



LILYDALE PIPELINE PROJECT

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN FOR LILYDALE PIPELINE

JULY 2011

**DOCUMENTATION CONTROL
MONARC ENVIRONMENTAL**

REPORT TITLE: Construction Environmental Management Plan for Lilydale Pipeline
VOLUME: 1 of 1
AUTHOR: Monarc Environmental Pty Ltd
CLIENT: Jemena Asset Management Pty Ltd
VERSION NUMBER: 4

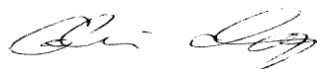
DISTRIBUTION

COPY NO.	VERSION NO.	HOLDER	DATE
1 (Master)	4	Monarc Environmental Pty Ltd	22 July 2011
2	4	Jemena Asset Management Pty Ltd	22 July 2011
3	4	Department of Primary Industries	22 July 2011

REVISION HISTORY

COPY NO.	VERSION NO.	HOLDER	DATE
1 (Master)	DRAFT	Monarc Environmental Pty Ltd	7 September 2010
2	DRAFT	Jemena Asset Management Pty Ltd	7 September 2010
	1	Monarc Environmental Pty Ltd	26 November 2010
	1	Jemena Asset Management Pty Ltd	26 November 2010
	2	Monarc Environmental Pty Ltd	14 June 2011
	2	Jemena Asset Management Pty Ltd	14 June 2011
	2	Department of Primary Industries	14 June 2011
	3	Monarc Environmental Pty Ltd	14 July 2011
	3	Jemena Asset Management Pty Ltd	14 July 2011
	3	Department of Primary Industries	14 July 2011

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1. INTRODUCTION

Jemena Asset Management (6) Pty Ltd ('Jemena') on behalf of the proponents of the project being Multinet Gas Distribution Partnership comprising Multinet Gas (DB No.1) Pty Limited and Multinet Gas (DB No.2) Pty Limited ('Multinet') is proposing to construct a new transmission pipeline from Yarra Glen to Lilydale. Refer to Figure 1 Site Location.

The Yarra Glen to Lilydale Pipeline commences at the APA Group Pakenham to Wollert 750 mm pipeline adjacent to the Yarra Glen City Gate and proceeds within Glenview Road Reserve to the Yarra River, crossing it into Spadonis Reserve on the southern side. After the Reserve it will run in a southerly direction along Victoria Road on the eastern shoulder, crossing to the western side 100 metres before meeting McIntyre Lane. It keeps to the western side of Victoria Road for 800 m from McIntyre Lane, when it crosses Victoria Road to enter private land on the eastern side of Victoria Road, for approximately 1.6 km. It returns to the western side of Victoria Road after Coldstream West Road for a further 1.7 km. It enters private land on the eastern side of Victoria Road at the proposed Lilydale City Gate location. From the City Gate it will be installed within Victoria Road on the western side, within a service road where available or on the western side of the bitumen to terminate at an existing Multinet Gas, Lilydale Regulator Station on the north side of the Maroondah Highway at its intersection with Victoria Road (Melways ref: 38 A6).

The majority of the proposed alignment is in a Shire of Yarra Ranges road reserve and part of this road reserve contains three fenced areas of remnant Yarra Gums (*Eucalyptus yarraensis*) which are protected by the council. At Spadoni's Reserve are the EPBC listed Buxton Gums (*Eucalyptus crenulata*).

It is a requirement under the *Pipelines Act 2005* for the proponent to prepare a Construction Environmental Management Plan ('CEMP'). The CEMP identifies significant environmental values and associated construction management requirements for the proposed project to avoid or minimize any harm to the environment. Jemena has engaged Monarc Environmental Pty Ltd ('Monarc') to prepare the CEMP.

1.1 Purpose

This CEMP has been prepared under the provisions of the *Pipelines Act 2005*. It summarises the potential environmental impacts of construction of the proposed pipeline and identifies the means by which Jemena intends to avoid or mitigate these impacts.

The key objectives of the CEMP include:

- Ensuring that construction activities are carried out in accordance with appropriate environmental statutory requirements, the conditions of approval for the project, relevant guidelines and existing environmental management systems and procedures of Jemena;
- Ensuring that construction operations are carried out in such a way as to minimise the likelihood of
- Ensuring that the construction operations are carried out in such a way as to manage the environmental impact on surrounding land uses;
- Identifying management responsibilities and reporting requirements to demonstrate compliance with the CEMP.

1.2 Outline of Construction Environmental Management Plan

The CEMP will serve as a working document to be used during the construction operations. The CEMP includes:

- Environmental goals and objectives;
- Conditions of project approvals;
- Lists of actions, timing and responsibilities;
- Identification of the areas of responsibility for environmental management of the project;
- Statutory requirements - licences and subsequent approvals required;
- Training of personnel in environmental awareness;
- Guidelines for emergencies, contact names and corrective actions for non-conformance and notifications to appropriate authorities and affected stakeholders;
- Incident reporting and management;
- Monitoring, auditing and reporting of progress against the environmental objectives.

Specifically, the CEMP will provide environmental management actions in relation to:

- Erosion and sediment control;
- Surface and ground water management;
- Flora and fauna management;
- Weed management;
- Control of air emissions;
- Control of construction traffic movements;
- Control of noise emissions;
- Waste generation and disposal;
- Aboriginal and European cultural heritage.

1.3 How to Use this CEMP

This CEMP describes the environmental management techniques that will be implemented during the construction of the Lilydale to Yarra Glen pipeline. The purpose of the CEMP is to ensure that appropriate environmental protection and impact minimisation techniques are implemented during construction. The CEMP will form part of Jemena's Health, Safety and Environmental Management System ('HSEMS'), which is designed to ensure that information on environmental requirements is provided to personnel in a relevant, accessible and understandable form.

The broad relationships and linkages between the project's environmental management plans and Jemena's HSEMS are diagrammatically represented in Figure 2.

The CEMP will set out the plans, roles, responsibilities, procedures, and specific commitments required to carry out the project in accordance with Jemena's Health, Safety & Environmental Policy and the environmental management objectives listed in Section 1.1.

The HSEMS is implemented at all levels of the business through position descriptions, operational and HSE management processes and procedures. Information, training and awareness are provided to Jemena's employees and contractors to ensure that they are aware of Jemena's commitment and of their responsibility to comply with quality and HSE management requirements and those outlined in this CEMP.

2. PROJECT OVERVIEW

The gas transmission pipeline construction will commence on the northern side of the Yarra River at the intersection of Glenview and Yarraview Roads, Yarra Glen, and terminate at the intersection of the Maroondah Highway and Victoria Road, Lilydale, approximately 10 kilometres in length.

The pipeline is to be installed below the ground surface from the Yarra Glen City Gate on the corner of Yarraview and Glenview Roads, continuing along Glenview Road and the unmade road reserve to the Yarra River. It will be horizontally directional drilled under the Yarra River and continues, within Crown land along Victoria Road on the eastern side, switching to the western side near McIntyre's Lane. It crosses Victoria Road, into private property for approximately 2.7 kilometres on the east side of the road until Coldstream West Road. The pipeline crosses back to the west side of Victoria Road, until entering the CSR property where the pressure will be reduced at the Lilydale City Gate, before proceeding to the pressure regulator at the intersection of Victoria Road and the Maroondah Highway, on the western side of Victoria Road.

The project construction area or Right of Way ('ROW') will consist of a permanent easement of 10m through private lands and up to an extra 13m temporary working width through private properties (with the exception of HDD entry and exit points for the Yarra River crossing - refer Appendix F). For the property known as "Tarcoola on The Yarra" and along Glenview Road, the ROW through these areas is proposed to be 11 metres in width. The ROW along Victoria Road will ensure sufficient space for one-way traffic is maintained.

Key characteristics of the project are summarised in Table 1.

Table 1: Key Characteristics of the Lilydale Pipeline

Project Element	Description
Construction timetable	July - November 2011
Total length of pipeline	10km
Pipeline diameter	300mm
Maximum allowable operating pressure	C1600 section 6890 kPa C1300 section 2760kPa,
Pipe steel grade	API5LX56
External corrosion coating	Factory applied dual layer FBE
Cathodic protection	Impressed current
Minimum depth of cover	1200 mm
Construction right-of-way width	Up to 23m through private property

2.1 Pipeline Construction

The project will be constructed and operated in accordance with the requirements of the Australian Standard 'AS2885: Pipelines - Gas and Liquid Petroleum' and the Australian Pipeline Industry Association's 'Code of Environmental Practice - Onshore Pipelines' 2009 (APIA, 2009).

The route of the proposed pipeline is marked in the Location Map included in APPENDIX A as shown in *Drawing 860-MA-PL-006: Lilydale Pipeline Proposed Route (REV E)*. The pipeline is to be laid below the

ground surface for the entire length of the project area and construction works will generally involve the excavation of a trench of approximately 600mm width, laying of the 300mm diameter piping and backfilling of the trench. The construction ROW will require space for machinery and appropriate temporary placement of stockpiled soil. Boring will be used along some sections of the corridor where minimal disturbance to significant features is required.

Width of the project ROW will vary depending on whether in road reserve, farmland or residential areas. In road reserve, sufficient space for one-way traffic must be maintained.

In farmland the ROW will be up to 23m for most of its length. The width of the construction easement is likely to be increased in a number of locations, such as, but not limited to, bore pit locations. Additional ROW might be obtained on a case by case basis in negotiation with the affected landholders.

The mainline crew, comprising a range of specialist construction personnel, will undertake the majority of the construction activities. Most pipeline construction works are to be carried out during daylight hours with the construction programme to be based on an alternating 5 day and 6 day working week (i.e working six days every second week). Minor segments of the pipeline may be required to be constructed outside of daylight hours in order to maintain road access along Victoria Road.

2.2 Construction Activities

Pipeline construction activities and their associated environmental impacts may involve the following:

1. Access to the ROW and facilities sites: Access to the ROW will be from Victoria and Glenview Roads as the majority of the pipeline construction will be along or parallel to these roads.
2. Establishment of temporary construction support worksites including:
 - Construction depot;
 - Equipment laydown areas;
 - Temporary pipe storage areas
 - Project Manager's site office.

While some of these may be consolidated on the same site, this is dependent upon construction logistics and will be determined by the construction contractor.

3. Watercourse crossing approvals: Jemena will obtain all necessary approvals for construction beneath the Yarra River from Melbourne Water and across the drainage lines from Shire of Yarra Ranges to meet all permit requirements;
4. Traffic Management: Sufficient gaps in the construction spread will be provided for public and private access including the movement of vehicles, farm equipment and livestock. A traffic management plan has been developed in consultation with the Shire of Yarra Ranges and VicRoads prior to the commencement of construction;
5. Installation of temporary gateways: Fences to be cut shall be marked by the surveyors. Temporary strainer assemblies and gateways shall be installed at every fence line that crosses the ROW. The eastern side of the temporary working width will be fenced off with electric fencing at those properties where there is livestock to provide extra security while construction progresses along the ROW;
6. Clear and grade: there are three different land surface types that the construction ROW will intersect: gravel or asphalt on roadways and soil with vegetative cover (grass, shrubs etc). Proposed construction methods of the pipeline include a clear and grade process that will remove the surface cover (such as the vegetation strip and topsoil) from the ROW to allow trenching to proceed.

The majority of the pipeline route is to be open trenched with the sensitive areas of Spadonis Reserve and Tarcoola on the Yarra identified for horizontal directional drilling (at Yarra River) to minimise disturbance (refer Section 6.2.3). The Project Manager will identify the extent of clearing required. Special features not to be disturbed will be marked at this time. This data will be provided on the construction line list.

In vegetated areas, clear and grade will involve the grading of up to 100mm of topsoil in private property and pasture, depending on the soil profile, using bulldozers and graders. The topsoil will be stockpiled in a separate ribbon along the edge of the ROW to permit safe and practical construction access whilst preserving the topsoil in separate windrows for later reinstatement.

Where potential sedimentation of water courses may occur, erosion and sediment control measures will be installed on stockpiles and spoil at these locations. Erosion and sediment control measures will be inspected and maintained on a regular basis and following rain events for the entire construction period.

Wherever practicable, roadside vegetation clearing will be minimised by bored crossings of sealed roads and major drainage channels. Trees and significant species will be worked around or bored below. Trimming overhanging branches may be necessary. There will be no clear and grade activities undertaken within 80m of the Yarra River riparian zone.

Vegetation cleared from the ROW will be stockpiled separately from the excavated trench material to ensure successful reinstatement of the ROW following construction. Cleared vegetation will be stockpiled and preserved for use during ROW restoration.

Within roadways, clear and grade will involve the removal of any asphalt/gravel and underlying roadbase. This will be removed from the ROW for disposal according to regulatory requirements.

7. **Trenching:** The trench will be approximately 600 mm wide and will be excavated using a range of specialist equipment, including wheel ditchers and excavators, to a depth that provides an appropriate cover for the pipe (as established in the Safety Management Study) commensurate with the terrain and land use characteristics. Trench depth will be increased at road and watercourse crossings (refer Table 2). Trench spoil will be stockpiled separately from topsoil on the trench side of the ROW and returned to the trench during the backfilling stage. As a general rule, the minimum cover over the pipeline will be 1200 mm except as outlined in Table 2.

Table 2: Depths of Cover along the Proposed Pipeline Route

Location	Minimum Depth of Cover (mm)
Open farmland	1,200
Ephemeral Drain/Watercourse crossings	1,500
Roads	1,200

8. **Pipe stringing:** This involves the delivery of pipe to the ROW. The individual pipes will each be 12m long. They will be removed from the semi-trailer and laid end-to-end alongside the trench on raised timber skids and sandbags to protect the pipe coating from damage and enable it to be welded into continuous lengths, or "pipestrings". All welds are then examined by radiography to ensure compliance with AS2885.2;
9. **Lowering-in:** This refers to the placement of the pipestrings into the trench by side-boom tractors, which gradually move along the ROW lowering in the pipestring. The side booms require enough distance from the trenchline to place the pipeline into the trench without touching the trench wall. Before lowering in, it may be necessary to de-water the trench where rain or groundwater has accumulated.
10. **Backfilling:** Stockpiled trench spoil will be returned to the trench and compacted following the lowering-in of the pipe. Special care will be taken to ensure that excavated spoil and soil profiles are re-established to avoid soil inversion particularly on private property. Excess spoil from either road base or private lands may be removed from site and transported to an approved landfill site. Where backfilling cannot be completed on the same day as lowering-in, the pipe will be covered by not less than 150 mm of padding over and around the pipe. This will only be permitted in non road reserve ROW;

11. **Hydrostatic testing:** The entire pipeline will be hydrostatically tested (ie. tested by pressurising with water), in accordance with the Australian pipeline standard (AS2885), to verify the integrity of the pipeline. Prior to hydrostatic testing, the pipeline will be pre-cleaned to remove weld debris, dust and surface scale. Once full of water, the pipeline will be pressurised for a period determined by the contractor (strength test). The pressure is then lowered and held for a period of 24 hours and monitored for pressure drops (leak detection test);
12. **Clean-up and restoration:** Following backfill and compaction of the pipe trench, clean-up will be undertaken by removing all temporary infrastructure and machinery, removing all construction waste (such as timber skids and pipe offcuts), re-establishing contours and re-spreading of stockpiled topsoil, installing permanent fencing and marker posts and signs. All compacted areas will be ripped to relieve compaction;
13. **Rehabilitation** of the ROW will aim to minimise adverse impacts of the pipeline on existing land uses and control the occurrence and extent of soil erosion.

In areas of soil containing vegetative cover, revegetation of the ROW will generally be based on conventional pasture restoration procedures in consultation with landholders. The success of restoration will continue to be monitored until the ROW is stable.

Within roadways, surfaces will be reinstated in accordance with the requirements of the local Council. Vegetated road reservations will also be restored in consultation with the local Council.

The project will also include the installation of a pressure reduction station (PRS), an above ground facility that includes a regulator skid to reduce pressure downstream of the PRS, a boiler heat exchanger to heat the gas after pressure reduction and fencing to protect the above-ground assets. This is to be located within the boundary of a property located on the east side of Victoria Road at KP7 (130 Victoria Road) and will require a space of about 20 metres by 30 metres. Vegetation will be cleared from the area and some excavation undertaken to provide a level surface as well as a trench for the pipe. Surface covering will include concrete and gravel. Native species will be planted around the periphery of the completed facility to provide a visual screen.

2.3 ROW Layout and Extra Workspace

The ROW utilised for pipeline construction accommodates construction equipment and vehicle travel, including the storage of trench spoil and topsoil, as shown in Figure 3. The width of the ROW also ensures that construction activities can be safely performed with minimum risk of accident or injury to construction personnel.

In general, the construction ROW will be up to 23m wide for most of its length. A 13m wide temporary working width abutting the easement will be obtained from property owners during construction. However, there are a number of locations where the construction-working width will be less than this. The working width will be limited to 11 metres where the billabongs exist on the property known as 'Tarcoola on the Yarra' and along sections of Victoria Road where the pipeline route passes alongside areas of significant vegetation.

