



## OPTIONS REPORT

LAND DEVELOPMENT AROUND PIPELINES  
FEBRUARY 2016

**This report has been prepared by the office of Spiire**

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### **Acknowledgements and Recognition**

We would like to acknowledge the input to this report from the Land Development Around Pipelines Working Group, comprising representatives from the following organisations:

**Energy Safe Victoria**

**Australian Pipelines and Gas Association**

**APA Group**

**Metropolitan Planning Authority**

**Department of Environment, Land, Water and Planning**

**Department of Economic Development, Jobs, Transport and Resources**

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## Contents

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1	Introduction	4
2	Key Issues	6
3	Other Jurisdictions	7
4	Options	10
5	Summary of Recommendations	22

### Appendices

Appendix 1 – Western Australian Planning Commission, Planning Bulletin 87

Appendix 2 – ‘Guideline for the Planning and Development of Land in the Vicinity of High Pressure Natural Gas and Liquid Petroleum Pipelines’, SeaGas and Epic Energy, October 2010

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# 1 Introduction

Land development around pipelines (LDAP) is a complex issue. The technical aspects of the relevant legislation and regulations, such as the Pipelines Act 2005 and AS2885, make it difficult for the planning industry to understand the issue in detail. Equally, the pipeline industry does not entirely grasp the intricacies of the Victorian planning system, and how their own regulatory requirements can be met within a complex planning framework.

To explain this complexity in simple terms, there are significant changes occurring within the land use and development environment around existing pipelines across Victoria. The potential risk associated with the proximity of land use and development to these pipelines and to the community is not being adequately considered.

This issue is not necessarily new, but a range of factors has culminated in a need to adequately consider and address the matter. Such factors include:

- the rapid growth and change that our cities are undergoing.
- the outcome of the Bushfire Royal Commission, which has led to Energy Safe Victoria (ESV) restructuring and being better resourced to investigate the causes of, and support pipeline licensees in addressing, non-compliance.

Melbourne's 2002 city plan, *Melbourne 2030*, introduced the concept of limits to urban expansion subsequently formalised through the application of an Urban Growth Boundary (UGB). Since that time, the UGB has been modified at least four times, essentially reclassifying over 61,000 hectares from farmland to enable future urban development. Victorian regional cities have also continued to experience this outward growth.

Within our cities, former industrial areas are undergoing unprecedented urban renewal and being recast as high-density activity centres for a mix of uses.

As a result of these fundamental changes to our cities, existing pipelines are being encroached upon.

The changing nature of cities and towns presents challenges for the pipeline industry in meeting their legislative and regulatory obligations to assess risk.

The current land use planning system provides little direction in relation to development around pipelines, and there is no requirement for planning authorities to either consult with or refer applications to relevant licensees. The *Pipelines Act 2005* and AS2885 similarly fail to recognise the planning system, using terminology that is not only inconsistent with the planning system but also contrary to it.

This lack of coordination and consideration across industries is creating difficulties for all those involved. The responses to the issue have, to date, been inconsistent and confused. The information available about the issue is limited, and there remains limited awareness of the issue across the planning industry.

ESV, as the technical regulator of the pipeline industry in Victoria, is concerned that this lack of coordination across industry and Government has the potential to increase risk to new communities and urban renewal areas being built in proximity to these pipelines.

ESV has led the formation of a cross-governmental working group (the working group) to discuss the issue more broadly and seek input on what steps should be taken to bring attention to the issue.

The Minister for Planning established a Ministerial Advisory Committee (MAC) on Major Hazard Facilities in late 2015. The MAC provides an ideal opportunity for the issue to be appropriately considered at a State wide level and has made reference to pipelines in its recently released discussion paper.

A Background Report was prepared by Spiire in February 2016 to assist ESV in their preparation of a submission to the MAC. This Options Report follows the preparation of the Background Report and considers a number of options to better manage the issue of land development around pipelines.

This report and the options presented has been a collaborative effort with members of the working group providing considerable input. The recommendations respond to key concerns raised by all sectors affected by the issue.

The Report sets out:

- The key findings from the Background Report;
- A summary of how development around pipelines is managed in other jurisdictions;
- A series of options to address the key themes arising from the Background Report; and
- A summary of recommendations.

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## 2 Key Issues

The Background Report prepared by Spiire dated February 2016 provides an overview of the issue that will not be repeated here. The key themes from the Background Report are as follows:

### **Theme 1: Mapping and Data**

- Datasets available to Local Government indicating the location of existing pipelines are not accurate.
- Landowners and developers don't know where pipelines are located, unless there is an easement on Title.
- Without seeking information from ESV or pipeline licensees, stakeholders don't know a pipeline measurement length, what risks are associated with that particular pipeline (i.e. to people or the environment), what classification the land has under AS2885 or what the pipeline is carrying.

### **Theme 2: Awareness & Education**

- There is a general lack of understanding within the planning industry and the community at large of pipeline infrastructure and its associated risks.
- The pipeline industry does not entirely understand the intricacies of the Victorian planning system.

### **Theme 3: Planning Industry Tools**

- There is little guidance for Local Government in dealing with pipelines in the Victorian planning system.
- There is no requirement for licensees to be notified of land use changes or significant developments in proximity to pipelines, outside of Planning Scheme Amendments.
- There is no ability for planners to consider risk associated with development around pipelines in their decision-making.
- As pipelines are not managed via a State-wide planning mechanism, Panels who have considered Planning Scheme amendments for land affected by a pipeline have provided varying recommendations as to how it may be best managed for that particular area.

### **Theme 4: Pipeline Industry Tools**

- There are a number of inconsistencies in terminology between AS2885 and the Victorian planning system, particularly in relation to 'land use classifications' and 'sensitive uses'.
- There is no central guidance available to developers or landowners about the process of gaining approval from a licensee to cross or traverse a pipeline easement.
- In the current situation, pipeline licensees are finding it increasingly difficult to comply with their relevant legislative requirements.
- When pipeline licensees are notified or consulted about proposed developments, advice from them is inconsistent, too late and provided on a case-by-case basis.

Options for responding to these issues are discussed under these key theme headings in Chapter 4 of this report.

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### 3 Other Jurisdictions

Whilst the *Pipelines Act 2005* and AS2885 both apply nationally, planning in Australia is dealt with at the State level. There is little consistency in how planning systems in each State manage the issue.

There are some good examples that Victoria can draw upon, particularly in Western Australia and South Australia. However, neither of the approaches taken by these States applies consistently across the State nor is either approach replicable for Victoria.

A summary of how land use and development around pipelines is managed in a number of Australian States is outlined below.

