Horsley Park Meter Station Upgrade Project

Environmental Impact Statement

Prepared for:

Review History

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Certification

Submission of environmental impact statement prepared under Part 5.1 of the *Environmental Planning and Assessment Act 1979*

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Address of the land to which the statement relates:

194-202 Chandos Road, Horsley Park, New South Wales.

Description of the infrastructure to which this statement relates:

Installation of gas conveyance, flow control and metering apparatus within an existing natural gas facility (the Horsey Park Meter Station) which is part of the Eastern Gas Pipeline.

Environmental impact statement:

An environmental impact statement is attached addressing all matters in accordance with Part 5.1 of the *Environmental Planning and Assessment Act 1979* and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

Declaration:

I certify that I have prepared this environmental impact statement in accordance with the Secretary's Environmental Assessment Requirements dated 2 December 2014, which includes the requirement to address all matters outlined in Schedule 2 to *Environmental Planning and Assessment Regulation 2000*. The environmental impact statement contains all available information that is relevant to the environmental assessment of the infrastructure to which the statement related. To the best of my knowledge, the information contained in the environmental impact statement is neither false nor misleading.

Signature: 

Name: John Fisher
Date: 13 March 2015

Executive summary

The proposal

SGSP (Australia) Assets Pty Ltd and its group of subsidiary companies (Jemena) propose to upgrade an existing natural gas facility at Horsley Park, New South Wales (the Horsley Park Meter Station). The proposal involves the construction and installation additional flow conveyance and control apparatus, associated connecting pipework and masonry enclosures within the boundaries of the existing facility. The objective and purpose of the proposal is to increase natural gas deliverability from the Eastern Gas Pipeline into the Sydney natural gas distribution by 120 terajoules per day by winter 2016 to address gas supply constraints and increased demand. The proposal is referred to as the Horsley Park Meter Station Upgrade.

The Horsley Park Meter Station is located at 194-202 Chandos Road, Horsley Park within the Fairfield local government area. The existing facility is located on Lot 3 in Deposited Plan 1002746. The works associated with the proposal would occur within the boundaries of that property.

Need for the proposal

An analysis of the current gas supply situation on the eastern seaboard of Australia indicates that the future gas supply into the Sydney distribution network is constrained and that gas supply could fall significantly below gas demand as early as 2016 if nothing is done.

Around 95% of the gas supplied to Sydney distribution network comes from either the Moomba-Sydney Pipeline or the Eastern Gas Pipeline. The Moomba-Sydney Pipeline supplies the Sydney distribution network with gas from Moomba in South Australia and also from the Victorian wholesale gas market, which is receipted via the NSW Interconnect Pipeline. The Eastern Gas Pipeline transports gas from Longford in Victoria to the Sydney distribution network and other gas distribution networks including Canberra and Wollongong.

As the existing gas supply contracts come to an end natural gas from Moomba is increasingly being committed and shipped to liquefied natural gas (LNG) facilities in Gladstone, Queensland, due to high export gas prices. Gas supply from the Victorian wholesale gas market along the Moomba-Sydney Pipeline is subject to internal security of supply considerations and cannot be relied upon to meet the future gas demand within the Sydney distribution network. The ability to maintain and increase gas supply to the Sydney distribution network from Moomba-Sydney Pipeline is therefore constrained.

Longford has additional gas supply capacity which can supply the Sydney distribution network via the Eastern Gas Pipeline. The most practicable option for meeting existing and future gas demand within the Sydney distribution network is from the Eastern Gas Pipeline.

Jemena owns and operates the Eastern Gas Pipeline and associated facilities. Jemena proposes to increase the ability of the existing pipeline to deliver gas to the Sydney distribution network.

Gas delivery from the Eastern Gas Pipeline is currently constrained the Horsley Park Meter Station.

The facility connects the Eastern Gas Pipeline to the Sydney distribution network. The Horsley Park Meter Station is currently operating at contractual capacity, meaning that Jemena cannot commit to additional gas supply through this facility. Gas deliverability needs to be increased to allow current and future gas demand within the Sydney distribution network to be supplied by the Eastern Gas Pipeline.

Options considered

The additional gas deliverability could be increased by:

- Option 1: Rely on the additional gas requirements to be delivered by the Moomba-Sydney Pipeline (effectively the 'Do Nothing' option)
- Option 2: Construct new pipeline sections that run parallel to and are connected to the existing Eastern Gas Pipeline (referred to a 'looping') to increase the capacity of the existing pipeline
- Option 3: Install additional compressor stations on the Eastern Gas Pipeline to deliver more gas through the pipeline
- Option 4: Upgrade existing facilities on the Eastern Gas Pipeline to increase Jemena's ability to deliver more gas into Sydney distribution network, or
- Option 5: Connect the Eastern Gas Pipeline to other pipelines connected to the Sydney distribution network that have additional capacity and divert gas from the Eastern Gas Pipeline into those pipelines.

Options 1, 2 and 3 do not meet the objective of the proposal and have been discounted.

Option 5 meets the objective of the proposal and is considered the most ideal solution as it would build supply redundancy into gas delivery from the Eastern Gas Pipeline. There are, however, risks associated with the approval pathway and timing for Option 5 which may mean that it cannot be implemented within suitable a time frame.

Option 4 would meet the objective of the proposal and is not subject to the same approval and timing risks as Option 5. Option 4 has therefore been adopted as the preferred option.

Statutory and planning framework

The Eastern Gas Pipeline and the Horsley Park Meter Station are subject to Pipeline Licence No. 26 under the NSW *Pipelines Act 1967*. As the proposal would occur within the existing licence area for the Eastern Gas Pipeline and the existing facility is described in the pipeline licence, a pipeline licence variation is not required.

In accordance with *State Environmental Planning Policy (State and Regional Development) 2011* the proposal is considered State Significant Infrastructure and requires approval from the Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (the EP&A Act). It is noted that prior to the introduction of this policy the proposal would not have required any approval under the EP&A Act.

No other statutory approvals are required for the proposal.

Community and stakeholder consultation

Jemena has consulted with the NSW Department of Trade and Investment, which administers the NSW *Pipelines Act 1967*, regarding the proposal. The Department has confirmed that a pipeline licence variation it is not required for the proposed upgrade work and that no alternative approval pathways are available. Jemena will keep the Department of Trade and Investment informed throughout the approval process.

Jemena has written to a wide range of government agencies and interested stakeholders during the preparation of this document.

Fire and Rescue NSW responded and requested a meeting to discuss the proposal. During the meeting the representatives of Fire and Rescue NSW noted that the key matters that they would like to see addressed in the EIS are how the facility and sections/components within the facility can be isolated in the event of an emergency and how Jemena's emergency response would contact, liaise and integrate with emergencies services such as Fire and Rescue NSW in the event of an emergency. Relevant information has been included in the EIS.

The other external stakeholders contacted either responded to indicate that they raise no objections to the proposal or did not respond at all.

Public Notices were placed in the local newspaper over two consecutive weeks providing details about the proposal and the preparation of the EIS. Contact details for the project team was included in the notices. No community contact was received in response to the public notices.

Jemena has written to the local residents in the vicinity of the existing facility on two occasions to advise them of the proposal. None of the residents have contacted Jemena to discuss the proposal further.

Hazard Analysis and Risk Assessment

An environmental risk analysis has been carried out for the proposal. The analysis focussed on the main aspects of construction and operation of the proposal that have the potential to interact with the environment. The potential risks have been analysed by considering likelihood and consequence of the potential impacts. Appropriate mitigation measures were identified to reduce the risks as much as reasonably practicable. The risk assessment concluded that all environmental risks associated with the proposal can be adequately managed and the overall level of environmental risk associated with the proposal is low.

A Preliminary Hazard Analysis (PHA) has been prepared for the proposal in accordance with the requirements set out in the *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (NSW Department of Planning, 2011). The identified risks were compared with the risk criteria in use in NSW, as specified in *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Landuse Planning* (NSW Department of Planning, 2011b). The PHA indicates that the proposal would comply with the relevant risk criteria for hazardous development.

Environmental impacts

No significant environmental impacts would occur as a result of the proposal.

A Biodiversity Impact Assessment has been carried out for the proposal. The vegetation present within the facility consists of exotic pasture grasses and planted native trees. No features of high biodiversity conservation significance would be affected by the proposal.

Only minor earthworks and changes to the existing surface topography would occur as a result of the proposal. There is no evidence to suggest that soils present are contaminated. The proposal would not result in any significant soil and water impacts or adverse changes to site hydrology and flooding.

A Due Diligence Archaeological Assessment has been carried out for the proposal in accordance with relevant guidelines. The assessment was carried out by a suitably qualified archaeologist with the involvement of a representative from the relevant Local Aboriginal Land Council. No features of aboriginal archaeological or cultural heritage significance were identified that would be impacted by the proposal. The assessment concluded that due to level of past ground disturbance associated with agricultural activities and the construction of the existing facility the likelihood of encountering any intact features of archaeological significance is minimal. There is little risk that any features of aboriginal archaeological or cultural heritage significance would be affected as result of the proposal.

The existing facility combusts natural gas for heating purposes. The proposed upgrade includes the installation of additional heating apparatus which would also combust natural gas. As the potential for natural gas combustion would double as a result of the proposal, potential greenhouse gas (GHG) emissions from the existing facility are also anticipated to double. GHG emissions from the combustion of coal are around 70% higher than those generated by the combustion of natural gas. The majority of natural gas supplied by the distribution network is combusted for heating purposes. If the ability to deliver natural gas into the Sydney distribution network is not increased, the energy shortfall may lead to increased use of electricity from coal combustion with associated GHG emission increases. In this regard the proposal would provide a benefit in terms of overall GHG emissions.

Gaseous emissions from the existing facility other than carbon dioxide include carbon monoxide (CO) and oxides of nitrogen (NO_X). The potential emissions of CO and NO_X are anticipated to double as a result of the proposal. A quantitative air quality impact assessment has been carried out for the proposal in accordance with the requirements of *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA 2005) (the NSW EPA Approved Methods). The assessment concluded that the predicted air quality impacts from the proposed development are minimal and would not exceed the criteria stipulated by the air quality guidelines. No significant impacts to local or regional air quality would result from the proposal.

The existing facility generates noise but is generally inaudible at the nearest noise sensitive receivers. The proposed upgrade includes the installation of additional noise generating apparatus. The nearest residences to the existing facility are around 300 metres to the south and south-east. A conservative quantitative assessment of operational and construction noise associated with the

upgrade indicates that any potential noise increases would not adversely affect the residents in the vicinity of the existing facility. No significant noise impacts would occur as a result of the proposal.

No vibration impacts are anticipated as a result of the proposal.

Construction of the proposal would result in increased light and heavy vehicle movements along Chandos Road. The increased vehicle movements due to construction of the proposal of the proposal would not significantly increase congestion or travel times for other road users or result in any property access restrictions for residents along Chandos Road. Operation of the upgraded facility would not increase existing site access requirements significantly. No significant traffic and access impacts would occur as a result of the proposal.

No features of European heritage conservation significance have been identified in the vicinity of the proposal. Due to level of past ground disturbance associated with agricultural activities and the construction of the existing facility the likelihood of encountering any intact features of European heritage significance is minimal. There is little risk that any impacts to features of European heritage significance would occur as a result of the proposal.

The location of the proposal is semi-rural in character but also features utility infrastructure and industrial operations. The proposal includes the installation of additional gas infrastructure within an existing gas facility. There is another gas facility located immediately south of the location of the proposal. The existing facility is around 300 metres the closest residence. The existing facility is obscured either wholly or partially from most of the residences in the vicinity by other buildings, agricultural structures, vegetation and topography. The proposal would not alter the landscape character of the location or result in any significant visual impacts.

The proposal would not directly or indirectly affect any properties or commercial activities in the vicinity of the existing facility and would not result in adverse socio-economic impacts. Natural gas as energy source is an important economic commodity. As outlined in this document the supply of natural gas to the Sydney distribution network is currently constrained. If the ability to deliver natural gas into the network is not increased the development and operation of gas dependent industries may be constrained with the potential for adverse socio-economic impacts to the wider community. The proposal would result in socio-economic benefits.