A site office with facilities will be located at a site to be determined by the pipeline contractor and agreed with the landowner. It has been estimated that an area of 10,000 square metres (100m x 100m) will be required. To prepare this temporary construction support site there will be:

- a light clearing of topsoil and grass;
- installation of silt fencing where required;
- laydown of geotextile and crushed rock to form temporary hardstand and driveway access;
- erection of 1.8 metre temporary fencing;
- placement of demountable office blocks, lunch rooms and toilets.

2.4 Roadways

The majority of the pipeline will be in the roadside shoulder or under the asphalt along Victoria and Glenview Roads.

The pipeline construction will take place predominantly on the eastern side of Victoria Road, within nature strips, road shoulders and bicycle lanes

Public use of Victoria Road during business hours is moderately busy, particularly during morning and afternoon peaks in the vicinity of the two local schools with the high school acting as a bus interchange for other schools in the area. The road is mainly used as a thoroughfare for residential traffic, and is also a main route for traffic travelling to the Yarra Valley. Properties in the area and adjacent to construction zones are a mix of urban, semi-rural and rural. Available space for construction is limited and particular care will be required to ensure separation of construction activities from public traffic on Victoria Road.

Victoria Road is a well formed public road managed by the Shire of Yarra Ranges, with one lane in each direction and bicycle lanes both sides of the road through urban areas. There are twenty intersecting residential roads and five major intersections along the alignment.

Glenview Road is a gravel road and the proposed alignment is beneath the road. All soil and waste material removed from these areas will be disposed of at an appropriate facility. The soil and waste material removed from these areas will also require testing to ensure there are no contamination issues.

2.5 Special Crossings

2.5.1 Open Cut Method

The pipeline route will pass through four drainage channels and one river crossing. Construction in and around these waterways can potentially disturb local fauna and can cause changes to the physical and biological components. Management of environmental issues during the construction stage will minimise and control the potential environmental risks.

The steel pipe will be installed at each drainage line as detailed in Table 2, at a depth of approximately 1.5m below the watercourse invert. This involves surface excavation across the road or watercourse. The selection of the crossing location is based on minimizing potential impacts and achieving long-term site stability. Sediment and water quality control measures, such as silt curtains, dam and pump or flume pipe techniques may be applied dependent upon site specific sensitivities.

2.5.2 Thrust Bore

Thrust bores will be used for special driveway crossings. The thrust bore method involves excavation of a bore pit at least 2m deep and approximately 4m x 6m to house the skid mounted boring machine, auger pieces, hydraulic rams and jacking pipe. A receiving pit slightly deeper than the designed pipe burial depth will be excavated on the other side of the object to be thrust bored. As the auger progresses under the object the displaced material is removed from the hole to insert the carrier pipe. A casing pipe may be used to allow insertion of the carrier pipe if the ground being bored is unstable. Any voids around the gas carrying pipe are usually filled with a grouting compound.

2.5.3 Horizontal Directional Drilling

Horizontal Directional Drilling ('HDD') will be utilized for the Yarra River crossing. For the Yarra River crossing, the length of HDD may be up to 800m. This involves drilling at around 10 metres beneath the invert of the river from bank to bank, then pulling the pipe through the bore hole. The drill rig will be larger than the thrust bore drills (higher torque and pullback force) and may have larger diameter drilling rods and tooling. This may enable line pipe to be installed following completion of the pilot hole without the need for reaming passes. The steering of the drill head is far more critical on longer drills than very short ones and often requires a specialist HDD steerer to be employed on the longer drills. This method avoids river bank and in-stream construction

activities, but it can pose technical and environmental risks as part of the crossing is within the watercourse that cannot be readily observed. Fluid loss needs to be monitored through the logging of fluid inputs and fluid returns. *Frac-out* potential is minimized by a review of geology and selection of HDD profile and depth that controls this potential risk. Duration of the drilling activity is dependent on geology. Tooling is therefore adjusted accordingly. This CEMP has referred to operations utilising this drill rig method as ‘Major HDDs’.

2.5.4 River & Drain Crossings

The proposed pipeline will cross four major drainage lines and the Yarra River as specified in Table 3. Jemena will prepare an Environmental Management Plan specific to the watercourses and obtain all the necessary approvals from Melbourne Water or the Shire of Yarra Ranges for these crossings.

Detailed engineering, geotechnical, environmental and hydraulic investigations at each of the watercourse crossings will need to be undertaken by the construction contractor to ensure the most appropriate method has been chosen. These assessment findings will be agreed on with the relevant regulatory authorities.

Table 3: Location of Watercourse Crossings

Location	Area	Watercourse	Method
171 Victoria Road	Chirnside Park	Cherry Hill Drain (Branch 1)	Open cut
175 Victoria Road	Chirnside Park	Cherry Hill Drain (Branch 2)	Open cut
Yering Meadows golf course	Yering	Victoria Road Drain 3 (South)	Open cut
Yering Meadows golf course	Yering	Victoria Road Drain 4 (North)	Open cut
Spadoni’s Reserve	Yering	Yarra River	Major HDD

2.5.5 Road Crossings

The crossing of public roads is subject to approval from the relevant Victorian Government authority, being the Shire of Yarra Ranges in accordance with the *Road Management Act 2004*. Private roads and track crossings are subject to landowner agreements.

All sealed bitumen roads are to be open cut for installation of the pipe. Unsealed tracks will also be open trenched and compacted during backfilling to required standards.

Table 4: Location of Road Crossings

Road Name	Owner	Surface	Crossing Method
Akarana Road	Shire of Yarra Ranges	Sealed	Open cut
Allambi Road	Shire of Yarra Ranges	Sealed	Open cut
Campus Gate	Shire of Yarra Ranges	Sealed	Open cut
Peden St	Shire of Yarra Ranges	Sealed	Open cut
Buggy Ride Lane	Shire of Yarra Ranges	Sealed	Open cut
Switchback Road	Shire of Yarra Ranges	Sealed	Open cut
Victoria Road (171)	Shire of Yarra Ranges	Sealed	Open cut
Coldstream West Road	Shire of Yarra Ranges	Sealed	Open cut
Victoria Road & Coldstream West Road	Shire of Yarra Ranges	Sealed	Open cut
Victoria Road (221)	Shire of Yarra Ranges	Sealed	Open cut

3. STATUTORY REQUIREMENTS

Jemena and the construction contractors have an obligation to ensure that the construction operations comply with all relevant regulatory requirements and guidelines. All project field personnel must be made aware of environmental regulations and best industry practices as part of an environmental induction process and the construction management system.

The project is subject to a range of regulatory approvals, including Victorian Legislation (such as the *Pipelines Act 2005* and the *Environmental Effects Act 1978*) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. In addition to these principal Acts, the project may need to comply with and obtain a range of other approvals under Victoria law.

The relevant legislation, regulations and policies are identified in the following sections.

3.1 Legislation

The construction of the pipeline must be in accordance with statutory and regulatory requirements, company policy, Australian Standards, industry guidelines and codes of practice. Key Commonwealth and State Acts are summarised in Table 5.

In Victoria, onshore natural gas pipelines with an operating pressure above 1,050 kPa require licensing under the *Pipelines Act 2005* ('Pipelines Act'). The Pipelines Act is administered by the Earth Resources Division of the Department of Primary Industries ('DPI'). Key steps in the granting of approvals for this licence under the Pipelines Act include:

- Approval to construct, following an approval of a construction safety case and a construction environmental management plan;
- Approval to operate, following successful construction and testing of the pipeline, and approval of an operating safety case and an operations environmental management plan.

Construction environmental management plans are assessed by DPI, following consultation with appropriate government and local government agencies and other interested stakeholders.

Table 5: Relevant Commonwealth and State Legislation

Regulatory Regime	Legislation
Commonwealth - Legislation	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
	<i>Native Titles Act 1993</i>
Victoria - Legislation	<i>Aboriginal Heritage Act 2006</i>
	<i>Catchment and Land Protection Act 1994</i>
	<i>Country Fire Authority Act 1958</i>
	<i>Crown Land (Reserves) Act 1978</i>
	<i>Dangerous Goods Act 1985</i>
	<i>Environmental Effects Act 1978</i>
	<i>Environmental Protection Act 1970</i>
	<i>Flora and Fauna Guarantee Act 1988</i>
	<i>Heritage Act 1995</i>
	<i>Land Acquisition and Compensation Act 1986</i>
<i>Pipelines Act 2005</i>	

Regulatory Regime	Legislation
	<i>Planning and Environment Act 1987</i>
	<i>Radiation Act 2005</i>
	<i>Roads Management Act 2004</i>
	<i>Water Act 1989</i>
	<i>Wildlife Act 1975</i>

3.2 Subsequent Approvals

In addition to the key legislative and regulatory approvals, a range of additional approvals may be required. The potential approvals are identified in Table 6.

Table 6: Subsequent Approvals

Legislation	Permit, Licence, Consent or Approval Sought	Authority
<i>Aboriginal Heritage Act 2006</i>	Approved Cultural Heritage Management Plan	Aboriginal Affairs Victoria
<i>Country Fire Authority Act 1958</i>	Permit to use fire in the open air, in support of operation of construction equipment in the open air during a total fire ban	Country Fire Authority
<i>Flora and Fauna Guarantee Act 1988</i>	Permit to disturb listed flora or fauna species or habitat	Department of Sustainability and Environment
<i>Pipelines Act 2005</i>	Consent to construct	Department of Primary Industries
	Consent to operate	Energy Safe Victoria
<i>Road Management Act 2004</i>	Permit to conduct works on or in a roadway	Shire of Yarra Ranges
<i>Water Act 1989</i>	Permit to construct 'Works on Water Ways (licence to construct works)'	Melbourne Water

3.3 Local Government

Planning overlays distinguish areas of special significance such as areas with environmental or heritage value. The construction ROW traverses land subject to the following local planning scheme zones and overlays:

- EMO -Erosion Management Overlay - Allambi Road to Campus Gate along Victoria Road;
- ESO1-Environmental Significance Overlay 1- Z2- Yarra River and Little Yarra River Corridor;
- ESO1-Environmental Significance Overlay 1- B12 Spadoni's Reserve - Buxton Gum (*Eucalyptus crenulata*);
- ESO1-Environmental Significance Overlay 1- B14 Yarra Gum (*Eucalyptus yarraensis*) stands between McIntyre Lane and Henley Road along Victoria Road. Both sides of the road;

- LSIO-Land Subject to Inundation - From about 1.7km south of the Yarra River to about 340m north of the Yarra River and Intermittent patches stretching eastwards along drainage lines that intersect Victoria Road;
- SLO4-Significant Landscape Overlay 4 - From Coldstream West Road to the intersection of Yarraview and Glenview Road, Yarra Glen and crossing the Yarra River;
- WMO-Wildfire Management Overlay - North of the Yarra River to Glenview Road and occasional intersections of Victoria Road south of the Yarra River.

3.4 Policies Standards and Guidelines

3.4.1 State Policies and Guidelines

The key Victorian Government environmental policies and guidelines that apply to this project are summarised in Table 7.

Table 7: Victorian Government Policies and Guidelines

Policies and Guidelines	Description
State Environment Protection Policies	<i>Air Quality Management 2001</i>
	<i>Ambient Air Quality 1999</i>
	<i>Waters of Victoria 2003</i>
	<i>Ground Waters of Victoria 1997</i>
	<i>Control of Noise from Commerce, Industry and Trade 1989</i>
	<i>Prevention and Management of Contamination of Land 2002</i>
Industrial Waste Management Policies	<i>Waste Acid Sulfate Soils 1999</i>
	<i>Environmental Protection (Industrial Waste Resource) Regulations 2009</i>
EPA Publications	<i>275: Construction Techniques for Sediment Pollution Control (May 1991)</i>
	<i>347: Bunding Guidelines (Dec 1992)</i>
	<i>464.2: Use of Reclaimed Water (June 2003)</i>
	<i>480: Environmental Guidelines for Major Construction Sites (Feb 1996)</i>
	<i>IWRG621: Soil Hazard Categorisation and Management (June 2009)</i>
	<i>IWRG702: Soil Sampling (June 2009)</i>
Department of Sustainability and Environment	<i>Victoria's Native Vegetation Framework - A Framework for Action (2002)</i>
	<i>Victorian Pest Management - A Framework for Action</i>
	<i>Victoria's Biodiversity Strategy</i>
Department of Primary Industries	<i>Biosecurity Guidelines for Movement of Equipment Contractors between Farms AG1171, 2008</i>

The key policy that potentially applies to the project refers to the clearing of native vegetation and is described in 'Native Vegetation Management: A Framework for Action'. The framework sets out goals for native vegetation management that are intended to achieve a reversal of the long-term decline in the extent and quality of native vegetation across the entire landscape. In accordance

with the Framework, loss of remnant native vegetation should be avoided where possible. Where clearance of native vegetation cannot be avoided, removal of any such native vegetation may be subject to a 'Net Gain' assessment¹. That is, native vegetation permitted to be cleared may be required to be offset by the planting, protection and management of other native vegetation.

3.4.2 Standards & Guidelines

The project is to be constructed and operated in accordance with the requirements of:

- Australian Standard AS 2885 Pipelines -- Gas and liquid petroleum;
- Australian Pipeline Industry Association Code of Environmental Practice - Onshore Pipelines 2009
- Australian Pipeline Industry Association/Victorian Farmers Federation - Pipeline Easement Guidelines 2009.

A list of relevant Standards or Industry Codes of Practice applicable to the project is provided in Table 8.

Table 8: Standards and Guidelines Relevant to Pipeline Construction

Authority	Title
Australian Standard	AS 1055-1997 Acoustics-Description and measurement of environmental noise (parts 1-3)
	AS 1940 - 2004 The storage and handling of flammable and combustible liquids
	AS 2885.1-2007 Pipelines - Gas and liquid petroleum - Design & Construction
	AS 2885.2-2007 Pipelines - Gas and liquid petroleum - Welding
	AS 2885.3.2001 Pipelines Gas and liquid petroleum - Operation and maintenance
	AS 2885.5-2002 Pipelines - Gas and liquid petroleum - Field pressure testing
	AS 3780 - 2008 The storage and handling of corrosive substances
	AS/NZS ISO 31000:2009, Risk management - Principles and guidelines
Industry Codes of Practice	AS 4970-2009 Protection of trees on development sites
	Australian Pipeline Industry Association (APIA). Code of Environmental Practice - Onshore Pipelines, March 2009.
National Codes of Practice	Australian Pipeline Industry Association & Victorian Farmers Federation. Pipeline Easement Guidelines, Nov 2009
	National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC: 2007(1994)]
	National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC: 2011(1994)]
Department of Sustainability and Environment	National Code of Practice for the Labelling of Workplace Substances [NOHSC: 2012(1994)]
	Code of Practice for Fire Management on Public Land 2006

¹ This potentially includes regrowth that is older than 10 years in age.

Authority	Title
Work Safe Codes	<i>Victorian Work Cover Authority. 2000. Dangerous Goods Storage and handling. Code of Practice No. 27</i>
	<i>Victorian Work Cover Authority. 2000. Code of Practice for Hazardous Substances. Code of Practice No 24</i>
National Guidelines	<i>ANZECC/ ARMCANZ. 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i>

4. KEY ENVIRONMENTAL FEATURES

A number of studies of the construction ROW have been undertaken to identify environmental and heritage issues that require management. These are summarised in Table 9.

Table 9: Summary of Environmental Studies

Consultant	Date	Report Title
Monarc Environmental Pty Ltd	Apr 2010	Lilydale Pipeline Project Environmental Desktop Survey
Monarc Environmental Pty Ltd	Jul 2010	Field Survey - Jemena Lilydale pipeline project
Douglas Partners Pty Ltd	Jul 2010	Report on Geotechnical Investigation Lilydale Pipeline Alignment- Lilydale to Yarra Glen Report No. 42741.00-3
Tardis Enterprises Pty Ltd	Jul 2010	Aboriginal Cultural Heritage Standard Assessment - Lilydale Gas Pipeline, Victoria Road to Glenview Road, Lilydale.
Douglas Partners Pty Ltd	Aug 2010	Lilydale Pipeline - Yarra River Horizontal Directional Drill Geotechnical Investigation Report 860-RP-GP-002
Douglas Partners Pty Ltd	Aug 2010	Lilydale Pipeline - Lilydale City Gate Geotechnical Investigation Report 860-RP-GP-001
Tardis Enterprises Pty Ltd	Dec 2010	Lilydale Pipeline Project, Victoria Road to Glenview Road, Lilydale - Cultural Heritage Management Plan No 11222.
Monarc Environmental Pty Ltd	Mar 2011	Targeted Flora and Fauna Surveys - Lilydale Pipeline Project
Monarc Environmental Pty Ltd	Mar 2011	Flora and Fauna Assessment -Yarra Glen to Lilydale Pipeline
Tree Logic Pty Ltd	Jul 2011	Arboricultural Assessment and Report - Victoria Road, Lilydale Gas Pipeline

This section:

- provides an overview of the existing environment in the project area;
- Identifies the key environmental issues that require management.