#### **Western Australia**

Western Australia is considered to have the most sophisticated approach to managing land use and development around licensed pipelines.

The *Planning and Development Act 2005* is the overarching legislation governing planning and development in Western Australia. The Western Australian Planning Commission prepared the 'Planning Bulletin 87: High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region' (the Bulletin) which applies to the Perth metropolitan region as defined by the Metropolitan Region Scheme. It applies to schemes, scheme amendments, structure planning, subdivision or development within the vicinity of the Dampier to Bunbury Natural Gas Pipeline corridor and the Parmelia Gas Pipeline easement.

The Bulletin provides a 'Notification Area' to define where consultation must occur with the pipeline owner regarding certain activities within proximity to a pipeline. In addition, it provides guidance regarding the setback distance, risk mitigation measures and a pipeline risk assessment for proposed development in a setback area. The risk assessment guidance is based on EPA risk criteria as set out in 'EPA Guidance Statement 2, July 2000: Guidance for risk assessment and management: off-site individual risk from hazardous industrial plant'.

The Bulletin clearly articulates the purpose and application of the controls. The setback distances for sensitive uses, as outlined in Table 1 in the Bulletin, are simple to understand and we note that a definition for sensitive development is also provided.

However, the controls set out in the Bulletin only apply to two pipelines within the Perth metropolitan region. It would be very difficult for Victoria to emulate these provisions for all 214 pipeline licenses.

A copy of the Bulletin is attached at *Appendix 1*.

#### **South Australia**

The *Development Act 1993* (the DA) and the associated *Development Regulations 2008* (the DA regulations) are the overarching legislation governing planning and development in South Australia. Transmission pipelines are essentially excluded from the operation of the DA and the DA Regulations.

Whilst the planning system provides no guidance in relation to development around pipelines, there is a helpful guidance note that has been prepared by South East Australia Gas Pty Ltd (SEA Gas). The 'Guideline for the Planning and Development of Land in the Vicinity of High Pressure Natural Gas and Liquid Petroleum Pipelines' outlines matters to be taken into account by the Department of Planning and Local Government (DPLG), local Councils and developers when considering land use changes and development proposals in the vicinity of high pressure pipelines. This guideline carries no statutory weight.

The purpose of the guideline is to:

- *'Establish a Notification Area along the length of each High Pressure Pipeline within South Australia to clearly define the region that could be affected by pipeline failure.*
- *To establish a process whereby developments planned, or being considered within the Notification Area are advised to the relevant Pipeline Operator in sufficient time for potential impacts on the safety profile of a pipeline to be managed, minimising the impact on both the pipeline and the development.*
- *Ensure future structure plans, development plans, development plan amendments, subdivisions and development will not inhibit the potential of an existing High Pressure Pipeline, to provide the future capacity required to meet the long-term needs for natural gas in South Australia.*
- *Provide a consistent approach for the assessment of structure plans, development plans, development plan amendments, subdivisions and development applications within the Notification Area of High Pressure Pipelines.'*

Once implemented, the process will:

- *'Ensure risk to persons, property and the environment is acceptable where structure plans, development plans, development plan amendments, subdivisions and developments are proposed within the Notification Area of a High Pressure Pipeline.*
- *Reduce potential risks to the Public and property arising from rupture of a High Pressure Pipeline during construction and maintenance works.'*

The Guideline provides some useful information about the impacts of land development around pipelines and measures that may be taken to reduce risk. Standard notification areas of between 200m and 640m are outlined for each of the 17 pipelines the Guideline applies to.

The Guideline suggests that notification to the pipeline operator should occur for **all** development, subdivision or rezoning proposals within the notification area. An exemption for *'incidental land use or development....that does not change the location classification under AS2885'* applies.

We are not aware of how successful the Guideline has been and whether local authorities are referring applications in line with the document.

A copy of this guideline is attached at *Appendix 2*.

## **Queensland**

In Queensland the overarching legislation regulating land use and development is the *Sustainable Planning Act 2009* and the *Sustainable Planning Regulations 2009*.

Currently pipelines are within, to a reasonable extent, some local Planning Schemes but not in others. Brisbane's City Plan has been identified as a plan that specifically addresses the protection of two major pipelines within the local government area. This plan specifies a range of distances, where if applicable, the development must comply with the Gas and Oil Pipeline Code. The performance criteria of the Code however do not prescribe an acceptable solution to achieving the safe operation of the pipelines and not increasing risk, which therefore results in inconsistent outcomes.

Some Council's will also informally refer development applications to pipeline licensees for affected properties.

A significant review and amendment to planning law and policy is currently underway in Queensland. It is proposed that the current State Planning Policies (SPP) be updated to maintain a single SPP for the entire State.

We understand that the pipeline industry is making considerable headway in having the issue of land development around pipelines considered as part of the Queensland review.

### **New South Wales**

The *Environmental Planning and Assessment Act 1979* is the overarching legislation for the assessment of development proposals within NSW. One of the objectives of this Act is to encourage the protection, provision and co-ordination of utility services. No further guidance is provided within the Act as to how these utility services (including pipelines) should be protected or co-ordinated with other land uses.

NSW does not have an overarching requirement for the 'consent authority', being either the Local Council or Minister for Planning (depending on the proposal) to consider the impact of a proposed development on or near a pipeline.

There is recognition of pipeline infrastructure in the State Environmental Planning Policies however there is a limited buffer provided as well as a lack of opportunity for pipeline operators to comment on proposed development.

### **Tasmania**

The *Land Use Planning and Approvals Act 1993* and the *State Policies and Projects Act 1993* set out the relevant planning legislation for Tasmania. There are no mechanisms within the planning legislative framework to consider the presence of existing pipelines or to manage land use and development around pipelines. There is, however, a mechanism under the *Gas Pipelines Act 2000* for the declaration of "pipeline planning corridors" which has placed a 'notification zone' around the Tasmanian Gas Pipeline.

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## 4 Options

The following section outlines the key themes (as identified in the Background Report) and presents a series of options (if relevant) and a recommendation to address each theme.

The outcomes being sought from each of the options presented are to be:

- Reasonable;
- Transparent;
- Effective; and
- Consistent.

A summary table has been formulated within Chapter 5 of this report which outlines a number of key objectives that have been developed in response to the key findings from the Background Report, and recommendations made accordingly. Responsibilities for each action have also been assigned for completeness.

The options listed are by no means exhaustive, but in our opinion they represent likely and realistic possibilities.

