

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 Studies¹, Metropolitan Area, Gas Pipeline Working Group, September 2004).

| Pipeline | Setback distance ² | | |
|--|-------------------------------|-------------|-------------------------|
| | 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 |

¹ (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.

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

3.1 Exemptions

The following proposals are exempt from this requirement:

- a) Small-scale infill land uses, subdivisions or development which completes or rounds-off existing land use, subdivision or development that is already at a lesser setback distances from that defined in table 1 other than sensitive developments as defined in part 5 of appendix 1.
- b) Incidental land use or development (ie land use or development associated with or attached to existing development and incidental to its main function) that does not change the approved land use from either industrial/commercial to residential or a sensitive use, or from residential to sensitive use (eg in the case of a child care facility).
- c) Proposals that have previously been supported or approved with a lesser setbacks based on former standards (eg 26 and 32 metre setbacks under former DEC Guidelines) by the EPA, or existing or former regulators or pipeline owners.

4 Notification area

A notification area has been defined to ensure that consultation occurs with the pipeline owners regarding certain rezoning proposals in the vicinity of a high pressure gas transmission pipeline to ensure that any changes to the pipeline location classification in accordance with AS2885 are identified. Proposals requiring notification are rezonings from rural to urban or urban deferred in the MRS, and rezonings in a local scheme, which either increases residential densities or introduces the potential for sensitive uses.

The notification area is defined in table 2, which sets out the distances within which rezoning proposals require notification to the pipeline owners by the planning authority.

The notification area is purely an administrative tool, which provides a distance from the pipeline within which the pipeline owners should be aware of any proposed activity so they can monitor the risk profile of the pipeline.

Table 2: Notification area for Dampier to Bunbury Natural Gas Pipeline (DBNGP) and Parmelia Gas Pipeline within the Metropolitan Region Scheme area

| Pipeline | Notification distance from the edge of corridor/easement |
|---|--|
| DBNGP north of Muchea (MLV116) | 660 m |
| DBNGP between Muchea (MLV116) and Baldivis (MLV141) | 275 m |
| DBNGP south of Baldivis (MLV141) | 660 m |
| Parmelia Gas Pipeline | 356 m |

5 Other considerations

The following matters should also be taken into account in considering planning proposals in the setback area:

- Section 3.6.2 of Development Control Policy 1.1 Subdivision of Land - General Principles outlines issues to be considered when proposing a subdivision of land across which there is an existing public utility easement. Proponents should negotiate with pipeline owners regarding protection of the easement or corridor prior to lodgement of an application.
- Any proposal for access across or any activity in the Dampier to Bunbury Natural Gas Pipeline corridor requires approval under section 41 of the *Dampier to Bunbury Pipeline Act 1997*. The central requirements for the Act are that: property owners, pipeline owners and others must seek approval from the Dampier to Bunbury Natural Gas Pipeline Land Access Minister to carry out any work in the corridor; and this approval should be sought by written application to DPI State Land Services, Infrastructure Corridors. There are penalties under section 41 of the Act for unauthorised use of the corridor.
- The provisions of the *Petroleum Pipelines Act 1969* apply within the pipeline licence area, which encompasses the corridor/easements, and contains penalties under section 65 of the Act for interfering with the operation of a pipeline.
- Note that in addition to a pipeline risk management plan (section 3) there is also a requirement for a pipeline protection plan that details the precautions taken and processes used to implement the risk management plan mitigation measures and construction of the works. A protection plan will be required as a condition of subdivision or development approval, and prior to commencement of works.

- Site planning and design should promote compatible uses, which may include public open space in the gas pipeline corridor/easements and adjoining setback area.
- While the corridor/easements may be used as public open space there are restrictions on the landscaping and amenities that may be installed. Line of sight should be preserved along the length of the pipeline where possible, and this typically restricts landscaping to grasses, groundcovers and low shrubs. Any landscaping and amenities requires the written consent of the pipeline owner and, in the case of the Dampier to Bunbury Natural Gas Pipeline the corridor manager, and should be documented in the risk management plan and protection plan as appropriate.
- Due to the need for pipeline owners to have unrestricted access to the pipeline for maintenance and emergency response purposes and protect the pipeline from direct damage land subsidence, buildings, swimming pools, artificial lakes, stormwater compensating basins, explosives, inflammables or corrosives and structures of any nature including temporary uses and storage or refuse disposal are not permitted in the gas pipeline corridor/easements. Any exceptions require the written consent of the pipeline owner, and in the case of the Dampier to Bunbury Natural Gas Pipeline the corridor manager, and should be documented in any risk management plan and protection plan as appropriate.
- All fences that cross or delineate the corridor/easements should have standard pipeline danger signs attached that indicate the close proximity of the pipeline.
- Roads and service crossings in the gas pipeline corridor/easements should be as close as practicable to