Operation of the upgrade facility would result in increased waste generation. Certain maintenance activities generate potentially contaminated wastes in the form of the used dry gas filter cartridges and materials contaminated by light hydrocarbons. These wastes are typically collected in 205 litre HAZMAT drums and taken away by suitably licensed waste contractors for disposal at suitably licensed waste facilities. Maintenance activities that generate these wastes would increase as a result of the proposal and waste stream could potentially double. The maintenance activities that generate these types wastes occur infrequently, however, and only small amounts of potentially contaminated waste are generated. The amount of wastes that would be generated by the upgraded facility would not be significant.

The main resources that would be used during construction of the proposal include steel, concrete, masonry products (bricks) and quarry products. The quantities required to construct the proposal would not result in resource availability issues and impacts.

Long term management

The existing work management system for the Eastern Gas Pipeline would be amended to include the new apparatus that would be installed within the Horsley Park Meter Station as part of the proposed upgrade. New procedures and work instructions relevant to the additional apparatus and upgraded facility would be developed and added to Jemena's work management system as required. The existing planned maintenance schedules would be amended to include relevant additional preventative maintenance requirements and integrity inspections for the new apparatus and associated systems.

The proposed upgrade would be designed so that all new key components are connected into the existing supervisory control and data acquisition (SCADA) system for the Eastern Gas Pipeline and its associated facilities. The operation of the upgrade facility would be continually monitored and controlled from the EGP Control Room, which is manned 24 hours per day 365 days per year, using the existing systems and processes currently in place.

No significant changes are therefore required to the existing operational, maintenance, monitoring and control systems associated with the Eastern Gas Pipeline and the Horsley Park Meter Station to ensure the ongoing safe operation of the upgraded facility in the long term.

Justification and conclusion

The proposed upgrade of the Horsley Park Meter Station would meet the objective of the proposal by increasing the deliverability of natural gas into the Sydney distribution network from the Eastern Gas Pipeline by 120 terajoules per day to address developing gas supply constraints.

The assessment of potential impacts associated with the proposal indicates that no significant environmental and amenity impacts would occur. Any adverse environmental and amenity impacts associated with the proposal would be more than adequately outweighed by the socio-economic benefits provided by increasing gas supply potential into the Sydney distribution network. On this basis the overall impact of the proposal would be beneficial in terms of state and regional environmental and economic planning objectives and the proposal is justified.

1 Introduction

1.1 Proposal identification

SGSP (Australia) Assets Pty Ltd and its group of subsidiary companies (Jemena) propose to upgrade an existing natural gas facility at Horsley Park, New South Wales (the Horsley Park Meter Station). The proposal involves the construction and installation flow conveyance and control apparatus, associated connecting pipework and masonry enclosures within the boundaries of the existing facility. The purpose of the proposal is to increase natural gas deliverability from the Eastern Gas Pipeline into the Sydney natural gas distribution by 120 terajoules per day by winter 2016 to meet the increasing demand for natural gas and address potential supply constraints. The proposal is referred to as the Horsley Park Meter Station Upgrade.

1.2 Purpose of this report

A review of relevant legislation, regulations and policies indicates that the proposal is State Significant Infrastructure. This Environmental Impact Statement (EIS) has been prepared by EnviroPlan Pty Ltd on behalf of Jemena to support an application for approval of the proposal under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (the EP&A Act). The purpose of this EIS to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposal which were issued on 2 December 2014.

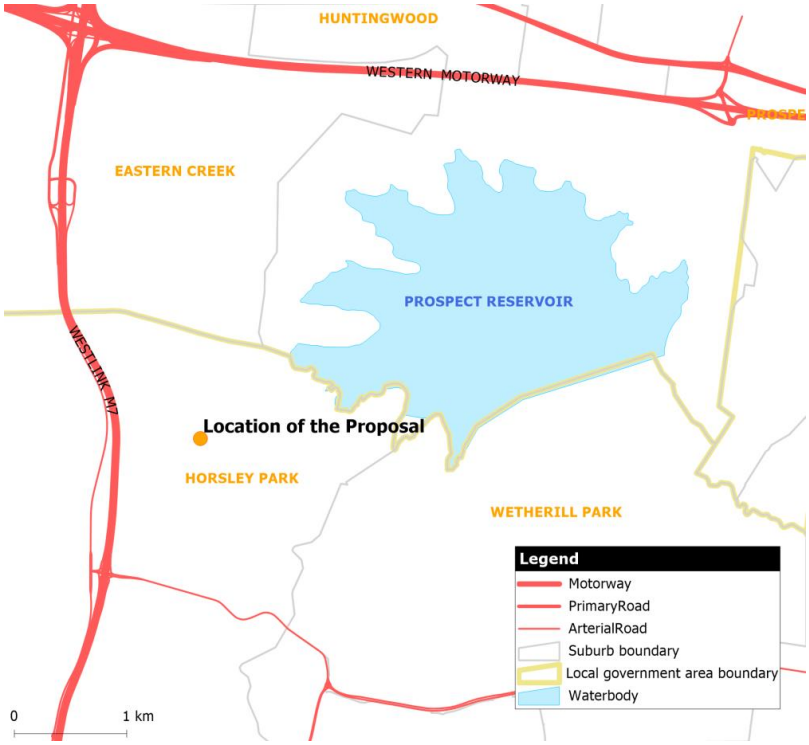
1.3 Location of the Proposal

The Horsley Park Meter Station is located at 194-202 Chandos Road, Horsley Park. The project location is within the Fairfield local government area. The location of the proposal is shown in Figure 1-1.

The facility is located on Lot 3 in Deposited Plan 1002746 as shown in Figure 1-2. All works associated with the proposal would occur within the boundaries of this property.

1.4 Land tenure

The certificate of title for Lot 3 in Deposited Plan 1002746 indicates that the lot is owned by Duke Eastern Gas Pipeline Pty Limited and DEI Eastern Gas Pipeline Pty Limited as joint tenants. A review of the Australian Business Number (ABN) histories of each entity indicates that these entities have been renamed Jemena Eastern Gas Pipeline (2) Pty Ltd and Jemena Eastern Gas Pipeline (1) Pty Ltd respectively. These two entities are the pipeline licensees of the Eastern Gas Pipeline and are wholly owned subsidiaries of SGSP (Australia) Assets Pty Ltd.



Data: Land and Property Information

Figure 1-1 The location of the proposal

Data: Land and Property Information. Imagery: Jemena

Figure 1-2 Location of property: Lot 3 in Deposited Plan 1002746

1.5 Background

The Eastern Gas Pipeline was constructed in 1999/2000 and extends approximately 797 kilometres from Longford in Victoria to Sydney as shown in Figure 1-3. The pipeline currently has a capacity of around 290 terajoules per day. The Eastern Gas Pipeline is subject to Pipeline Licence No. 26 under the NSW *Pipelines Act 1967*. The licensees for the Eastern Gas Pipeline are Eastern Gas Pipeline (1) Pty Ltd and Eastern Gas Pipeline (2) Pty Ltd, both subsidiaries of Jemena.

Figure 1-3 The Eastern Gas Pipeline

The Eastern Gas Pipeline is one of the major gas feeds into the Sydney distribution network. The other main feed into the network is the Central Trunk (Pipeline Licences No. 1 and No. 3) which is owned by Jemena Gas Network (NSW) Limited. The Central Trunk is fed by the Moomba-Sydney Pipeline (Pipeline Licence No. 16) which is owned and operated by the APA Group. Together these pipelines provide for almost all of the gas demand within Sydney distribution network.

The Horsley Park Meter Station reduces and regulates the pressure of gas from the Eastern Gas Pipeline and delivers that gas into the Central Trunk and another pipeline referred to as the Smithfield Lateral. The Central Trunk feeds the Sydney distribution network. The Smithfield Lateral

is an extension of the Eastern Gas Pipeline and supplies high pressure gas to a large volume industrial gas user in the Smithfield area. The pipelines connected by the Horsley Park Meter Station are shown in Figure 1-4.

The existing facility is currently at contractual capacity, meaning that it has the capacity to meet the full requirements of all existing gas supply contracts. Jemena cannot, however, commit to providing additional gas supply through the facility to meet any increased demand within the Sydney distribution network.

Data: Land and Property Information, Jemena. Imagery: Jemena

Figure 1-4 Pipelines connected by the Horsley Park Meter Station

1.6 The existing facility

The Horsley Park Meter Station includes:

- A bulk liquid separator
- Two dry gas filters
- Three water bath heaters which heat the gas up prior to pressure reduction
- Gas metering equipment to measure the amount of gas being delivered to the Central Trunk
- Gas regulators to reduce the pressure of gas from the Eastern Gas Pipeline to the required pressures for the Central Trunk and the Smithfield Lateral
- Associated connecting pipework
- Pipeline internal inspection tool receiving (Easter Gas Pipeline) and launching (Smithfield Lateral) apparatus
- Pipeline venting apparatus

- A number of site buildings, and
- Perimeter fencing.

A schematic showing the main apparatus of the Horsley Park Meter Station is provided in Figure 1-5. Photos of the main gas flow conveyance and control apparatus are provided in Plate 1-1, Plate 1-2, Plate 1-3, Plate 1-4 and Plate 1-5.

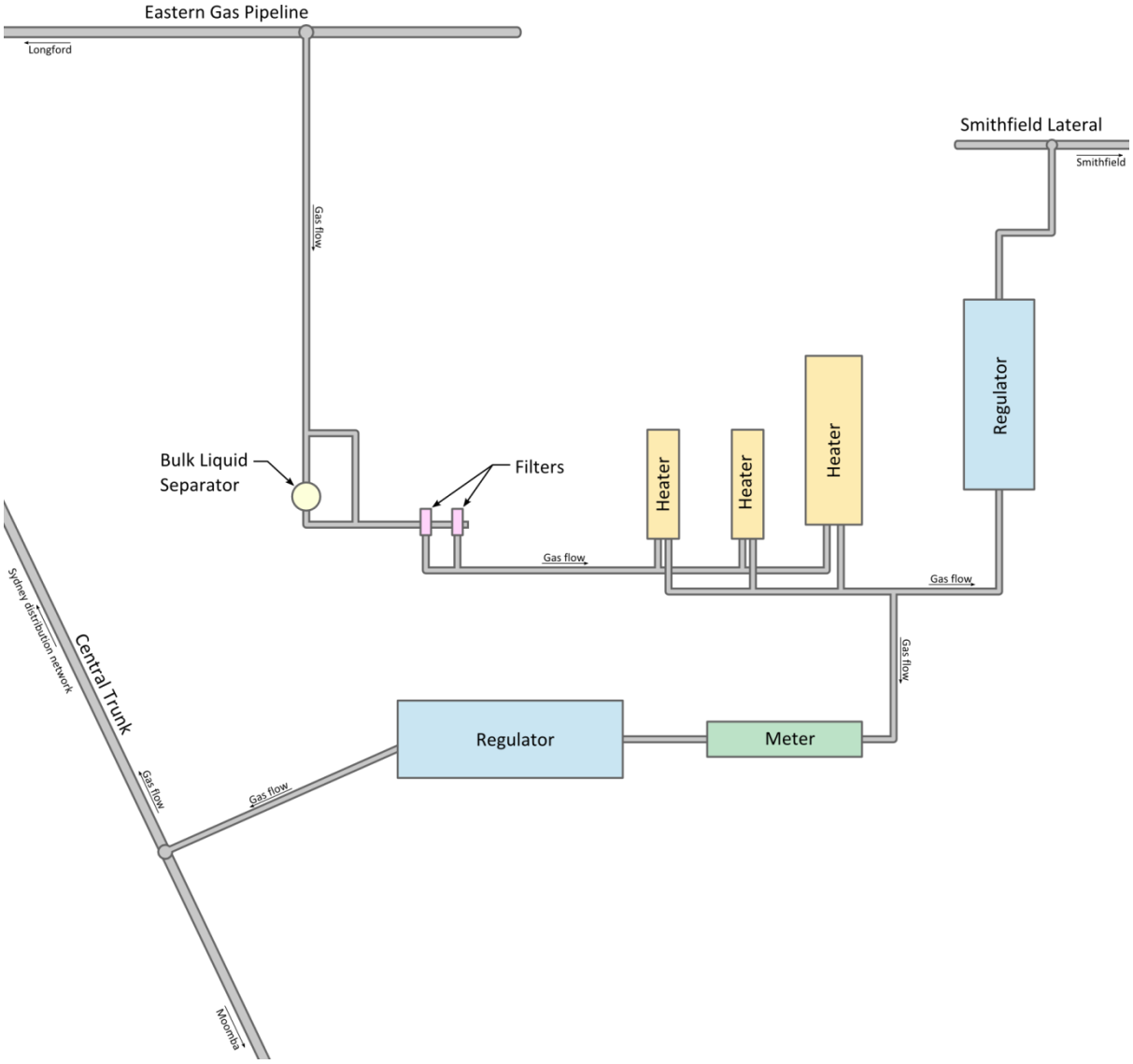


Figure 1-5 Schematic of the Horsley Park Meter Station

Plate 1-1 **Metering equipment (foreground) and regulator for gas delivery to the Central Trunk (inside masonry enclosure)**

Plate 1-2 **Regulator gas for delivery to the Smithfield Lateral (inside masonry enclosure)**

Plate 1-3 **Dry gas filters and associated pipework**

Plate 1-4 **Water bath heaters (three) and associated pipework**

Plate 1-5 **Bulk liquid separator and associated pipework**

1.7 The Proponent

The proponent for the proposal is SGSP (Australia) Assets Pty Ltd and its group of subsidiary companies (Jemena). Jemena, its subsidiaries and associated sub-contractors would carry out the proposal on behalf the pipeline licensees.