4.1 Land Use

The construction ROW lies wholly within the municipality of the Shire of Yarra Ranges. Within the boundaries of the Shire, the pipeline will traverse:

- Green Wedge Zone Schedule 5 (GWZ5): located between Glenview Road and the Yarra River (about 700m)
- Public Conservation and Resource Zone (PCRZ) from the Yarra River to about 200m south of the Yarra River
- Green Wedge Zone Schedule 4 (GWZ4): located from about 200m south of the Yarra River to about 950m north of Switchback Road (about 6.4km)
- Green Wedge A Zone Schedule 1 (GWAZ1): located between Switchback Road and about 950m north of the road
- Residential Zone 1 (R1Z): located between Maroondah Highway and Switchback Road (about 1.7km)

Land usage along the route ranges from largely rural at the northern end to residential at the southern end between Lilydale Memorial Park and Maroondah Highway. Horticultural and agricultural activities occur between the intersection of Glenview and Yarra View Roads and the northern side of the Yarra River. Between Spadoni's Reserve and Switchback Road it ranges between horticultural, agricultural,

equestrian and some commercial activities. The pipeline shares the road reserve with other utility services at the majority of the roadside intersections.

4.2 Landform, Soils and Geology

4.2.1 Landform

Lilydale and Yarra Glen lie at the southern edge of the Eastern Highlands which begin to the north of Melbourne and extend eastwards for about 250km across the southern extent of the Australian Alps.

The Yarra River Basin extends into the Eastern Highlands eastwards from Melbourne to beyond the Upper Yarra Reservoir. The Yarra River itself originates in the rugged forests south of Matlock and flows westerly down a steep narrow valley towards Warburton and then through a broad valley towards Melbourne.

The geomorphology of the area between Lilydale and Yarra Glen belongs to the regional Inter-montane Basins of the Eastern Highlands and forms part of the Croydon Sunkland, a moderately thick uplifted Silurian & Devonian sequence. The regional landform is undulating to hilly country surrounded by more rugged terrain. The geology is comprised of Palaeozoic sediments and granitic rocks with the basin boundaries often controlled by structural forces (Geological Society of Australia, 1976).

East of the Yarra faultline, the natural surface along the proposed route runs from an elevation of about 170m (ahd) at Maroondah Highway to about 70m (ahd) at the Yarra River crossing before rising slightly to the Yarra Glen City Gate (about 80m).

4.2.2 Soils

The soils are classified as hard, acidic, grey podsolc soils over red clayey sub-soils; brown and locally red friable porous earths. Loams, silty loams and fine sandy loams are mainly derived from sedimentary rocks (Geological Society of Australia , 1976).

4.2.3 Geology

The outcropping geological formations that will be encountered along the proposed construction ROW may be broadly characterized from north (Yarra Glen) to south (Lilydale) as the Quaternary alluvium (Qa1), Dargile Formation and Older Volcanic Group respectively, as summarised in Table 10 below. Refer also to Figure 3 which is based on the geological layer of the Geovic website operated by the State Government of Victoria.

Table 10: Stratigraphic Summary

Period	Formation	Lithological Description	Outcrop Areas
Quaternary	Unnamed (Qa1)	Alluvium (Qa1) consisting of fluvial sediments (alluvium, gravel, sand, silt, clay)	Within the flood plain influence of the Yarra River at the north end of the construction ROW & lower lying drainage lines associated with minor tributary gullies along the central part of the construction ROW
Tertiary	Older Volcanic Group (Po)	Extrusive basalts at Lilydale, tholeiitic and minor alkaline basalts. These are typically weathered to a sandy clay or boulders or floaters that are not uncommon in the near surface.	South end of the pipeline at Lilydale, straddling the Maroondah Highway
Devonian	Humevale Siltstone (Dxh)	Marine siltstone, minor sandstone	North of the Yarra River
Silurian	Dargile Formation (Sxg)	Massive Silurian marine siltstone and thinly interbedded sandstone	Central part of the pipeline traverse

Detailed logs of the local geological profile that is expected to be encountered along the proposed route are available in a report prepared by Douglas Partners (Douglas Partners, 2010a). A summary of the geology extracted from the report is provided below: -

The ground conditions encountered comprised some surface fill over residual clays/weathered rock materials. Typically the fill was associated with nature strips and was found to vary in thickness between about 0.1 m and 0.4 m. However in places, Victoria Road had been constructed on a cut/fill platform and there was a significant level difference between the road and borehole location in places up to 1.9 m of fill being found. The deepest fill was found in BH7, 8 and 9.

Residual basaltic clay grading to highly weathered basalt was found at the southern end of the route (BH1 and 2 only). Elsewhere residual clays derived from the underlying weathered siltstone were encountered. The residual clays were typically of a stiff to very stiff consistency with underlying rock being highly to moderately weathered.

Borehole refusal occurred in BH2, 6, 29, 45, 47, 48 and 51 at depths of between 1.3 and 2.3m. These boreholes were generally located on ridges which are also indicative of stronger ground (refer to figure 3, Appendix A within (Douglas Partners, 2010a)).

The areas indicating higher drilling resistance and auger refusal implies, generally the areas consisted of rock mainly found on higher grades (hilly areas) and the lower lying areas consisted of residual clays or river alluvial clays.

The underlying geology in the vicinity of the Yarra River at the proposed river crossing comprises alluvials (silty clay, sandy clay, clayey sand, sand and gravelly sand) before encountering dominantly medium to highly fractured siltstone rock at 18m on the north side of the Yarra dipping to 22m bgl on the south side of the Yarra (Douglas Partners, 2010b).

4.2.4 Acid Sulfate Soils

The proposed pipeline route does not traverse known acid sulfate soil areas (DPI, 2003).

4.2.5 Contaminated Soils

There are currently no known contaminated sites in the project area. However given the long agricultural history of the area, the potential for soil contamination along the route is, in general, considered low. But it is possible that unknown areas of contaminated soil may exist in the project area such as the soil and road material that will be removed from under Victoria and Glenview Roads. Roadways generally have metal contamination issues and the soil and waste will require soil testing before removal. Other areas of potential contamination are expected to be primarily restricted to agricultural uses such as pesticide mixing or storage areas or potential disposal of farming waste.

4.3 Hydrology

4.3.1 Surface Water

There is one natural waterway (Yarra River) along the pipeline route and there are four drainage channels that carry stormwater from urban and rural development around the construction ROW into the Yarra River. These are summarised (in order from south to north) in Table 11. The river falls under the responsibility of Melbourne Water while the drainage lines, where they intersect the road reserve, are the responsibility of the local Council.

Table 11: Major Drainage Lines on Pipeline Route

Name	Location	Catchment Area
Cherry Hill Drain (Branch 1)	171 Victoria Road	Upper Yarra Catchment
Cherry Hill Drain (Branch 2)	175 Victoria Road	Upper Yarra Catchment
Victoria Road Drain (3) (South)	Yering Meadows Golf Course	Upper Yarra Catchment
Victoria Road Drain (4) (North)	Yering Meadows Golf Course	Upper Yarra Catchment
Yarra River	Spadoni's Reserve	Upper Yarra Catchment

The drains are concrete lined drains at the point of intersection with the construction ROW except for Victoria Road Drain (3) (South) where it is an open earth drain. All of the watercourses flow in a westerly or north-westerly direction to join the Yarra River about 2km west of the line at its closest point. The river discharges to Port Phillip Bay about 40km southwest of the intersection of the alignment with Spadoni's Reserve.

As a result of the relatively flat topography and vegetation clearance, parts of the surrounding area are subject to flooding, particularly around the Yarra River. The Yarra River floodplain extends south along Victoria Road as well as north of the Yarra River. The proposed pipeline route bisects the floodplain area.

A number of farm dams and wetlands are also located in the vicinity of the proposed alignment but no natural ponds or lakes are present in the project area.

4.3.2 Groundwater

a) Geology/Aquifers

The main hydrogeological units are the bedrock units consisting of Silurian and Lower Devonian folded sediments, which outcrop extensively in the upper sub catchment of the Yarra River Basin and relatively smaller deposits of Quaternary alluvials and co-alluvials.

Refer to 'Table 10: Stratigraphic Summary' and 'Figure 3: Geological Plan' for the location and distribution of each outcropping stratigraphic sequence. All four rock types are expected to be unconfined and water bearing due to low permeability barriers such as clays in the quaternary alluvials or in the Siluro-Devonian basement or where fracture systems are saturated.

b) Groundwater Levels & Uses

The Groundwater Resources Victoria map-sheet, 1:1,000,000, (1982) indicates that the proposed pipeline route traverses two distinct groundwater salinity zones of the same fractured, weathered indurated sediment/metasediment/intrusive aquifer system as follows:

- A groundwater salinity zone with TDS range 1000 to 3000 mg/L at Lilydale for a distance of approximately 5km northwards from Lilydale.
- A groundwater salinity zone with a TDS range 3000 to 7000 mg/L in locations beyond 5km north of Lilydale and towards Yarra Glen.

The above discussion refers to groundwater quality in the Siluro-Devonian sequence only. No data is available for the quality of groundwater found in the alluvial aquifers but good quality water with a low salinity generally less than 500 mg/L, hence classified as *Segment A* under the *State Environment Protection Policy (Groundwaters of Victoria)*, may be expected.

No groundwater seeps were recorded during the drilling conducted as part of the shallow bore (maximum 3m) geotechnical investigation conducted in late June 2010. While the shallow boreholes were not left open long enough to establish equilibrium conditions, observations suggest that the lower lying areas can become waterlogged especially during wet weather (Douglas Partners, 2010a).

The depth to gauged water levels ranged between 3.5 to 5m bgl in the three relatively deeper bores (26 to 35m depth) in late June 2010, near the proposed Yarra River crossing (Douglas Partners, 2010b).

The Victorian Government Groundwater Database of the proposed pipeline route was examined within 5km in conjunction with Figure 4 (showing bore locations for water level information) but was limited. It was found that: -

- Six shallow bores (ranging 2 to 7m below ground) at the Lilydale end of the proposed pipeline but lacked any water level and intended use details;
- At least 7 deep bores were drilled between 47m and 115m deep with water levels generally greater than 50m.

The dominant purpose of the bores in the vicinity of the proposed pipeline route is for stock and domestic use.

c) Groundwater Flow

Groundwater in the shallowest aquifer is concomitant with unconsolidated alluvial sediments that infill the river valleys and tributary gullies and through which groundwater flows down-gradient towards the Yarra River.

Bedrock fracture systems in which groundwater flows through hydraulically connected fracture systems are likely to be dominantly oriented north-east / south-west in line with regional structural features.

The deeper aquifers are found where weathering has been extensive and, where they are saturated, groundwater flow is more likely to be driven by gravity rather than by permeability barriers due to the relative homogeneity of this sequence.

4.4 Flora and Fauna

4.4.1 Flora

The construction ROW is located in a region that has been highly modified due to extensive land clearing for agriculture, infrastructure and road construction. It consists mostly of pasture dominated by introduced grasses and weeds with remnant native vegetation confined mostly to roadsides. The location of significant flora is presented in APPENDIX B (note that this is based on an early pipeline route map; some minor adjustments have been made to the route since the identification of significant flora). The following is noted with regards to the pipeline route:

- Spadoni's Reserve is located on the south side of the Yarra River and contains one of only two known naturally occurring populations of the endangered Buxton Gum (*Eucalyptus crenulata*). Specimens of the gum also occur in the surrounding land. As part of the Arboricultural Assessment undertaken, these trees were inspected and it was concluded that there will be no impact to any trees in the alignment of the HDD including all Buxton Gums within Spadoni's Reserve;
- There are a number of gum trees along the pipeline route. Some are protected by fencing close to the pipeline route such as Yarra Gums (*Eucalyptus yarraensis*) which are intermittently spaced in the road reserve along Victoria Road between properties 158-174 Victoria Road and on Victoria Road outside No 2 McIntyre Lane. There are other scattered gum trees along the proposed route and immediate surrounds. They all provide significant habitat value and all are considered regionally significant. Tree protection measures will therefore be required (refer Section 6);
- The construction ROW through the property known as 'Tarcoola on the Yarra' is on an undeveloped road reserve. There are fenced off trees in this area (DSE mapping states the vegetation is EVC 56 Floodplain Riparian Woodland). These areas are to be avoided;
- Targeted surveys for the following EPBC and FFG listed flora species were undertaken in the spring of 2010 along the unused road reserve through 'Tarcoola on the Yarra' and Glenview

Road, Yarra Glen: Austral Moonwort (*Botrychium austral*), Clover Glycine (*Glycine latrobeana*), Maroon Leek-orchid (*Prasophyllum frenchii*) and Matted Flax-lily (*Dianella amoena*) will be undertaken. None of the listed species were located in the project area;

- As part of the Arboricultural Assessment undertaken, of the 86 trees assessed, 6 trees within the High Impact zone were dead and recommended for removal or significant crown reduction and a further 3 are unsuitable to be retained and recommended for removal. All other non-indigenous and indigenous trees will be retained and, where they are in the High Impact Zone, they will be bored or the pipeline realigned within the easement to avoid the Tree Protection Zone ('TPZ');
- No other areas of remnant indigenous vegetation are to be removed as part of the project. However, the installation of the PRS on Victoria Road requires clearance of the vegetation over an area of about 20 metres by 30 metres. The PRS has been sited to minimise the removal of indigenous species but will require the removal of one indigenous tree (Narrow-leaf Peppermint). This is not a threatened species but the removal of the tree is to be offset via an approved vegetation offset plan prepared in accordance with the Native Vegetation Management Framework.

4.4.2 Fauna

The largely homogenous landscape and limited distribution of native flora effectively means that the faunal assemblage for this tract of land is of low diversity. Past removal of native grasses and other vegetation and subsequent invasion by weed species has reduced the available habitat for significant native fauna. The following is noted:

- Fauna recorded during a recent study of the construction ROW was generally typical of a farmland/woodland environment. No species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act* (EPBC Act) or State *Flora and Fauna Guarantee Act* (FFG Act) were recorded within or in the immediate surroundings of the proposed construction ROW.
- The Yarra River is an important habitat for endangered fauna. The listed fauna that has been confirmed as being in the Yarra River includes Macquarie Perch and Australian Grayling. The river is listed on the EPBC Directory of Important Wetlands as a wetland of importance. The river is also classified as a heritage River in Victoria.
- Significant habitat for native fauna along the proposed route occurs along the drainage lines, Spadoni's Reserve, Tarcoola on the Yarra and remnant gums alongside Victoria Road. The remnant gums and Spadoni's Reserve provide good potential habitat for small mammals, avifauna and reptiles.
- The drainage channels provide habitat for fish and amphibians, especially vegetated areas along the drainage lines. Targeted surveys for the EPBC Act & FFG Act listed *Litoria raniformis* (Growling Grass Frog) and Dwarf Galaxias (*Galaxia pusilla*) were conducted along four of the drainage channels over the summer of 2010/11. None of the listed species were located.

4.4.3 Weeds and Pests

The field survey recorded the prevalence of opportunistic weed infestations throughout the proposed alignment, particularly in agricultural properties. Some properties displayed a relatively higher prevalence of weeds.

Introduced pasture grasses dominate the alignment and the success of invasive weed species is expected to persist with current land use.

The following species recorded along the proposed alignment are all declared noxious weeds under the *Catchment and Land Protection Act 1994* ('CLP Act') and are regionally controlled within the Port Phillip and Westernport Catchment management region:

- Spear Thistle (*Cirsium vulgare*);
- Blackberry (*Rubus fruticosus* agg.);
- Artichoke Thistle (*Cynara cardunculus*);

- Hawthorn (*Crataegus monagyna*);
- Gorse (*Ulex europaeus*);
- Patterson's Curse (*Echium plantagineum*);
- Sweet Briar (*Rosa rubiginosa*).

Phylloxera, an aphid like insect, is also found in the Yarra Valley. This is one of a number of pests and diseases that can be found in vineyards and feeds on the root system of grapevines causing direct damage to the roots and allowing infections by fungi and bacteria which leads to gradual decline in vine health and vigour.

4.5 Cultural Heritage

A Cultural Heritage Management Plan (Tardis Enterprises , 2010) was commenced for the Lilydale Pipeline on 8 April 2010 complying with the *Aboriginal Heritage Act 2006*. The assessment included desktop, standard and complex assessments (refer APPENDIX G).

Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc ('WTLCCHC') is the Registered Aboriginal Party ('RAP') for the activity area and have been consulted throughout the assessment.

4.5.1 Desktop assessment

The desktop assessment considered geographic region, previously registered places and studies, historical and ethno-historical accounts, landforms and geomorphology and land-use of the activity area.

Based on the desktop assessment, any raised areas within developed or undeveloped sections of the activity area were considered to be of low Aboriginal archaeological sensitivity for previously disturbed subsurface low density (1-30/m²) stone artefact scatter sites due to the previous ground disturbance of the area in conjunction with the evidence of shallow topsoil deposits. That is, the previous disturbances would likely have disturbed to depths beyond prior land surfaces.

The floodplain area is considered to have very low sensitivity for previously disturbed subsurface low density stone artefact scatter sites due to the likelihood of this area being regularly inundated since prior to human occupation of the area. Areas subject to regular inundation are not conducive to human occupation.

