarrone Lane runs east-west from the Hamilton-Port Fairy Road to Penshurst-Warrnambool Road. For the purposes of this study, only the section of Tarrone Lane from Tarrone North Road to Penshurst Warrnambool Road was assessed.

Tarrone Lane is clearly divided into two sections with differing road conditions. The western section is defined from the intersection with Tarrone North Road to the Cemex quarry site, situated to the west of the Moyne River. The eastern section is defined from the Cemex quarry site to the intersection with Penshurst-Warrnambool Road.

The eastern section of Tarrone Lane is suitable for B-Double trucks, as it has been upgraded to allow access to the Cemex quarry. The road is a single 6.4m wide carriageway with one lane in each direction. There are no shoulders and a wide grassed land reserve either side of the carriageway with spoon drains close to the carriageway. Line marking consists of central line marking only. The road surface is asphalt and is in very good condition.

The eastern alignment is relatively straight with very few gentle horizontal curves. Any vertical gradients are gentle and suitable for commercial vehicles. A grade separated crossing allows stock to pass under the carriageway. The bridge over the Moyne River has recently been upgraded and is 7m in width. Load ratings were not obtained for these structures, however they are currently in use by B-Double trucks accessing the quarry.

The western section of Tarrone Lane consists of a single sealed carriageway of varying widths, with the majority of the alignment being approximately 5.3m wide. There are no shoulders and limited central line markings. The road surface is in reasonable to good condition with some potholes, patching and rutting.

The western alignment is winding with many narrow horizontal curves and some steep vertical crest and sag curves. A narrow single lane bridge has been constructed over Back Creek, however this bridge is a known safety hazard in the local area. The bridge is approximately 3.5m wide and is situated in a sag curve between two horizontal curves. The western approach is particularly dangerous as there is extremely poor site distance around the horizontal curve before the single lane bridge.

In its current condition the western section of Tarrone Lane is unsuitable for large or commercial vehicles and truck movements are banned.

3 Existing Conditions

Willatook – Warrong Road

The Willatook – Warrong Road provides a connection from the locality of Willatook on the Woolsthorpe – Heywood Road (C176) to the locality of Warrong on the Penshurst – Warrnambool Road (C178) and provides a more direct route between the Woolsthorpe – Heywood Road (C183) (west towards the subject site) and the Penshurst – Warrnambool Road (C178) (south towards Warrnambool). The Willatook – Warrong Road has junctions with the following access roads:

- Threfall Road;
- Gittens Road;
- Malseeds Road; and
- Poyntons Road.

The eastern-most part of the pipeline corridor investigation area is to the east of Willatook – Warrong Road and several access roads that have junctions with Willatook – Warrong Road would provide access to the pipeline corridor investigation area, east of Back Creek.

Willatook-Warrong Road is a single lane sealed rural access road. In most areas, the carriageway consists of 2 metre wide gravel shoulders and a 3.2 metre sealed central lane. These widths vary over the length of the road, and the section north of Poyntons Road consists of a 3.5 metre sealed carriageway with no shoulder. There are no line markings on the sealed surface and the sealed surface is in poor to reasonable condition from Penshurst-Warrnambool Road to Poyntons Road with some patching, potholes and rutting. The road condition is good from Poyntons Road to Woolsthorpe-Heywood Road. There is a wide road reserve on either side of the carriageway which contains native grasses and other vegetation.

The road has a relatively straight horizontal alignment from the intersection of Penshurst-Warrnambool Road through to the intersection with Threfall Road. From Threfall Road through to the intersection with Woolsthorpe-Heywood Road, there are a number of narrow horizontal curves with poor sight distance on the single lane carriageway. A number of vertical crest and sag curves exist along the alignment which also provide poor sight distance. Warning signs alert drivers to rough and winding road conditions with a 70km/hr suggested speed limit.

A small 6 metre wide bridge allows the road to cross the Blackwood river near the intersection of Penshurst-Warrnambool Road and another small culvert near the intersection of Gittens Road allows a drain to pass under the carriageway. A larger bridge crosses the Moyne River near the intersection of Poyntons Road in Willatook. No load ratings were obtained for these structures.

A number of stock crossings exist along the alignment, both at grade and grade separated with the stock crossing under the carriageway.

Coomete Road

Coomete Road is a ‘Formed Unpaved Rural Access Road’, and is a no through road that terminates at Poyntons Road. Coomete Road would provide the primary access to parts of the pipeline corridor investigation area, particularly between the Moyne River and Back Creek.

3 Existing Conditions

3.2 Existing Public Transport and Freight Routes

3.2.1 Public Transport

There is limited public transport servicing the area surrounding the subject site. VLine services connect major regional centres to Melbourne and each other, while local school bus routes service the region allowing children to commute to and from school.

VLine

VLine operates a number of services in the region;

- A train service from Melbourne to Warrnambool
- Bus services
  - Casterton to Melbourne (via Hamilton, Penshurst, Woolsthorpe and Warrnambool)
  - Mt Gambier to Melbourne (via Port Fairy and Warrnambool)
  - Ararat to Warrnambool (via Hamilton, Macarthur and Port Fairy)

There are currently no services within close proximity to the subject site.

School Bus

DOT supplied a map showing the school bus routes in the area and from this it is clear that buses run on the following roads;

- Princes Highway (north)
- Princes Highway (east0
- Ettrick Road (Woolsthorpe Heywood Road between Homerton and Heywood)
- Hamilton Highway
- Penshurst-Warrnambool Road (South of Hawkesdale only)
- Woolsthorpe-Heywood Road
- Willatook-Warrong Road
- Tarrone North Road
- Tarrone Lane (East of Tarrone North Road only)

Timetable information is not available but it can be assumed that the frequency of buses travelling each route will be limited but will occur between approximately 7.00-9.00AM and 3.00-5.00PM.