perpendicular to the corridor/easements and may be approved subject to appropriate conditions recommended by the pipeline owners.

- Any easement over the existing pipeline corridor/easement requires the written consent of the pipeline owner, and in the case of the Dampier to Bunbury Natural Gas Pipeline the corridor manager.
- Applicants must liaise with the pipeline owner prior to site works and construction activities to agree to the terms of the protection plan.
- Earthworks and construction activities over and adjacent to the pipeline corridor/easements must be undertaken in accordance with AS2885 and require approval from the pipeline owner and can only be performed under the pipeline owners work permit system.

6 Comments

Comments on the matters contained in this planning bulletin are invited and should be directed to:

Secretary
Western Australian Planning
Commission
469 Wellington Street
Perth WA 6000

Please quote file number
554/1/1/12PV in all correspondence.

Schedule 1: Postcodes affected by this planning bulletin

| Dampier to Bunbury Natural Gas Pipeline | |
|--|-----------------|
| Postcode | Locality |
| 6084 | Bullsbrook |
| 6065 | Melaleuca |
| 6065 | Lexia |
| 6069 | Ellenbrook |
| 6055 | Henley Brook |
| 6055 | West Swan |
| 6055 | Caversham |
| 6055 | Guildford |
| 6055 | South Guildford |
| 6105 | Perth Airport |
| 6057 | High Wycombe |
| 6058 | Forrestfield |
| 6107 | Wattle Grove |
| 6109 | Orange Grove |
| 6110 | Martin |
| 6110 | Gosnells |
| 6110 | Southern River |
| 6112 | Forrestdale |
| 6164 | Banjup |
| 6167 | Wandi |
| 6167 | Mandogalup |
| 6167 | The Spectacles |
| 6167 | Postans |
| 6167 | Medina |
| 6167 | Kwinana Beach |
| 6167 | Calista |
| 6170 | Leda |
| 6171 | Baldivis |
| 6125 | Mardella |
| 6125 | Hopeland |
| Dampier to Bunbury Natural Gas Pipelinem (Laterals) | |
| Postcode | Locality |
| 6167 | Kwinana Beach |
| 6167 | Postans |
| 6165 | Hope Valley |
| 6165 | Naval Base |
| 6166 | Wattleup |

| Parmelia Gas pipeline | |
|------------------------------|-----------------|
| Postcode | Locality |
| 6084 | Bullsbrook |
| 6065 | Melaleuca |
| 6065 | Lexia |
| 6069 | Ellenbrook |
| 6055 | Henley Brook |
| 6055 | West Swan |
| 6055 | Caversham |
| 6055 | Guildford |
| 6056 | Woodbridge |
| 6055 | South Guildford |
| 6055 | Hazelmere |
| 6105 | Perth Airport |
| 6057 | High Wycombe |
| 6058 | Forrestfield |
| 6105 | Kewdale |
| 6107 | Wattle Grove |
| 6107 | Kenwick |
| 6107 | Beckenham |
| 6108 | Thornlie |
| 6155 | Canning Vale |
| 6149 | Leeming |
| 6164 | Jandakot |
| 6164 | South Lake |
| 6164 | Yangebup |
| 6164 | Beeliar |
| 6166 | Munster |
| 6166 | Wattleup |
| 6165 | Hope Valley |
| 6167 | Postans |
| 6167 | Medina |
| 6167 | Kwinana Beach |
| 6168 | East Rockingham |
| 6170 | Leda |
| 6171 | Baldivis |
| 6125 | Hopeland |
| 6176 | Karnup |

Appendix 1

Planning guidelines for proposals within the high pressure gas transmission pipeline setback distance.