## Theme 1: Mapping & Data

Key findings from the Background Report relating to Mapping and Data are:

- Datasets available to Local Government indicating the location of existing pipelines are not accurate.
- Landowners and developers don't know where pipelines are located, unless there is an easement on Title.
- Without seeking information from ESV or pipeline licensees, stakeholders don't know a pipeline measurement length, what risks are associated with that particular pipeline (i.e to people or the environment), what classification the land has under AS2885 or what the pipeline is carrying.

To address these issues, the development of accurate and consistent data on pipeline infrastructure is required.

This fundamental issue has been acknowledged by the pipeline industry and measures are already being taken to address it. The Australian Pipeline and Gas Association (APGA) is currently preparing a centralised database of pipeline locations, which is scheduled for completion at the end of March 2016. More specifically, the data will include:

- the location of the pipeline easement;
- the pipeline measurement length, and
- who the relevant licensee is.

The Pipeline Database will exist as a web service. Initially, access will be limited to Government planning agencies of any type. Users will have the ability to conduct address and title detail searches online and receive formal reports, or to download the data and use it in their own GIS systems.

All pipelines have a location classification that aligns with definitions set out in AS2885. Location classifications are explained in Chapter 2 of the Background Report. It is important that the location classification of a pipeline is known, as this assists in understanding whether a proposed change of use or a new development in proximity to a pipeline requires consideration by a pipeline licensee. For example; an existing pipeline located within a higher order activity centre in Melbourne would be classified as T2, the highest location classification. There is no land use change that would trigger a change in location classification, and therefore a pipeline licensee may not require notification in this instance. Location classifications are discussed further under Theme 3: Planning Industry Tools.

The APGA will collate the data, but how the data will be published and who it will be available to are yet to be determined. To provide maximum benefit and transparency the data should be available on a central mapping service, such as the DELWP administered VicMap.

### Mapping and Data Recommendations

- Collate all data on pipelines, including the location classification.
- Ensure mapping data is available on a central mapping service such as VicMap.

## Theme 2: Awareness & Education

Key findings from the Background Report relating to awareness and education are:

- There is a general lack of understanding within the planning industry and the community at large of pipeline infrastructure and its associated risks.
- The pipeline industry does not entirely understand the intricacies of the Victorian planning system.

To address these issues, ongoing engagement with the planning industry and the development of guidance notes are required.

There is a broad lack of awareness and understanding within the planning industry around the presence of pipeline infrastructure and the potential risks associated with development around pipelines.

ESV and a select number of pipeline licensees have been actively engaging with the Local Councils and State Government to educate them on the issue and the preferred planning outcomes from the pipeline industry perspective, in an attempt to raise awareness about industry obligations and challenges. Notwithstanding, after approximately two years of engagement initiatives by the pipeline industry, the issue is still prevalent.

There appears to be inconsistencies across State and Local Government with respect to the knowledge and understanding of the issue. Awareness of the implications and obligations of AS2885 has increased with some Council's due to areas of their municipality affected by a pipeline measurement length. This has however been occurring on an ad-hoc basis and those Council's unaffected by a pipeline are typically unaware of the issue.

Whilst some progress has been made, significant improvements need to be made to the current system to improve its effectiveness and ensure there is consistent policy.

### **Awareness and Education Recommendations**

- ESV and pipeline licensees should continue to engage with Local Councils and State Government Departments to provide ongoing education and to build and maintain relationships.
- Utilise industry bodies, such as the Municipal Association of Victoria (MAV), the Planning Institute of Australia (PIA), Victorian Planning Environment and Law Association (VPELA) or the Urban Development Institute of Australia (UDIA), to distribute information to stakeholders. This could include presenting at conferences and forums, or providing a summary paper in industry publications.
- Alert industry to any publications or new information about the issue in 'Planning Matters', issued weekly by DELWP.
- Once changes to the planning system have been implemented, prepare a Planning Practice Note for land development around licensed pipelines. Planning practice notes provide advice about planning provisions, processes and topics. They are generally prepared for the planning practitioner however they can also assist other users of the planning system. This action would only be applicable in conjunction with changes to the Victoria Planning Provisions.
- Once changes to the planning system have been implemented, prepare an Advisory Note to be released. Advisory Notes however provide point in time information about new initiatives and changes to specific VPP and planning scheme provisions, processes and subjects.

### Theme 3: Planning Industry Tools

Key findings from the Background Report relating to the planning industry are:

- There is little guidance for Local Government in dealing with pipelines in the Victorian planning system.
- There is no requirement for licensees to be notified of land use changes or significant developments in proximity to pipelines, outside of Planning Scheme Amendments.
- There is no ability for planners to consider risk associated with development around pipelines in their decision-making.
- As pipelines are not managed via a State-wide planning mechanism, Panels who have considered Planning Scheme amendments for land affected by a pipeline have provided varying recommendations as to how it may be best managed for that particular area.

The risk associated with pipelines needs to be identified first before planners can consider it as part of a land use planning decision. In particular, the risk needs to be defined spatially and the pipeline industry must be clear about not only land use, but what buildings and works are a concern.

Notwithstanding, to address the above issues, a number of improvements and changes to the current planning system are required to better recognise pipeline infrastructure, provide a mechanism for notification for particular types of use and development, allow an adequate assessment of risk and to provide a consistent policy approach to land development around pipelines across the State.

The issue at hand is complex and how it may be better managed within Victoria's planning system is also a complex proposition. Any changes suggested to the planning system must be reasonable, transparent, effective, and allow a consistent approach. A number of different options have been considered and are discussed in turn below.

#### Option 1 – No change

The planning system in Victoria includes policies and controls to manage certain types of risk, including bushfire, coastal inundation and flooding. Including these elements in the planning system provides for transparency and informs communities that there are certain areas that require particular consideration to assess the risk of a proposal and ensure it is appropriate for that location.

The issues outlined in detail in the Background Report and the key findings (described above) make it clear that 'no change' is not a viable option. Whilst the current ad-hoc approach may have resulted in some positive results in some circumstances, mainly by working with the MPA on Precinct Structure Plans (PSP's), this approach is not replicable across the State. Maintaining the status quo increases the potential risk to our communities and is not in keeping with the purpose of planning in Victoria.

The 'no change' option has been eliminated.

#### Option 2 – Clause 19.03-6 Update

This option involves amending Clause 19.03-6 of the VPP's to provide clearer articulation about land development around pipelines. Whilst it acknowledged that the State Planning Policy does address the issue, the level of recognition and strategies provided to manage the issue are minimal and don't achieve the desired outcomes being sought by ESV minimising risk to the community and the environment.

This Clause states that existing transmission-pressure gas pipelines need to be recognised in planning schemes and protected from further encroachment by residential development or other

sensitive land uses, however there is no other mechanism in the VPP's to in fact implement this Strategy.