3.2.2 Freight Routes

Freight routes for B-Double and Higher Mass vehicles were provided by Moyne Shire Council and it can be seen that the greatest concentration of freight is south east of the site with little impact on the primary route from Geelong to Tarrone (refer section 4.3.1 below). Relevant roads that are utilised by freight are parts of: Warrnambool-Caramut Road, Willatook-Warrong Road and Tarrone Lane. The main arterial roads considered for construction traffic: Penshurst-Warrnambool Road and Woolsthorpe-Heywood Road seem not to be affected and local roads Tarrone North Road, Riordans Lane and Landers Lane also appear to be void of freight routes.

Given that there is some freight use on Warrnambool-Caramut Rd and Tarrone Lane, it may be advisable, to follow option ‘1’ (refer Section 5.1)which favours the use of Penshurst-Warrnambool Road and access the site via the Northern approach as described in Section 4.3.1 which avoids the use of Tarrone Lane.

To the south west of the site, Portland is a commercial and industrial centre, including significant port facilities. Freight volumes on arterial roads surrounding Portland are generally the highest in the region. Glenelg Shire Council was not able to provide specific freight routes as they are pending the information from the various agricultural industry providers.

3.3 Existing Road Accident Data

Road accident data has been analysed along the routes proposed to be utilised by the traffic movements of the development. Given that there is little accident data available, the analysis has not been separated into two categories – accident data collected from intersections, and accident data collected within specified 'midblocks' between intersections as is typically done. For the purposes of this study, accident data at intersections and mid-blocks are displayed together.

The following accident data was obtained from VicRoads Crashstats from 2003 to 2007:

3 Existing Conditions

Table 3-1 Accident Data

Location	Type	Serious Injury	Other Injury	Type of incident
At Woolsthorpe-Heywood Road & Hamilton-Port Fairy Road	Intersection	1		right against
On Woolsthrope-Heywood Road btw Macknights Road & Dunmore Lane	Mid-block	1		hit fence wall
On Woolsthrope-Heywood Road btw Old Dunmore Road & Tarrone North Road	Mid-block	1	1	lost control
On Woolsthorpe-Heywood Road btw Hauslers Road & Red Lane	Mid-block		1	lost control
On Faulkner Road btw Toolong West Road & Hamilton-Port Fairy Road	Mid-block		1	lost control
On Faulkner North Road btw Tarrone North Road & Gapes Road	Mid-block	1		lost control
On Tarrone Lane btw Tarrone Lane & Tarrone Lane	Mid-block	1		lost control
At Henty Highway and Garden Street	Intersection		1	lost control
At Henty Highway and Princes Highway	Mid-block	1	12	lost control
On Henty Highway between Cahmore Road and Lowe Street	Mid-block	1	2	lost control
At Henty Highway and Wyatt Street	Intersection	1		lost control
At Henty Highway and Unnamed	Intersection	1	4	lost control
On Henty Highway between Westlakes Road and Princes Highway West	Mid-block	1	1	lost control
On Henty Highway between Atlantis Avenue and Westlakes Road	Mid-block	1		lost control
On Princes Highway West between Caledonian Hill Road and Keillers Beach Road	Mid-block	1		lost control
On Princes Highway West between Hollis Road and Caravan Park Road	Mid-block		5	lost control
At Princes Highway West and Caledonian Hill Road	Intersection	2		lost control
On Ettrick-Tyrendarra Road between Settlers Road and Woolsthorpe Heywood Road	Mid-block	1		lost control
At Ettrick-Tyrendarra Road and Mibus Road	Intersection	1		lost control
On Ettrick-Tyrendarra Raod between Mibus Road and Princes Highway West	Mid-block		1	lost control

From the table above, it can be seen that in the last 6 years, a total of 45 accidents have been recorded. It should be noted that VicRoads Crashstats covers accidents occurring on arterial roads and as such, accidents on the following local roads are not available: Riordans Road, Tarrone North Road, Willatook-Warrong Road, and Poyntons Road. In discussion with Moyne Shire Council, URS were advised that accidents on these roads are very limited with no trends or danger zones identified.

There is a narrow bridge on Tarrone Lane just east of Tarrone North Road that may potentially be a concern due to its width. This bridge should be avoided in determining transport routes to the site.

Further, the table shows that most of the recorded incidents have taken place on the Henty Highway/Princes Highway. Given that this arterial road will be trafficked by commercial vehicles during construction, it is critical that the road meets required standards and any recommended upgrades should be strongly considered.

4

Traffic Volumes

This section provides existing traffic volumes and forecasts of future traffic volumes during the construction and operational phases of the proposed development.

4.1 Existing Traffic Volumes

Annual Average Daily Traffic (AADT) is a simple measure of transport demand obtained by counting the number of axles passing a given point on the road. AADT was obtained from VicRoads (refer Table 4-1) for midblocks on the arterial roads surrounding the subject site and is for two way traffic. Such information is not available for the local roads in the area, however, an estimate of volumes for these roads was undertaken using results of the traffic intersection surveys outlined below.

Signalised intersection plans, were provided by Moyne Shire Council and were incorporated into the traffic impact assessment.

Table 4-1 2008 Annual Average Daily Traffic Volumes

Road	Cars	Commercial Vehicles	Total Vehicles	% Commercial Vehicles
From Portland				
Henty Highway/Princes Highway between Madeira Packet Road and Tyrendarra Ettrick Road	2800	300	**3100**	9.7%
Tyrendarra Ettrick Road between Princes Highway and Woolsthorpe Heywood Road	520	160	**680**	24.0%
Woolshorpe Heywood Road between Tyrendarra Ettrick Road and Hamilton Port Fairy Road	200	30	**230**	13.0%
Princes Highway North between Portland and Heywood	2610	390	**3000**	13%
Woolsthorpe Heywood Road (Ettrick Road) between Tyrendarra Ettrick Road and Princes Highway	525	175	**700**	25%
From Geelong				
Woolsthorpe Heywood Road between Warrnambool Caramut Road and Penshurst Warrnambool Road	400	44	**444**	9.9%
Woolsthorpe Heywood Road between Penshurst Warrnambool Road and Hamilton Port Fairy Road	200	30	**230**	13.0%
Penshurst Warrnambool Road	900	81	**981**	8.3%
Warrnambool Caramut Road	700	50	**750**	6.7%
Hamilton Highway between Cressy and Mortlake	1400	150	**1550**	9.7%
Hamilton Highway between Mortlake and Penshurst	800	80	**880**	9.1%

Surveys were conducted by URS on 13th January 2008, to determine turning movement characteristics and vehicle classification at critical intersections. These surveys recorded data between the hours of 8:00am and 9:30am. Surveys were conducted at the following locations:

- Woolsthorpe Heywood Road / Penshurst Warrnambool Road (8:00am – 8.50am); and
- Penshurst Warrnambool Road / Tarrone Lane (9:00am – 9.30am).