1 Introduction

This appendix provides guidance regarding the setback distance, risk mitigation measures and pipeline risk assessment for proposed development in the setback area (table 1) 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 information provided is indicative and in any particular case needs to be validated in the relevant pipeline protection plan.

Australian Standard 2885 Pipelines - Gas and liquid petroleum (AS2885) is the Australian Standard recognised by the Council of Australian Governments for high pressure gas pipelines designed, constructed and operated throughout Australia. It requires a metre by metre qualitative analysis to identify each threat to pipeline integrity followed by a defined process to manage each threat either by eliminating it through external interference or design processes, or by development of management procedures to reduce the risk from hazardous events to negligible, low or in unresolved cases, to as low as reasonably practicable. The pipeline owners must operate and maintain the pipelines consistent with the requirements of their licence.

Acceptable levels of risk to the pipeline may be determined by conducting an AS2885 qualitative risk assessment by a suitably qualified professional. The AS2885 assessment does not necessarily need to be supported by quantitative (numeric) risk assessment, however, the outcome (ie an acceptable level of risk – low, negligible or as low as reasonably practicable) must be acceptable to the pipeline owner.

Acceptable levels of risk from the pipeline, consistent with the EPA objective for management of risk, generally require a quantitative risk assessment to determine the risk levels for comparison with the EPA risk criteria relevant to the nature of the development. The assessment needs to be performed by a suitably qualified professional. Typically a full assessment is not required as it can be based on an extrapolation of the existing, often generic, assessment by using known risk reduction factors associated with particular risk mitigation measures. The outcomes of the assessment are often expressed as risk contours that define the required setback distance for a class of developments.

In the conduct of quantitative risk assessment the assumptions made for the probability of pipeline hit rates, gas ignition rates etc, should be consistent with the assumptions made in the assessment conducted by the pipeline owner as part of the formal safety assessment which forms part of the safety case for the relevant pipeline.

Achieving a risk level of low, negligible or as low as reasonably practicable may require changes to the planning proposal, changes to the operational characteristics of the pipeline or installation of additional safety measures such as a concrete cap, additional coverage and/or training of the construction crew involved in any site works adjacent to the pipeline. It is, therefore, important for the proponent to liaise with the pipeline owner prior to lodgement of a planning proposal in order to reach agreement on the mitigation measures required.

2 Measures that may reduce risk within the setback distance

The setback distances set out in table 1 have been determined through a quantitative risk assessment based on generic factors for each pipeline. The results of the generic assessment are identified risk contours that have been used to set the required setback to achieve the EPA's criteria for individual fatality risk. Risk contours may be described as a diagrammatic representation of levels of risk determined via quantitative assessment; usually concentric circles indicating intensity of risk. As the distance to the source decreases, the level of risk increases.

Proposals for development within the setback distance should demonstrate that the level of risk to the pipeline during, and after the construction of the proposed development is low, negligible or as low as reasonably practicable. They also need to demonstrate that the EPA criteria for individual fatality risk relevant to the development are met.

2.1 Risk factors

The major factor influencing the risk contours and resultant setback distance is the potential for the pipeline to fail and the extent of the resultant loss of containment (gas escaping under pressure).

The important factors that can impact on the probability of failure of a pipeline and hence the risk contours include:

- pipeline wall thickness and steel type;
- whether joints are welded or flanged; and
- depth of cover over the pipeline.

In some locations, the pipeline walls may be thicker and the pipeline buried more deeply than in the generic case. The pipeline owner will be able to provide further information on these factors and how they impact on the established risk contours. This is discussed further in section 2.3.1.

As the pipelines are well maintained and are monitored on a regular basis, the major potential cause of pipeline failure is impact on the pipeline by external factors such as an excavator or drill, which penetrates the pipeline. Subdivision works around pipelines can increase excavation and boring work in the vicinity, and hence the risk of such interference.