4.5.2 Standard assessment

The activity area was subject to ground surface survey but was constrained by extremely poor ground surface visibility. No Aboriginal cultural heritage was identified during the standard assessment. Land subject to ground surface survey included 2.5 km of pipeline to be constructed in private land and 1.7 km of pipeline to be constructed in road reserves on road shoulders or grassy reserves. These areas were subject to systematic pedestrian surveys by two surveyors walking 10m apart to identify and survey all bare ground within the activity area such as patches of bare dirt, dams, tracks, land beneath windrows and areas of cattle disturbance. Based on the desktop and standard assessment for cultural material, a number of areas were identified for intrusive investigations during the complex assessment.

4.5.3 Complex Assessment

The complex assessment was carried out between 2-18 August, 2010. A total of 70 test pits were excavated in areas identified during the desktop and standard assessments as having potential to contain Aboriginal Cultural Heritage. One Aboriginal stone artefact scatter was found in the area of the proposed 'bell hole' to the north of the Yarra River (proposed drill entry point for the Yarra River crossing) but large scale excavation of the area was not undertaken pending a decision on the final location of the bell hole. This site is considered to have low scientific significance, and demonstrates the possibility that additional Aboriginal cultural heritage may be found during the excavation of the northern bell hole. The southern bell hole has been comprehensively assessed and requires no further action (Tardis Enterprises 2010).

5. ENVIRONMENTAL MANAGEMENT FRAMEWORK

The actions taken and decisions made during the construction of the proposed pipeline project will be guided by Jemena's Health, Safety and Environmental Management System ('HSEMS').

5.1 Commitment to the Environment

Jemena is committed to responsible environmental management during their operations and has formalised this commitment in a Health, Safety and Environment (HSE) Policy (refer APPENDIX C).

This CEMP is written in accordance with this policy and all activities associated with the construction of the pipeline shall comply with this policy.

In managing the construction process, Jemena is committed to:

- Complying with all obligations relating to Statutory Laws, Policies and Licences and Industry Standards and Codes of Practice;
- Operate and maintain land corridors in a manner that minimise potential and actual environmental effects of any activities and operations;
- Carry out construction, maintenance and repair activities consistent with Australian Pipeline Industry Association (APIA) Code of Environmental Practice and other relevant energy industry association codes and guides;
- Implement and adhere to the CEMP;
- Consult with government officers, the local community, landholders and interest groups concerning the progress of the Project, and issues relating to the management of environmental impacts;
- Audit, track and report in accordance with regulatory requirements and business plans emissions, discharges and wastes;
- Rectify any rehabilitation problems identified during the auditing and monitoring program.

In order to achieve these objectives, the following will be required:

- Inform construction personnel and contractors of their environmental obligations including obligations for reporting of environmental incidents;
- Provide rational and practical environmental guidelines associated with pipeline construction activities that aim to meet these objectives;
- Establish processes for monitoring, inspection and compliance to the plan.

The commitments made by Jemena relating to responsible environmental management for this project are:

- Obtain all necessary regulatory approvals prior to construction;
- Undertake further targeted fieldwork to assist in the development of the Flora and Fauna Field Survey and Cultural Heritage Management Plan;
- Prepare alignment sheets and line lists during the detailed design phase that identify all sensitive site-specific environmental issues;
- Ensure an appropriate environmental induction and education program is implemented to instruct construction workers regarding the environmental management measures and requirements to be adopted during the construction phase of the project;
- Keep all stakeholders appropriately informed of the project's progress and relevant environmental management issues;
- Undertake audits of construction works to ensure environmental management and mitigation measures are being complied with;
- Rectify any rehabilitation or stability problems identified during the monitoring program;

- Monitor critical areas post-construction to ensure site stability and successful rehabilitation progress;
- Carry out a post-construction environmental audit of the pipeline to evaluate revegetation, erosion, soil stability and weed control and to rectify any identified problems;
- Prepare, implement and adhere to an Operations Environmental Management Plan during the operations and maintenance phase.

A detailed listing of the environmental performance objectives, the performance standards and measurement criteria for these objectives is contained in APPENDIX D.

5.2 Environmental Risk Assessment

An environmental risk assessment will be undertaken to provide a careful and systematic examination of the potential for environmental harm caused by the construction activities of this project before construction commences.

The risk assessment methodology is described below and is consistent with *AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines* and *AS2885.1:2007: Pipelines - Gas and liquid petroleum - Design & Construction*.

The results of the risk assessment will be incorporated into a document known as the *Environmental Aspects and Impacts Risk Register* which:

- identifies the aspects or elements of the activities that can interact with the environment;
- identifies the source of potential harm or situation with potential to cause impact (including unplanned interactions ie accidents);
- the potential impact or change to the environment that may result from the aspect; and
- the appropriate management and control measures to be implemented to keep the risks at a level as low as reasonably practicable.

Each aspect will be assigned a risk rating, following the implementation of mitigation measures, based on the likelihood of occurrence and the consequence of the impact (refer to the risk matrix discussed in Section 5.2.4). A copy of the *Environmental Aspects and Impacts Risk Register* is contained in APPENDIX E.

5.2.1 Risk Assessment (Analysis & Evaluation)

Risk analysis is about developing an understanding of the risk. It provides an input to decisions on whether risks need to be treated and the most appropriate and cost-effective risk treatment strategies. The risk assessment will assist in determining the likelihood and consequence of the hazard causing damage to the environment.

Risk can be viewed at 3 primary levels:

- Absolute Risk (before any controls are put in place)
- Residual Risk (after controls have been put in place)
- Treated Risk (after controls and treatments have been put in place)

Residual Risk is primarily assessed because it takes into account all current risk reduction measures. This decision is based on the recognition that in a mature business such as Jemena, many risk reduction measures have long been established. It is believed that to assess risk without consideration of these long standing risk reduction measures would not represent an accurate risk assessment.

5.2.2 Consequence (or Severity)

Consequence (or severity) is defined as the most realistic outcome expected if the risk aspect manifests itself and the associated impact occurs. For this project, the following classifications of *consequence* on the environment have been employed:

Catastrophic	<i>Actual</i> material harm to the environmental and/or the health and safety of human beings (onsite and/or offsite) with long-term or irreparable effects
Major	<i>Actual</i> material harms to the environment and/or the health and safety of human beings (onsite and/or offsite) with short-term effects and is reparable through remedial action
Severe	Discharge of any substance from site, which poses <i>potential</i> harm to the environment or the health and safety of human beings (onsite and/or offsite) Incident poses <i>actual</i> or <i>potential</i> loss or property damage exceeding \$10,000 Is a reportable incident under state-relevant legislation;
Serious	Spillages, leaks or other escapes which have migrated offsite; is not a reportable incident to the authorities; Leaves minor residual impact on the environment
Minor	Spillages, leaks or other escapes which occur and are contained within the site boundary; is not a reportable incident to the authorities; Does not leave residual impact on the environment.

5.2.3 Likelihood (or Frequency)

Likelihood (or Frequency) is defined as the likelihood that a risk event will occur within a given time frame. For this project, these have been defined as:

Almost Certain	Will almost certainly occur once (or more) every couple of years. Expected to happen, happens frequently.
Likely	Will probably (>50%) occur once (or more) in 20 years.
Possible	Could occur, but not probable.
Unlikely	Not expected to occur. Has not occurred at Jemena, but has occurred within the industry within Australia.
Rare	May occur only in exceptional circumstances. Has occurred in known history worldwide or is conceptually possible.

5.2.4 Risk Impacts and Ratings

Based on the consequence (or severity) and likelihood (or frequency) of the potential impact, residual risk is classified into five risk ratings, namely, extreme, high, significant, moderate and low. These are depicted in Table 12.

Table 12: Qualitative Risk Analysis Matrix

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK					
LIKELIHOOD	CONSEQUENCE				
	1 Minor	2 Serious	3 Severe	4 Major	5 Catastrophic
5 Almost Certain	Moderate	High	Extreme	Extreme	Extreme
4 Likely	Moderate	Significant	High	Extreme	Extreme
3 Possible	Moderate	Moderate	Significant	High	Extreme
2 Unlikely	Low	Low	Moderate	Significant	High
1 Rare	Low	Low	Moderate	Moderate	Significant
1 For Financial Risks this is Moderate					

These risk ratings generate the following environmental mitigation actions:

Extreme risk is unacceptable to Jemena and the following should occur:

- Modify the threat, frequency or consequence to reduce the risk class to Moderate or Low;
- Urgent and immediate management action required;
- Controls weakness poses unacceptable (extreme) level of exposure to the business.

High risk is unacceptable to Jemena and the following should occur:

- Safety risks - modify the threat, frequency or consequence to reduce the risk class to moderate or low;
- High level of management focus required to address issue. Executive management of oversight required;
- Control remediation should be completed within next 3 months (approx);
- Control weakness poses high/significant level of exposure to the business.

Significant risk level is unacceptable to Jemena and the following should occur:

- Repeat threat identification and risk evaluation processes to verify and, where possible, quantify the risk estimation, determine the accuracy and uncertainty of the estimation;
- Where the risk class is confirmed to be Significant modify the threat, frequency or consequence to ensure the risk class is reduced to Moderate or Low;
- Where the risk class cannot be reduced to Moderate or Low action shall be taken to remove threats, reduce frequencies or consequences so as to reduce the risk to ALARP.

Moderate risk

- Management responsibility must be specified. Monitor to determine if risk changes and needs to be reassessed;
- Focus required from line management;
- Control issue requires remediation within a specified timeframe (3 - 12 months approx);
- Control weakness poses moderate level of exposure to the business.

Low risk

- Manage by routine procedures. Reassess at next review;
- Opportunities for control improvement;
- No remediation action required;
- Low level of exposure posed to business operations.

6. ENVIRONMENTAL ASPECTS, IMPACTS AND STRATEGIES

The risk assessment to be established with the construction contractor will assess the risk of harm to the following key considerations for the environment and identify the necessary mitigation measures to be employed by project personnel to avoid or minimise those risks. Key environmental impacts include those to:

- Landholders and third-party users;
- Watercourse crossings;
- Threatened flora and fauna including significant vegetation;
- Soil and erosion;
- Cultural heritage;
- Noise;
- Dust and emissions to air;
- Weed and Diseases;
- Fire;
- Hazardous chemicals;
- Waste.

Management guidelines to minimise impacts to each of the environmental segments or issues that may be affected by construction activities (as identified in the *Environmental Aspects and Impacts Risk Register* - refer APPENDIX E) are discussed in the following sections. These segments are also represented in the *Code of Environmental Practice - Onshore Pipelines* (APIA, 2009) published by APIA.

For each of the identified environmental segments or issues, the following sections describe:

- The key environmental issues associated with each segment;
- The environmental performance objectives or compliance standards for protection of each segment;
- Control measures to ensure the risk to the segment of the environment is reduced to ALARP.

The avoidance, mitigation and management measures outlined below are in accordance with the EPA Publication 480, *Environmental Guidelines for Major Construction Sites* (EPA, 1996) and follow the guidelines of the Australian Pipeline Industry Association *Code of Environmental Practice - Onshore Pipelines* (APIA, 2009) and the APIA/VFF *Pipeline Easement Guidelines* (APIA VFF, 2009).

A detailed listing of the environmental performance objectives, the performance standards and measurement criteria for these objectives is contained in APPENDIX D.

6.1 Landholders and Third Party Users

The potential impacts to agricultural land use that may arise as a result of construction and operation of the pipeline include:

- Permanent restrictions on land use;
- Temporary disruption to landholders and third parties;
- Impacts to land amenity via vehicle and personnel movements including:
 - Soil erosion and sediment release to land and water;
 - Compaction and disruption of soil profile;
 - Damage to pasture land or other land uses
- Farm production impacts including:
 - Temporary loss of grazing pasture during, and for the season immediately following, construction;
 - Stock movement, access and safety;

- Altered lateral water flow regime and/or interference with drainage;
- Impeded property access, internal and external.
- Spread of weeds and pathogens (refer Section 6.8 Weeds and Diseases).

6.1.1 Access to Right-of-way

A separate traffic management plan has been prepared for the project and is contained in Appendix L.

The following measures shall be adopted to ensure appropriate management of environmental issues associated with access along the ROW:

- Access to the construction ROW shall be via Victoria Road and Glenview Road. To minimise property entry points, private property access to the construction ROW has been arranged with individual landowners and lessees;
- The width of any track shall be kept to the minimum practical to enable safe vehicle movement;
- In sensitive environments such as Spadoni's Reserve and Tarcoola on the Yarra, vehicle access shall be restricted and kept to a minimum;
- Vehicle parking shall be restricted to the pipeline construction area and other designated areas. Private vehicles shall not park on roadsides;
- Public access along the construction ROW is restricted. Physical barriers (e.g. gates, fences, log and rock barriers, trenches) and signs shall be installed to restrict access;
- Vegetation and soil erosion shall be adequately controlled to allow continued access and safe navigation by vehicles;
- Access to the construction ROW shall be managed to minimise potential weed impacts (refer to Section 6.8);
- Access to the construction ROW shall be conducted in a manner that adequately considers potential noise or vibration impacts. In some areas, access may need to be restricted to specific times as determined in consultation with local authorities or landowners;
- Potential impacts associated with access to the construction ROW will be monitored as part of the inspection and monitoring program and recorded;
- The ROW shall not be used as a general thoroughfare unless that right already exists.

6.1.2 Land Use during Construction

Specific mitigation or management measures to reduce land use impacts during construction include:

- Where the ROW passes through a fence line, a temporary gate will be installed of adequate size to retain stock;
- All personnel accessing agricultural land will ensure permanent and temporary gates are closed to prevent livestock escaping or mixing with other mobs;
- When requested by landowners, plugs will be installed and left in place until just before pipeline lowering-in, to reduce restriction to stock and vehicle movements;
- Spoil stockpiles shall not impede natural or constructed surface drainage channels or access tracks;
- Where required, gaps shall be left between soil stockpiles to allow the passage of vehicles. Gaps shall coincide with access roads or tracks, stock and wildlife trails, boundary fences and gaps in stockpiled vegetation;
- Where required breaks in pipe strings will be provided to allow stock and vehicle movements;

- Stripped topsoil and subsoil will be stored separately on the ROW and returned to the trench in their original order. Care will be taken to ensure topsoil and subsoil is not mixed;
- Natural drainage lines will be returned to their previous level of effectiveness;
- Compacted or waterlogged areas will be ripped or tilled to a depth sufficient to alleviate compaction and potential water accumulation within the root zone. Rippers, tynes, mouldboard ploughs and winged rippers will not be used in duplex soils (to avoid mixing of topsoil and subsoil) unless compaction is a significant problem;
- All vehicle and machinery movement will be confined to the ROW and designated access tracks and roads.

6.1.3 Restoration of Project Area

Key issues relating to the completion of construction activities are:

- Erosion and sediment control;
- Revegetation of disturbed construction areas;
- Reinstatement of habitat.

Agricultural land that is disturbed by pipeline construction activities will be rehabilitated so that it is returned to its previous level of productivity within a reasonable time after construction. Each landholder's specific requirements and requests will be identified, conditions will be negotiated, and contact will be maintained with the landholder during construction activities. Rehabilitation will be agreed with each landholder that specify the agreed fertiliser and seed mixes for each property, as well as standard measures for weed and pathogen control. The entire disturbed area of the alignment will be subject to a weed monitoring and control program.

Rehabilitation of the ROW will aim to minimise the potential for soil erosion and sedimentation, minimise the impact of the pipeline installation on drainage patterns, minimise weed establishment, minimise the visual impact of the pipeline installation, and minimise adverse impacts of the pipeline on other existing land uses. The intent is to rehabilitate the land to the condition of its previous use so that the occurrence and extent of soil erosion is reduced and soil stability is maintained.