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2 Need and options considered

2.1 Strategic need for the proposal

Around 95% of the gas supplied to Sydney distribution network comes from either the Moomba-Sydney Pipeline or the Eastern Gas Pipeline. The Moomba-Sydney Pipeline transports gas from Moomba in South Australia and also from the Victorian wholesale gas market, which is via the NSW Interconnect Pipeline. The Eastern Gas Pipeline transports gas from Longford in Victoria to the Sydney distribution network and other gas distribution networks including Canberra and Wollongong. The remainder of gas demand in the Sydney distribution network is supplied from small coal seam gas reserves in south western Sydney. A schematic of the pipelines and gas markets relevant to gas supply in the Sydney distribution network is provided as Figure 2-1.

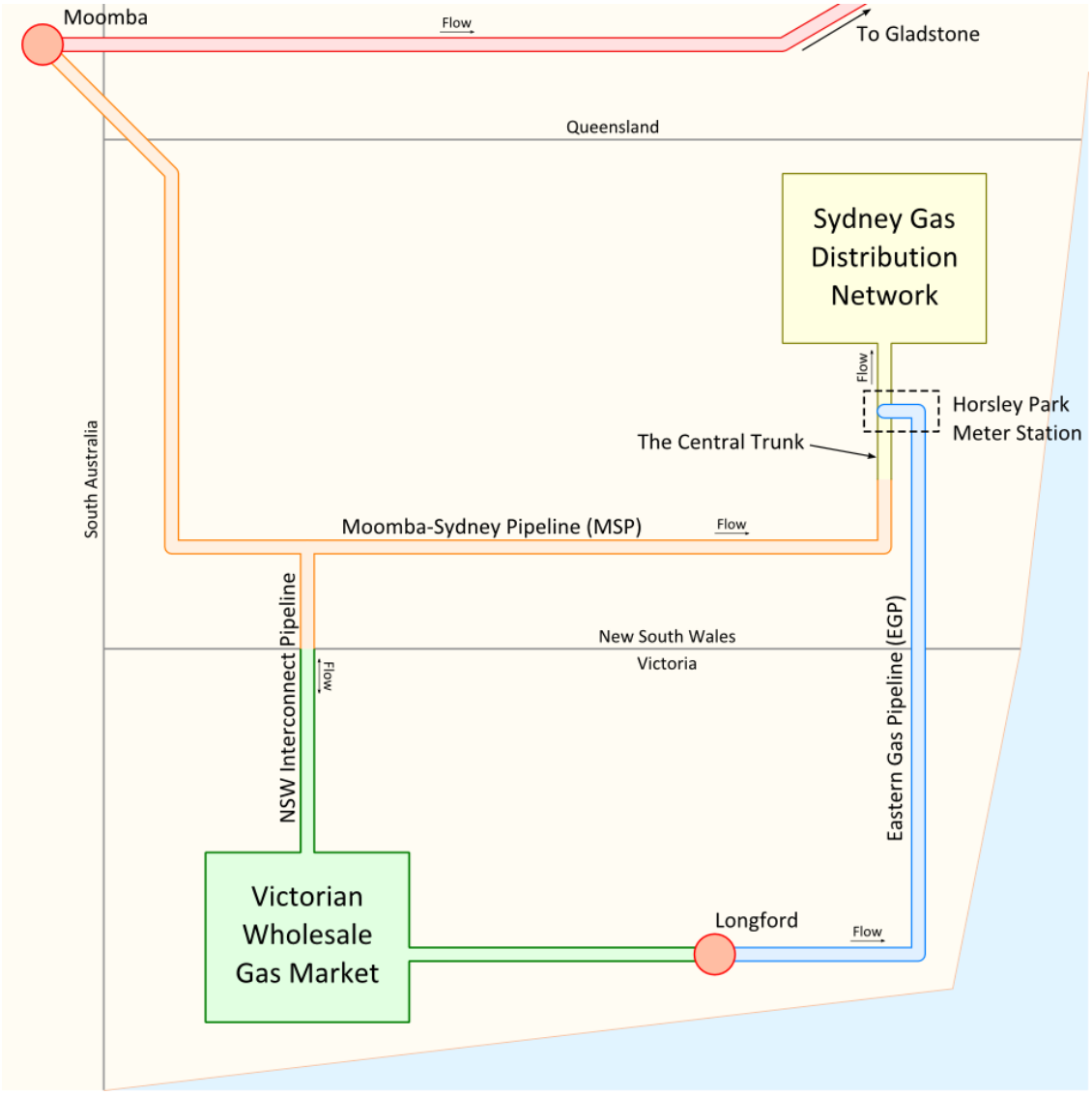

Figure 2-1 Gas pipelines and markets relevant to gas supply in the Sydney distribution network

Future gas supply availability options for the Sydney distribution network are currently limited. Gas supply capacity at Moomba is almost completely utilised. As existing contracts for gas supplied from Moomba come to an end gas is increasingly being committed and shipped to the new liquefied natural gas (LNG) facilities in Gladstone, Queensland, to make the most of the export gas prices, which are significantly higher than domestic wholesale gas prices. The ability to maintain and increase gas supply to the Sydney distribution network from Moomba is therefore constrained.

The Victorian wholesale gas market is regulated by the independent Australian Energy Market Operator (AEMO). Gas can be supplied to the Sydney distribution network from the Victorian wholesale gas market along the Moomba-Sydney Pipeline via the NSW Interconnect Pipeline. The export of gas from the Victorian wholesale gas market to other markets is, however, governed by the gas demand within that network and is at the discretion of the AEMO. When demand within the Victorian wholesale market is at or near its peak, AEMO will prioritise security of supply within that market over exports of gas for the Sydney distribution network. The ability to maintain and increase existing gas supplies for the Sydney distribution network from this market is therefore also constrained.

No such market constraints affect the supply of gas from Longford into the Sydney distribution network along the Eastern Gas Pipeline. Longford has additional gas supply capacity which can supply the Sydney distribution network. Unless gas reserves within NSW are developed and utilised, meeting the current and future gas supply requirements of the Sydney distribution network from the Eastern Gas Pipeline is the most practicable option.

The ability to increase gas supply to the Sydney distribution network from the Eastern Gas Pipeline is currently constrained by the existing physical capacity of the pipeline and associated facilities. In particular, the Horsley Park Meter Station, which connects the Eastern Gas Pipeline into the Sydney distribution network, is at its maximum contractual capacity. This means that it only has the physical capacity to deliver the full requirements of all existing gas supply contracts at peak demand. Jemena cannot commit to providing sustained additional gas delivery through the facility without jeopardising the ability of existing gas customers to draw their full contractual amounts of natural gas from the network.

Some analysis indicates that gas supply to the Sydney distribution network could fall significantly below gas demand as early as 2016 if nothing is done (Simshauser and Nelson, 2014). Jemena intends to address this concern by increasing the ability of the Eastern Gas Pipeline to supply gas to the Sydney distribution network. Addressing the delivery restrictions imposed by the existing Horsley Park Meter Station is necessary to achieve this outcome.

2.2 Proposal objective

The objective of the proposal is to address the current requirement to increase gas deliverability into the Sydney distribution network and to do so in a timely manner that minimises the potential for environmental impact and community disruption.

2.3 Alternatives and options considered

The additional gas deliverability could be increased by:

- Option 1: Rely on the additional gas required to be delivered by the Moomba-Sydney Pipeline (effectively the 'Do Nothing' option)
- Option 2: Construct new pipeline sections that run parallel to and are connected to the existing Eastern Gas Pipeline (referred to a 'looping') to increase the throughput capacity
- Option 3: Install additional compressor stations on the Eastern Gas Pipeline to deliver more gas through the pipeline
- Option 4: Upgrade existing facilities on the Eastern Gas Pipeline to increase Jemena's ability to deliver more gas into Sydney distribution network, or
- Option 5: Connect the Eastern Gas Pipeline to other pipelines that connect to the Sydney distribution network that have additional capacity and diverting gas from the Eastern Gas Pipeline into those pipelines.

The options are evaluated below.

Option 1 – Do nothing

Under this option the Eastern Gas Pipeline would not be altered and the Moomba-Sydney Pipeline would deliver additional gas required. As outlined above, the ability to maintain and increase gas supply to the Sydney distribution network from Moomba and the Victorian wholesale gas market along the Moomba-Sydney Pipeline is limited.

This option would not, therefore, meet the objective of the proposal in the short or long term.

Option 2 – Pipeline looping

Pipeline looping has the ability to significantly increase the capacity of an existing pipeline. Pipeline looping projects typically require extensive environmental investigations and lengthy planning and approval processes, which would reduce the ability of the option to meet the more immediate gas supply issues. Also, any additional capacity that a looping project would provide on the Eastern Gas Pipeline would be limited by the current supply restrictions at the Horsley Park Meter Station, which is currently operating at capacity.

As this option would not provide a timely increase in supply capacity and the benefits would be limited by the restrictions at the Horsley Park Meter Station it would not meet the objective of the proposal.

Option 3 – Installing additional compressor stations

Additional compressor stations can be installed to push more gas through the existing pipeline. Compressors are typically connected at the location of existing valves on the pipeline and require specific connections, which are typically installed during construction of the pipeline. Decisions about the location of number of future compressor stations that can be installed on a pipeline are therefore made during the original pipeline planning process.

Additional connection points for compressors were installed on the Eastern Gas Pipeline during construction. Jemena is currently progressing plans to install additional compressor stations at some of these locations. Any additional gas supply capacity that would be provided by the additional compression would, however, be limited by the current delivery restrictions at the Horsley Park Meter Station, as it is currently operating at contractual capacity.

The installation of additional compressors alone would not therefore meet the objective of the proposal.

Option 4 – Upgrade the Horsley Park Meter Station

Under this option the Horsley Park Meter Station would be upgraded to provide the additional gas supply capacity currently required. This could be achieved by the installation of additional pipework and associated gas conveyance and flow control apparatus. This would increase the existing delivery capacity of the facility by 120 terajoules per day, which is a significant increase. This option would allow Jemena to increase gas supply into the Sydney distribution network from the Eastern Gas Pipeline. As the work required to upgraded facility would occur within the boundaries of the existing facility it could also be implemented relatively quickly with minimal impact to the environment.

This option would therefore meet the proposal objective in the required timeframe.