4 Traffic Volumes

Further surveys were conducted on 12th August 2009. These surveys recorded data between the hours of 8:00am and 9:40am. Surveys were conducted at the following locations:

- Woolsthorpe Heywood Road / Hamilton Port Fairy Road; and
- Princes Highway / Tyrendarra Ettrick Road

Peak times are typically derived from traffic volume data but due to the lack of data available, the surveys were conducted during AM peak hours as defined by Moyne Shire council to be between 8:00am and 10:00am.

Summaries of the surveys are available from URS on request.
From the surveys, the peak hourly volumes were extrapolated to obtain estimates of AADT volumes for the eastern section of Tarrone Lane. This is shown in Table 4-2.

Table 4-2 2008 Estimated AADT Volumes Based on Survey Results

Road	Cars	Commercial Vehicles	Total Vehicles	% Commercial Vehicles
Tarrone Lane (eastern section)	20	180	**200**	90%

The large percentage of commercial vehicles observed on Tarrone Lane is due to the quarry located on the eastern section of the road.

4.2 Traffic Generation from Proposed Development

The number of vehicles generated by the construction of the power plant, pipeline and associated works is based on previous projects similar in size and output capacity.

At this stage of planning, limited information is available in order to determine the generated traffic and therefore a 10% contingency has been added to previous projects.

Information on the size and number of over dimension vehicles required to transport components of the turbines has not been confirmed.

4.2.1 Construction

Traffic generated by the construction of the facility is based on the worst case scenario that 4 turbines are built in a single stage.

Due to the poor condition of the local roads surrounding the site, additional traffic has been allowed for additional road upgrades.

No information regarding employee housing locations or transport methods have been provided and therefore the worst case scenario has been analysed in which all employees travel to and from site in single occupancy cars.

A summary of predicted construction related traffic is provided in Table 4-3. Vehicles are classified as cars or Commercial Vehicles (CV). Over dimension vehicles are not included in this table.

Table 4-3 Predicted Construction Traffic Generation

Stage	Duration	Vehicles Per Month		Vehicles Per Week		Vehicles Per Day	
		CARS	**CV**	**CARS**	**CV**	**CARS**	**CV**
Average	24 months	4650	1160	1165	290	215	55
Peak	6 months	9295	2325	2325	580	425	105

As the specific duration and start/finish times of construction shifts have not been determined, it is assumed that that all movements will take place during the peak periods for the region. This will produce a very conservative worst case scenario in the event that shifts commence 7:00-8:00am and conclude 4:00-5:00pm and that all personnel, material and equipment deliveries will occur in those periods.

4.2.2 Operation

The ongoing operation of the power station will generate significantly less traffic than the construction phase of the project. The primary traffic generated by the operational phase will be cars from employee commuting. The increase in traffic from the daily operation of the power station is accounted for in the general growth in traffic for the region. The increase from scheduled maintenance requirements will be significantly less that that generated by the construction phase.

For this reason, operational traffic is not analysed in depth and is considered to have a negligible effect when compared to construction traffic.

4.3 Traffic Distribution

For impact assessment, it is assumed that all generated traffic will use the existing road network and that all materials and equipment will be transported to site via Portland. A route from Geelong is also discussed. A number of options have been identified for local access into the site as described below. Round trips are assumed to use the same route in reverse.

All routes are assumed to be for B-double trucks, as cars able to be accommodated on any route accessible to B-doubles. Over dimension vehicles are not considered here and are detailed in Section 8.2.

4.4 Future Traffic Volumes

4.4.1 Background Volume

In order to determine the future background traffic volumes (expected volumes on the road network without the proposed development), the current volumes are projected forward using historical growth rates in traffic provided by VicRoads. VicRoads estimated a 0.5% growth per annum for Woolsthorpe-Heywood Road and 1% for the Hamilton Highway. As such, these growth percentages have been adopted for the aforementioned roads and 0.5% growth has been assumed for remaining local roads as they have similar usage patterns to Woolsthorpe-Heywood Road. A 1% annual growth has been assumed for the Henty Highway / Princes Highway in line with the Hamilton Highway.

The traffic volumes have been projected from 2008 to 2014 and are presented at two year intervals in Table 4-4 below. It is anticipated that this forecast includes additional traffic generated by the mix of proposed developments outlined in Section 2.2.

4 Traffic Volumes

Table 4-4 Predicted AADT Volumes 2008-2014

Road	2008		2010		2012		2014	
	Total	%CV	Total	%CV	Total	%CV	Total	%CV
From Portland								
Henty Highway/Princes Highway between Madeira Packet Road and Tyrendarra Ettrick Road	3100	11%	3162	11%	3226	11%	3291	11%
Tyrendarra Ettrick Road beween Princes Highway and Woolsthorpe Heywood Road	680	31%	687	31%	694	31%	701	31%
Woolshorpe Heywood Road between Trendarra Ettrick Road and Hamilton Port Fairy Road	230	15%	232	15%	235	15%	237	15%
Princes Highway North between Portland and Heywood	3000	15%	3060	15%	3122	15%	3185	15%
Woolsthorpe Heywood Road (Ettrick Road) between Tyrendarra Ettrick Road and Princes Highway	700	33%	707	33%	714	33%	721	33%
From Geelong								
Woolsthorpe Heywood Road between Warrnabool Caramut Road and Penshurst Warrnambool Road	444	11%	448	11%	453	11%	457	11%
Woolsthorpe Heywood Road between Penshurst Warrnambool Road and Hamilton Port Fairy Road	230	15%	232	15%	235	15%	237	15%
Penshurst Warrnambool Road	981	9%	991	9%	1001	9%	1011	9%
Hamilton Highway between Cressy and Mortlake	1550	11%	1581	11%	1613	11%	1645	11%
Hamilton Highway between Mortlake and Penhurst	880	10%	898	10%	916	10%	934	10%
Warrnambool Caramut Road	750	7%	758	7%	765	7%	773	7%
Tarrone Lane (eastern section)	200	11%	202	11%	204	11%	206	11%