2.2 Procedural measures to reduce risk

Pipeline owners have a number of procedural measures in place to reduce or remove the risk of pipeline damage. These include the following:

- Pipeline patrols to identify encroachment and related excavation activities adjacent to the pipeline.
- 'Dial Before You Dig' (tel: 1100 - www.dialbeforeyoudig.com.au), which enables parties to obtain information on below ground services, including the location of gas pipelines.
- Landowner liaison to raise awareness of the pipelines presence.
- Management of construction activities where use of equipment in the vicinity of the pipeline is required to ensure:
 - a) physical proving of the location of the pipeline by hand excavation;
 - b) equipment is sized so that it cannot rupture the pipeline;
 - c) the third party performing the work is made aware of all factors relating to the pipeline including its location and the possible consequences of damaging the pipeline; and
 - d) no third party activity with potential to damage a pipeline occurs without the presence of the pipeline owner on site to supervise the contractor.

These measures are already applied by the pipeline owners consistent with AS2885 and have been included in the quantitative risk assessment.

2.3 Physical measures to reduce risk

The purpose of physical protective measures is to prevent loss of pipeline integrity (pipeline rupture) resulting from an identified third party interference event by either physically preventing contact with the pipe, or by providing adequate resistance to penetration of the pipe itself.

Protective measures include (but are not limited to):

- increased wall thickness (normally not feasible for an operating pipeline);
- increased depth of cover (there is a maximum depth of cover limit in order to ensure maintainability);
- below ground concrete or other hard cover above the pipeline; and
- restriction of access via bollards, fencing etc.

In considering the alternatives, the applicant should consult with the pipeline owners on the cost and suitability of the measures.

To ensure reduction of the risk to an acceptable risk level, it will usually be necessary to apply the mitigation measures to adjoining land for the setback distance. Permission from the adjoining landowner(s) will need to be sought by the applicant to enable installation and ongoing maintenance of the required mitigation measures.

2.3.1 Increased wall thickness and/or depth of cover

Where the wall thickness of the pipeline, or depth of cover over the pipeline is increased, the setback distances required to ensure an acceptable level of risk, based on the EPA's criteria and depicted by risk contours, are reduced. The quantitative risk assessment for this planning bulletin applied the generic pipeline design factors listed in table 3.

Table 3: Generic pipeline factors used in the quantitative risk assessment

| Pipeline | Diameter | Wall thickness | Depth of cover |
|--|----------|----------------|----------------|
| Dampier to Bunbury Natural Gas Pipeline (DBNGP) north of Muchea (MLV116) | 660 mm | 8.74 mm | 1200 mm |
| DBNGP between Muchea (MLV116) and Kwinana (KJN) | 660 mm | 12.7 mm | 1200 mm |
| DBNGP between Kwinana (KJN) and Baldivis (MLV141) | 500 mm | 7.92 mm | 1200 mm |
| DBNGP south of Baldivis (MLV141) | 500 mm | 5.56 mm | 1200 mm |
| Parmelia Gas Pipeline | 356 mm | 5.16 mm | 760 mm |

Table 4 shows how the risk contours change with varying depth of cover for the Parmelia Gas Pipeline. It should be noted that, in this example, the wall thickness is also increased from 5.16 mm to 7.14 mm.

Table 4: Reduction in setbacks from the easement edge with increased wall thickness to 7.14 mm and increased depth of cover for the Parmelia Gas Pipeline

| Depth of cover and increased wall thickness contour | Sensitive development contour | Residential contour |
|---|-------------------------------|-------------------------------|
| 1.10 m | 45 m | boundary of pipeline easement |
| 1.73 m | 15 m | boundary of pipeline easement |
| 2.00 m | not tested | boundary of pipeline easement |

The Dampier to Bunbury Natural Gas Pipeline is a thicker walled pipe than the Parmelia Gas Pipeline. Table 5 shows how the risk contours change when depth of cover is increased over the Dampier to Bunbury Natural Gas Pipeline, with no change in wall thickness.