A number of measures shall be adopted to ensure appropriate environmental management following completion of the line installation including:

- The period of time between backfilling and restoration of the pipeline construction area shall be minimised to prevent degradation and loss of exposed soils. Restoration will commence when all other construction works likely to disturb any restored land have been completed along a section of the works area;
- Waste materials and equipment shall be removed from the pipeline construction area once backfilling and tie-ins are completed - refer to section 6.11 Waste;
- Compaction relief shall be undertaken as required by ripping or scarifying soils along the contours, particularly on heavily trafficked areas such as the pipeline construction work side, temporary access roads and turn-around bays and work sites. Figure eight or zigzag rip lines may be appropriate in flat to low gradients to prevent rilling;
- In agricultural areas the topsoil shall be respread evenly across the ROW;
- The pipeline construction area shall be re-profiled to original or stable contours, re-establishing surface drainage lines and other land features. Site specific stabilisation measures may be necessary to prevent slumping or erosion;
- Regular inspections shall be undertaken during the pipeline construction maintenance period and operation phases to monitor for trench subsidence (refer Section 9).
- Subsoil displaced by the pipe, may be temporarily stockpiled in locations approved by landholders or regulatory authorities for use during operations or pending subsequent removal. Imported topsoil, of an appropriate quality and weed free, will be required to cover subsoil used for trench repairs and shall only be used with landholder approval. Stockpiles shall be managed in accordance with the requirements of Section 6.4 Soil and Erosion;

- Erosion and sediment control measures (e.g. diversion berms, geotextile matting, silt fences and sediment basins) shall be installed as necessary - refer Section 6.4 Soil and Erosion. The erosion controls will be left in place and monitored until rehabilitation has been achieved. Erosion/subsidence monitoring and management will be maintained as part of the pipeline operation inspections;
- Rocky spoil that is not used in erosion control will not be left on the ROW unless this is consistent with the pre-pipeline conditions or otherwise pre arranged with the landholder. In agricultural or horticultural land there will be no rock left on the subsoil surface (before topsoil respreading) or in the topsoil to at least the depth to which the surrounding soil is free from rock;
- Prompt reseeding, revegetation and weed-control will be undertaken after construction. Reseeding and revegetation will depend on seasonal conditions and preferably after weed seeds have germinated to permit control as part of the reseeding programme;
- Soon after revegetation, there will be a follow-up weed spray, where necessary, to control any emerging weeds. If necessary, a second follow-up weed spray will be conducted in the same season. In the second year after construction, if required there will be another weed spray, most likely after the autumn break but before mid-winter;
- All areas that are revegetated with native vegetation will be temporarily fenced to protect the area from grazing damage;
- Stockpiled vegetation may be respread so as to prevent erosion and promote revegetation. Appropriate measures shall be used to ensure that the respreading of stockpiled vegetation will not result in weed introduction or spread;
- Flagging used to identify sensitive environmental features (e.g. natural and cultural heritage), shall be removed and disposed of at the completion of construction to avoid drawing attention to sites;
- All fences that were cut shall be repaired to at least pre-construction conditions unless permanent gates or other arrangements are agreed with the landowner;
- All disturbed land will be rehabilitated in accordance with an ongoing program to achieve stable and sustainable conditions of soil cover and vegetation;
- Requirements for reseeding and fertiliser will be approved by the landowner on a land parcel basis.

6.2 Watercourse Crossings

The potential surface and ground water impacts associated with the construction of the Lilydale pipeline are:

- Impacts to water quality;
- Disruption to water flow regimes;
- Impacts to flora and fauna.

These potential impacts and the proposed mitigation and management measures are discussed below.

6.2.1 Drainage Channels

If heavy rain falls during construction, the exposed soils on the ROW could erode and sediment could be transported into waterways. If heavy rain falls, work will cease where erosion and sedimentation is likely.

All drains encountered along Victoria Road will either be thrust bored or open cut depending on water flow.

- Thrust Bore Method
 - Proper tooling (clay or rock augers) shall be selected according to the geology of the site.
- Open Cut Method

- Sediment and water-quality control measures, such as silt curtains, or isolation construction using dam and pump or flume pipe techniques, may be applied as necessary depending upon site-specific sensitivities;
- A range of measures will be applied to restore and stabilise the open trenched watercourse crossings using methods such as rock rip-rap, geotextile fabric and revegetation depending upon what is most appropriate in the circumstances.

General mitigation and management measures to address potential impacts associated with watercourse crossings if open cut include:

- The removal of vegetation on the banks and bed of the drainage channels shall be restricted to the minimum necessary;
- There shall be no stockpiling of materials in drainage or flowlines - stockpiles will be placed at least 10m from the top of the channel;
- No polluted or sediment laden runoff from trench dewatering is to be discharged directly or indirectly into the watercourses, during or after the works. Appropriate silt/debris control measures will be installed to prevent any silt/debris discharging into the watercourses from either the development or crossing works;
- Drainage bed and bank material and trench spoil shall be stockpiled separately away from banks;
- Bending, welding and pipe coating will be completed prior to commencement of trenching within a drain;
- Trench excavation will stop short of the drain until the crossing work has been initiated;
- Trench plugs will be used to reduce sediment transport into the drain caused by water flowing along the excavated trench;
- Surface and storm water drainage in the vicinity of the ROW will be protected from sediment by constructing and maintaining sediment control measures downstream of the ROW (e.g. silt fences and/or fine shade cloth);
- A temporary flume shall be used to cross the various drains if open-cut;
- Drainage patterns shall be reinstated to pre-construction conditions;
- Banks of drainage lines shall be fully restored to their original profile unless they have vertical erodible banks where they may need to be battered to achieve stability. Banks shall be stabilised to prevent scouring. Bank protection may include: rip rap, batters, granular filter layers, grading and revegetation etc;

Measures to ensure appropriate management of equipment near watercourses include:

- Any pumps shall be bunded;
- No washing of equipment or machinery within or adjacent to watercourses;
- Hazardous materials shall not be stored near watercourses (refer Section 6.10.1) or allowed to drain into watercourses.
- Installation of temporary silt fences at the outlet of diversion drains and near the base of slopes of the drains, as surface erosion could result in siltation of the drains.

General mitigation and management measures to address potential impacts associated with watercourse crossings include:

- No vegetation will be cleared from the ROW between the drilling entry and exit points if thrust bored;
- In-stream (or drain) sediment control structures, such as staked or floating silt barriers, will be constructed downstream of the worksite prior to undertaking activity in a drain that may result in the release of sediment and these will be maintained and will be kept in place until bank restoration is completed;
- To minimise the risk of scour, the pipeline burial depth will be a minimum of 1.5 m at all drain crossings.

6.2.2 Disruption to Water Flow Regimes

Once pipeline construction is complete and the pipe trench is backfilled and compacted, there is a period of time during which subsidence along the trench line can occur as the backfill material settles. The risk of this happening depends on soil type, soil moisture and level of backfill compaction. Trench subsidence can divert surface water flows along the trench and lead to erosion, affect ROW revegetation by influencing regrowth, and create a crossing hazard for stock and vehicles.

Mitigation and management measures to address impacts associated with potential disruption to water flow in the area of the trench include:

- Drainage patterns shall be reinstated to pre-construction conditions;
- The trench backfill will be compacted.

Refer also to measures covered in Section 6.1.3 (Restoration of Project Area) and Section 6.4.2 (Erosion and Sedimentation).

6.2.3 HDD Management Plan

Key issues relating to the Yarra River crossing are:

- Soil erosion and sedimentation of land and water;
- Watercourse bank degradation;
- Impacts to riparian and aquatic flora and fauna;
- Temporary obstruction of other land users.

The Yarra River will be crossed at Spadoni's Reserve utilising Horizontal Directional Drilling (HDD). The entry and exit bell holes will be in the car park to the Lilydale & District Model Flying Association and north of the riparian zone beyond the first group of fenced off trees. This will avoid impacts on the river. An EMP specific to the HDD crossing has been prepared by the contractor and includes mitigation measures to be employed as well as the contingency measures to respond to frac-outs, the recording and management of driller's mud and fluids as well as the management of noise and dust (refer APPENDIX F).

Some of the control measures that shall be implemented to mitigate the environmental impacts of the Horizontal Directional Drilling (HDD) construction method are given below.

- A comprehensive geotechnical survey to determine the suitability of the proposed route under the Yarra River;
- Entry Bell hole on the south side of the Yarra River will be at least 250m from the Yarra River riparian zone (within Lilydale Model Airplane club Victoria Road Yering, current co-ordinates 37° 41' 4" S, 145° 20' 55" E);
- Exit Bell hole on the north of the Yarra River will be beyond the first group of fenced off trees and sufficient distance from the Yarra River riparian zone (within 351 Glenview Road, Yarra Glen "Tarcoola on the Yarra", current co-ordinates 37° 40' 38.8"S, 145° 21' 02.9"E).

Construction vehicles and equipment should not proceed towards the Yarra River or billabongs beyond these points except in the emergency of a frac-out.

Permits for the Yarra River crossing have been obtained from Melbourne Water prior to the construction of the watercourse crossings and, in accordance with permit requirements, an HDD Environmental Management Plan has been prepared describing management measures specific to the crossing.

The HDD Environmental Management Plan also contains a contingency plan should the initial bore be unsuccessful. This has been prepared by the EPI construction contractor in conjunction with the drilling contractor.

6.3 Threatened Flora and Fauna including Significant Vegetation

The flora and fauna assessment carried out prior to construction identified a number of issues that require management. The potential impacts to flora and fauna include:

- Vegetation loss and fragmentation of wildlife habitat;
- Fauna habitat loss;
- Disturbance to or loss of flora or fauna species of conservation significance;
- Fauna or stock entrapment in the open trench;
- Weed and plant pathogen invasion;
- Sedimentation of watercourses.

The construction of the Lilydale to Yarra Glen pipeline incorporates measures to minimise the impacts to the ecological values of the region by avoiding native vegetation removal where possible by directional boring or re-routing. A number of measures shall also be adopted to ensure appropriate environmental management during any clearing that may be required along the ROW:

- Of the 86 trees assessed as part of the Arboricultural assessment, 5 trees within the High Impact zone are dead and recommended for removal or significant crown reduction and a further 3 are unsuitable to be retained and recommended for removal. All other non-indigenous and indigenous trees will be retained and, where they are in the High Impact Zone, they will be bored or the pipeline will be realigned within the easement to avoid the Tree Protection Zone ('TPZ');
- Approval to remove or habitat prune the abovementioned trees will be obtained from the responsible owners being either Shire of Yarra Ranges or private landowners. Note that Net Gain is not applicable to the three trees recommended for removal. Of the five trees recommended for removal or crown reduction by the arborist, two may be subject to net gain requirements should they be removed or significant pruning is required. It is not intended to undertake removal or crown reduction for these 2 trees however, should this occur, a vegetation offset plan will be required to be prepared and approved in accordance with the Native Vegetation Management Framework;
- No other areas of remnant indigenous vegetation are to be removed as part of the project. However, the installation of the PRS on Victoria Road requires clearance of the vegetation over an area of about 20 metres by 30 metres. The PRS has been sited to minimise the removal of indigenous species but will require the removal of one indigenous tree (Narrow-leaf Peppermint). This is not a threatened species but the removal of the tree is to be offset via an approved vegetation offset plan prepared in accordance with the Native Vegetation Management Framework.
- All other remnant indigenous vegetation, including remnant gums, will be retained and protective fencing will be erected around those trees whose TPZ, as defined under AS 4940-2009, will intersect the construction ROW;
- Vegetation to be retained shall be located on the construction alignment sheets (refer Section 10) and flagged in the field as not to be disturbed;
- Vegetation clearance shall be minimised, particularly at watercourses and roadsides (e.g. Cherry Hill Drain (Branch 1) Property 171 Victoria Road, Cherry Hill Drain (Branch 2) Property 175 Victoria Road, Victoria Road Drain (3) Yering Meadows South, Victoria Road Drain (4) Yering Meadows North);
- Clearing shall aim to retain the maximum amount of root stock within the pipeline construction area. Slashing may be undertaken as a means of vegetation clearing, particularly in sown pastures or at watercourses;
- All vegetation stockpiles shall be confined to the construction corridor and shall be separated from all soil stockpiles.

Additionally, to minimise impacts to the ecological values within the construction ROW the following will be implemented:

- Employee and contractors shall be inducted prior to commencement of works which will highlight environmental, cultural and other construction issues (such as erosion etc);

- Pipeline construction within the vicinity of the remnant Yarra Gums (*Eucalyptus yarraensis*) along Victoria Road, that are protected by the Shire of Yarra Ranges will be managed in accordance with the recommendations of the arborist;
- Best-practice sediment management will be implemented to protect native vegetation and freshwater habitats;
- No buildings or works, including stockpiling of soil, loading and unloading, storage of materials, dumping of waste, vehicle access and parking or other construction activity, will occur within areas of retained vegetation.

The following mitigation measures will be employed to reduce impacts to fauna habitat and to minimise faunal injury or mortality:

- Construction traffic through sensitive areas such as Spadoni's Reserve and Tarcoola on the Yarra will be kept to a minimum;
- A safe speed limit shall be adopted to minimise the potential for collision with fauna moving through roadside or other remnant vegetation;
- Minimising the period and length of time that the trench remains open, particularly in areas where sensitive habitat has been identified nearby such as Spadoni's Reserve and Tarcoola on the Yarra;
- Gaps shall be left between soil stockpiles to allow the passage of animals and vehicles;
- End caps shall be used on pipe strings to prevent entry of fauna prior to laying;
- Daily monitoring of open sections of trench at regular intervals for trapped animals such as reptiles and small ground-dwelling mammals, particularly in areas where sensitive habitat has been identified, such as Spadoni's Reserve and Tarcoola on the Yarra;
- If fauna is located during the inspection, they will be relocated by a suitably qualified and experienced animal handler that holds a current wildlife permit issued by DSE. A Vet is to be called to attend to injured animals, otherwise animals are to be relocated to the nearest suitable habitat;
- Appropriate measures shall be adopted to prevent fauna entrapment within the pipeline trench, such as branches, hessian sacks, ramped gangplanks or similar used to create "ladders" to enable fauna to exit the trench;
- Trench plugs and ramps (slopes no greater than 50%) shall be placed at appropriate intervals to minimise erosion within the trench and also to allow the movement of fauna across the trench. Trench plugs should occur wherever wildlife corridors are identified and access roads or livestock trails are crossed. Trench plugs should coincide with gaps in stockpiles of topsoil and subsoil, so that they direct animal movement towards the trench plugs;
- Keeping trench plugs in place to allow the movement of fauna across the open trench;
- The open trench shall be checked for fauna prior to backfill and any trapped animals removed;
- Reporting injured or dead native wildlife within construction sites to regional DSE personnel.

6.4 Soil and Erosion

The construction of the proposed pipeline may potentially cause the following impacts to landforms and soils:

- Exposure of topsoil;
- Soil erosion and sediment release to land or water;
- Slope instability;
- Soil inversion, compaction and subsidence;
- Disturbance of contaminated soil;
- Contamination of soil (refer Section 6.10).

6.4.1 General Soil Management Requirements

The following general requirements apply to management of soil stockpiles:

- All stockpiles, including vegetation stockpiles, shall be confined to the construction corridor and shall be separated;
- Topsoil shall not be graded across property boundaries;
- Soil stockpiles shall not impede natural or constructed drainage lines or access tracks.
- Sub soil and ROW material transported onto Victoria Road shall be immediately cleaned by the use of a Sweeper Roller, to ensure the safety of passing traffic.

6.4.2 Roadway Management

A significant portion of the construction ROW is within roadways, either on the edge of the road shoulder or under the asphalt or gravel road.

Measures to be implemented to manage traffic and the cartage and disposal of excavation materials include:

- Road Opening Permits will be obtained from Shire of Yarra Range to operate from Yarraview Road to Maroondah Highway;
- As works intersect with Maroondah Highway, a Road Opening Permit will be obtained from Vicroads in order to facilitate signage set up either side of Maroondah Highway;
- A load exemption permit will be obtained from Shire of Yarra Range to operate heavy vehicles and equipment on Victoria Road which has a 6 Tonne limit;
- Only trained and accredited traffic controllers and supervisors will be permitted to plan traffic arrangements, place and monitor signage, control traffic and conduct required audits;
- Traffic control will be conducted by Diona's internal personnel, who will be accredited to conduct works through Vicroads. Where required due to works conditions or changes, local traffic control companies may be utilised to assist if additional controls are needed. In this instance, only Vicroad's accredited companies will be used;
- Where the construction ROW crosses side streets and intersections, detours and road closures will be adopted to best suit the traffic flow and construction conditions;
- Progressive placement of warning signs, barriers, warning lights and other visual indicators of abnormal road conditions during all periods while construction equipment is present;
- Analytical testing of road fill and base prior to excavation of the trench;
- Disposal of road fill and base directly to an appropriate landfill or receiving facility;
- Use of EPA registered trucks if soil is contaminated;
- Reinstatement of the roads to Shire of Yarra Range's standard.

6.4.3 Erosion and Sedimentation

Much of the construction ROW follows terrain that is undulating with relatively minor fluctuations in grade. Specific zones of erosion and sedimentation hazard that occur along the construction ROW are at the drain crossings (refer also to Section 6.2 Watercourse Crossings and Section 6.11.2).