4.4.2 Generated Volume

The future generated traffic volumes were outlined in section 4.2.1. For the purposes of worst case scenario analysis, the daily peak volumes will be used to assess the impact on the road network. Therefore, the total number of vehicles per day generated by the construction of the power plant will be 535 vehicles, with 20% commercial vehicles.

Note that the daily peak volume refers to the daily volume at maximum traffic generation.

4.4.3 Total Volume

The total volume of traffic in the network at the time of construction is then determined by adding the future background traffic volume and the generated volume for the construction of the power plant. For the worst case scenario, future background traffic volumes have been used for the year 2014. Table 4-5 below outlines the total volume of traffic during the construction period.

Table 4-5 Total Volume of Traffic during the Construction Period

Road	2014 Volume		Construction Traffic		Total Traffic Volume	
	Total	*Total*	*Total*	*%HV*	*Total*	*%HV*
From Portland						
Henty Highway/Princes Highway between Madeira Packet Road and Tyrendarra Ettrick Road	3291	9.68%	535	20%	3826	11%
Tyrendarra Ettrick Road beween Princes Highway and Woolsthorpe Heywood Road	701	23.53%	535	20%	1236	22%
Woolshorpe Heywood Road between Trendarra Ettrick Road and Hamilton Port Fairy Road	237	13.04%	535	20%	772	18%
Princes Highway North between Portland and Heywood	3000	92.35%	535	20%	3535	81%
Woolsthorpe Heywood Road (Ettrick Road) between Tyrendarra Ettrick Road and Princes Highway	700	59.14%	535	20%	1235	42%
From Geelong						
Woolsthorpe Heywood Rd b/w Warrnabool Caramut Rd and Penshurst Warrnambool Rd	457	9.90%	535	20%	992	15%
Woolsthorpe Heywood Rd b/w Penshurst Warrnambool Rd and Hamilton Port Fairy Rd	237	13.00%	535	20%	772	18%
Penshurst Warrnambool Rd	1010	8.30%	535	20%	1545	12%
Hamilton Hwy b/w Cressy and Mortlake	1645	9.70%	535	20%	2180	12%
Hamilton Hwy b/w Mortlake and Penhurst	934	9.10%	535	20%	1469	13%
Warrnambool Caramut Rd	773	6.70%	535	20%	1308	12%
Tarrone Lane (eastern section)	206	90%	535	20%	741	39%

5

Traffic Distribution

This section outlines potential routes for the transportation of equipment, materials and personnel to and from the nominated site.

On advice from AGL it is assumed that all equipment and materials will be transported via Portland. However, an option for transportation from Geelong to Site has also been included.

URS is aware that a route survey report has been provided to AGL for transporting oversized cargo to the local area by BLIS Equipment Hire Pty Ltd. This report has been read by URS, with roads highlighted by the report included in this investigation, however no comment is made on the accuracy of the BLIS report.

5.1 Route Options

Portland to Site

Following discussions with Glenelg Shire Council and VicRoads and by conducting a survey of the relevant roads, the following potential routes to the reach the site from Portland have been identified:

a) Traffic will travel north east along the Henty Highway to Tyrendarra. The route then turns left onto Tyrendarra Ettrick Road to the intersection with Woolsthorpe- Heywood Road where traffic will turn right and head to Tarrone North Road.
b) Traffic will travel north east along the Henty Highway past Tyrendarra East where it will intersect with Portland Road taking it North to Bessiebelle. The route then turns right onto Woolsthorpe-Heywood Road heading to Tarrone North Road.
c) Traffic will travel north along the Princes Highway from Portland to Heywood, the turn right at the Ettrick Road and continue east along Woolsthorpe Heywood Road to Tarrone North Road.

Once at Tarrone North Road, the traffic will turn right to approach the site from the north

Geelong to Site

In discussion with Moyne Shire Council and conducting a survey of the relevant roads, the following appropriate routes to the reach the site from Geelong have been identified:

a) Traffic will travel west along the Hamilton Highway to Penshurst via Mortlake. The route then turns left onto Penshurst-Warrnambool Road to the intersection with Woolsthorpe-Heywood Road.
b) Traffic will travel west along the Hamilton Highway to Caramut via Mortlake. The route then turns left onto Warrnambool-Caramut Road, to the intersection with Woolsthorpe-Heywood Road and travels west towards the site.

Once at the intersection of Woolsthorpe-Heywood Road and Penshurst-Warrnambool Road, there are two options to access the site;

1. Northern Approach: Traffic travels west along Woolsthorpe-Heywood Road to the intersection with Tarrone North Road, and then turns left at Tarrone North Road to approach the site from the north.
2. Southern Approach: Traffic travels south along Penshurst-Warrnambool to the intersection with Tarrone Lane, then turns right into Tarrone Lane and travels west to the intersection with Tarrone North Road. From this intersection, traffic turns right into Tarrone North Road and approaches the site from the south.

Quarry to Site

For this report, it is assumed that the quarry in closest proximity to the site will be used. Cemex Quarry mines crushed bluestone and it is located off Tarrone Lane approximately 2.5km East of Tarrone North Road. While the presence of the quarry at such close proximity to the site may be ideal for obtaining bluestone during construction, it is important to consider any relevant traffic implications.

Two options are available to transport materials from the quarry to the site. They follow the similar routes as options 1 and 2 detailed above.