This Chapter recommends a number of options in addressing the issue of land development around pipelines including the application of an Overlay to some existing pipelines and a Clause 66.02 referral provision.

In order to strengthen and implement the existing strategy contained in Clause 19.03-6, it is recommended that this Clause be updated to refer to the specific strategies to be used to manage the issue, including a combination of an Overlay and Clause 66.02 referral which is discussed in further detail in the following sections of this Chapter.

### Option 3 – Section 173 Agreement

This option relates only to permit applications for residential subdivision within a pipeline measurement length. More specifically this option involves the inclusion of a condition on a planning permit issued for subdivision within a pipeline measurement length that requires a Section 173 Agreement to be registered on Title.

This option would provide notice for newcomers buying into the area about the existence of a pipeline and its measurement length, along with the associated risk of its presence.

Planning Panels Victoria recommended in their consideration of Amendment C246 to the Greater Geelong Planning Scheme Amendment (Lara West) that a condition be placed on subdivision permits within the pipeline measurement length that requires a Section 173 Agreement be registered on Title. In the Panel's discussion they state:

*'it is in no-one's interest that prospective land purchasers are ignorant of the presence of the pipeline or the risks associated with it and therefore notice for newcomers buying into the area about the existence of the pipeline is reasonable'.*

The recommendation for a Section 173 Agreement attracted serious concern from the planning and development industry. Both the Property Council and the UDIA wrote directly to the Minister for Planning urging him to not accept the Panel's recommendation.

Ultimately, the Minister for Planning did not accept the recommendation by the Panel to require a Section 173 Agreement to be registered on every Title for every new lot created within the Lara West Growth Area. In a letter to the Property Council dated 4 February 2014, then Minister for Planning Matthew Guy stated *'I consider that the requirement is unnecessary as gas supply infrastructure is common to the majority of urban areas in Victoria and the pipeline that runs through the Lara West site has been designed and constructed in accordance with the relevant Australian Standard...for a residential (T1) environment'.*

The letter goes on to state *'An interdepartmental working group has been set up to discuss the impact of high pressure gas pipelines...I anticipate this group will make recommendations to inform a State-wide response to this issue'.*

The Section 173 Agreement option can be quickly eliminated. It will result in a considerable cost burden to proponents, is difficult to apply consistently across the State and will not achieve the outcomes being sought.

However, the Minister's position that the Section 173 requirement is unnecessary due to the construction standard of the pipeline provides an interesting basis for us to consider whether a mechanism is required for **all** pipelines. This is discussed further under Option 5.

#### Option 4 – Updating the Zoning Provisions

This option involves updating the existing Zones within the VPP's to include permit requirements for sensitive land uses within a pipeline measurement length.

It is envisaged that the Table of Uses contained within each of the Zones would need to be updated to include a condition for sensitive uses within 'Section 1 – Permit not required' which would state:

*'The use must not be undertaken within a pipeline measurement length'.*

As such, sensitive uses within a pipeline measurement length default to 'Section 2 – Permit required' land uses. This option would be used in conjunction with a Clause 66.02 referral provision which is described in further detail in the following sections of this report.

As per Option 5 below, the existing pipelines would need to be identified along with the corresponding zoning and then the relevant zones within the VPP's would have to be updated accordingly to include the above condition. Only the 'higher risk' pipelines and their associated measurement lengths (as outlined in Option 5 below) should incorporate the above amendment to the zoning provisions as it is anticipated the 'low risk' pipelines will be captured by a Clause 66.02 referral process as described in Option 7.

This option could be effectively used to capture applications for use within a pipeline measurement length, but the purpose of requiring the application and the specific decision guidelines that need to be associated with risk assessment are not easily included. This option, although feasible, does not provide sufficient transparency or policy direction about why the application is required or how a decision on a use application should be made. It would be particularly unclear to the broader public. This option is therefore eliminated.

#### Option 5 – Applying a Planning Overlay

In contemplating the application of a planning Overlay as an option, it is important to consider 'Ministerial Direction: The Form and Content of Planning Schemes'. This Direction applies to all Planning Schemes and states that any Planning Scheme Amendment must be prepared and presented in accordance with the style guide set out in the document.

In addition, 'Planning Practice Note 10: Writing Schedules' prepared by DEWLP, explains the role of schedules in Planning Schemes, provides guidance on how they should be written and provide an example of the use of schedules. The Practice Note states that some schedules allow particular requirements about how land may be used to be specified which may include a complete table of uses. Schedules to zones typically fall into this category however Overlays can also contain land use requirements. An example is the Melbourne Airport Environs Overlay that contains permit requirements for particular land uses.

Planning Panels Victoria has recommended on a number of occasions that pipeline easements and associated measurement lengths be identified within a dedicated overlay control.

There is no overlay currently available within the Victorian Planning Provisions (VPP's) that would be easily applied to manage risk associated with development around pipelines.

There are examples cited in the Background Report of the use of a Design and Development Overlay (DDO) or a Development Plan Overlay (DPO) to manage the issue. A DDO is used to ensure a particular design outcome is achieved, and would therefore not be appropriate to manage use. A DPO is used for discreet precincts where the future use and development of the land needs to be outlined prior to a permit being granted. A DPO essentially falls away after a development is delivered and is therefore not appropriate to manage use or development in perpetuity.

There are examples of the Environmental Significance Overlay (ESO) being used to manage the interface area around a major hazard facility. It is also used to manage development in proximity to the Port of Melbourne. It is noted that the ESO manages development and not use and is therefore considered inappropriate to utilise for the purpose of managing sensitive uses around pipelines.

Other hazards which are considered under the current planning system include bushfire, flooding, and land subject to inundation, all of which have a specific overlay associated that is easily identifiable and understandable. As such, a new overlay would be the most effective mechanism to manage land use and development around pipelines.

There are currently 214 pipeline licenses across the state, with a total pipeline length of 4,686 kilometres. Using an average measurement length of 300 metres (provided by the APGA as an appropriate assumption), the total area affected if an overlay were to be applied to all pipelines is approximately 2,953 square kilometres. This is a significant area of land and careful consideration is required before an overlay of such magnitude is applied.

There are a number of questions about the content and application of an overlay that must be considered. Each of the questions are addressed in turn below:

- Does an overlay need to apply to **all** pipelines?

This question was discussed at the options workshop held with the working group in January 2016. Subsequent discussions were held between ESV and the APA to determine whether a clear set of engineering criteria could be used to identify 'higher risk' pipelines. The criteria agreed upon are:

1. Pipelines carrying gas and high vapour pressure liquids (i.e. ruling out fluids that are liquids at atmospheric pressure); and
2. Pipelines with hoop stress in excess of 30 per cent of specified minimum yield strength (SMYS).