Option 5 – Provide an alternate connection into the Sydney gas distribution network

Under this option a connection would be made between the Eastern Gas Pipeline and the Moomba-Sydney Pipeline or Central Trunk at a location upstream of the Horsley Park Meter Station. Both of these pipelines and their associated facilities have additional capacity and are located close to the Eastern Gas Pipeline in certain locations. Creating an interconnecting pipeline between either of these two pipelines and the Eastern Gas Pipeline would allow the supply restriction at the Horsley Park Meter Station to be avoided, increasing gas supply into the Sydney distribution network.

Jemena is assessing a proposal to construct an interconnecting pipeline. The proposed pipeline would be constructed as part of the Eastern Gas Pipeline and would require approval from the Minister for Energy under Part 5 of the EP&A Act. If it is determined that the proposal would result in any significant environmental impacts, however, the proposal would need to be assessed as State Significant Infrastructure under Part 5.1 of the EP&A Act. If that occurs it is unlikely that the interconnecting pipeline would be finished in time to meet current and future gas supply requirements.

This option would therefore meet the proposal objective. There are, however, risks associated with implementing this option within suitable time frames.

Analysis of options

Option 1 does not provide adequate security of future gas supply into the Sydney gas distribution and beyond. This option would rely on all future increases in gas to be supplied from either Moomba, the Victorian gas wholesale market or internal reserves within NSW that are yet to be developed. Option 1 has therefore been discounted.

Options 2 and 3 would provide a good solution to the long term requirement to increase gas supply into the Sydney distribution network. Without a corresponding upgrade of the Horsley Park Meter Station or a connection to the Moomba-Sydney Pipeline or the Central Trunk, however, any capacity increases in the Eastern Gas Pipeline provided would be limited. Option 2 and Option 3 alone do not therefore meet the objective of the proposal. It is also noted that the construction of new pipeline sections and the clearing of land on which to construct a compressor stations could result in environmental impacts more significant than the current proposal.

If Option 5 was approved and completed in time it would meet the objective of the proposal. This option would be preferred over the other options as it would add supply redundancy (i.e. two connections into the Sydney distribution network). If it is determined that such a proposal would result in any significant environmental impacts, however, the preferred approval pathway for Option 5 would not be available and the interconnecting pipeline would not be constructed within suitable timeframes. There are therefore timing risks associated with adopting Option 5 as the preferred option.

Option 4 would increase the overall gas supply capacity into the Sydney distribution network significantly and within acceptable timeframes. Also, it would occur entirely within the boundary of an existing facility gas facility, reducing the potential for additional environmental impacts. Option 4 therefore represents lowest risk way to meet the objective of the proposal and has been selected as the preferred option.

2.4 Justification of the proposal

Upgrading the Horsley Park Meter station is justified on the basis that it:

- it is the least complex option
- requires the no land acquisition
- would involve no disturbance to land outside those areas already disturbed as part of construction of the existing pipeline and facility, and
- can be implemented relatively quickly to ensure that future demand can be met in a timely manner.

As the proposal would occur within the boundaries of an existing facility it would also meet the objective of the proposal of minimising the potential for environmental impact and community disruption, which is demonstrated in the following sections.

2.5 Ecologically sustainable development

Ecological sustainable development (ESD) is using, conserving and enhancing the community's resources so that ecological processes on which life depends are maintained and the total quality of life now and in the future can be increased (Ecologically Sustainable Development Steering Committee, 1992).

The EP&A Act identifies the following four principles to assist in the achievement of ecological sustainable development:

- The precautionary principle
- Inter-generational equity
- Conservation of biological diversity and ecological integrity, and
- Improved valuation and pricing and incentive mechanisms.

The principles of ecological sustainable development have been considered throughout the development of the proposal as outlined below.

Precautionary principle

The precautionary principle requires that if there are threats of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The precautionary principle has been applied throughout the design and development of the proposal.

The alternatives and options analysis has considered the potential ways of addressing Sydney's future gas supply constraints from existing pipeline capacity. The potential for environmental impact has been considered in the options analysis. As the current proposal would occur entirely within the boundaries of an existing facility it represents the least potential environmental risk of all the options considered. All potential environmental impacts have been identified and assessed and mitigation measures identified to ensure that the overall level of environmental risk associated with the proposal is as low as reasonably practicable.

This EIS details the evaluation of environmental impacts associated with the proposal and has been undertaken using the best available information, in accordance with relevant assessment guidelines and adopts best practice environmental mitigation measures to minimise environmental risks.

The proposal is consistent with the principles of ecologically sustainable development, including the precautionary principle, in this regard.

Inter-generational equity

The principle of intergenerational equity requires that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The objective of the proposal is to increase deliverability of natural gas into the Sydney natural gas distribution network to avoid predicted future gas shortages. The proposal would ensure that natural gas supply is able to meet demand and ensure that there is a feasible energy alternative to electricity. Decreased usage of electricity generated from coal combustion would reduce overall greenhouse gas emissions and contributions to human-induced climate change which has the potential to affect future generations (refer to Section 7.4).

The proposal is consistent with the principles of ecologically sustainable development, including intergenerational equity, in this regard.

Conservation of biological diversity and ecological integrity

The conservation of biological diversity and ecological integrity is a fundamental consideration of the proposal.

The proposal would occur entirely within the boundaries of an existing gas facility that has been subject to previous disturbance and is devoid of any features of high biological and ecological value and conservation significance (refer to Section 7.1). All the viable alternative options have the potential to affect areas that have not been subject to previous disturbance and have increased potential to contain features of high biological and ecological value and conservation significance.

The proposal is consistent with the principles of ecologically sustainable development, including conservation of biological diversity and ecological integrity, in this regard.

Improved valuation and pricing of environmental resources

The principles of ecologically sustainable development require that environmental factors should be included in the valuation of assets and services, such as:

- Polluter pays (i.e. those who generate pollution and waste should bear the cost of containment, avoidance, or abatement)
- The users of goods and services should pay prices based on the full life cycle of costs of providing the goods, and
- Environmental goals, having been established, should be pursued in the most cost effective ways.

The costs associated with construction and operation of gas transmission and distribution infrastructure, including the costs associated with environmental compliance, is factored into the price of gas, which is regulated by the Independent Pricing and Regulatory Tribunal (IPART). This supports the concept of users of goods and services paying prices based on the full life cycle of costs of providing those goods and services.

The environmental goals for the proposal have been established with consideration of relevant guidelines and environmental performance criteria. The costs associated with achieving the required goals have been factored into the decision making process with regards to facility design. The design concept is considered to be cost effective.

The proposal is consistent with the principles of ecologically sustainable development, including improved valuation and pricing of environmental resources, in this regard.

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3 Description of the proposal

3.1 The proposal

The proposal involves the construction of additional gas flow conveyance, control and metering equipment and associated pipework within the boundaries of the existing Horsley Park Meter Station. To increase the overall capacity of the station a second run of pipework and gas conveyance control apparatus would be installed in parallel with the existing infrastructure within the boundaries of the existing facility.

The proposal includes the following:

- Removal of the existing bulk liquid separator and associated pipework
- Installation of new dry gas filtration equipment
- Installation of new gas heat exchangers
- Installation of hot water heaters (boilers) and a noise attenuating masonry enclosure
- Installation of a new gas metering unit
- Installation of a new gas regulator and a noise attenuating masonry enclosure, and
- Associated above and belowground connecting pipework.

The new section of pipework and apparatus would inject additional gas flows into the outlet of the existing regulator that supplies the Central Trunk and the Sydney distribution network. A schematic of the additional components that would be installed as part of the Horsley Park Meter Station is provided in Figure 3-1. All the new gas conveyance control equipment would be connected into the existing telemetry system and continually monitored at the existing Jemena Control Centre, which is located remotely from the site.

A preliminary design documentation for the proposed upgrade is provided as Appendix A. It is noted that the detailed design for the proposal has not yet been finalised. As a result the details of the proposal provided in this document may change. Any such changes, however, would be accommodated entirely within the boundary of the existing facility and would not result in any additional environmental impacts.

The location where the majority of the new apparatus would be installed is shown in Plate 3-1.

3.2 Capital investment value

The capital investment value of the proposal is $15 million.

3.3 Design

All flow conveyance and control apparatus and associated pipework will be designed and constructed in accordance with the requirements of Australian Standards *AS2885.1 Design and construction of Pipelines gas and liquid petroleum* and *AS4041-2006 Pressure piping*.

The masonry structures that would be placed around the new regulator and water heaters would be constructed in accordance with the Building Code of Australia and certified by an appropriate certifying authority.

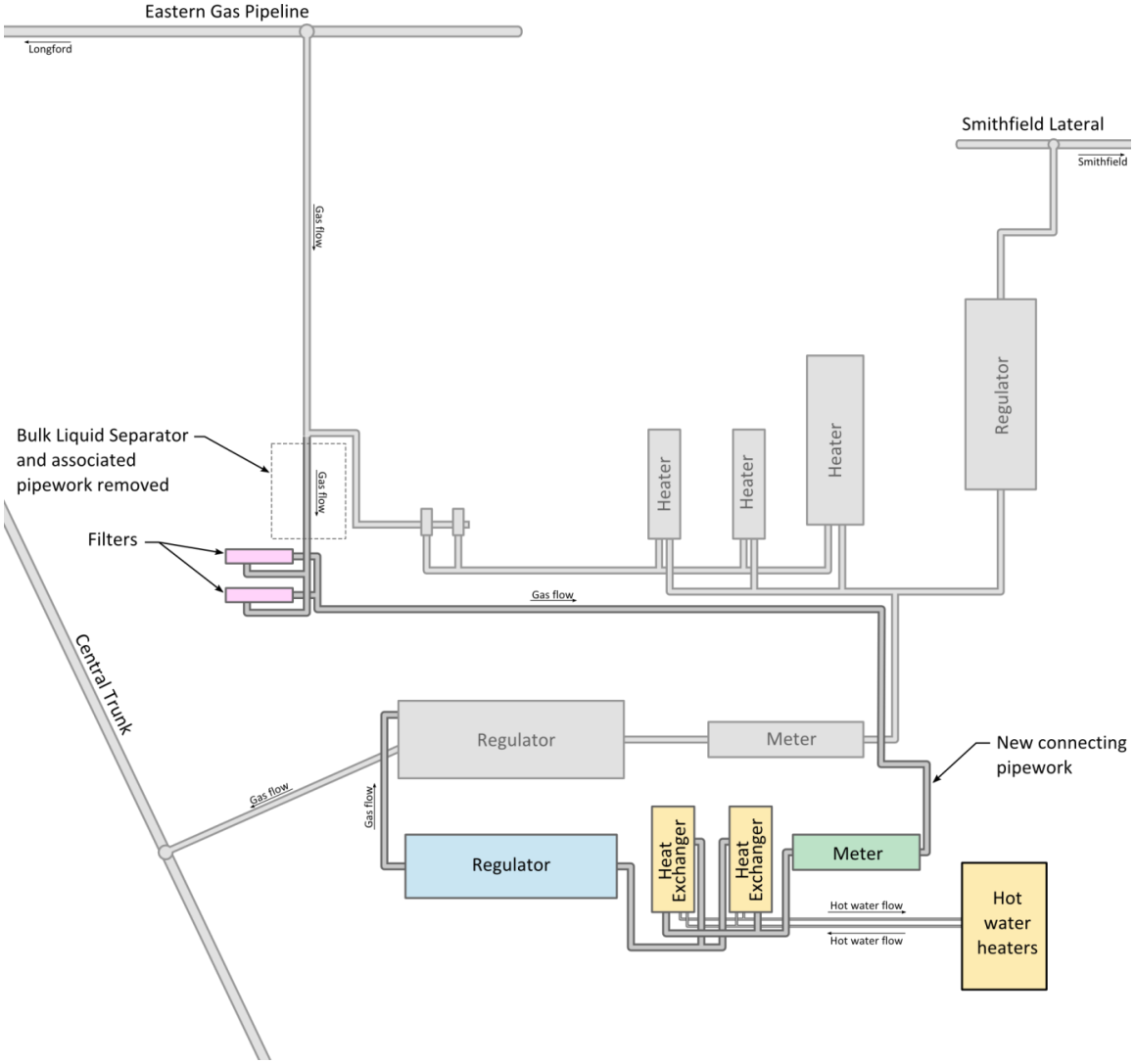

Figure 3-1 Schematic of the additional apparatus and pipework to be installed as part of the proposal

Plate 3-1 The location where most of the new apparatus would be installed

3.4 Construction activities

3.4.1 Work methodology

It is noted that the flow conveyance control equipment would typically be fabricated at an off-site location and brought to site for installation. Certain components of the connecting pipework, such as elbows and flanges, would also be fabricated offsite. Other components would be cut to size on site and installed. The proposal includes the following construction activities:

- Site establishment, including installation of temporary site shelters and amenities for construction personnel, installation of storage containers and areas.
- Site survey and mark out
- Verification of the locations of underground pipework and services
- Bulk excavations to extend the existing level surface of the facility and create the new area onto which to install the new infrastructure
- Minor excavations for concrete pads and plinths and for underground conduits, services and pipework
- Creation of concrete pads for apparatus and plinths for connecting pipework
- Delivery and installation of gas flow conveyance control equipment
- Delivery and installation of connection pipework
- Installation of electrical systems
- Installation of connections to the existing pipework
- Introduction of gas into the new pipework and apparatus, and
- Testing and commissioning.