1. Northern Approach: Traffic turns right out of the quarry and travels east along Tarrone Lane to the intersection with Penshurst-Warrnambool Road, then turns left and follows this road to the intersection with Woolsthorpe-Heywood Road. From here the route follows the same path as route 1 described above.
2. Southern Approach: Traffic turns left out of the quarry and travels west on Tarrone Lane to the intersection with Tarrone North Road. From here the route follows the same path as route 2 described above.

Direct Site Access

It has been proposed that direct access to the site which is located on the corner of Riordans Road and Landers Lane is direct access from Tarrone North Road to the east. The other option is for the traffic will to drive approximately two kilometres on Riordans Road between Tarrone North Road and then possibly into Landers Lane in order to access the site. However the latter is not a preferred option due to the poor condition of Riordans Road (refer Section 3.1.2)

Workforce

No specific route has been identified for employees to commute to the site, as no accommodation location has been nominated.

5.2 Route Selection

A number of factors will influence the decision of which roads to utilise to access the site. Major considerations should include;

- Road assessment, monitoring, maintenance and upgrade requirements
- Travel time and distance
- Road safety
- Council and VicRoads approval requirements

Construction (Portland to Site)

If approaching from Portland, option a) via Tyrendarra-Ettrick Road and Woolsthorpe-Heywood Road is considered the most appropriate option for access for standard dimension commercial and non-commercial vehicles. It is recommended that a swept path survey is completed at the intersection of Woolsthorpe-Heywood Road and Tarrone North Road to determine any required upgrades.

Option b) is not considered appropriate after a survey of Portland-Woolsthorpe Road, as in its current condition, the road is not suitable for use as a thoroughfare for standard dimension commercial vehicles.

The option to travel along the Princes Highway North (option c) was considered however deemed a less desirable route by Council and VicRoads since it would bring the construction vehicles through the township of Heywood and through a signalised intersection at that location which is unnecessary, especially considering there is little gain with that route given that traffic volumes are lower on Henty Highway / Princes Highway east. A further reason to avoid Princes Highway North is that it is a popular route for forestry freight travelling between Portland and northern townships such as Hamilton and Myamyn.

Construction (Geelong to Site)

If approaching from Geelong, both options d) and e) are viable routes for access to the local area. It is recommended that swept path surveys are completed at intersections along both routes to assist in determining the most efficient route.

For direct access to the site once in the local area, as shown in table 5-1, it can be seen that although options 2 provides a more direct route, it requires potentially more upgrades than option 1 for local road access. If minimising required works is a main priority, option 1 (north approach) is recommended to access the site. However, if the most direct route to the site is required to minimise travel times, option 2 would be the shorter route.

Construction (Quarry to Site)

As shown in Table 5-1, it can be seen that although a more direct route from the quarry, option 2 requires potentially more upgrades than option 1 for local road access. If minimising required works is a main priority, option 1 (north approach) is recommended to access the site. However, if the most direct route to the site is required to minimise travel times from the quarry to site, option 2 would be the shorter route.

5.3 Works Required

From the road assessment site visits, and discussions with the Moyne Shire and Glenelg councils, recommendations for the monitoring, assessment and potential upgrade of roads required for the development of the Tarrone Power Station are outlined in Table 5-1 below.

Note that the recommendations are only relevant for standard dimension vehicle use.

Table 5-1 Summary of Potential Works Required

Issue		Assessment	Monitoring	Works
Poyntons Road				
1	The road surface is formed but unsealed.		Road condition should be monitored during use.	Maintenance work may be required during use. Water for dust suppression will be required.
2	The intersection of Poyntons Road and Coomete Road has tight turning radius and poor grade alignment.	Swept path movement and grade assessment may be required.		Improvements to swept path and grade may be required after assessment.

5 Traffic Distribution

	Issue	Assessment	Monitoring	Works
Willatook-Warrong Road				
3	The intersection at Willatook-Warrong Road and Woolsthorpe-Heywood Road may be used by trucks during construction of the proposed pipeline. Turning radius may be too small.	Swept path movement assessment may be required.		Localised widening may be required for swept path movement/
4	Poor road surface condition near Willatook. Current condition is suitable only for cars, not trucks.	Assess road surface condition in sections selected as truck routes.	Road condition should be monitored during use	Road surface repair or upgrade may be required if route is selected for truck use
Woolsthorpe-Heywood Road				
6	The intersection with Penshurst-Warrnambool Road is in good condition; however medians may interfere with swept path movements for commercial vehicles.	Swept path movement assessment may be required		Minor median works may be required if swept paths can not be accommodated in existing condition.
7	The seal on the left turn from Woolsthorpe-Heywood westbound into Tarrone Lane is in poor condition and unsuitable for trucks.	Swept path movement assessment is required		Widening and strengthening of the turning movement.
Tarrone Lane				
8	Horizontal alignment to west of quarry is unsuitable for heavy use by trucks.	Survey road alignment if road is identified for truck use.		
9	Poor road condition on crest near intersection with Tarrone North Road	Assess road surface condition in sections selected as truck routes		Road surface repair or upgrade may be required if route is selected for truck use
Riordans Road				
10	Intersection with Tarrone North Road is in poor condition and not suitable for truck use	Swept path movement and road condition assessment is required		Widening and strengthening of the turning movement
11	Road is unsuitable for use to access site. Current grade lines are extreme and road surface is loose gravel.	Assess road surface condition. Survey of grade and alignment required.	Road condition should be monitored during use.	Cut and fill to smooth grade line. Reform carriageway and realign. Water for dust suppression will be required
Tarrone North Road				
12	Road is a single carriageway with limited shoulders. Heavy truck usage may require wider shoulders for passing.	Road condition assessment.	Road condition should be monitored during use.	May require localised widening
13	Native vegetation and trees exists on shoulders which may affect widening and height restrictions.	Road condition assessment.		Native vegetation removal permits may be required to clear and widen shoulders.