Measures to be implemented to minimise erosion and sedimentation impacts include:

- A buffer zone will be established to protect the riparian zone above each drain crossing if the drains are open-cut (minimum 10 m from the top of the channel);

- Erosion and sediment control structures will be installed to prevent sediment entering drainage lines;
- Diversion berms and erosion and sediment control structures will be placed and constructed so that they are stable and drain to the downstream side of the ROW. Sediment fences, weed-free straw bales or similar barriers will be installed down slope of exposed soil and stockpiles to minimise sediment entering drains or waterbodies (e.g. drainage lines, table drains and dams);
- Temporary erosion control berms shall be constructed from subsoil and not topsoil;
- Erosion and sediment control structures shall be routinely inspected, especially following heavy or prolonged rainfall events or following heavy traffic use to ensure their effectiveness;
- Sediment controls shall be reinstated at the conclusion of works each day prior to leaving the site;
- The width of the ROW will be kept to a minimum at all drainage lines to minimise erosion risk;
- The banks and approach slopes of all open cut crossings will be restored immediately after the trench is backfilled and prior to dismantling any flow diversion measures, using appropriate stabilisation measures, such as grading, granular filter layers, rock rip-rap, diversion berms, sediment fences, jute matting and immediate reseeding and plantings. Where fencing is present, it will be reconstructed to follow the restored bank profile;
- The time between clearing and grading of the mainline ROW and trenching and backfilling will be minimised to limit the time of exposure to the elements of the cleared ROW, to prevent erosion of exposed soils as well as trench collapse and to minimise risk and inconvenience to third parties associated with the open trench. It is anticipated that the trench shall remain open for a maximum of 14 days;
- Every attempt will be made to re-establish vegetation as soon as practicable after reinstatement earthworks to stabilise the exposed soils. Erosion and sediment control structures are to be retained during reinstatement until vegetation is clearly established.
- Grading of slopes will be kept to a minimum. When required, the impacts of grading of slopes will be mitigated by:
 - Limiting the grading of narrow ridges and sharp changes of slope to the extent necessary to allow the pipe to be constructed within the limits of pipe bending and to permit the safe passage of heavy equipment;
 - In such cases, stripping top soil from the full right of way width for stockpiling each side of the right of way to facilitate an even respread; and
 - Not allowing excavated material to be sidecast down ridge slopes as this can impede drainage, damage or cover vegetation, cause serious visual impacts and induce slope instability.
- Gradients on the majority of the route are relatively small with the greatest gradients occurring on the northern side of the river from the flood plain to Glenview Road. Where appropriate, trench plugs/breakers and ramps shall be placed at appropriate intervals to minimise erosion within the trench;
- Trench barriers shall be installed in sloping terrain, at drainage lines or elsewhere as directed by the project manager;

Rehabilitation of the ROW will aim to minimise the potential for soil erosion and sedimentation. The intent is to rehabilitate the land so that the occurrence and extent of soil erosion is reduced and soil stability is maintained (refer Section 6.1.3).

6.4.4 Soil Inversion, Compaction and Subsidence

Mitigation and management measures to address impacts associated with soil inversion, compaction and subsidence include:

- Vehicle access should be restricted to stable ground. Additional care should be taken near waterways and drainage lines;

- Depressions and pipeline subsidence will be in-filled with appropriate material;
- Topsoil will be stripped and stockpiled separately from subsoil. In the vicinity of drainage lines, farm dams, stormwater entry and steep slopes, stockpiles shall be protected by the use of silt fences;
- Construction will be restricted during wet weather and ceased during & following heavy rain to ensure that compaction and surface rutting is limited;
- Topsoil shall not be used as padding material;
- Soils shall be replaced in the opposite order of excavation to reduce the possibility of soil inversion. Only spoil shall be returned to the trench during backfilling. Topsoil stockpiles shall remain undisturbed until reinstatement;
- Soil surfaces that have been compacted due to construction activities, such as ROW traffic or storage areas, will be ripped to a maximum depth of 100 mm to allow the topsoil to bind with the subsoil, increase water infiltration, promote regeneration and prevent rilling;
- Trench backfill shall generally be compacted to a relative density sufficient to prevent further settlement under natural moisture and load conditions. The topsoil horizon shall be compacted to a similar relative density to that of the adjacent topsoil.
- Borrow pits will not be established without the written authority of the landholder and the relevant local authority;
- Soil surfaces will be returned to the profile evident prior to excavation;
- Road fill reinstatement to Shire of Yarra Range's standard.

6.4.5 Contaminated Soils

No contaminated sites are known to exist along the construction ROW. However, it is recognised that contaminated sites may potentially exist in the project area as a result of previous land uses, such as pesticide mixing or storage. Other areas of potential contaminated soils may include the road base of Victoria and Glenview Roads. Known contaminants found in road base generally include metals and PAHs. The following measures, where required, shall be adopted to ensure appropriate environmental management during construction:

- Before the commencement of trenching below the road base, a contamination assessment will be undertaken of the road base to assess the waste classification of trenching spoil;
- Monitoring for indicators of possible soil contamination, such as discolouration, odours and abnormal soil structure;
- Should a suspect site be encountered during construction, work will stop in the area and the site will be assessed by a suitably qualified environmental consultant in accordance with EPA guidelines. Appropriate clean-up measures will be undertaken, in collaboration with the relevant authority and the party responsible for the contamination.

If soil is contaminated by construction or maintenance activities, such as re-fuelling, vehicle maintenance, or thrust boring, the contamination will be assessed and the contaminated soil will be remediated or disposed of by an approved contractor at an approved facility in accordance with EPA guidelines. Refer to Section 6.10.1 and 6.10.2.

6.4.6 Acid sulfate soils

The project area does not traverse any known acid sulfate soil areas.

If acid sulfate soils are encountered during construction, site-specific management plans will be developed in consultation with the appropriate authorities in accordance with regulatory guidelines. Generally, this will involve replacement of the acid sulfate soil material 1 m below the water-table and treatment of the soil with lime. If acidic sub-soils are encountered, they shall not be backfilled to come into contact with the pipeline. Appropriate measures shall be adopted for managing problem soils, eg. saline or acid sulfate soils.

6.5 Cultural Heritage

The construction of the proposed pipeline may cause disturbance to culturally important materials.

A complex investigation of the construction ROW has therefore been undertaken in consultation with the RAP (being WTLCCHC). This involved sub-surface investigation of several landforms followed by the preparation and approval of a Cultural Heritage Management Plan (refer APPENDIX G).

As part of this complex investigation, it has been agreed with the RAP that the excavation of the northern bell hole for the Yarra River HDD will be carried out under the following conditions:

- If the northern bell hole is north of location GPS 'Longitude: 145.350596, Latitude: -37.678428', then no archaeological monitoring will be required as natural clay occurs from 400mm depth and would exhibit no cultural heritage activity. No further testing will be required as this and other northern locations were tested during the Complex Assessment and yielded no discoveries.
- If the northern bell hole location is at, or south of, GPS 'Longitude: 145.350596, Latitude: -37.678428', then archaeological monitoring and sieving will be required for the excavated bell hole material.

These conditions shall be stipulated in the CHMP. Further requirements include:

- Excavation of the bell hole in the presence of one archaeologist and one aboriginal representative.
- That if highly significant Aboriginal cultural heritage sites (ie a hearth or burial) are identified during excavation, that works are to cease pending investigation by the archaeologist and the RAP;
- Relocation of the bell hole may be an outcome of this investigation.
- Consideration should be given to timeframes involved in these works; minimum three days excavation and sieving;
- Appropriate health and safety, and environmental controls should be adopted.

For the whole of the construction ROW, the mitigation measures to protect heritage values will include:

- All construction personnel will be provided with an Aboriginal heritage awareness induction by an elder of WTLCCHC prior to commencing work on the project;
- Construction personnel will be made aware of the location and value of any recorded heritage sites to ensure impacts are avoided;

In the event of discovery of previously unidentified cultural material, the following guidelines will apply:

- Construction personnel will cease work in the vicinity of the site immediately and will not disturb the site. If suspected human remains are discovered, the area will be treated as a Crime Scene and the Police will be notified;
- The Project Manager will be advised and the construction personnel will not recommence work in the affected area until appropriate management strategies have been implemented;
- Relevant authorities will be contacted and an assessment made about the correct course of action to adopt;
- The discovery of new sites of heritage significance is to be recorded for reference by the construction personnel. Location details of such sites are to be maintained and, where possible, details regarding the significance and management measures specific to each identified site will be included. Appropriate approvals must be obtained prior to any planned or potential disturbance of a known site;
- Any disturbance or damage to heritage sites must be reported to the Project Manager and should also be reported as an incident, possibly requiring investigation.

Throughout the project investigations, regular consultation took place between the cultural heritage advisor and:

- Monarc (Jemena's Environmental Representative),
- WTLCCHC.

In addition, the following were also consulted as part of this assessment:

- Victorian Aboriginal Heritage Register (VAHR);
- Australian Heritage Database;
- Land Victoria;
- Land managers.

As a result of this consultation the CHMP was approved by the RAP on the 24 December, 2010. A copy of this CHMP is included in APPENDIX G.

6.6 Noise

During construction, the key activities likely to generate noise include:

- Excavation, welding and backfilling plant and equipment;
- Hydrostatic testing process;
- Vehicles and machinery travelling along the pipeline ROW corridor and access tracks; and
- Gas vented from pressurised equipment.

Noise emissions, in particular those with tonality, modulation or impulsiveness may lead to adverse impacts to local residents. All plant and facilities should be designed and operated to comply with relevant State noise regulations *EPA publication N-1 (Control of Noise from Commerce, Industry and Trade)* and *Australian Standard AS 1055-Acoustics*.

The following environmental control measures will be implemented to ensure that noise emissions are minimised:

- All field personnel will be made aware of potential noise sources from their operations, the noise limits to be observed and the noise mitigation measures available;
- Equipment will be selected that is likely to result in the lowest noise impact whilst still completing the required task;
- Equipment will be fitted with appropriate noise abatement devices (eg. mufflers, silencers and screens) maintained in good working order;
- For activities which may generate abnormal noise levels, local residents will be informed prior to commencement;
- Where practicable, excessively noisy activities will be scheduled for periods that are less likely to result in a noise nuisance. This decision should be made in consultation with the residents;
- Residents with special needs shall be identified in accordance with the project Consultation Management Plan and any special needs shall be incorporated into the specific works plan;
- In particular, noise complaints will be investigated as part of the Incident and Corrective Action Notification process outlined in section 9.5 and remedial action taken as required. This may include the completion of noise monitoring.

Most pipeline construction works are to be carried out during daylight hours. Minor segments of the pipeline may be required to be constructed outside of daylight hours in order to maintain road access along Victoria Road. Where work is required out of daylight hours:

- Approval shall be sought from DPI, advice provided to local council and adequate notification of affected residents is to be provided;
- Three residential dwellings are located within 500 metres of drilling works on the northern side of the Yarra River. These properties are the only ones that have been identified as being affected by 24 hr operations should they occur and will be notified prior to the commencement of testing;
- The generators used for the pressurisation of the pipe for hydrostatic testing and for the condensing air drying unit will be operated from the Lilydale City Gate Station which is isolated from heavily populated areas.

Vibration impacts are considered unlikely as a result of the pipeline installation. However, in the event that vibration is found to be a nuisance to nearby residents, noise and vibration monitoring will be undertaken to ascertain the source of vibration and appropriate mitigation measures adopted if necessary.

6.7 Dust and Emissions to Air

The key activities that may result in construction air emissions include:

- Vehicle and machinery exhausts; and
- Dust emissions from vehicle and equipment movement.

All vehicles and equipment shall be maintained in good working condition and operated as intended, with appropriate emission control equipment.

Dust may arise through the operation of vehicles on dry land with minimal vegetative cover, along the ROW. To minimise the impact of dust Jemena requires staff and contractor drivers to slow to an appropriate speed to minimise dust generation and the resultant impacts to local landholders.

Appropriate dust emission controls shall be applied during operation as necessary. If dust problems still occur at particular sections of the pipeline ROW corridor, the following measures must be adopted:

- Ensure speed limits are appropriate and being observed and minimise vehicle movements;
- Employ water trucks in dry conditions using approved recycled water or approved privately sourced water;
- In some cases (e.g. high winds) construction activities may need to cease until conditions improve. This will be at the direction of project management personnel with the authority to cease works (see Section 7).

6.8 Weeds and Diseases

Vehicles and equipment can carry plant and animal pathogens that are harboured in the soil. Some noxious species recorded along the construction ROW are Patterson's Curse (*Echium plantagineum*), Blackberry (*Rubus fruticosus* agg), Spear Thistle (*Cirsium vulgare*), Artichoke Thistle (*Cynara cardunculus*), Hawthorn (*Crataegus monagyna*), Gorse (*Ulex europaeus*) and Sweet Briar (*Rosa rubiginosa*).

In addition, Phylloxera, an aphid like insect, is also found in the Yarra Valley. This is one of a number of pests and diseases that can be found in vineyards and feeds on the root system of grapevines causing direct damage to the roots and allowing infections by fungi and bacteria which leads to gradual decline in vine health and vigour.

Appropriate measures to manage the potential spread or introduction of weeds or disease during construction include:

- All work supervisors will receive induction training in weed identification (particularly weeds present or in the vicinity of the ROW), control and management to pass on to their respective crews prior to starting work on properties;
- All construction and operations personnel will receive induction training in procedures for weed-control personal hygiene practices, such as removing seeds and mud from clothing and footwear;
- All vehicles and construction equipment will be cleaned and certified by the contractor upon arrival in the project area and rewashed or blown down and disinfected if upon inspection foreign material is found on the vehicle or equipment;
 - Cleaning shall be thorough so as to remove all soil or organic matter from the surface of vehicles, equipment and portable infrastructure, including the undercarriage and running gear.
 - Jemena and the construction contractor will establish specific washdown procedures. The risk of transfer will be minimised once the topsoil has been stripped and stockpiled. Air cleaning may be appropriate in dry conditions but where topsoil conditions are moist, appropriate wash down will be required;

- Weed material and weed-contaminated material will be disposed of in a manner that does not increase the risk of weed spread.
- Vehicles, contractors and equipment shall avoid entering properties with grape vines. If any equipment enters a property with grape vines, the equipment must be cleaned before re using on another property to reduce the spread of Phylloxera.
- All work supervisors will receive induction training in control and management to prevent the spread of Phylloxera from property to property to pass on to their respective crews prior to starting work on properties;
- Surface vegetation will be cleared immediately prior to requirements to ensure the shortest possible time the ground surface is exposed to weed invasion;
- Topsoil shall not be graded across property boundaries;
- All vehicle and machinery movement will be confined to the construction ROW and designated access tracks and roads;
- Revegetation and weed-control will be undertaken after construction. Revegetation will occur when seasonal conditions are appropriate and preferably after weed seeds have germinated so that they can be controlled prior to revegetation. This shall be discussed with landowners;
- Weed emergence following reseeding will be controlled in accordance with sound agronomy practices;
- Post-construction weed monitoring and control will be undertaken (throughout the project life) to minimise environmental weeds colonising disturbed areas, control and prevent the spread of noxious weeds. The intent of the weed control measures will be to prevent the spread of any noxious or environmental weed that does establish (eg. by spraying weeds prior to flowering). In addition, independent site audits will be undertaken by environmental monitors;
- In the vicinity of watercourses, control of weeds by chemical spraying is not advised due to the potential proximity to aquatic fauna habitat.

6.9 Fire

Fires may cover vast areas in a very short period of time making escape difficult for both people and animals, particularly in dry seasons. Fire may also destroy valuable crops and burning of vegetation may leave topsoil exposed, increasing the risk of soil erosion.

Generally, the risk of fires or bushfires in this region as a result of pipeline construction is considered low. The main fire ignition sources include spark-emitting works such as welding, acetylene cutting, grinding, and the use of gas torches for heating, drying and shrinking of coating sleeves.

All field operations personnel must take suitable precautions to prevent fires occurring throughout the year and especially in summer. Pipeline construction operations shall be conducted in accordance with the requirements of regulatory and local fire authorities. In particular, operations shall comply with relevant fire restrictions, notification requirements and permitting procedures.

The *Jemena-Multinet Gas Emergency Response Management Plan MNG-PL-0001* (ERMP) establishes the structure of emergency teams, the communication processes and the resources which may be required for managing the emergency.

All project related fires must be reported immediately to the Project Manager, who will be responsible for notifying the relevant personnel and fire authority. A project-specific emergency management plan is to be developed by the Construction contractor that aligns with the Jemena-Multinet ERMP to cover emergency events such as a major fire. This will establish the structure of emergency teams, the communication processes and the resources which may be required for managing the emergency.

Control measures include:

- Contractors will contact relevant fire authorities for regulatory permits and any other local approvals.
- Fire extinguishers provided in all vehicles;

- Display of suitable signs to indicate to the public the extent of any hazardous areas to prevent an accidental ignition of hazardous concentrations of flammable vapour or gas;
- Prohibition of smoking in the vehicles at the worksite;
- The control of any sources of ignition to the work area (e.g. spark-ignition engines, motor vehicles grinding, chainsaws, etc);
- Vehicles shall be regularly checked to ensure that combustible materials such as grass and debris do not build up in areas where ignition may occur;
- As the construction ROW will be cleared, there is no reason for vehicles to be parked on, or driven through, long grass.

It is not expected that there will be any controlled burns required for this pipeline.

6.10 Hazardous Chemicals

6.10.1 Chemical and Fuel Storage

The use and storage of oils, fuel and chemicals on-site can pose a threat to the environment and personnel if not managed properly. Management procedures have been put in place prior to the introduction of any chemical on-site. Control of these substances from both environmental and safety aspects rely primarily on the selection of chemicals that pose little risk to the safety of employees or the environment. Emphasis is then placed on controlling the loss to the environment.

The storage and handling of fuels and chemicals shall comply with all relevant legislation and *Australian Standard AS1940: 2004 - The storage and handling of flammable and combustible materials*.