The regulator, metering unit, heat exchangers and filters would be assembled off site on platforms referred to as skids. This allows the units to be pre-assembled, pre-tested, brought to site and then lifted directly into the appropriate position within the facility for connection. This method

substantially reduces the amount of work required onsite.

3.4.2 Construction hours and duration

Typical construction hours for the proposal would be:

- 6am to 7pm Mondays to Fridays, and
- 7am to 1pm Saturdays

No construction work likely to generate significant noise levels would occur on Sundays and Public holidays and outside standard construction hours. Works associated with the proposal could potentially be carried out outside these standard construction hours where they are unlikely to result in disturbance of any noise sensitive receivers in the vicinity of the work location. The assessment of potential construction noise levels and impacts (refer to Section 7.6) indicates that construction activities outside standard construction hours would be permissible in accordance with relevant guidelines.

It is anticipated that the proposal would take around six months to construct and commission. The new pipework and apparatus would continue to operate for the life of the Eastern Gas Pipeline.

3.4.3 Plant and equipment

The plant and equipment required to carry out the proposal typically would include:

- Excavators
- Back hoes
- Skid loaders
- Delivery trucks
- Dump trucks
- Mobile cranes (Hiabs, Frannas, slew cranes etc)
- Generators
- Compressors
- Plate compactors
- Concrete trucks
- Concrete pumps
- Welding equipment
- Painting equipment, and
- Hand tools.

Other equipment may also be required.

3.4.4 Earthworks

Earthworks would be carried out to:

- Create a level surface at the same level as that on which the existing facility is located on which to install the new apparatus and pipework

- Create trenches for belowground pipework
- Create trenches for belowground service and telemetry conduits
- Create concrete pad foundation for gas conveyance control equipment, and to
- Create footings and foundations for plinths to support aboveground pipework.

3.4.5 Traffic management and access

The site would be accessed directly from Chandos Road, Horsley Park. The facility is connected to Chandos Road along an asphalt driveway around 220 metres long. Chandos Road would be typically accessed from Wallgrove Road which connects to both Westlink M7 Motorway and the M4 Western Motorway along with a number of other arterial roads.

All parking for construction personnel would be accommodated with existing unused space within Lot 3. No offsite parking would be required as part of the proposal.

3.5 Ancillary facilities

Existing space on the western side within Lot 3 would be used for laydown and storage areas and to locate site sheds, storage containers and site amenities required during construction. No land outside Lot 3 would be required for ancillary facilities.

3.6 Public utility adjustments

The location of services within the site boundary may require relocation as part of the proposal. The proposal would not disrupt gas flow through the existing components of the facility or otherwise affect gas delivery into the Sydney distribution network.

The proposal would also include an upgrade of the electricity supply connection outside the boundaries of the site. This would likely include the installation of standard 3 phase 400V industrial connection equipment on an existing power pole on Chandos Road and an upgrade of the electrical lines between the new equipment and the facility. The application for the proposed connection upgrade would be lodged with Endeavour Energy. It is unlikely that electricity supply in the vicinity would be disrupted during the installation and connection process.

No other public utility adjustments are anticipated due to the proposal.

3.7 Property acquisition

The proposal does not include any property acquisition or adjustments, changes to the existing pipeline easements or the licence areas for the existing pipelines.

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4 Statutory and planning framework

4.1 State Environmental Planning Policies

4.1.1 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (the Infrastructure SEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 53 of the Infrastructure SEPP permits development for the purpose of a pipeline without consent on any land if the pipeline is subject to a licence under the NSW *Pipelines Act 1967*. The Horsley Park Meter Station is part of the Eastern Gas Pipeline which is subject to Pipeline Licence No. 26 under the *Pipelines Act 1967*. The proposal would occur on land wholly within the lands included in the existing pipeline licence area. Based on this policy alone the proposal would not require any consent.

4.1.2 State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 (the State and Regional Development SEPP) aims to identify types of development of State regional and environmental significance that should be assessed and approved by Minister for Planning and to confer planning assessment and approval functions on the Planning Assessment Commission.

Under clause 14 in the State and Regional Development SEPP development that does not require consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) and is of a type specified in Schedule 3 to the policy is classified State Significant Infrastructure. Clause 5 in Schedule 3 includes development for the purpose of a pipeline licensed under the NSW *Pipelines Act 1967*. This essentially means that any development associated with a licensed pipeline, even minor alterations within the existing licence area, is considered State Significant Infrastructure that requires approval from the Minister for Planning.

As the facility is subject to Pipeline Licence No. 26 granted under the *Pipelines Act 1967* and the proposal does not require approval under Part 4 of the EP&A Act (due to the Infrastructure SEPP) the proposal therefore meets the definition of State Significant Infrastructure and requires approval under Part 5.1 of the EP&A Act. It is noted, however, that prior to the introduction of this policy no consent under the EP&A Act would have been required for the proposal.

4.1.3 State Environmental Planning Policy (Western Sydney Parklands) 2009

The aim of *State Environmental Planning Policy (Western Sydney Parklands) 2009* (the Western Parklands SEPP) is to put in place planning controls that will enable the Western Parklands to be developed into a multi-use urban parkland for the region of western Sydney.

A review of maps referenced in the Western Parklands SEPP indicates that the location of the proposal falls within the area covered the Western Parklands. Under Clause 9 of *State*

Environmental Planning Policy (Western Sydney Parklands) 2009 this land is considered to be unzoned.

Part 2 of the Western Parklands SEPP describes land uses and provisions applying to development within the Western Parklands. The proposal is not of a type included within the description of activities that may be carried out without consent in the Western Parklands. Schedule 2 to the policy lists describes development that is exempt from the need to obtain development consent. The proposal is not of a type described in Schedule 2.

Clauses 12 and 17 set out matters that must be considered by the consent authority for development in the Western Parklands. As the proposal would occur within an existing gas facility and would not require the disturbance and use of any additional land outside the property boundary, the proposal is consistent with the aims of the Western Parklands SEPP.

Clause 17A of the Western Parklands SEPP provides that consent must not be granted to development unless the consent authority is satisfied that any of the following services that are essential for the proposed development are available:

- The supply of water
- The supply of electricity
- The disposal and management of sewage
- Stormwater drainage or on-site conservation, and
- Suitable road access.

The proposal location is already serviced by the essential services required to operate the existing gas facility. It is noted that a minor upgrade of electrical infrastructure along Chandos Road is proposed to augment electrical supply into the facility (refer to Section 3.6).

4.2 Local Environmental Plans

4.2.1 Fairfield Local Environmental Plan 2013

The proposal is within the Fairfield local government area. A review of zoning maps for Fairfield local government area indicates that that the location of the proposal is within an area covered by the Western Parklands SEPP. Accordingly, the land is not zoned. In accordance with clause 6 of the Western Sydney Parklands SEPP the *Fairfield Local Environmental Plan 2013* does not apply to the location of the proposal.

4.3 State legislation

4.3.1 The Pipelines Act 1967

The *Pipelines Act 1967* regulates the construction, operation and maintenance of high pressure natural gas transmission pipelines in NSW. Under section 11 a person must not construct or a pipeline unless in pursuance of the licence granted under the *Pipelines Act 1967*. The Eastern Gas

Pipeline subject to Pipeline Licence No. 26 granted under the *Pipelines Act 1967*. As the pipeline licence already includes the Horsley Park Meter Station and no additional land is required for the proposal, no amendment to the licence is required for the proposal.

The savings and transitional provisions in clause 6 of Schedule 1 to the Act provide that where a pipeline was subject to a permit issued under the pre-2006 version of the Act and the proposed alterations are entirely within the lands subject to the permit, alterations can be assessed under Part 5 of the EP&A Act and approved by the Minister for Energy, rather than as State Significant Infrastructure. While the Eastern Gas Pipeline was subject to such a permit, the permit did not cover the section for the pipeline from Wilton to Sydney, including the Horsley Park Meter Station. Approval for the proposal under Part 5 of the EP&A Act is therefore not available for this facility. This position has been confirmed through correspondence with the NSW Department of Trade and Investment. This proposal must therefore be assessed as State Significant Infrastructure.

4.3.2 Environmental Planning and Assessment Act 1979

The proposal is classified as State Significant Infrastructure and requires approval under Part 5.1 of the EP&A Act (the EP&A Act). Under section 115W of the EP&A Act the Minister for Planning is the consent authority for State Significant Infrastructure.

As noted in section 115ZG of the EP&A Act, the following approvals are not required for State Significant Infrastructure projects:

- Concurrence under Part 3 of the *Coastal Protection Act 1979*
- Permits under section 201, 205 or 219 of the *Fisheries Management Act 1994*
- Approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*
- Aboriginal heritage impact permits under section 90 of the *National Parks and Wildlife Act 1974*
- An authorisation referred to in section 12 of the *Native Vegetation Act 2003* to clear native vegetation or State protected land,
- Bush fire safety authorities under section 100B of the *Rural Fires Act 1997*, and
- Water use approvals under section 89, water management work approvals under section 90 and activity approvals (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*.

Based on the assessment outlined in this document the risk that any of these approvals would be required if the proposal was not State Significant Infrastructure is extremely low.

4.4 Commonwealth legislation

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regulates actions that the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. Any actions that have the potential to result in such impacts must be referred to the Commonwealth Department of the Environment.

No matters of national environmental significance have been identified that would potentially be impacted by the proposal. Accordingly, it is unlikely that the proposal would need to be referred to the Commonwealth Department of the Environment.

4.5 Summary of consents required

As outlined above the only statutory consent required for the proposal is approval from the Minster for Planning under Part 5.1 of the NSW EPA Act.

5 Stakeholder and community consultation

5.1 Agency consultation

The SEARs list a number of government agencies and other external stakeholders that Jemena must consult with regarding the proposal.

Letters regarding the proposal were prepared and sent to the following external stakeholders:

- Fairfield City Council
- NSW Department of Primary Industries
- NSW Office of Water
- NSW EPA
- Fire and Rescue NSW
- NSW Office of Environment and Heritage
- NSW Roads and Maritime services
- NSW Trade and Investment
- NSW Rural Fire Service
- Water NSW
- Western Sydney Parklands Trust, and
- Deerubbin Local Aboriginal Land Council

The letters gave an overview of the proposal and the findings of the Preliminary Environmental Impact Assessment of the proposal regarding the matters of relevance to each stakeholder. An offer was extended to each stakeholder to meet with representatives of Jemena to discuss the proposal.