5 Traffic Distribution

	Issue	Assessment	Monitoring	Works
Tyrendarra-Ettrick Road				
14	Intersection with Woolsthorpe Heywood Road – turning path is too narrow for OD vehicles	Swept path movement and road condition assessment is required		Widening and strengthening of the turning movement may be required

General Comments

- Three routes were identified if arriving from Portland (refer section 5.1) however it is recommended that only the first option (travel north east along the Henty Highway to Tyrendarra then left onto Tyrendarra Ettrick Road to the intersection with Woolsthorpe- Heywood Road) is considered. This is in order to avoid bringing construction vehicles into a township, to avoid a Highway already trafficked by freight and to avoid using poor quality roads.
- Two routes have been identified if arriving from Geelong (refer section 5.1), to reach the junction of Woolsthorpe-Heywood Road and Penshurst Warrnambool Road, one option is to go via Penshurst and the other via Caramut. It is recommended that swept path surveys are completed at major intersections along both routes to assist in determining the most efficient route.
- Tarrone Lane: The option to approach the site from the south (passing the quarry on Tarrone Lane) is deemed unsuitable as the limited amount of quarry material required for construction does not justify negotiating the unsafe curves, crests and poorly aligned narrow bridge in Tarrone Lane.
- Tarrone Lane: Cars should be discouraged from using Tarrone Lane to access the site when approaching from the south due to safety concerns. Instead they should follow the same route taken by the commercial vehicles whereby they are to travel up Penshurst-Warrnambool Road turning left onto Woolsthorpe-Heywood Road then left again onto Tarrone North Road.
- The intersection of Warrnambool-Caramut Road and Woolsthorpe-Heywood Road has been designed for large trucks and therefore is acceptable for standard commercial vehicles.
- Once at the intersection of Woolsthorpe-Heywood Road and Penshurst-Warrnambool Road, there is the option to either access the site from the North or the South. Although a more direct route from the quarry, Southern access requires potentially more upgrades than Northern access for local road access (refer table 4-4). If minimising required works is a main priority, the Northern approach is highly recommended to access the site. However, if the most direct route to the site is required to minimise travel times from the quarry, the Southern option would be the shorter route.
  - Recommended upgrades:
    - Either Approach: Tarrone North Road widening of approximately 6km length of road
    - Southern Approach: Intersection of Tarrone North Road with Tarrone Lane
    - Southern Approach: Western section of Tarrone Lane from the quarry to Tarrone north Road (approximately 10km of road)
    - Southern Approach: Narrow bridge on Tarrone Lane east of Tarrone North Road requires widening, realignment and potential strengthening for use by commercial vehicles

Either Approach: Is site access if not possible from Tarrone North Road, Riordans Road and Landers Lane will require a full upgrade for access by commercial vehicles (approximately 2km length).

6

Road Network Performance

6.1 Analysis Method

In this section of the report, all roads have been assessed with the intention of transporting equipment and materials to the site by B-Double trucks. Over dimensional vehicles are assessed in Section 8.2.

The road network performance has been assessed using the total daily traffic volumes, rather than peak hour volumes as this was only the information available. Traffic volumes were assessed against Austroads guidelines for Level of Service (LoS) performance.

Level of Service is an index of the operational performance of traffic on a given traffic lane, carriageway, road or intersection, based on service measures such as speed, travel time, delay and degree of saturation during a given flow period.

In general, there are six levels of service, designated from A to F, with LoS A representing free flowing traffic with no delays and LoS F being congested traffic with no flow and major delays. A level of service up to LoS C is generally considered acceptable in road design.

6.2 Existing Performance

Classifying the existing roads under analysis as 'Rolling Terrain' (as opposed to Level or Mountainous), the Level of Service (LoS) falls under category 'A' for all roads except the Henty Highway / Princes Highway, as described in Austroads guidelines (NAASRA 1988) with the existing level of traffic volume. The Henty Highway / Princes Highway falls under LoS category 'B'.

Level of Service A is defined as a condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.

Level of Service B is defined to as the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream, although the general level of comfort and convenience is a little less than with Level of Service A.

In general traffic engineering practice, the Level of Service of a road is desired to be 'D' or below and hence existing operating conditions on the road network are acceptable.

6.3 Future Performance Excluding Construction Traffic

Table 6-1 below shows the operational level of service will remain LoS 'A' for the future predicted background traffic volumes with the exception of the Henty Highway / Princes Highway which will fall under LoS 'B'.

Table 6-1 Level of Service for Projected Daily Two Way Traffic Volumes

Road	2008	2010	2012	2014
	Total	*Total*	*Total*	*Total*
From Portland				
Henty Highway/Princes Highway between Madeira Packet Road and Tyrendarra Ettrick Road	3100*	3131*	3162*	3194*
Tyrendarra Ettrick Road between Princes Highway and Woolsthorpe Heywood Road	680	687	694	701
Woolsthorpe Heywood Road between Tyrendarra Ettrick Road and Hamilton Port Fairy Road	230	232	235	237

6 Road Network Performance

Road	2008	2010	2012	2014
	Total	*Total*	*Total*	*Total*
From Geelong				
Woolsthorpe Heywood Road between Warrnambool Caramut Road and Penshurst Warrnambool Road	444	448	453	457
Woolsthorpe Heywood Road between Penshurst Warrnambool Road and Hamilton Port Fairy Road	230	232	235	237
Penshurst Warrnambool Road	981	991	1001	1010
Hamilton Highway between Cressy and Mortlake	1550	1581	1613	1645
Hamilton Highway between Mortlake and Penshurst	880	898	915	934
Warrnambool Caramut Road	750	758	765	773
Tarrone Lane	200	202	204	206
Midblock Level of Service (LoS) A/B Threshold	**3000**	**3000**	**3000**	**3000**
Midblock Level of Service (LoS) B/C Threshold	**6000**	**6000**	**6000**	**6000**
Midblock Level of Service (LoS)	**A**	**A**	**A**	**A**

*LoS ‘B’

In general traffic engineering practice, the Level of Service of a road is desired to be ‘D’ or below and hence future operating conditions on the road network excluding construction traffic are acceptable.

6.4 Future Performance Including Generated Traffic

6.4.1 Construction

During construction of the power plant, trucks will be transporting materials to the site. It has been estimated that the works will generate 535 vehicles per day with 20% of these being commercial vehicles.