By applying these criteria, the number of licensed pipelines to which an overlay would be required is 86, a reduction of some 60% from the 214 pipelines in Victoria.

- Can any other criteria be used to limit the number of pipelines?

As previously mentioned, all pipelines have an identified location classification. This essentially identifies the type and intensity of development in proximity to the pipeline and denotes certain management criteria for a pipeline licensee to abide by; such as how often the pipeline is checked, how far apart signage markers are etc.

One of the key risks associated with land development around pipelines is where development proposed is contrary to the location classification of a pipeline. For example, if a pipeline is located within a suburban area it may have a location classification of T1 in accordance with AS2885. A proposal for a large shopping centre adjacent to the pipeline would not accord with the T1 classification, and therefore a risk assessment may be needed.

But what about a situation where a pipeline has been designed consistent with a T2 location classification, the location classification (and hence operational practices are consistent with) T2 and a large shopping centre was proposed adjacent to the pipeline? In this case, no further assessment is required.

We can therefore eliminate a number of pipelines in high density urban environments from requiring an overlay given that they have already been designed and constructed to the highest possible standard. This will further reduce the number of pipelines to which an overlay should apply.

- What permit triggers would be included within an overlay?

It is recommended that an overlay only be applied to the higher risk pipelines for which there is a potential for immediate risk to the public following loss of containment. The types of proposals that would therefore trigger the need for consideration by a licensee relate to **use** only.

The uses that would trigger a permit under the overlay would be those that were contrary to the location classification outlined in AS2885. Considerable thought is required to identify a comprehensive list of uses and ensure there is consistency between the planning terminology and definitions in AS2885 and this work should be completed in preparation for the Advisory Committee hearings scheduled for March 2016. A framework for potential permit triggers, as required by the pipeline industry, would be based on:

1. Pipelines in Residential Areas

Where land is already developed to a T1 location classification permit triggers would include: uses that change the classification to T2, sensitive uses and those relating to heavy industry and major infrastructure.

2. Pipelines in Rural Areas

Where land is not yet developed to a T1 (i.e. R1 or R2) location classification, permit triggers would include: uses that change the classification to T1 or T2, sensitive uses and those relating to heavy industry and major infrastructure.

- How will an overlay manage both risk to people (gas and high vapour pressure liquids pipelines) and risk to the environment (liquids pipelines)?

It won't need to, as the overlay will only apply to higher risk pipelines, which do not include any pipelines with fluids that are liquids at atmospheric pressure. This is discussed further in Options 4 and 6.

#### **Recommendation:**

- Prepare a new 'Major Hazard Facilities and Pipelines Overlay' with two schedules for pipelines: Schedule 1) Pipelines in Rural Areas, and Schedule 2) Pipelines in Residential Areas.
- Determine which pipelines to apply an Overlay based on a set of agreed criteria to identify 'higher risk' pipelines.
- Determine the appropriate planning permit triggers associated with use or development for each Schedule.

#### Option 6 – Clause 66 Referral

Applying an overlay to the 'higher risk' pipelines does not provide a comprehensive approach to the issue and should not be employed as the 'single solution' mechanism. To complement the overlay, and to capture other pipelines that are not affected by an overlay, a formal referral process should be employed.

The 'lower risk' pipelines need to be captured as there may still be risk associated with development within their measurement lengths.

To ensure referrals are mandated and not optional, it is suggested a licensee be identified as a referral authority within Clause 66 of the VPP's. In particular, a pipeline licensee would be included within Clause 66.02 that relates to use and development referrals. Clause 66.02 identifies a number of

service authorities and including pipeline licensees seems a natural fit in this section of the VPP's. Pipeline licensees will require appropriate education to enable them to fulfil the role as a referral authority pursuant to the *Planning and Environment Act 1987*.

The following matters need to be taken into consideration:

- There needs to be a clear understanding on the types of applications being referred and why, and this should be agreed within the pipeline industry and translated accordingly. It is likely that two types of referral are required; for **development** proposals within a pipeline measurement length where the risk is to the **environment**, and for **use** proposals within a pipeline measurement length where the risk is to the **public**.
- Whether ESV or a pipeline licensee directly is the referral authority. Given the onus for risk assessment associated with development around pipelines lies clearly with the licensee, they should be the nominated referral authority. It is suggested that they are a recommending rather than a determining referral authority.

#### **Recommendation:**

- Include the relevant pipeline licensee as a recommending referral authority within Clause 66.02 of the VPP's.
- Arrange for all pipeline licensees to be appropriately briefed and educated on any proposed changes to the Victorian planning system.
- Outline a licensee's duty as a referral authority, including prescribed timeframes for responses and what a licensee can have regard to in their consideration of an application as a referral authority.

#### Option 7 – Particular Provision

This option involves preparing a new particular provision for the 'Management of Land Use and Development around Pipelines' at Clause 50 of the VPP's.

The particular provision would include a purpose, series of permit requirements for sensitive uses (as defined in AS2885) within the pipeline measurement length, application requirements and referral/notice requirements. The referral/notice provisions could include ESV or the relevant pipeline licensee as a referral authority for permit applications.

Whilst this option adopts a State-wide and consistent approach to addressing the issue, it fails to meet the 'Operation of Particular Provisions' at Clause 51 of the VPP's which states:

*'The requirements of these particular provisions apply to the specified categories of use and development and other matters in addition to any provisions which apply due to any other provision of this scheme.'*

Given that the issue relates to land use and development surrounding pipelines and not the pipelines themselves, this option can be eliminated.

#### Option 8 – Mapping and Online Assessment Tool

This option would see the mapping of pipelines in the Planning Maps Online service. The mapping layer would identify a pipeline easement and measurement length and this information would be included within the Planning Property Report which are generated for different land parcels.

In addition, an online assessment tool would need to be developed by the pipeline industry in consultation with Government which would detail the types of applications being considered for further assessment (i.e. proposals for sensitive land use and development within a pipeline measurement length) and whether a Safety Management Study (SMS) is required to be prepared and approved by the pipeline licensee.

This approach would be similar to the tool used to manage areas of aboriginal cultural heritage sensitivity.

This option would ensure that Council is unable to issue any planning decisions until all matters (i.e. an SMS) have been resolved between the proponent and pipeline licensee.

The *Pipelines Act 2005* would need to be amended to refer to the *Planning and Environment Act 1987* and to state that planning decisions cannot be made until a resolution has been made between the proponent and the pipeline licensee.

This option provides a State-wide consistent approach, and puts the onus on a developer to ensure they are liaising with the pipeline licensee to complete the required assessment.