An email was received from Fire and Rescue NSW on 22 January 2015 requesting a meeting to discuss the project. Fire and Rescue NSW's submission regarding the Preliminary Environmental Impact Assessment was attached to provide a guide of the matters to be discussed. Jemena responded to many of the matters raised by Fire and Rescue NSW in the Preliminary Environmental Impact Assessment submission via email on 23 January 2015. A meeting was then held between representatives of Fire and Rescue NSW, Jemena and EnviroPlan on 30 January 2015 at the Fire and Rescue NSW depot in Greenacre. The proposal was discussed in detail. The representatives of Fire and Rescue NSW noted that the key matters that they would like to see addressed in the EIS are:

- how the facility and sections/components within the facility can be isolated in the event of an emergency, and
- how Jemena's emergency response would contact, liaise and integrate with emergencies services such as Fire and Rescue NSW in the event of an emergency.

Details about facility operation and isolation during an emergency and relevant details of Jemena's emergency response management protocols for the Eastern Gas Pipeline and the Horsley Park Meter Station have been included in Section 7.8 of this document.

An email was received from the Greater Sydney Planning Team in the NSW Office of Environment and Heritage on 3 February 2015 regarding the proposal. The email noted that the NSW Office of Environment and Heritage has been reviewed the Preliminary Environmental Impact Assessment,

has no interest in the proposal and has no further need to be involved in the assessment process.

A letter was received from the NSW Roads and Maritime Service regarding the proposal on 9 February 2015. The letter stated that the NSW Roads and Maritime Service raises no objection to the proposed upgrade of the Horsley Park Meter Station and also noted the existing state road network has sufficient capacity for construction purposes.

A letter was received from the Policy, Legislation and Innovation section the Department of Primary Industries on 9 February 2015 regarding the proposal. The letter stated that as the proposal is relatively minor in terms of water impacts, the NSW Office of Water did see the need for a meeting with Jemena at this stage of the proposal. The letter stated that the NSW Office of Water will review the EIS during the public exhibition stage of the assessment process.

NSW Trade and Investment administers the *Pipelines Act 1967* under which the Horsley Park Meter Station and the Eastern Gas Pipeline are licensed. Regular consultation has occurred with NSW Trade and Investment during the development of the proposal and the environmental impact assessment process. This consultation will continue throughout the approval process, construction and operation.

An email was received from the NSW Department of Trade and Investment – Geological Survey of NSW (GSNSW) on 4 February 2015. The email contained the advice provided to DP&E regarding the Preliminary Environmental Impact Assessment for the proposal, which advised the proponent to contact:

- Austral Bricks, the operator of the quarry and brick manufacturing facilities to the north of the location of the proposal, and
- Macquarie Energy Pty Ltd, the holder of Petroleum Exploration Licence (PEL) 463, which covers the location of the proposal.

A call was placed to and a message left for the Manufacturing Manager of the Austral facilities on 5 February 2015 to discuss the proposal. No response was received.

PEL 463 is held by Macquarie Energy Pty Ltd, a wholly owned subsidiary of Dart Energy. An appropriate representative of Dart Energy was identified and an email was sent on 5 February 2015 providing details of the proposal. An email response was received from Dart Energy on 6 February 2015 indicating no objections are raised to the proposal in relation to PEL 463.

No other submissions or contact was received from the other external stakeholders.

5.2 Aboriginal community involvement

The Deerubbin Local Aboriginal Land Council (LALC) were involved in the preparation of the Due Diligence Archaeological Assessment of the proposal in accordance with *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (NSW Department of the Environment, Climate Change and Water, 2010). The assessment included a site survey with a representative of the Deerubbin Local Aboriginal Land Council (LALC) present.

As no features of Aboriginal archaeological or cultural heritage significance were identified on site no

further investigations were recommended. This approach was confirmed by the LALC. No further consultation and or involvement in the proposal was requested by Deerubbin LALC.

No further contact has been received from Deerubbin LALC in response to the letter sent regarding the preparation of the EIS.

5.3 Community Consultation

Public Notices were prepared and placed in the local newspaper, the Fairfield City Champion, on 11 and 18 February 2015. The Public Notices provided details about the proposal, including a map, and indicated that an Environmental Impact Statement was being prepared. The notices provided contact details for the Jemena Project Team for enquiries and further information. No responses or community contact were received in response to the Public Notices.

Letters were placed into the letterboxes of the residents along Chandos Road between the Westlink M7 Motorway and the intersection between Chandos Road and Ferrers Road during the preparation of the Preliminary Environmental Impact Assessment and again on 20 February 2015. No responses have been received from the residents.

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6 Hazards and Risk Assessment

6.1 Environmental risk

An environmental risk analysis has been carried out for the proposal and as is included as Appendix B. A summary of the risk analysis process and outcomes is provided in this section.

Construction activities and operational aspects of the proposal have the potential to interact with and impact upon the environmental. The level of environmental risk associated with each impact is a function of the consequence of the impact and the likelihood that it will occur.

During construction the following main site activities have the potential to interact with and impact upon environment:

- Site establishment
- Earthworks to create a benched surface onto which to install the new gas infrastructure and trenching for the installation of pipework and conduits
- Civil works to create concrete pads and plinths for new gas infrastructure
- Mechanical installation of prefabricated gas conveyance and control apparatus and associated connecting pipework, and
- General construction-related activities.

The main aspects of facility operation that have the potential to interact with and impact upon the environment include:

- Emissions due to combustion of natural gas within the gas-fired boiler that would be installed
- Emissions of greenhouse gases (GHG) associated with natural gas combustion (direct) and electricity usage (indirect)
- Noise emissions, and
- Waste generation from during maintenance activities.

The potential impacts to the environment, features of heritage significance and the community residents due to the above activities and aspects were identified in the risk analysis. For each impact appropriate mitigation measures and controls were identified. The residual environment risk was then evaluated using defined consequence and likelihood descriptions to determine an environmental risk rating from 'Low' through to 'Catastrophic'.

Construction of the proposal would have the greatest number of activities that have the potential to interact with the environment. During construction the only environmental risks identified with a residual risk above 'Low' relate to potential traffic hazards associated with project vehicles entering and leaving the facility site. Mitigation measures are proposed to reduce the likelihood of traffic accidents at this location. As behaviour of drivers using Chandos Road is outside of the proponent's control, accidents may still happen. The risk level cannot be reduced from 'Moderate' as the potential consequence of such incidents is still 'Severe' as per the consequence table in the environmental risk assessment.

The location of the proposed works within an existing gas facility and does not feature any sensitive environmental or heritage features. The proposed work location is not in close proximity to sensitive environmental features and residents. The overall environmental risk associated with construction is low if the outlined environmental controls are implemented.

During operation the only environmental risks that are assessed with a residual risk above 'Low' are:

- Direct GHG emissions due to the combustion of natural gas within the gas-fired boiler and
- Indirect GHG emissions associated with the electricity use by fans associated with the gas-fired boiler, and
- The risk of traffic accidents due to vehicles turning into the driveway of the facility.

GHG emissions during operation of the facility are unavoidable. The pressure reduction process within the proposed gas infrastructure results in dramatic temperature loss. If not corrected the low temperatures can cause metal pipework and components to become brittle which in turn affects the ongoing safe operation of the facility. Natural gas is combusted to provide the energy to heat the gas prior to pressure reduction to avoid this issue. The only way to do this other than combustion of natural gas would be by combusting another fossil fuel or using electricity. Both options would generate GHG. The environmental risk is rated is 'Moderate' because while the overall contribution to atmospheric GHG levels might be low, the GHG emissions will almost certainly happen.

The majority of natural gas supplied by the distribution network is combusted for heating purposes. If the ability to deliver natural gas into the Sydney distribution network is not increased, the shortfall in natural gas supply may lead to increased use of electricity generated by coal combustion, with associated GHG emission increases. In this regard, the proposal may actually provide a benefit in terms of overall GHG emissions. So while the potential increases in GHG that would result from the proposal are significant relative to existing GHG emissions from the facility, the increases are considered justified based on the potential benefits provided by proposed upgrade.

The additional components to be installed within the facility would increase electricity consumption, with associated indirect GHG emissions. The electricity would be used to drive fans within the gas-fired boiler/heat exchanger package. Choosing alternative methods to heat the gas (such as using water bath heaters similar to those already in operation within the facility) would decrease electricity usage. The gas-fired boiler/heat exchanger option, however, has been selected because it is significantly quieter than alternatives. The solution is therefore justified on the basis of minimise overall impacts to the environment, including the adjacent residents. While the overall consequence of increase indirect GHG emissions due to increased electricity usage is relatively minor in terms of potential contributions to atmospheric GHG levels, the environmental risk level is rated as 'Moderate' as it will almost certainly happen.

The risk of traffic hazards on Chandos Road are discussed above in reference to the construction phase. As operation of the upgraded facility will not significantly affect overall traffic levels and maintenance is only required very infrequently, the level risk will remain similar to the existing situation.

The potential environmental risks associated with the proposed Horsley Park Meter Station Upgrade Project have been identified based on the activities that will be carried out on site. The potential

risks have been analysed and appropriate controls outlined to reduce the risks as much as reasonably practicable. It is considered that all environmental risks associated with the proposal can be adequately managed and the overall level of environmental risk associated with the proposal is low.

The mitigation measures and controls outlined in the environmental risk analysis have been incorporated into the appropriate locations in Section 7 of this document.

6.2 Hazard analysis and risk assessment

A Preliminary Hazard Analysis (PHA) has been prepared for the proposal in accordance with the NSW Department of Planning and Environment (DP&E) requirements set out in the *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (NSW Department of Planning, 2011)(HIPAP6). The identified risks were compared with the risk criteria in use in NSW, as specified in *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Landuse Planning* (NSW Department of Planning, 2011b) (HIPAP4). The PHA covers the existing and proposed upgraded components of the Horsley Park Meter Station. The complete hazard analysis and risk assessment is included as Appendix C. The findings of the PHA are summarised below.

The main hazard associated with the Horsley Park Meter Station (existing and upgraded) is associated with the conveyance of natural gas which is a flammable gas held under pressure. Hazards may arise in fixed plant, storage and pipelines. The predominant mode in which a hazardous incident may be generated is associated with a leak. This would generally only have the potential to cause injury or damage if there was ignition, which resulted in a fire or explosion incident. The factors involved are:

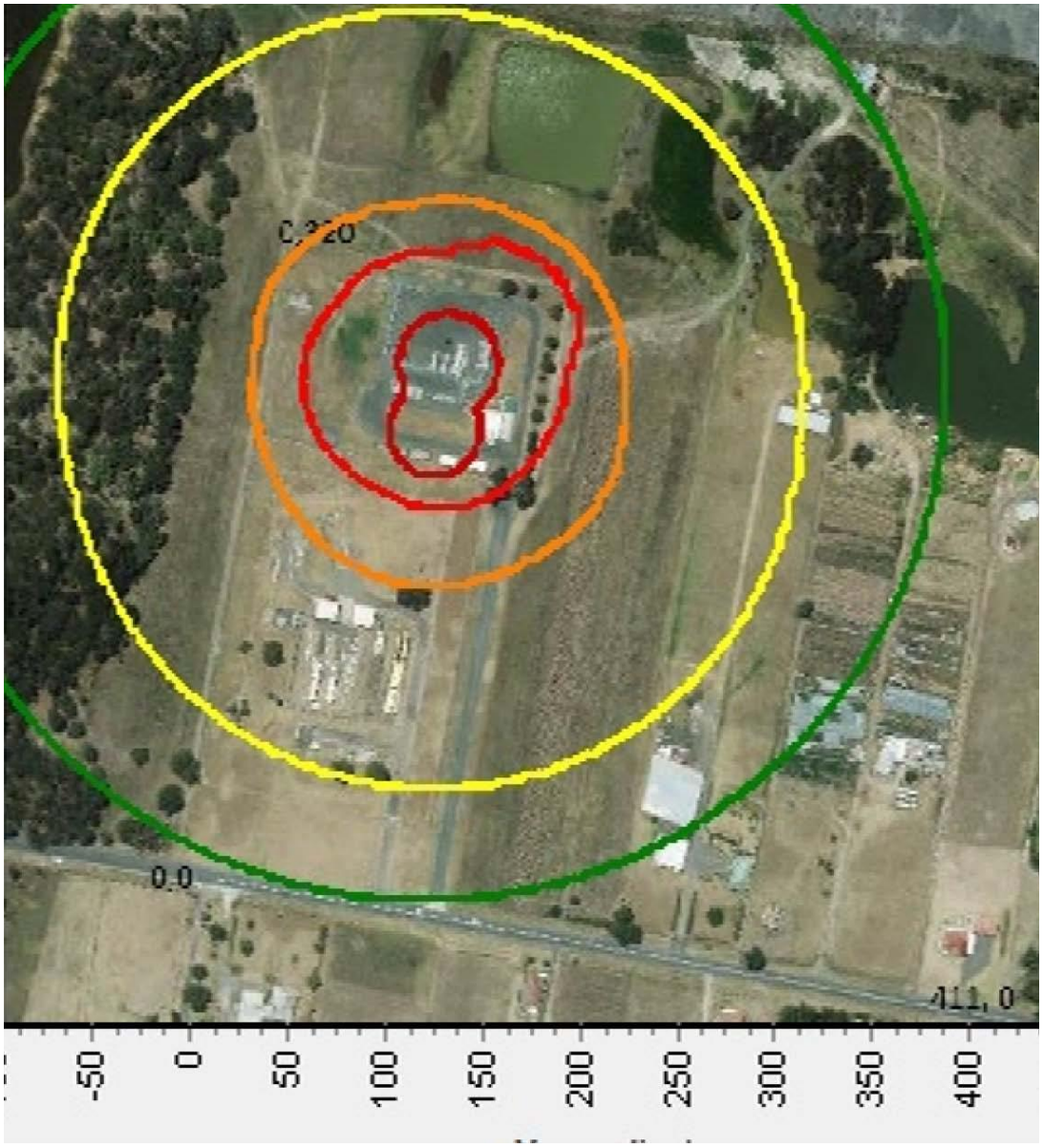
- Failure must occur causing a release. There are several possible causes of failure, with the main ones being corrosion and/or mechanical damage due to physical interaction with the infrastructure
- The released material must come into contact with a source of ignition. In some cases this may be heat or sparks generated by mechanical damage while in others the possible ignition source could include non-flame proof equipment, vehicles or flames some distance from the release
- Depending on the release conditions, including the mass of material involved and how rapidly it is ignited, the results may be a localised fire (for example a so called jet fire), a flash fire or an explosion of the vapour cloud formed through the release, and
- Finally, for there to be a risk, people must be present within the harmful range (consequence distance) of the fire or explosion. How close the people are would determine whether any injuries or fatalities result.

The individual fatality risk contours for the upgraded facility were calculated as part of the PHA and are shown in Figure 6-1.

The 1 person per million per year (pmpy) contour extends past the site boundary by 130m to the east, by 120 metres to the west, by 165 metres to the south and by 95 metres to the north. The analysis indicates that the 1 pmpy contour does not encroach into the residential development in

the vicinity of the facility, which is located along Chandos Road. The criterion for residential development as provided in HIPAP4 is satisfied for the upgraded facility as proposed. The risk level at the site boundaries of the residences along Chandos Road is less than 0.4 pmpy, or less than the criteria for sensitive development such as schools and kindergartens.

Figure 6-1 Individual fatality contours for risks associated with the upgraded Horsley Park Meter Station



Legend:

- Industrial criterion 50×10^{-6} per year
- Active open space criterion 10×10^{-6} per year
- Commercial / Retail centre criterion 5×10^{-6} per year
- Residential development criterion 1×10^{-6} per year
- Sensitive development criterion 0.5×10^{-6} per year

Source: Planager (2014)

The risk of fatality contour of 5 pmpy, corresponding to the criterion for offices and retail centres, extends past the Horsley Park Meter Station site boundary by 45 metres to the east, by 5 metres to

the west, by 65 metres to the south and by 35 metres to the North. There are no offices or retail centres in this area. Hence the criterion for offices and retail centres is satisfied for the upgraded facility as proposed.

The risk of fatality contour of 10 pmpy, corresponding to the criterion for open space (active), is contained within the site boundary to the west of the site and extends past the site boundary by 14 metres to the east, by 20 metres to the south and by 12 metres to the north. There is no active open space in this area. Hence the criterion for active open space is satisfied.

The 50 pmpy risk of fatality contour is fully contained within the site. Hence the criterion for industrial development is satisfied.

The 0.5 pmpy risk of fatality contour for sensitive development (such as schools, hospitals etc.) extends 195 metres to the east, 185 metres to the west, 20 metres to the south and 210 metres to the north of the site boundary. There are no sensitive developments within this area and hence the criterion for sensitive development satisfied.

The PHA indicates that the societal risk for the upgraded facility is consistently within the tolerable risk zone.

The risk for levels of heat radiation and overpressures which may be damaging to process equipment in the neighbouring natural gas facility (industrial development) to the south of the Horsley Park Meter Station is defined as 23 kW/m^2 and 14 kPa as per HIPAP6. The criterion for maximum risk of propagation at a neighbouring facility is 50 pmpy. The PHA indicates that this level of risk, however, is never reached outside of the boundaries of the upgraded Horsley Park Meter Station. The criterion for maximum risk of propagation to neighbouring facility is satisfied.

The risk for levels of heat radiation and overpressures which may be injurious to people is defined as 4.75 kW/m^2 and 7 kPa as per HIPAP6. The criterion for maximum injury risk at a neighbouring residential area is 50 pmpy. This level of risk is confined to the immediate location around the existing heaters within the facility. The criterion for maximum risk of injury at neighbouring residential development is therefore satisfied.

The land which the facility is located and the adjacent areas are covered by *State Environmental Planning Policy (Western Sydney Parklands) 2009* and is therefore currently unzoned (refer to Section 4.1.3). The location and the action of this planning policy substantially restrict what forms of future development would be permissible around the facility. It is therefore unlikely that the future land use would alter substantially from the existing and that population densities would increase.

The PHA indicates that the proposal would comply with the risk criteria outlined in HIPAP4.

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7 Environmental assessment

7.1 Biodiversity

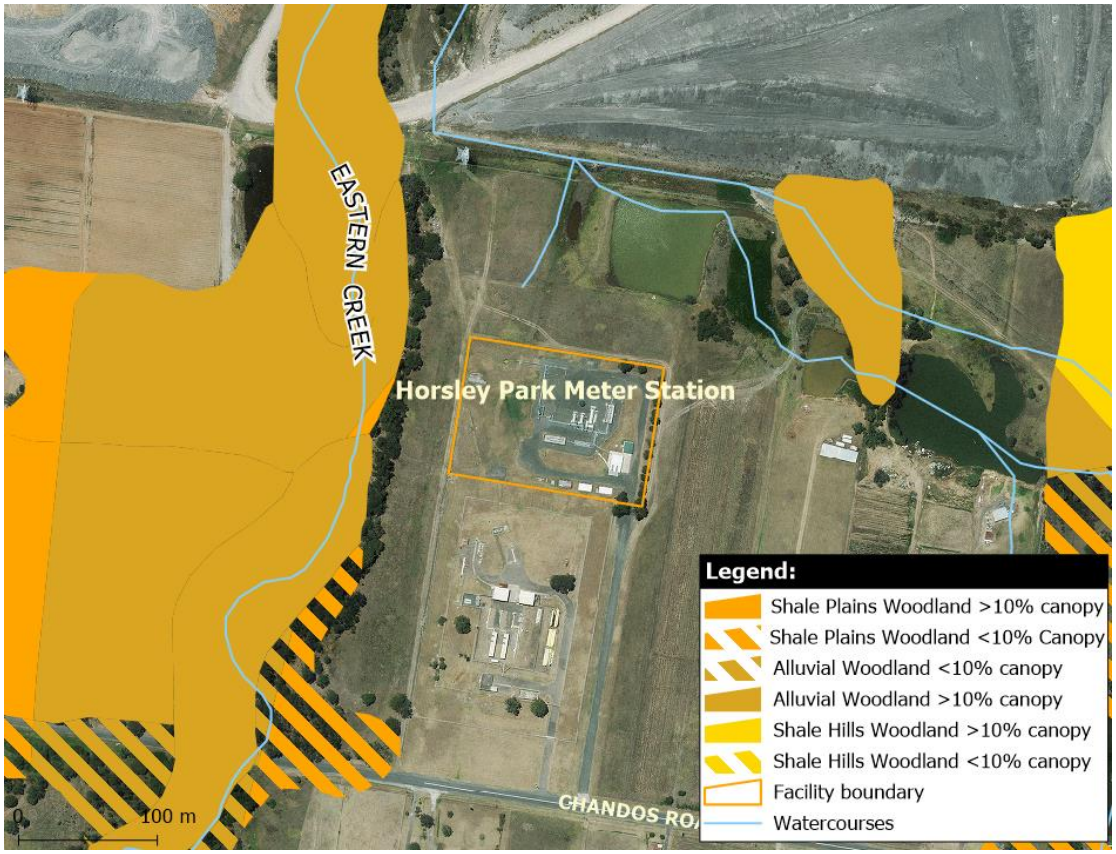
7.1.1 Existing environment

A Biodiversity Impact Assessment of the site has been carried out by Biosis Pty Ltd and is included as Appendix D. A summary of the outcomes of the assessment is provided below.

The Horsley Park Meter Station occupies a rectangular site roughly 140 metres by 100 metres. The site is mostly covered with exotic pasture grasses and areas of gravel hardstand. There are a number of native trees (*Eucalyptus spp*. and *Corymbia spp*.) either side of the facility access gate at the south eastern corner of the site and along the inside of the fence along the eastern site boundary. The species are representative of the trees commonly found on the Cumberland Plain.

Due to the apparent ages of the trees, the fact that they are planted in a straight line and the fact that there are no other trees outside the fence line in close proximity to the facility the assessment concluded that trees were mostly likely planted as landscaping during construction of the facility in 1999/2000 and are considered to be part of an ecological community referred to as Planted Eucalyptus Over Exotic. The trees may, however, provide some foraging and temporary roosting habitat for highly mobile native fauna species.

The native vegetation in the vicinity of the existing facility is mapped as ecological communities considered part of either *River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions*, an endangered ecological community (EEC) under NSW *Threatened Species Conservation Act 1995* (TSC Act) or *Cumberland Plain Woodland in the Sydney Basin Bioregion* which is critically endangered ecological community (CEEC) under the TSC Act and Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The closest mapped native vegetation is around 40 metres to the west of the fence of the existing facility as shown in Figure 7-1.



Data: NSW Office of Environment and Heritage. Imagery: Jemena Limited

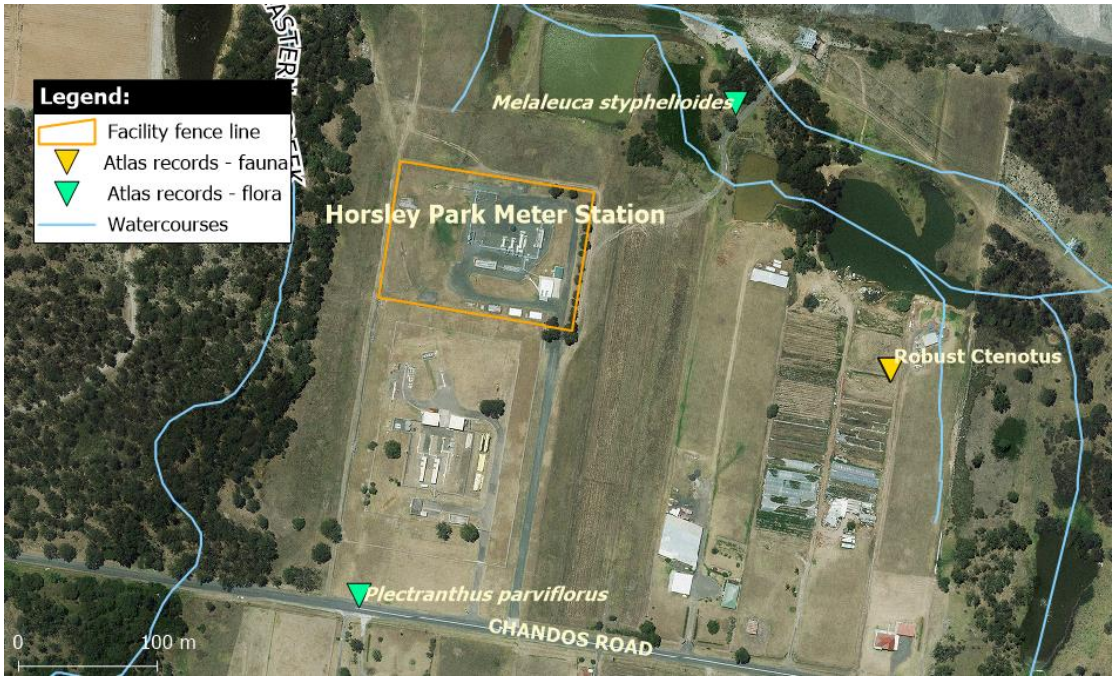
Figure 7-1 Mapped ecological communities in the vicinity of the location of the proposal

Various publicly available databases containing ecological information were searched during the preparation of the Biodiversity Impact Assessment. All threatened biota protected under relevant State and Federal legislation within 5 km of the location of the proposal were identified. The NSW Wildlife Atlas was searched in the vicinity of the location of the proposal. The search identified observations of a number of threatened flora and faunas, the closest of which is around 125 metres northeast of the facility fence, as shown in Figure 7-2.