Future performance of the road network has been assessed by adding the generated construction traffic to the future estimated background traffic. As no specific routes have been selected, this generated traffic has been added to all roads under consideration.

Table 6-2 below shows the Level of Service will remain LoS ‘A’ once construction traffic is included and hence the road network will not be negatively impacted by the inclusion of the generated construction traffic.

Table 6-2 Level of Service incorporating Daily Two Way Construction Traffic Volumes

Road	2014 Traffic Volume	Construction Traffic	Total Traffic Volume
From Portland			
Henty Highway/Princes Highway between Madeira Packet Road and Tyrendarra Ettrick Road	3194*	535*	3826#
Tyrendarra Ettrick Road between Princes Highway and Woolsthorpe Heywood Road	701	535	1236
Woolsthorpe Heywood Road between Tyrendarra Ettrick Road and Hamilton Port Fairy Road	237	535	772

6 Road Network Performance

Road	2014 Traffic Volume	Construction Traffic	Total Traffic Volume
From Geelong			
Woolsthorpe Heywood Road between Warrnambool Caramut Road and Penshurst Warrnambool Road	457	535	992
Woolsthorpe Heywood Road between Penshurst Warrnambool Road and Hamilton Port Fairy Road	237	535	772
Penshurst Warrnambool Road	1010	535	1545
Hamilton Highway between Cressy and Mortlake	1645	535	2180
Hamilton Highway between Mortlake and Penshurst	934	535	1469
Warrnambool Caramut Road	773	535	1308
Tarrone Lane	206	535	741
Midblock Level of Service (LoS) A/B Threshold	**3000**	**3000**	**3000**
Midblock Level of Service (LoS) B/C Threshold	**6000**	**6000**	**6000**
Midblock Level of Service (LoS)	**A**	**A**	**A**

*LoS 'B' # LoS 'C'

Level of service 'C' is defined as the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.

It should be noted however that the figures in the table above are achieved by adopting the worst case construction traffic volumes (year 2014) and that Level of Service 'C' is an acceptable operating condition.

6.4.2 Practical Absorption Capacity

The practical absorption capacity at the intersection of Penshurst-Warrnambool Road with Woolsthorpe Heywood Road was assessed adopting the 2014 traffic volumes, including the generated construction traffic (1545 vehicles/day).

Absorption capacity is defined as the number of vehicles per hour in a minor stream of traffic that can enter a major stream of traffic. The minor stream in this case being Woolsthorpe Heywood Road and the priority / major stream the north-south Penshurst Warrnambool Road.

The absorption capacity analysis was undertaken for through traffic travelling from the East representative of 'route b)' defined in Section 4.3.1 which travels south from Caramut along Warrnambool Caramut Road to the intersection at Woolsthorpe before turning right towards the intersection with Penshurst-Warrnambool Road. This is considered to be critical over 'route a)' which approaches the intersection from the North (travelling south along Penshurst-Warrnambool Road from Penshurst) since with the latter route, the traffic is already on the priority road hence has less traffic to negotiate in turning right onto the minor road.

6 Road Network Performance

The 1545 vehicles (refer Table 4-6) were proportioned into left traffic and right traffic based upon the ratios obtained from the turning movement survey. An absorption capacity of approximately 300 vehicles/hour was achieved for the through movement from the Eastern leg of the minor road crossing the major road and heading into the Western leg of the minor road towards the site. Given that the projected traffic expected on the Eastern leg of Woolsthorpe Heywood road is 457 vehicles/day (refer table 4-6 above) which, assuming a 10 hour day, translates to 45 vehicles per hour, the predicted traffic is within the capacity of the road.

6.4.3 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. Minor maintenance is expected to take place every six to seven years and would require up to ten contractors for five days each time. Major maintenance is expected to require up to 50 personnel for 2 months, every 2 to 3 years, which may generate up to 100 car trips per day. These trips are significantly less than the traffic generated during the construction period.

Therefore, the operational traffic generated by the Power Project is considered to have a negligible effect when compared to construction traffic and given that level of service will generally remain LoS ‘A’ during construction, operational traffic is not considered to reduce the level of service.

7

Site Arrangements

7.1 Access

The exact configuration for site access to the site is yet been finalised. There are currently two access points to the area under the proposed site layout, with direct access from Tarrone North Road being the preferred option. These options are outlined below.

Direct Access from Tarrone North Road through Private Property

- A corridor exists on the site property which will allow traffic to enter the site from Tarrone North Road and is approximately 2km in length. This corridor should be assessed for its ability to safely accommodate two-way traffic consisting of standard commercial vehicles, standard light vehicles as well as one-way flow for over dimension vehicles. This would require a width of approximately 7 meters, depending on over dimension vehicle requirements.
- A swept path assessment will also be required to ensure the intersection of the access road and Tarrone North Road is large enough to accommodate both standard commercial vehicles and any over dimension vehicles.
- Use of this corridor as the only access point will avoid the need to upgrade Riordans Road.

Access from Riordans Road and Landers Lane

Site access from Riordans Road and Landers Lane will require traffic to drive approximately two kilometres on Riordans Road to the west of Tarrone North Road and then into Landers Lane in order to access the site, according to the current proposed site layout.

Both Riordans Road and Landers Lane are currently unsuitable for use by standard commercial vehicles and over dimension vehicles and will require upgrades, including widening into vegetation. Approvals would need to be sought for this work.

A swept path assessment would also be required at both intersections for commercial and over dimension vehicles.

Increased light vehicle (cars) volumes on these roads will result in dangerous traffic conditions, due to the horizontal and vertical alignment and the single lane width of the carriageways. If this route is to be used for car access, upgrades such as re-grading and widening will be required to meet safety standards.

7.2 Circulation

The final internal road layout for the construction phase should take into consideration that a large number of truck and car movements will occur within the site. A continuous circulating internal road layout should be employed in order to reduce the likelihood of heavy vehicles being required to perform hazardous reversing or turning movements. Examples of continuous circulation may be by providing a one-way direction at all times or in allowing ample space for large vehicles to safely perform a u-turn movement (without the need to do three-point turns).