All chemical storage in Victoria must also comply with *EPA Publication 347 (Bunding Guidelines)*.

Persons handling chemicals shall undertake the following: -

- The storage and handling of fuels and chemicals shall comply with all relevant legislation and Australian Standard AS1940;
- Material Safety Data Sheets should be obtained when purchasing chemicals and should be available on-site for all chemicals stored and handled;
- All chemicals will be stored in the construction depot wherever possible. If required to be stored on the ROW, chemicals must be stored on flat land, away from any watercourse, native vegetation and cultural heritage site;
- In the construction depot, fuels, lubricants and chemicals shall be stored and handled within containment facilities (e.g. bunded areas, leak proof trays) designed to prevent the release of spilt substances to the environment;
- Fuels and chemicals shall not be stored or handled in the vicinity of the built waterways or water storage areas (e.g. streams, canals, dams, lakes);
- Persons handling chemicals shall be provided with, use and be trained in appropriate personal protective equipment;
- Follow all instructions for use as detailed in Material Safety Data Sheets (MSDS);
- The minimum practicable volume of chemicals should be stored on-site and chemical use should be minimised;
- When fuels, lubricants and chemicals are handled outside of the construction depot, they must be handled within containment facilities (e.g. leak proof trays) designed to prevent the release of spilt substances to the environment;
- There shall be no refuelling within 100m of any drain or watercourse with the exception of pumps and other equipment used in constructing the water course. In these circumstances, refuelling must only be undertaken at the greatest practical distance from the watercourse and with the use of absorbent material and drip trips;

- Appropriate spill response equipment, including containment and recovery equipment, shall be available on-site with each fuel-carrying vehicle;
- Workforce training shall be conducted in fuel and chemical handling and spill response and recovery procedures by way of project specific induction.

6.10.2 Spill Prevention and Response

Vehicles carrying liquids such as oil or chemicals used in the construction of the pipeline have the potential to impact the environment in the event of a spill. This section deals with general operational procedures to minimise the risk and consequence of a liquid spill.

Jemena will ensure that all operations personnel and contractors are adequately trained in the maintenance of all equipment so as to prevent the accidental discharge or spill of fuel, oil, lubricants and other chemicals. Training will include:

- Prevention and reporting of spills;
- Pollution control regulations;
- Potential sources of spills (i.e. equipment failure, malfunction, refuelling operations);
- Standard operating procedures in case of a spill and equipment; and
- Materials and supplies available for cleanup of a spill.

Jemena's objective in respect to the management of land and water contamination is to ensure that all potentially contaminating substances are transported, stored, used and disposed of in accordance with the best practice techniques to prevent release of contaminants.

Mitigation and management measures to address impacts associated with potential spills include:

- All fuel storage will be bunded in accordance with the requirements of EPA Publication 347 *Bunding Guidelines*, and the bunding requirements of Section 5.9 of Australian Standard AS1940 *The Storage and Handling of Flammable and Combustible Liquids*;
- Spill recovery and containment kits will be maintained at all fuel storage areas and all vehicles over 3.5 t (in particular, construction equipment fitted with hydraulic power packs or actuators) will carry a spill kit capable of containing any spills;
- Spill response equipment will be located at all drainage crossings during construction. In the event of a spill, work will be shut down at the spill site and the spill response will be activated. Measures will be put in place to prevent recurrences.
- Construction crews will be trained in the use of these kits;
- Pipeline construction machinery and equipment will not be refuelled within 100 m of any watercourse;
- EPA will be notified of any spills that may impact on waterways in accordance with EPA guidelines.

Site specific procedures for boring setup, operation and decommissioning will be implemented by the boring contractor - refer Section 6.2.1 and 6.2.3.

Refer also to Section 9.5 for management of incidents involving spills and for the requirements of notifying the EPA for Reportable Incidents.

6.11 Waste

Inappropriate management of waste may result in contamination of the environment and regulatory breaches. All personnel are required to conform to State regulations for waste management and litter control.

6.11.1 General Requirements

All wastes will be disposed of in an environmentally acceptable manner and as per the construction contractor's waste disposal procedure. Waste management procedures need to comply with all necessary regulatory requirements and shall be based on the following principles listed in order of priority:

- Reduce wastes at the source;
- Reuse materials where possible;
- Recycle wastes where practicable;
- Dispose of wastes appropriately and responsibly.

Persons handling waste shall follow the following guidelines to ensure that the environmental impact associated with the pipeline construction are minimised:

- Littering of the construction area shall not be tolerated;
- Portaloos shall be chemical closets and managed by a licensed Sullage Contractor. The disposal of collected sullage shall be in accordance with EPA's Waste Guidelines;
- All putrescible rubbish shall be removed from the site and legally disposed of daily;
- Liquids, such as sump oil, diesel and kerosene that cannot be reused are to be placed in labelled 205L regulated waste drums (separate to condensate waste). Once the container is full a licensed contractor is to collect for recycling or licensed disposal. Note that fuels and chemicals shall not be stored or handled in the vicinity of waterways or water storage areas;
- Solid wastes contaminated by hazardous materials, such as oily rags or filters, should be placed in a suitable storage drum. The contents of full drums should be bagged and removed for disposal by a waste contractor;
- Spent Absorbent Materials shall be bagged and stored in a suitable storage container (a 205 L regulated waste drum) labelled accordingly. Full containers will be removed by a licensed contractor to licensed landfill;
- Vegetation wastes resulting from weed control, poisoning or manual clearing of sucker regrowth are to be disposed of in a manner approved by the Project Manager.

Management of waste materials from pipe stringing and welding (eg grinding dust), as well as from the pipeline tie-in, is to be undertaken by licensed contractors. Permits from regulatory authorities are to be obtained where appropriate and waste materials disposed at appropriately licensed landfills.

6.11.2 Trench Water

Water may accumulate in the open trench via rain, run-off or seepage from groundwater. Appropriate management of such water is required to ensure that its disposal does not adversely affect land productivity via erosion or distribution of contaminants. It is equally important to ensure that any such water does not adversely affect any waterbodies or drainage systems in the vicinity (including stormwater drainage systems).

If water is found in the trench, dewatering will be carried out in accordance with EPA's guidelines, "Construction Guidelines for Major Construction Sites-December 1995". The following measures will be utilised to address potential impacts associated with dewatering:

- The removal and subsequent discharge of water from the trench shall not result in erosion and shall be discharged from the trench in a manner that does not impact on native vegetation, cultural heritage sites, waterways or create erosion;
- Water shall be disposed in a manner that will ensure no adverse impacts from sediment load or low dissolved oxygen levels to waterways. Water from trench de-watering will therefore be disposed to land via an energy-dissipating and sediment-trapping system (eg via grassed areas,

straw bales or geotextile filter/fabrics) and shall not be disposed directly into a waterway or result in flooding of the easement;

- Water quality shall be monitored for odour and discoloration and appropriate discharge options adopted, if required. The removal and subsequent discharge of water from the trench shall not result in pollutants being released to land or water (such as sediment, saline, contaminated or acid sulfate affected water). Excess water will be tested for pH and electrical conductivity prior to being pumped out of the trench;
- The pump intake should be kept as close to the surface of the pool as possible to minimise sediment uptake;
- The outlet shall be placed in such a way that it doesn't increase turbidity in the downstream side. Therefore, sediment control devices may be required to ensure sediment load is no greater than upstream conditions. If required, water from trench de-watering will be disposed to land via an energy-dissipating and sediment-trapping system (e.g. rock rip-rap, or geotextile filter/fabrics) and shall not result in flooding of the surrounding land;
- Excessively saline or acidic water will be disposed of at an EPA-licensed facility.

6.11.3 Pipeline Testing

Key issues relating to pipeline testing and commissioning are:

- Temporary third party deprivation of water resources.
- Modification of test water quality via use of chemical additives (e.g. corrosion inhibitors, biocides);
- Disposal and management of hydrotest water including:
 - Potential impacts to aquatic fauna
 - Soil contamination, erosion and sedimentation resulting from hydrotest water discharge

Water for hydrostatic testing will be sourced from town water supply and approvals will be obtained from the local water authority.

A pig will be used to remove the majority of scale prior to hydrostatic testing. This, together with the quality of sourced water, should ensure that the risk of sediment from the pipe is low and that the quality of post-hydrotest water is maintained. Standard handling and safety procedures apply for disposal of all pigging waste.

The hydrostatic testing will be conducted from the new Lilydale Pressure Reduction Station. No additional additives will be required as the water will not be held in the pipeline for an extended period. The pipe will be dewatered using bi-directional pigs and will be filtered through sediment tanks and silt dams, and then released naturally through existing swales. Turbidity and pH tests will be conducted prior to final release. Council will also be offered the opportunity to take hydro-test water via tankers for use in watering turf/playing fields/flowerbeds and dust suppression within the local area.

A number of measures shall be adopted to ensure appropriate environmental management during pipeline testing and commissioning including:

- The use of environmentally harmful chemical additives in the hydrotest water, such as corrosion inhibitors and biocides, shall be avoided;
- Hydrotest water shall be checked for water quality parameters prior to determining disposal options including, at a minimum, tests for pH, dissolved oxygen and electrical conductivity;
- Sediment control devices will be employed to remove suspended solids such as geotextile fabric filters or hay bales;
- Rates of disposal are to be controlled to ensure scour or erosion of soil is minimised and to ensure that any discharges do not cause flooding or runoff beyond the area of intended discharge. Methods such as energy dissipaters should be employed where required. Spray bars may also be utilised to ensure dissolved oxygen levels are acceptable;

- Records will be kept of water sourcing, testing and disposal.

The hydrotest water will be disposed of in accordance with relevant regulatory requirements and approvals including applicable water quality standards as required by relevant regulations such as the *SEPP (Waters of Victoria)*:

All work associated with the hydrostatic testing of the pipeline that will be used for the crossing of the Yarra River will be conducted under the approved HDD management plan. These will include:

- All hydrostatic testing water will be collected in holding tanks and no water will be disposed into the Yarra River or the surrounding billabongs;
- Bunding methods will ensure no water directly enters a watercourse or causes erosion or flooding;
- The Shire of Yarra Ranges will be invited to take the water, in the first instance, for use in watering turf/playing fields/flowerbeds and dust suppression within the local area. Applicable water quality standards will be adhered to.

The EPA will be advised prior to discharge and invited to comment on the discharge plan.

7. ORGANISATION AND RESPONSIBILITY

The project will be constructed and commissioned in accordance with Jemena’s Health Safety & Environmental Management System (‘HSEMS’). Responsibility for environment management of the project rests ultimately with Jemena. The Construction Contractor will be obliged to meet environmental requirements through contractual arrangements. All Jemena and Contractor personnel are responsible for ensuring that their work complies with the project EMS as detailed in this CEMP. Responsibilities for the implementation of Jemena’s HSEMS have been allocated to project personnel and are listed in Table 13. The Contractor’s proposed Project Organisation Chart is contained in APPENDIX H.

Table 13: HSEMS and Project Responsibilities

Position	General Responsibilities	Specific EMS Responsibilities
Jemena Project Manager/ Construction Manager	<ul style="list-style-type: none"> Reports directly to Jemena senior management. Responsible for project management of the pipeline installation. Responsible for overall implementation of the project EMS. 	<ul style="list-style-type: none"> Reports to Jemena senior management on environmental matters. Ensures appropriate Jemena and contractor resources are allocated to implement the HSEMS. Ensures project approvals are in place. Orders STOP WORK for any environmental breaches and reports incident to DPI and other relevant authority Reports to regulatory authorities on environmental matters in accordance with legislative requirements. Ensures environmental induction and training program is developed and implemented. Ensures adjoining landowners and other stakeholders are kept informed of matters relating to their interest. Coordinates the environmental inspection and monitoring program. Monitors performance against Key Performance Indicators
Construction Contractor	<ul style="list-style-type: none"> Reports to the Jemena Project Manager. Responsible for implementing the requirements of the EMP. 	<ul style="list-style-type: none"> Reports to Jemena Project Manager on environmental matters. Ensures appropriate contractor resources are allocated to implement the HSEMS. Ensures project permits are in place. Orders STOP WORK for any environmental breaches and reports incident to Jemena Project Manager. Ensures environmental induction and training program is implemented for all construction personnel. Ensures landowners and other interested parties are notified of noise, dust and traffic issues or other matters relating to their interest. Manages the daily and weekly environmental inspection and monitoring program. Monitors performance against Key Performance Indicators
Jemena Construction Inspectors	<ul style="list-style-type: none"> Field based personnel responsible for inspecting and checking construction activities for compliance with construction contracts and project objectives. 	<ul style="list-style-type: none"> Assesses contractor and Jemena compliance with EMP procedures on an ongoing basis.

<p>Jemena Construction Supervisor/ Health, Safety and Environment (HSE) representative</p>	<ul style="list-style-type: none"> • Provides specialist advice to the Construction Manager on HSE matters on a day to day basis. ▪ Arranges induction training ▪ Ensures personnel hold relevant experience and training. 	<ul style="list-style-type: none"> • Reviews contractor environmental induction and training program for compliance with EMP requirements. • Ensures weekly environmental audits are completed and any shortfalls are brought to the notice of the Jemena Project Manager/Construction Manager for KPI management.
<p>Easement & Land Management representative</p>	<ul style="list-style-type: none"> ▪ Liaison with stakeholders, to ensure minimal disruption; acquire relevant interests in land. 	<ul style="list-style-type: none"> ▪ Ensure compliance with commitments to landowners, investigate complaints and settle compensation issues.
<p>Jemena's Environmental Representative(s)</p>	<ul style="list-style-type: none"> ▪ Provide expert guidance and monitoring of environmental performance in accordance with CEMP to Jemena Project Manager 	<ul style="list-style-type: none"> ▪ Undertake periodic audits to ensure compliance to CEMP. ▪ Attend HDD of the Yarra River to ensure compliance with CEMP and Melbourne Water permit requirements. ▪ Attend construction during boring under trees in High Impact Zone to ensure compliance to Arborist's recommendations. ▪ Issue non-conformance requests on environmental issues identified during field audits. ▪ Orders STOP WORK for any environmental breaches and reports incident to Jemena Project Manager.
<p>Community Relations Manager</p>	<ul style="list-style-type: none"> ▪ Liaison with media/public ▪ Public relations management with regard to incidents 	<ul style="list-style-type: none"> ▪ Liaises with media ▪ Public concerns/complaints

8. TRAINING AND COMMUNICATION

8.1 Training

All Project personnel, subcontractors, consultants and visitors will receive inductions into the Jemena's environmental obligations prior to commencing on site. All environmental inductions will be conducted as part of the EMS.

Project induction and training will fall under the following categories:

8.1.1 General Project Induction

A General Project Induction will be developed to induct personnel into the broad aspects of the Project. The environmental component of this induction will reinforce that it is the responsibility of all personnel to adhere to the environmental requirements. The Induction will cover the following environmental components with respect to the Project as a whole:

- Community Issues;
- Significant trees;
- Significant habitat;
- Cultural heritage (to be presented by the RAP);
- Fire prevention and response;
- Reportable incidents (including definitions and reporting requirements);
- Project emergency contact details;
- Key environmental issues including noise, waste management, dust management, soil and water management, traffic and access, Aboriginal and Non-Aboriginal heritage and flora and fauna.

8.1.2 Visitor Induction

Special short inductions may be provided for personnel working short-term on the project where there is minimal potential for environmental harm and visitors.

All visitors must undergo a visitor's induction. Subcontractors are responsible for the actions and conduct of their visitors, and shall ensure that visitors obey all environmental requirements of the site.

All visitors shall be accompanied at all times. Under no circumstances shall a visitor undertake any physical work on site.

8.1.3 Job Specific Environmental Training

Jemena will ensure that its project personnel have appropriate training and experience necessary for their roles and responsibilities and an awareness of their environmental duties and obligations.

The Project team will keep records of experience, qualifications and training undertaken.

8.2 Communication

8.2.1 Consultation

A Consultation Plan for the project was prepared on 8 April 2010 in accordance with Section 17 of the *Pipelines Act 2005* and approved by DPI on 4 May 2010 (Multinet Gas , 2010).

A diverse range of stakeholders has been identified as having an interest in the Lilydale to Yarra Glen Pipeline project. Table 14 identifies the stakeholders and groups them into broad categories reflecting their differing interests.

Consultation with relevant stakeholders is to be undertaken during all stages of the project. During the construction of the pipeline, the Easement and Land Management Coordinator will continue to consult with affected landholders, aboriginal representative bodies and Government agencies.

8.2.2 Client Contractor Meetings

During the construction of the pipeline, Jemena project meetings will be held initially on at least a weekly basis. The meeting agenda will include an environmental management section where the contractor's performance will be discussed and appropriate action plans developed consistent with the project's environmental objectives. Meetings will be minuted.

8.2.3 Environmental Construction Inspectors

At the direction of the Project Manager, environmental monitoring of construction aspects will be undertaken at:

- the start of the project, where photo-monitoring points will be established;
- during and following the clear and grade of the corridor where a check of environmental performance will be undertaken principally for soil management, sedimentation and erosion;
- following pipe laying and trench reinstatement;
- following corridor reinstatement and reseeding where an audit will be undertaken for the progress of rehabilitation works;
- following any other significant project activity such as during watercourse crossings and/or thrust boring operations.