However, the mechanism by which cultural heritage is dealt with through the planning system is fraught with issues and fundamentally flawed. There is ambiguity in the interpretation of the *Aboriginal Heritage Act 2006* that has created great uncertainty within the property industry as to when a Cultural Heritage Management Plan is required. Planning Panels and VCAT have all commented on the issues but there does not appear to be an easy solution to the issue.

In light of the above, using a similar approach for pipelines would not be recommended. This option is also likely to result in uncertainty in its application and too much flexibility in the interpretation of requirements and as such, can be eliminated.

#### **Planning Industry Tools Recommendations:**

- Prepare a new 'Major Hazard Facilities and Pipelines Overlay' with two schedules for pipelines: Schedule 1) Pipelines in Rural Areas, and Schedule 2) Pipelines in Residential Areas.
- Determine the appropriate planning permit triggers associated with use or development for each Schedule.
- Determine which pipelines to apply an Overlay based on a set of agreed criteria to identify 'higher risk' pipelines.
- Include the relevant pipeline licensee as a recommending referral authority pursuant to Clause 66.02.
- Arrange for all pipeline licensees to be appropriately briefed and educated on any proposed changes to the Victorian planning system.
- Outline a licensee's duty as a referral authority, including prescribed timeframes for responses and what a licensee can have regard to in their consideration of a referral.
- To identify those pipelines that will not have an overlay applied, ensure Land.vic.gov.au mapping data is updated to include all pipelines and their measurement lengths. This will also enable planning officers to refer relevant applications pursuant to Clause 66.02.

- Determine which pipelines do not need to be mapped based on their land use classification (i.e. T2 areas).
- Retain the mechanism to notify the Minister administering the *Pipelines Act 2005* of Planning Scheme amendment applications.
- Amend Clause 19.03-6 of the Victoria Planning Provision to provide clearer articulation about land development around pipelines. Update to refer to the specific strategies to be used to manage the issue, including a combination of an Overlay and Clause 66.02 referral.

#### Theme 4: Pipeline Industry Tools

Key findings from the Background Report relating to the pipeline industry are:

- There are a number of inconsistencies in terminology between AS2885 and the Victorian planning system, particularly in relation to 'land use classifications' and 'sensitive uses'.
- There is no central guidance available to developers or landowners about the process of gaining approval from a licensee to cross or traverse a pipeline easement.
- In the current situation, pipeline licensees are finding it increasingly difficult to comply with their relevant legislative requirements.
- When pipeline licensees are notified or consulted about proposed developments, advice from them is inconsistent, too late and provided on a case-by-case basis.

The inconsistencies in terminology between AS2885 and the planning system cause great confusion, particularly when both industries use terms such as 'sensitive uses' and 'land use' and the meanings can be very different. There is opportunity for improvement in the consistency of terminology and an upcoming review of AS2885 may be the best opportunity to complete this review. This needs to be completed on the understanding that the AS2885 is a national standard and planning systems vary from State to State.

Even after a pipeline has been sufficiently considered and a planning permits granted for development, a separate approval is required from the licensee to cross or traverse a pipeline. Crossing or traversing a pipeline constitutes anything that crosses the pipeline easement or corridor, such as a road, service infrastructure or shared paths and landscaping.

Licensees each interpret this section of the Act differently and consequently there is a significant divergence in the way each licensee assesses risk. This, coupled with a lack of policy and guidance for proponents to prepare and deliver infrastructure suitable for approval by the licensee, creates uncertainty as to what needs to be provided.

Furthermore there is no clarity as to timeframes for review and assessment by the licensees, which can cause considerable delay to a project. This has a material impact on time and cost for developers including potential loss of sales and delays in construction.

The ability for licensees to interpret AS2885 so differently means there is an obvious gap in the Standard. It's clear that further direction to both the development industry and pipeline licensees is required in the interpretation of requirements of the Standard in a way that supports interaction with planners and developers.

**Pipeline Industry Recommendations:**

- Include guidance on the interpretation of relevant sections of AS2885 to enable a more consistent approach and provision of advice by licensees to planners and developers associated with land development around pipelines.
- Include guidance on how a pipeline licensee should facilitate appropriate works within a pipeline easement (road crossings, service crossings etc). This guidance should include information required by a proponent to enable an appropriate assessment and approval, in what circumstances a Safety Management Study is required, what costs are reasonably attributed to a proponent and what costs are to be borne by the licensee, decision timeframes and an escalation process for dispute.
- Consider how terminology can be better expressed to avoid confusion with planning terminology, recognising that planning systems vary across States but AS2885 is a national standard.

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## **5 Summary of Recommendations**

The table provided overleaf outlines a summary of the key themes outlined in this report. A number of key objectives have been developed in response to the key findings from the Background Report, and recommendations made accordingly. Responsibilities for each action have been assigned for completeness. These recommendations will be used to inform ESV's submission to the Major Hazard Facilities Advisory Committee.

These recommendations are the views of Spiire and do not necessarily reflect those of Energy Safe Victoria or members of the LDAP Working Group.