Table 5: Reduction in setbacks from the corridor edge with increased depth of cover for the Dampier to Bunbury Natural Gas Pipeline between Muchea (MLV 116) and Kwinana (KJN)

| Depth of cover | Sensitive development contour | Residential contour |
|----------------|-------------------------------|-------------------------------|
| 1.20 m | 90 m | boundary of pipeline corridor |
| 2.00 m | boundary of pipeline corridor | boundary of pipeline corridor |

This suggests that should an application proposed to increase the depth of cover over the Dampier to Bunbury Natural Gas Pipeline in an area between Muchea and Kwinana from 1.2 m to 2 m, a sensitive development is likely to be permitted up to the boundary of the corridor, all other issues being adequately managed. The cost of any earthworks, including drainage works to accommodate the altered contours, the impact on pipeline maintenance and the maintenance of those required earthworks should be borne by the applicant.

2.3.2 Concrete cover

Advantica has carried out a quantitative risk assessment analysis to determine the impact of installation of a 3 m wide by 150 mm thick concrete cover with marker tape placed over the pipeline below the surface. The results of this study indicate that this measure reduces the potential failure frequency by a factor of 30. Consequently, with a concrete cover and marker tape over the pipeline under generic conditions, the risk contours may be reduced, as shown in table 6.

Table 6: Reduction in setbacks where a concrete cover and marker tape are installed with generic pipeline conditions

| Pipeline | Setback distance | | |
|---|-------------------------------|-------------------------------|-------------------------------|
| | Sensitive | Residential | Commercial |
| Dampier to Bunbury Natural Gas Pipeline (DBNGP) between Muchea (MLV116) and Kwinana (KJN) | boundary of pipeline corridor | boundary of pipeline corridor | boundary of pipeline corridor |
| DBNGP ³ between Kwinana (KJN) and Baldivis (MLV141) | 70 m | boundary of pipeline corridor | boundary of pipeline corridor |
| Parmelia Gas Pipeline north of Caversham | 55 m | boundary of pipeline easement | boundary of pipeline easement |
| Parmelia Gas Pipeline south of Caversham | boundary of pipeline easement | boundary of pipeline easement | boundary of pipeline easement |
| Adjoining DBNGP corridor and Parmelia Gas Pipeline easement | 45 m | boundary of pipeline corridor | boundary of pipeline corridor |

Prior to recommending a concrete cover, the applicant should consult with the relevant pipeline owner on the design and cost of the cover, and the need for removal and reinstatement for regular maintenance surveys.

³ This distance also applies to the expanded DBNGP corridor

2.3.3 Restriction of access using bollards

While the increased depth of cover or installation of a concrete cover and marker tape can significantly reduce the likelihood of impact by excavators on the pipeline, the most effective method is to ensure that excavators and other machinery cannot access the pipeline without the knowledge and attendance at the site of the pipeline owners.

Control of access can be achieved by suitable bollards with distinct danger gas pipeline markings, on each side of the pipeline corridor/easements with controlled access to the corridor via locked gates. These bollards should be located on the edge of the pipeline corridor/ easements.

The purpose of the bollards is to stop civil operators from inadvertently entering the pipeline corridor/easements by clearly marking its presence. While the bollards should be sturdy it is not considered practicable to construct bollards that will be a physical barrier to the type of equipment to be excluded from the pipeline corridor/easements, thus the requirement for distinct danger gas pipeline markings.

An agreement is also required between the applicant and the pipeline owner regarding location and construction, as well as arrangements for ongoing maintenance of the bollards and associated gates.

3 Preparing a pipeline risk management plan (including a risk assessment)

The pipeline owner is required to operate and maintain the pipeline consistent with the requirements of their pipeline licence, regulated by DoIR. This involves the assessment and management of risk consistent with the requirements of AS2885, which should establish that the level of risk should be low, negligible or as low as reasonably practicable, and that the level of individual fatality risk meets the relevant EPA criteria.

The process for preparing a pipeline risk management plan is:

- a) The applicant should contact the pipeline owner as early as possible regarding the scope of the risk management plan and need for an AS2885 qualitative risk assessment and/or qualitative risk assessment of the subject proposal or application, and potential risk mitigation measures to facilitate development within the setback area. The pipeline owner and the applicant should reach agreement at this stage on an appropriately qualified consultant to undertake the risk assessment, the process, information to be supplied by the pipeline owner and outcomes required to facilitate and ensure a comprehensive risk assessment in a timely manner.
- b) The responsibility to prepare the risk management plan and undertake the risk assessment lies with the applicant.
- c) The pipeline owner will provide the consultant with the information and access to relevant data necessary to complete the risk management plan and risk assessment.
- d) The risk assessment will determine which (combination) of the selected mitigation measures will reduce the level of risk to low, negligible or as low as reasonably practicable to meet the relevant EPA individual fatality risk criteria. The findings of the risk assessment and the selected mitigation measures should be presented in a clear, precise and unambiguously worded report.
- e) The applicant should discuss the recommendations of the report and risk assessment with the pipeline owner and document the agreed mitigation measures and their area of application in the risk management plan, which should not be open to differing interpretations. As a minimum the plan should document:
 - the mitigation measures;
 - the timing and responsibility for the installation of the mitigation measures;
 - any ongoing management measures;
 - the cost of implementing the mitigation measures, both initial costs of construction and ongoing maintenance cost; and
 - responsibility for these costs.
- f) Following endorsement by the pipeline owner the applicant should then forward the risk management plan as part of the planning proposal to the relevant planning authority.

4 Relevant authorities, agencies and organisations

Where appropriate, planning proposals and applications should be referred to the following authorities, agencies and organisations:

- relevant pipeline owners
- DPI State Land Services, Infrastructure Corridors (for the Dampier to Bunbury Natural Gas Pipeline).

For further information regarding the guidance in this planning bulletin and statutory planning proposals and applications in the vicinity of high pressure gas transmission pipelines, contact DPI Statutory Planning, 469 Wellington Street Perth WA 6000, tel: 9264 7777.

Pipeline owners

Parmelia Gas Pipeline

24 hour gas control centre

Tel: 9353 7555

Fax: 9353 2452

Dampier to Bunbury Natural Gas Pipeline

Email: land.management@wng.com.au

Tel: 6213 7000

Fax: 6213 7010

Pipeline licence regulator

Department of Industry and Resources,

Director Petroleum and Royalties Division

Tel: 9222 3262

Dampier to Bunbury Natural Gas Pipeline corridor manager

DPI State Land Services, Infrastructure Corridors

Tel: 9347 5134

Information on corridor management and guidelines to landowners, developers, local and state government authorities and use of land in the corridor may also be found at the following website: <http://www.dpi.wa.gov.au/dbngp>

5 Definitions and abbreviations

| | |
|----------------------------------|--|
| As low as reasonably practicable | AS2885 defines as “the cost of further risk reduction measures is grossly disproportionate to the benefit gained from the reduced risk that would result”. |
| AS2885 | Australian Standard 2885 Pipelines – Gas and liquid petroleum. |
| Setback distance | The distance perpendicular to the edge of the pipeline corridor or easement where schemes, scheme amendments, structure plans, land use and subdivision and development applications will need to demonstrate that the risk of damage to the pipeline from construction works is low, negligible or As low as reasonably practicable. |
| DBNGP | Dampier to Bunbury Natural Gas Pipeline. |
| DoIR | Department of Industry and Resources. |
| DPI | Department for Planning and Infrastructure. |
| EPA | Environmental Protection Authority. |
| Individual fatality risk | The chance (likelihood or probability) per year that any one member of the general public will be killed as a result of exposure to an activity. |
| Parmelia Gas Pipeline | The high pressure gas transmission pipeline from Dongara to Pinjarra (previously known as the CMS/APT pipeline or Wang pipeline). |
| Pipeline protection plan | Pipeline protection plan details the precautions taken and processes used to protect the pipeline during construction of the works and implement the risk management plan mitigation measures. |
| Pipeline risk management plan | Pipeline risk management plan, includes any risk assessments required and documents the mitigation measures and where they will be applied and sets out the timing and responsibility for the implementation of the mitigation measures, ongoing management measures, the cost of implementing the mitigation measures, both initial costs of construction and ongoing maintenance cost, and the responsibility for these costs. |
| Quantitative risk assessment | Quantitative (or numeric) risk assessment. |
| Sensitive development | Development such as hospitals, schools, childcare facilities and aged care housing development. |
| WAPC | Western Australian Planning Commission |

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This document is available in alternative formats on application to WAPC Communication Services.



Figure 1: Dampier to Bunbury natural gas pipeline and Parmelia gas pipeline in the Perth metropolitan region