The construction inspectors will be required to report performance of Contractors with regard to the CEMP to the Project Manager on a regular basis (refer Section 9). A KPI performance/penalty system will be applied to the EPI Construction contractor and sub-contractors.

8.2.4 Landowner/Occupiers

Consistent communications with landowner/occupiers is essential to the successful delivery of the project and ongoing relationship. The main goal for the Easement and Land Management Manager is to:

- Open and maintain communications with stakeholders;
- Convey concerns of stakeholders to the Project Manager;
- Facilitate solutions to landowners issues;
- Manage specific landowner requirements.

A register of landowners has been established and they have been marked on the Alignment Sheets for the project (refer Section 10.1).

Table 14: Key Stakeholders

Stakeholder	Group Description
Client	<ul style="list-style-type: none"> • Multinet Gas
Landholders	<ul style="list-style-type: none"> • Landowners and occupiers whose property will be traversed by the pipeline; • Lilydale Memorial Park
Interest groups	<ul style="list-style-type: none"> • Yarra Valley Tree Group • Upper Yarra and Dandenong Environment Council ('UDEC') • Group for the Lilydale and District Environment ('Glade')
Aboriginal organisations	<ul style="list-style-type: none"> • Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc
Government (local council, members of parliament)	<ul style="list-style-type: none"> • Shire of Yarra Range
Regulatory bodies	<ul style="list-style-type: none"> • Department of Environment, Water, Heritage and the Arts(Canberra) • Aboriginal Affairs Victoria • Country Fire Authority • Department of Planning & Community Development • Department of Primary Industries • Department of Sustainability and Environment • Environment Protection Authority • Heritage Victoria • Melbourne Water • Port Phillip and Westernport Catchment Management Authority • VicRoads • Energy Safe Victoria • Victorian Work Cover Authority
Third Party Infrastructure Providers	<ul style="list-style-type: none"> • SP AusNet transmission towers • Telstra • United Energy Distribution electricity • APA GasNet TP main and Yarra Glen Line Valve • Multinet TP Main • Multinet Yarra Glen City Gate • Yarra Valley Water
General public	<ul style="list-style-type: none"> • Residents, road users, • Schools • Spadoni's Reserve users

9. REPORTING

Periodic reviews of the overall effectiveness of the CEMP will be undertaken on regular basis to ensure continual improvement and sustainability.

Monitoring of the ROW will be undertaken by the construction contractor to demonstrate compliance with this CEMP and statutory requirements. Environmental aspects for inspection have been discussed in section 8. The following sections outline the guidelines for pipeline inspections and corrective actions.

9.1 Daily Inspections

Daily inspections of the works within the project area shall be performed by the construction contractor. Proforma to be completed for these inspections are contained in APPENDIX J. This will include monitoring for:

- ROW management;
- Access;
- Tagging of environmental or heritage issues;
- Soil management;
- Erosion control;
- Sediment control;
- Weed management;
- Dust control;
- Noise control; and
- Waste management.

Results of the inspections will be reported to Jemena for calculation according to the KPI performance/penalty system.

9.2 Weekly Reporting

Weekly reporting of the status of the construction will be provided to DPI and will outline, at a minimum the following:

- Work status;
- Environmental activities undertaken;
- Monitoring undertaken;
- Consultation undertaken;
- Completed reinstatement; and
- Tasks to be completed.

A copy of the weekly progress report is to be forwarded electronically to DPI at the following address:

operational.reports@dpi.vic.gov.au

9.3 Landowner/Occupier Signoff

Prior to construction commencing, Jemena's construction contractor will take a Video Log of the route showing each property's pre-construction condition to guide rehabilitation standards. Following completion of works on each property, interviews will be held with each landowner to ensure rehabilitation works are completed to their satisfaction and that the land has been reinstated at least to the condition specified in the Property Inspection Form. Please refer to the approved Consultation

Management Plan for the project. Satisfactory completion will be recorded on a standard damage release form which will be countersigned by the landowner upon satisfactory completion of rehabilitation. Compensation arising from construction losses will be assessed following completion of restoration works. The completed result must be, at least, to the standard of the pre-construction condition.

9.4 Monitoring of Rehabilitation Works

The main outcomes from the rehabilitation works are:

- Rehabilitation works will be completed to a standard acceptable to Jemena and the landholders;
- Conditions on the easement following construction will be returned to a standard that is comparable to the pre-pipeline environment as evidenced by the pre-construction Video Log;
- The construction ROW environment will remain stable over the long term;
- The visual impact of construction works will be minimised.

Monitoring and reporting requirements includes the following:

- An inspection of completed rehabilitation works by Jemena with the Construction Contractor will determine if the works have been carried out to an acceptable standard and areas requiring remedial action;
- Construction Contractor to attend to all requirements of Melbourne Water regarding the monitoring and rehabilitation of watercourse crossings including pre-construction inspection, practical completion inspection and final inspection;
- A Post Construction inspection will be conducted with the Construction Contractor, prior to the expiry of the Defects Liability period, to identify areas requiring further remedial action;
- Vegetation growth along the corridor for soil stabilisation problems, weed invasion and revegetation effectiveness will be ongoing;
- The monitoring will be done jointly by Jemena through the use of internal auditors and the construction contractor.

9.5 Environmental Incident Reporting

9.5.1 Incident Reporting

All incidents shall be investigated commensurate with the seriousness or potential seriousness of the incident. Incident investigation helps to prevent not only a recurrence of the specific incident, but a whole class of aligned incidents.

‘Incidents’ are defined as unplanned events with undesirable consequences. The consequences of such incidents may result in environmental damage or asset loss. “Near misses” can be defined as extraordinary events that could have reasonably resulted in an incident.

All incidents including those involving contractors and visitors that occur during construction shall be recorded and managed according to Jemena’s Incident Management System (‘IMS’). All environmental incidents and near misses must be reported to the Project Manager, in particular:

- All loss of containment or releases of liquids, solid, or gas;
- Any dangerous goods or hazardous substance spills (any volume or weight);
- Complaints by landowners and other stakeholders;
- Regulatory Breaches - Fines, Prosecutions, Improvement Notices, Breaches of licence conditions;
- Property damage or loss - all incidents (e.g. third party);
- Loss or damage to native vegetation or flora and fauna significance (e.g. flora & fauna near the drainage, as mentioned in Table 6).

This shall occur as soon as possible after the incident has occurred to ensure that Jemena meets their regulatory obligations. In some cases, reporting to the Minister is required within 2 hours of the incident - refer below.

Information recorded for all incidents shall include:

- Initial Report & Notification detailing facts about the incident;
- The classification of the incident including 'environment', 'third party encroachment', 'fire';
- For environmental incidents, the type of environmental impact including water, air, land, noise, flora/fauna, cultural heritage or waste management;
- Whether the incident relates to a contaminant spill or release;
- Specific details and sources if relating to fires;
- Risk assessment based on Jemena's risk matrix;
- Whether the incident resulted in Regulatory Non Compliance;
- Whether the incident resulted in security breaches;
- Investigation of the incident;
- Actions for resolution.

Jemena's HSE Management System also contains procedures for:

- Hazard & Risk Management;
- Incident Management;
- Emergency Preparedness; and
- Performance, Measurement and Reporting.

The supervisors) are responsible for the regular review of work reports to implement modifications to the work program and work practices.

Reportable Environmental Incidents

The *Pipelines Regulations 2007* require that the Minister must be notified of all reportable environmental incidents no later than 2 hours after the incident occurs or 2 hours after the licensee becomes aware of the incident. Reportable incidents are those:

- That cause substantial damage to the environment; or
- That has significant potential impact on the environment.

Environmental incidents that shall be reported to DPI immediately (no more than 2 hours) after the incident occurred shall include:

- Any spill to a watercourse, including drains as defined under the *Water Act 1989*;
- loss of hydrocarbons or chemicals greater than 20L in volume to land;
- spills or releases, including soil movement, which has moved offsite and has had a negative impact;
- death or injury to native fauna or livestock;
- damage caused to significant and/or flagged flora that impacts on its survival;
- disturbance caused to significant fauna which impacts on the survival of the population;
- interference with cultural heritage sites without appropriate approval;
- transfer of known noxious weeds and diseases as a result of pipeline construction activities;
- transfer of known noxious weeds as defined in the CALP Act and plant and animal diseases that threaten the biosecurity of any property;
- frac outs;
- mass soil movement which has moved offsite and has a negative impact;
- soil inversion;
- damage to property outside the ROW;

- unresolved landowner issues whereby agreement on the solution plan cannot be reached;
- incident that is likely to cause regional or widespread negative publicity;
- serious environmental damage or imminent risk of serious environmental damage;
- significant environmental breach of CEMP or other legislative requirement.

Contact numbers for incident reporting are provided in Appendix I. This includes a dedicated 24 hour emergency/incident mobile number for reporting to DPI:

0419 597 010

A written report of the incident must be submitted to the Minister no later than seven (7) days after the incident occurs - refer to the *Pipelines Regulations* for a description of the contents of the report.

9.5.2 Complaints Procedure

In the event of an environment-related complaint from the community regarding noise, waste, air emission or general pipeline operation issues, the Community Relations Manager will ensure the matter is recorded and shall undertake further investigation. Responses and actions to manage the complaint shall be documented through the Incident Management system.

Jemena should notify, if necessary, the EPA and other relevant authorities in accordance with statutory requirements.

9.5.3 Reporting Responsibilities

The Project Manager is responsible for the initial reporting of significant non-compliances with this CEMP or relevant legislation to the relevant statutory authorities in accordance with legislative requirements.

The Project Manager is the primary contact for government environmental agency officers with regard to environmental issues in the field whilst all contacts at a senior level will be through the Project Director.

Other environmental responsibilities are described in Section 7.

9.5.4 Corrective Action

Where corrective or preventative action is required based on monitoring, incident reports/investigations, or work site inspections, these actions will be documented.

The Jemena Project Manager will issue a request for corrective action to the relevant Construction Manager. The Construction Manager will action the request as appropriate and provide updates on progress in addressing the issue at contractor meetings or as requested by the Jemena Project Manager.

9.6 Operation Environmental Management Plan

Jemena has an approved Operations Environmental Management Plan ('OEMP') under the *Pipeline Regulations 2007* relating to Jemena pipelines in Victoria. As previously agreed with the Regulator, Energy Safe Victoria, this OEMP will be updated to include this new pipeline prior to the completion of construction and the rehabilitation monitoring period.

The implementation of the OEMP will be the responsibility of Jemena operations and maintenance and will outline the environmental monitoring program for the life of the pipeline.

9.7 Melbourne Water Environmental Management Plan

An Environmental Management Plan (EMP) specific to the management of watercourse crossings has been prepared and approved by Melbourne Water prior to commencement of the Yarra River HDD. This provides all measures for the appropriate management of environmental issues associated with the construction and rehabilitation of the water course crossings.

The construction contractor is responsible for the successful execution of the project including all environmental requirements outlined in the EMP for the HDD crossing beneath the Yarra River. Melbourne Water requirements include a pre-construction inspection by Melbourne Water and the constructor, a practical completion inspection following construction and a final inspection at least three months following construction.

10. ENVIRONMENTAL MANAGEMENT TOOLS

A number of tools designed to assist in the management of environmental issues during the construction of the Lilydale to Yarra Glen Pipeline Project have been prepared. These include:

- Detailed mapping showing the pipeline route and the locations of known sensitive environmental and cultural heritage sites such as Spadoni's Reserve and Tarcoola on the Yarra;
- Proformas for recording of environmental inspections; and
- Procedures in the event of an emergency.

During the construction of the pipeline, Jemena will:

- Direct the Construction Contractor to follow all permit conditions, environmental regulations and to meet, in real terms, the commitments made;
- Continue to consult with affected landholders, aboriginal representative bodies and Government agencies.

10.1 Alignment Sheets

Alignment sheets depicting the route of the pipeline have been prepared. These include provision for marking of environmental issues such as:

- Vegetation management;
- Heritage management.

A copy of the alignment sheets is included in the construction specification.

10.2 Technical Drawings

A register of technical drawings is maintained by Jemena. These include:

- Special Crossing Drawings including Horizontal bores, road crossing details and water crossing details;
- Drawings for particular design features such as drainage bank restoration, vehicle crossings, property gates etc.

All Special Crossing Drawings are cross-referenced to locations on the pipeline including chainage and/or property number.

10.3 Proformas

Proformas to be utilised to monitor and report during the construction phase of the project have been prepared and include:

- Construction progress reports;
- Environmental incident reports (refer APPENDIX I);
- Non-conformance reports;
- Complaints register;
- Remedial actions taken following incidents, non-conformances or complaints;
- Inspection and monitoring reports (refer APPENDIX J).
- Induction attendance records;
- Consultation records and meeting notes;
- Complaints register.

Specific records relating to emissions and waste discharges will need to be maintained on site and include:

- EPA Waste Transport certification for the transport of contaminated soil, solid wastes, spent absorbent materials, oils and lubricants and sillage;
- Landfill/receiving facility disposal acceptance approvals;
- Drilling Fluid Loss Reporting System;
- DPI and Council approval for noise emissions outside of working hours covered by SEPP;
- Notifications to landholders and interested parties for noise involving hydrostatic testing;
- Wheel wash certification for all construction vehicles and equipment commencing on the project;
- Register and copies of all MSDS;
- Register of spill containment kits;
- Hydrostatic testing water quality measurements for pH, DO and EC;
- EPA waste discharge approval for hydrostat testing and waste trench water.

Jemena will report on environmental performance in accordance with regulatory requirements. In the event of an incident covered by EPA legislation, an incident report will be raised and the EPA's head office will be advised.

10.4 Emergency Response Procedure

Appropriate risk management and the prevention of emergency situations is fundamental to all project activities and the implementation of the project CEMP is aimed at anticipating, preventing and mitigating foreseeable risks associated with this project. Part of the risk management strategy is also to ensure that in the event of an emergency situation plans have been developed so that pre-planned response, notification and recovery activities can be initiated.

Jemena-Multinet Gas Emergency Response Management Plan MNG-PL-0001 (ERMP) establishes the structure of emergency teams, the communication processes and the resources which may be required for managing the emergency. The Emergency Manual comprises the following:

- General Responsibilities;
- Incident Management and Notification structure;
- Event Classification and Notification;
- Resources; and
- Training requirements.

The objectives of the Emergency Response Management Plan are to:

- Decrease the level of risk to life, property and the environment;
- Describe how an emergency response is initiated and how the emergency teams are activated;
- Specify command, control and communication arrangements between Jemena; contractors, external response agencies and statutory authorities;
- Identify the roles and responsibilities of all personnel likely to be at the site of the emergency or involved in the response;
- Identify emergency response equipment required;
- Identify training requirements for response personnel;
- Provide the basis for training of all people who could be involved in an emergency.

The ERMP has been tested during two separate exercises being firstly, a field-based test codenamed as "Exercise Flathead" conducted on 25 February 2010 and secondly, a desktop exercise codenamed "Exercise Crown" conducted on 6 October 2010. Two further exercises are planned for 2011.

The objectives of the exercises were to test the capability of Jemena in responding to a gas transmission/distribution emergency, in the Multinet Gas Network with a particular emphasis on:

- Notification and mobilisation of the emergency response teams.
- Transfer of the command and control as the incident escalates.
- The existence and effectiveness of communication protocols and interfaces, between:
 - Site, and Emergency Teams within Jemena; and
 - External groups such as emergency services,
 - The ability to recognise, respond to and manage non-technical emergency issues.

A Project specific EMP has been developed by the Construction Contractor that aligns with the Jemena-Multinet Gas ERMP.

11. REFERENCES

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12. STATEMENT OF LIMITATIONS

Monarc Environmental Pty Ltd ('Monarc') has prepared this Construction Environment Management Plan for Jemena Asset Management (6) Pty Ltd ('Jemena') for the construction of the Yarra Glen to Lilydale pipeline along Victoria Road, Lilydale. This project will be undertaken for the MultiNet Gas Distribution Partnership.

Monarc has exercised care in checking and interpreting the data and information referred to in this report. The report has been designed in good faith in a manner that seeks to confirm the information available and test its accuracy and completeness. However, Monarc cannot guarantee the accuracy of completeness of that data and information. Accordingly, while our conclusions are based on the information available to us during our assessment of the alignment, some of those conclusions could be different if the information upon which they are based is determined to be inaccurate or incomplete.

Persons seeking to rely upon the report should only do so after seeking independent expert advice from a Natural Resource Environmental Auditor or other appropriately qualified person. The extent of any environmental, health and safety or financial risks associated with the alignment may vary significantly according to the proposed use or development of the site.

Therefore, any representation, statement, opinion or advice expressed or implied in this report is made in good faith but on the basis that Monarc, its agents and employees are not liable to any other persons for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

Monarc disclaims any obligation to update the report for events taking place, information becoming available or known to us, after the preparation of this report.