Theme	Objective/s	Option	Key Action	Responsibility
Mapping & Data	To develop accurate and consistent data on existing pipeline infrastructure  To make mapping and data available to practitioners and stakeholders	Develop a mapping and data depository	Collate all data on existing pipelines, including: - the location of the pipeline easement - whether the pipeline is classified as "higher risk" - who the relevant licensee is - the pipeline measurement length - whether the land use is already equivalent to T1 or to T2 usage	APGA
			Translate data into the interactive maps available through the mapping system managed by the Department of Environment, Land, Water and Planning (DELWP), including mapping and spatial data	DELWP
Awareness & Education	To increase awareness and understanding within the planning industry of the risks associated with land use and development around pipelines	Engagement with Planning Industry	ESV and pipeline licensees should continue to engage with Local Councils and State Government Departments to provide ongoing education and to build and maintain relationships	ESV Pipeline Licensees
			Utilise industry bodies, such as the Municipal Association of Victoria (MAV), the Planning Institute of Australia (PIA), Victorian Planning Environment and Law Association (VPELA) or the Urban Development Institute of Australia (UDIA), to distribute information to stakeholders. This could include presenting at conferences, forums or providing a summary paper in industry publications	ESV
			Alert industry to any publications or new information about the issue in 'Planning Matters', issued weekly by DELWP	ESV, DELWP
		Planning Practice Note	Prepare a Planning Practice Note for land development around licensed pipelines. Planning practice notes provide advice about planning provisions, processes and topics. They are generally prepared for the planning practitioner however they can also assist other users of the planning system. This action would only be applicable in conjunction with changes to the Victoria Planning Provisions	DELWP
Planning Advisory Note	Prepare an Advisory Note to be released concurrently with changes to the planning system to recognise pipelines. Advisory Notes however provide point in time information about new initiatives and changes to specific VPP and planning scheme provisions, processes and subjects	DELWP		
Planning Industry Tools	To better recognise existing pipeline infrastructure in the Victorian Planning System  To provide an appropriate mechanism for licensees to be notified of relevant land use changes or development with a pipeline measurement length  To identify the location of pipelines and their measurement length  To allow for an adequate assessment of risk when considering relevant changes in land use or built form in a pipeline measurement length  To differentiate between the risks associated with gas and high vapour pressure pipelines (risk to people) and liquid pipelines (risk to environment)  To distinguish between pipelines of different location classifications  To provide a consistent approach for the assessment of planning scheme amendments, strategic land use plans, subdivisions, development applications and land use changes in vicinity of pipelines	Planning Overlay	Prepare a new 'Major Hazard Facilities and Pipelines Overlay' with two schedules for pipelines: Schedule 1) Pipelines in Rural Areas, and Schedule 2) Pipelines in Residential Areas	DELWP
			Determine the appropriate planning permit triggers associated with use or development for each Schedule	ESV, DELWP
			Determine which pipelines to apply an Overlay based on a set of agreed criteria to identify 'higher risk' pipelines	ESV, APGA
		Clause 66 Referral	Include the relevant pipeline licensee as a recommending referral authority pursuant to Clause 66.02	DELWP
		Mapping	To identify those pipelines which will not have an overlay applied, ensure Land.vic.gov.au mapping data is updated to include all pipelines and their measurement lengths. This will also enable planning officers to refer relevant applications pursuant to Clause 66.02	DELWP, APGA
			Determine which pipelines do not need to be mapped based on their land use classification (i.e. T2 areas)	ESV
		Notification of Planning Scheme Amendments	Retain the mechanism to notify the Minister administering the Pipelines Act 2005 of Planning Scheme amendment applications	N/A
		Clause 19.03-6	Amend Clause 19.03-6 of the Victoria Planning Provision to provide clearer articulation about land development around pipelines. Update to refer to the specific strategies to be used to manage the issue, including a combination of an Overlay and Clause 66.02 Referral	DELWP

Theme	Objective/s	Option	Key Action	Responsibility	
Pipeline Industry Tools	To enable a more consistent approach to the assessment of risk posed by development around pipelines	Guidance Note for Pipeline Licensees and/or Amendment to Pipeline Regulations	Include guidance on the interpretation of relevant sections of AS2885 to enable a more consistent approach and provision of advice by licensees to planners and developers associated with land development around pipelines	ESV	
	To provide clear and consistent guidance on the process required to gain approval for works within a pipeline easement		Include guidance on how a pipeline licensee should facilitate appropriate works within a pipeline easement (road crossings, service crossings etc.). This guidance should include information required by a proponent to enable an appropriate assessment and approval, in what circumstances a Safety Management Study is required, what costs are reasonably attributed to a proponent and what costs are to be borne by the licensee, decision timeframes and an escalation process for dispute	ESV	
	To provide pipeline licensees with education and instruction on their duties and responsibilities as a referral authority		Outline a licensee's duty as a referral authority, including prescribed timeframes for responses and what a licensee can have regard to in their consideration of a referral	ESV, DELWP	
	To improve consistency of terminology between the pipeline and planning industries		Review of AS2885	Consider how terminology can be better expressed to avoid confusion with planning terminology, recognising that planning systems vary across states but AS2885 is a national standard	APGA, ESV
			Education	Arrange for all pipeline licensees to be appropriately briefed and educated on any proposed changes to the Victorian planning system	ESV



## APPENDIX 1

WESTERN AUSTRALIAN PLANNING COMMISSION, PLANNING BULLETIN 87

## 1 Purpose and application

High pressure gas transmission pipelines have a level of risk, which must be assessed when considering local planning schemes, scheme amendments, structure plans, land use, subdivision and development of land in the vicinity of the pipelines, to ensure that risk to people and property is within acceptable levels. Pipelines are susceptible to third party damage and landowners in the vicinity of these pipelines must be aware of this possibility.

Two high pressure gas transmission pipelines currently pass through the Perth metropolitan region, transporting gas from the north-west to the south-west of the State. These pipelines are the Dampier to Bunbury Natural Gas Pipeline, constructed in 1984, and the Parmelia Gas Pipeline, constructed in 1971.

The need for this planning bulletin has arisen because the pipelines traverse parts of the metropolitan region that have been identified for future urban development. Accordingly, improved planning mechanisms are needed to ensure people and property are not put at unacceptable risk levels and that the future potential of the pipeline corridor/easements are not constrained, including the possibility for additional pipelines within the Dampier to Bunbury Natural Gas Pipeline corridor.

This planning bulletin provides guidance on matters to be taken into account by the Western Australian Planning Commission (WAPC), local governments and applicants in considering planning proposals in the vicinity of the Dampier to Bunbury Natural Gas Pipeline and the Parmelia Gas Pipeline, in the Perth metropolitan region (figure 1).

The purpose is to:

- Ensure risk to persons and property is at an acceptable level where schemes, scheme amendments, structure plans, land use, subdivision and

development are proposed within the vicinity of pipeline corridor/easements.

- Reduce potential risk arising from rupture of the pipeline during adjacent construction works.
- Ensure future schemes, scheme amendments, structure plans, land use, subdivision and development will not encroach on the potential for the existing pipeline corridor/easements to provide the capacity required to meet the long-term demand for natural gas in the south west of Western Australia.
- Provide a consistent approach for the assessment of the schemes, scheme amendments, structure plans, land use, subdivision and development applications in the vicinity of high-pressure gas pipelines.

This planning bulletin applies to the Perth metropolitan region as defined by the Metropolitan Region Scheme (MRS). It applies to schemes, scheme amendments, structure planning, subdivision or development, except for conventional agricultural or rural pursuits, within the vicinity of the Dampier to Bunbury Natural Gas Pipeline corridor and the Parmelia Gas Pipeline easement, refer figure 1. See schedule 1 for locations that may be affected by the policy.

This planning bulletin does not apply to high pressure gas transmission pipelines outside the Perth metropolitan region where construction and the resultant risk profiles may differ, however the same principles should be applied to ensure acceptable risk levels. Advice of risks associated with the non-metropolitan sections should be sought from the relevant pipeline owner.