Trucks will generally be performing through movements within the site whereby they will be delivering or picking up certain materials and continuing on to their destination. Cars, on the other hand, will mainly be used for personal travel and will be situated at the site for extended durations. Such a mix of vehicles increases the safety risk of circulating traffic within the site. It is therefore suggested that truck through movements be separated from car movements to reduce the possibility for conflict

occurring. Once cars have parked within the site, they will generate pedestrians. The safety and circulation of pedestrians within the development must also be taken into consideration and, where possible, conflict points should be avoided or appropriately managed (i.e. adequate visibility at pedestrian crossing locations).

The proposed site layout has adequate area to accommodate circulation movements, although temporary construction works, access roads and parking facilities should be carefully planned to accommodate traffic requirements and the issues discussed in this section.

7.3 On Site Parking

Car parking within the site should be designed to provide adequate parking for cars and (if required) buses and trucks. It has been calculated that approximately 105 commercial vehicles (trucks) and 425 cars will be generated at the site per day during peak periods.

Articulated trucks have a swept path with a 26 m radius and this should be considered when designing 90 degree parking bays. This need for safe turning areas can be minimised by using 45 degree angle parking bays for large vehicles.

It is assumed that parking provision will be required for only a small proportion of trucks, as the majority will be completing round trips, with loading and unloading occurring on site before moving to their next location. Trucks should be accommodated within an off site depot outside working hours and for maintenance purposes. This will ensure space on site is used efficiently.

Similarly, if it is determined that employees will be transported to site in buses rather than cars, bus parking needs can be minimised by providing a circulation route around specific sites within the LNG facility to drop off and pick up employees. Buses can then be stored at an off site facility until further required. These needs may be filled through the use of a subcontract whereby buses can be provided as needed and then used for other purposes when not required.

Provision will also be needed for some visitor car parking near the main site office.

A general guide for car parking space is 25m^2 per car which allows safe circulation space. Truck and bus parking area can vary according to configurations, but is in the order of 170-250m^2 per vehicle.

During the operation phase, it is assumed that the parking provided during construction can be transformed into light vehicle parking to accommodate employee commuters.

The design of car parking facilities should consider the Australian Standards for Parking Facilities;

- AS 2890.1:2004 Parking facilities Part 1: Off-street car parking
- AS 2890.2:2002 Parking facilities Part 2: Off-street commercial vehicle facilities

8

Additional Considerations

8.1 Stakeholder Consultation

A community stakeholder information day was held on February 29, 2009 at the Willatook Community Hall. It was attended by 27 people. Comments received from the community included concerns over increased traffic, including trucks, on narrow local roads.

8.2 Over-Dimension Vehicles

VicRoads will require permits to be obtained for all over-dimension vehicles (geometric and mass). In order to approve the permits, a detailed logistics plan will need to be developed. Logistics plans will need to be submitted for individual components (i.e. each separate vehicle) as well as the entire program of planned movements.

Permit applications must include, but are not limited to individual axle loads, gross mass and vehicle configuration. For over dimension loads, route selection, potential traffic conflicts and proposed traffic management must also be provided in order to be assessed.

Common issues that may need to be addressed when planning the routes for over-dimension vehicles include;

- Overpasses and bridges will need to assessed for clearance envelopes when exact dimensions of the load and vehicles are known;
- Concrete median islands may need to be removed and rein-stated or modified to allow for width and turning movements of over dimension vehicles;
- Overhanging and encroaching trees and vegetation may need to be removed and permits may be required for this;
- Some overhead transmission lines may require lifting. A detailed route investigation should be conducted along the proposed over-dimension route to determine whether low lying transmission lines pose a hazard;
- Some traffic signals may need to be laid down in order to allow for adequate movement of over-dimension vehicles;
- Rail crossings and bridges may need to be assessed for width and load ratings for over-dimension vehicles;
- Old culverts under roadways will need to be assessed for load ratings;
- Single lane roads may cause an issue for over-dimension vehicles accessing the site; and
- There may be scheduling limitations for transportation of over dimension loads.

It is noted that a number of low clearance bridges exist in Portland, which will need to be assessed in detail if transportation from this port is required. The Moyne Shire council has advised URS that other similar developments have not been able to transport large components from this port due to the height restrictions on some bridges. For example, the Bridgewater Overpass has a clearance height of 5.25 metres at its lowest point, which may not be high enough to transport a 4.8 metre high component when the trailer height is taken into consideration.

A number of roads in the local area have been identified as having narrow widths, for example Tarrone North and Riordans Road. These roads may require widening and strengthening to accommodate over dimension vehicles.

8 Additional Considerations

Additionally, all intersections identified along the preferred over dimension route will need to be assessed for swept path movements when specific vehicle sizes are known. If it is determined that the intersection is not large enough to accommodate the vehicle, upgrade works will be required.

Consideration will also need to be given to the facilities available at the selected Port for the unloading over dimension components, such as craneage and berthing facilities.

In general, planning for over-dimension vehicles will require a number of parties to be involved and therefore careful planning is needed. The submitted plans and documents for over-dimension vehicle movements will need to be submitted to VicRoads several months prior to allow for advanced warning and adequate time for planning.

9

Summary

9.1 Transport Summary

- There is an extensive regional and local road network surrounding the site.
- 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); and
- There is limited road access to the pipeline corridor investigation areas, and the access that exists is by unsealed roads that may need to be maintained and dust control measures implemented, if utilised.
- Detailed assessment will be required for the road conditions and suitability of roads and associated structures when a preferred transport route is selected.
- Further assessment will be required to assess the road conditions and suitability for over dimension vehicles in the vicinity of the site.
- The additional traffic to the road network caused by this development will not cause significant performance issues for the arterial and local road network, subject to recommended upgrades and management measures.
- Subject to management measures identified in this report, there is no traffic engineering reason for the development to not proceed.

10

Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of AGL Energy Limited and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 12 September 2008.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between September 2008 and October 2009 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

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