Nothing in this planning bulletin removes any responsibility from the pipeline owners to ensure that the Dampier to Bunbury Natural Gas Pipeline and Parmelia Gas Pipeline are constructed, operated, monitored

and maintained to Australian Standard 2885 Pipelines - Gas and liquid petroleum (AS2885). In addition, nothing in this planning bulletin removes any responsibility from the pipeline owners to ensure that their obligations under the *Petroleum Pipelines Act 1969* and the relevant pipeline licence are met.

The Dampier to Bunbury Natural Gas Pipeline is owned by Dampier Bunbury Pipeline and the Parmelia Gas Pipeline is owned by APA Group.

## 2 The pipelines

The Dampier to Bunbury Natural Gas Pipeline and Parmelia Gas Pipeline currently transport gas from the north-west to the south-west of the State through the Perth metropolitan region. The Dampier to Bunbury Natural Gas Pipeline easement (referred to as the Dampier to Bunbury Natural Gas Pipeline corridor under the *Dampier to Bunbury Pipeline Act 1997*) and the Parmelia Gas Pipeline easement guarantee access to the pipelines at all times to permit any necessary construction, maintenance or repair works. The operators of the Parmelia Gas Pipeline conduct maintenance work in the easements that are registered on the applicable titles.

Under the *Petroleum Pipelines Act 1969*, the Director Petroleum and Royalties Division of the Department of Industry and Resources (DoIR) is the statutory regulator for gas pipelines and is responsible for ensuring that risks associated with pipelines are managed in accordance with the owner's licence. (The Department of Consumer and Employment Protection - Resource Safety Division provides regulatory and technical advice to DoIR.)

The Department for Planning and Infrastructure (DPI) State Land Services, Infrastructure Corridors, manages the Dampier to Bunbury Natural Gas Pipeline Corridor on behalf of the Dampier to Bunbury Natural Gas Pipeline Land Access Minister. This role is distinct from that

of the pipeline owners or licensees, who are responsible for operation of the pipeline and maintaining its safety and integrity.

### 3 Setback distances

Several quantitative risk assessments of the Dampier to Bunbury Natural Gas Pipeline and the Parmelia Gas Pipeline in the Perth metropolitan region have been undertaken and identify setback distances from the edge of the corridor/easements for sensitive development as well as residential, commercial and industrial development. The distances are based on the Environmental Protection Authority's (EPA) criteria for individual fatality risk from hazardous industrial plants. The terms sensitive development and individual fatality risk, which are based on *EPA Guidance Statement 2, July 2000: Guidance for risk assessment and management: off-site individual risk from hazardous industrial plant*, are defined in part 5 of appendix 1.

The setback distance is dependent on the type of land use or development as indicated in table 1, which provides setback distances based on the generic quantitative risk assessment (QRA) undertaken in 2004 by Advantica Worley for the (then) gas pipeline working group.

The setback distances in the table are based on the following individual fatality risk levels set by the EPA in EPA Guidance Statement 2.

- A risk level in residential areas of one in a million per year or less.
- A risk level in sensitive developments such as hospitals, schools, childcare facilities and aged care housing of one half in a million per year or less.
- A risk level for commercial developments, including offices, retail centres, showrooms, restaurants and entertainment centres of five in a million per year or less.

Proposed schemes, scheme amendments, structure plans, land use, subdivision and development within the setback distances indicated in table 1 will need to demonstrate that the risk from the pipeline is within acceptable levels consistent with AS2885 and EPA Guidance Statement 2. Proposed schemes, scheme amendments, structure plans, land use, subdivision and development land use and development outside the

setback distances are deemed acceptable under this planning bulletin.

Mitigation measures to manage risks to acceptable levels are set out in part 2 of appendix 1. These include site management measures and physical works such as concrete covering over the pipeline or depth of cover.

For proposals within the setback distances, a pipeline risk management plan will be required to demonstrate that the risk from the pipeline is within acceptable risk levels. The risk management plan may require a risk assessment, which is the responsibility of the applicant and must be undertaken in consultation with the pipeline owner. Where land use, subdivision or development is proposed within the setback distances and risk mitigation measures are required these should be documented in a risk management plan endorsed

by the pipeline owner. The extent of those measures should be limited to the works required to provide the level of protection, which is necessary and reasonable for the purpose of the subdivision or development. They should not extend to upgrading or maintenance of the pipeline, which is the normal responsibility of the owner.

Any risk management plan endorsed by the pipeline owner required for land use, subdivision or development within the setback distance must form part of the subdivision or development application lodged with the planning authority. There should be no need for a further risk assessment following the approval in accordance with the endorsed risk management plan.

**Table 1: Width of the high pressure gas pipeline setback distances at 90° to the edge of the pipeline corridor/easements (adapted from Summary of Quantitative Risk Assessment Studies<sup>1</sup>, Metropolitan Area, Gas Pipeline Working Group, September 2004).**

Pipeline	Setback distance <sup>2</sup>		
	Sensitive	Residential	Industrial / commercial
Dampier to Bunbury Natural Gas Pipeline (DBNGP) north of Muchea (MLV116)	200 m	150 m	100 m
DBNGP2 between Muchea (MLV116) and Kwinana (KJN)	90 m	0 m	0 m
DBNGP2 between Kwinana (KJN) and Baldivis (MLV141)	130 m	110 m	70 m
DBNGP2 south of Baldivis (MLV141)	115 m	100 m	80 m
Meter stations	95 m	90 m	85 m
Main line valves	90 m	85 m	55 m
Parmelia Gas Pipeline north of Caversham	80 m	70 m	60 m
Parmelia Gas Pipeline south of Caversham	70 m	65 m	45 m
Parmelia Gas Pipeline main line valves and above ground facilities	80 m	75 m	0 m
DBNGP corridor and Parmelia Gas Pipeline easement when adjoining between Muchea and Baldivis	110 m	75 m	60 m

<sup>1</sup> (a) A Prediction of Individual Risks from Gas Transmission Pipelines – A Study Undertaken for Worley Safety and Risk management, Advantica Doc. No. R5697 Issue 1, Nov 2002.

(b) Parallel Pipelines Assessment, Advantica Doc. No. R6510 Issue 3.0, Sep 2004.

(c) Safely Meeting Current and Future Gas Transmission Needs, Worley Doc. No. 450-01583-rpt-001, rev 0, May 2002.

(d) Perth Metropolitan High Pressure Pipelines – Above Ground Facilities Risk Assessment, Worley Doc. No. 450-01583-015-rpt, rev. 1, Oct 2003.

(e) Additional studies compiled by Alinta Asset Services, Land Management, based on Advantica reports R5607 and R8402, June 2006.

<sup>2</sup> This distance also applies to the Dampier to Bunbury Natural Gas Pipeline corridor, irrespective of whether or not there is an existing pipeline.