Site observations indicate that stormwater runoff from the facility flows north along a grassed drainage line and ponds in a depression formed to the west of an existing farm dam. The depression was likely formed as part of significant earthworks and surface alterations that occurred as part of the quarrying and tile manufacturing operation that occur to the north of the facility. During times of significant rainfall the pond would overtop and flow westwards along a depression on the electricity transmission easement and overland into Eastern Creek. Eastern Creek is generally ephemeral at this location and would only contain water during periods of significant rainfall or ponded in depressions.

The water quality in the pond and Eastern Creek is affected by urban and agricultural runoff. To the north of the site Eastern Creek passes between significantly disturbed areas associated with two large quarrying and associated with brick and tile manufacturing activities. The pond, swampy areas and Eastern Creek in the vicinity of the location of the proposal do not represent high quality or important habitat for aquatic or amphibian species.

The Biodiversity Impact Assessment did not identify any threatened species or important potential habitat for threatened species within the site boundary.



Data: Office of Environment and Heritage and Land and Property Information. Imagery: Jacobs Pty Ltd

Figure 7-2 NSW Wildlife Atlas records in the vicinity of the location of the proposal

7.1.2 Potential impacts

Construction activities associated with the proposal would occur entirely within the boundaries of the existing facility. The native vegetation mapped as EEC and CEEC near the facility and the locations where threatened flora and fauna have previously been observed in the vicinity of the facility would not be affected by the proposal either directly or indirectly.

Some pruning of the planted native trees around the access gate for the facility may be required in order to facilitate access for deliveries of large items of gas conveyance apparatus that would be installed as part of the proposal. It is unlikely that the native trees planted along inside of the eastern fence line would be affected by the proposal.

No listed threatened flora species were identified within the areas that would be directly affected by the proposal. No threatened fauna species or important habitat for threatened fauna species were identified within areas that would be affected by the proposal. The planted native trees present may provide some temporary foraging and roosting habitat for native fauna species, including threatened species. The Biodiversity Impact Assessment concluded that all threatened biota noted within the locality were deemed to have a low likelihood of occurrence or were not likely to be directly impacted by the proposed works.

The proposal may result in stormwater runoff with elevated sediment or hydrocarbons levels leaving the site and entering the pond in the depression to the north. An assessment of potential soil and water quality impacts associated with the proposal is provided in Section 7.2. Due to the poor

quality of the water within the pond and the low habitat potential that it provides any run off from site would not result in any significant impact to aquatic ecosystems.

No significant impacts on features of biodiversity conservation significance are anticipated as a result of the proposal.

7.1.3 Mitigation and management measures

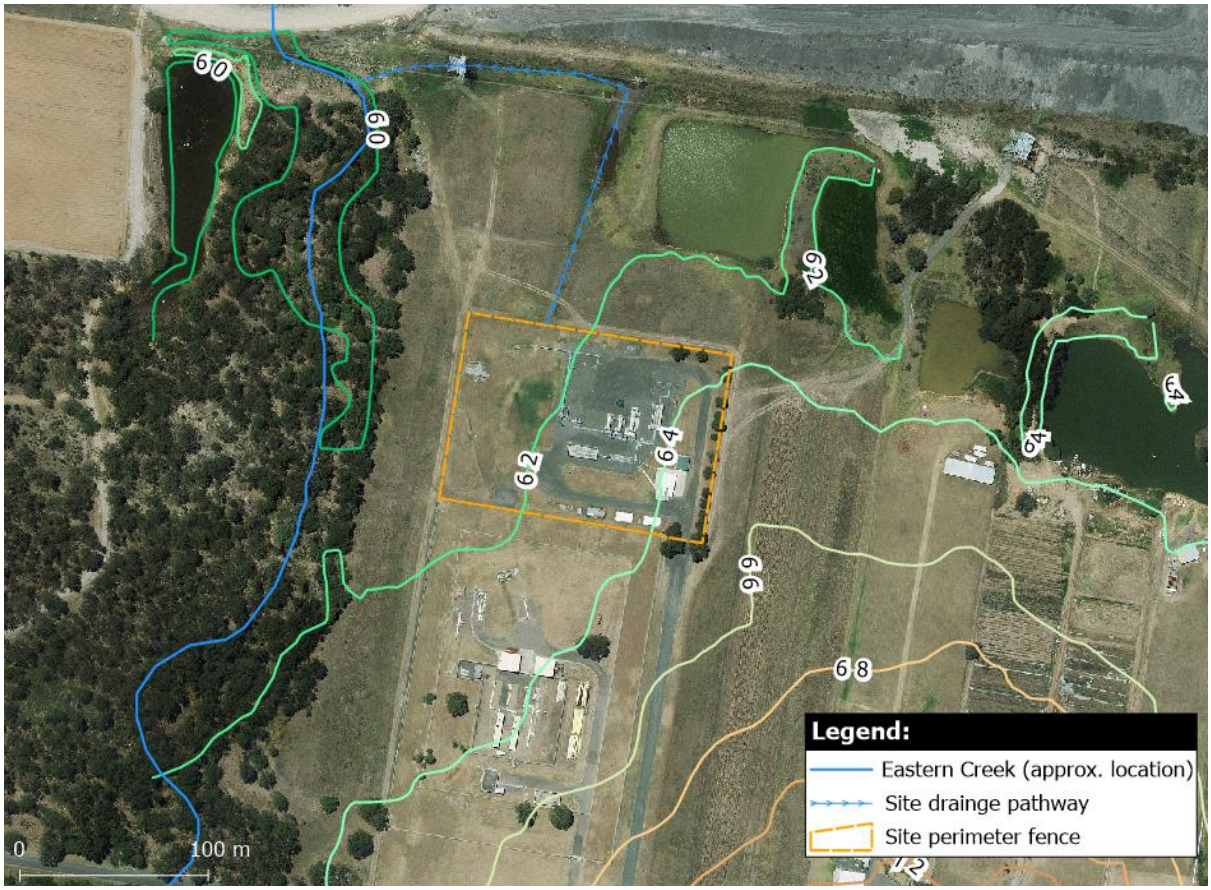
The following mitigation and management measures would be implemented during the proposal to avoid and manage potential biodiversity impacts:

- Limit all works and access to within the existing fenced site perimeter and access driveway
- Review the trees in the vicinity of the site entrance from the perspective of clearance for deliveries of large plant and equipment. If potential clearance issues are identified, favour selective pruning of lower limbs rather than complete removal
- Any tree limb pruning would be carried out by a suitably qualified and experience arborist
- Limit surface disturbance to reduce erosion and potential sedimentation impacts in aquatic ecosystems down gradient from the work location
- Install appropriate sediment filtration devices inside the lowest point of the facility fence line to intercept runoff from site and filter out sediment as outlined in Section 7.2, and
- Implement fuel and chemical storage and use mitigation and management measures outlined in Section 7.2 to reduce the risk of impact to aquatic ecosystems down gradient from the proposed work location.

7.2 Soil and water, hydrology and flooding

7.2.1 Existing environment

The topography of the location in which the proposal would occur is gently undulating. The land on which the existing facility is located generally declines to the northwest. The average slope across the site is around three to four percent. The surface of the facility features local variations due to excavations that have occurred to create a level bench on which the existing facility is constructed. The general topography of the location of the proposal is shown in Figure 7-3.



Data: Land and Property Information (LPI). Imagery: Jacobs Pty Ltd

Figure 7-3 Site topography

The proposal is located within the upper catchment of Eastern Creek. The catchment has been subjected to significant disturbance associated with past vegetation clearing and agricultural practices. Numerous agricultural dams have been constructed along the drainage lines in the vicinity of the site.

Observations from site indicate that the site drains to a low point on the northern side of the facility, as shown in Figure 7-3. From this location runoff from site flows along a small grassed drainage line northwards to a small depression near the electricity transmission easement. The landforms in this location have been significantly altered from the original contours, likely through past agricultural practices, construction of the electricity transmission lines and the establishment of the quarry and tile manufacturing activities that occur to the north. Water ponds in the depression, which connects to a swampy area orientated east to west under the electricity transmission lines. The swampy area drains overland to the west and into Eastern Creek when water levels are sufficiently high.

The ground surfaces both inside and outside the existing facility upslope and downslope from the proposed work location feature continuous and dense grass cover. The site driveway, internal access road and the hardstand area around the existing pipework and apparatus feature are constructed from blue metal rock.

As the facility is on raised ground relative to Eastern Creek and located near the top of the catchment, it is unlikely that it would be subject to significant flood levels affecting the whole site

and inundating the pipework and equipment. Site observations and communications with Jemena operational personnel indicate that the lower (western) portion of the site (below the level of the bench) is subject to inundation during significant rainfall events. To the northwest of the site Eastern Creek passes through a culvert under an access road associated with the quarry and tile manufacturing facility to the north of the proposal location. The culvert and access road would act as a flow restriction during times of significant water flow along the creek. The inundation of the lower portion of the existing facility would likely be a result of ponding above the flow restriction created by the road and culvert. As the floodwaters pond rather than flow the site would not be exposed to significant flow velocities.

Jemena is unaware of any soil contamination within the site. Prior to the construction of the existing facility anecdotal evidence suggests that the property was used as a market garden. Jemena has no records from the construction of the Eastern Gas Pipeline at this location or the facility to suggest that contaminated soil was encountered or that any residual soil contamination persists. A search of the NSW EPA contaminated land record has been carried out. No records were identified in Horsley Park. There is no evidence to suggest that the soils present within the existing facility are contaminated.

7.2.2 Potential impacts

The proposal would involve disturbance of the ground surface. The existing pipework and associated apparatus has been constructed on a level bench, which would be expanded to accommodate the new pipework and apparatus proposed as part of the upgrade. This would require excavation of the raised ground to the south of the existing retaining wall. A depth of around 0.5 metres of soil would be removed creating an extent area of exposed soil roughly 750 square metres in area. Movements of vehicles and plant on unsealed surfaces within the site during construction may lead to further ground disturbance. Erosion from disturbed surfaces on site during periods of rainfall may lead to sedimentation in aquatic ecosystems down gradient from the work location.

The local catchment above the proposed work location is limited, the surface gradient is not steep and there is good grass cover above the proposed work location. It is therefore unlikely that the site would be subject to significant overland stormwater flow volumes and velocities, which would reduce the potential for scour and erosion on site during the works. Sediment controls installed along the inside of the existing northern site perimeter fencing would prevent sediment transport off site. Also, the ground surface down gradient from the facility features dense and continuous ground cover that would intercept runoff from site, reduce flow velocities and limit sediment transport northwards down gradient.

All runoff from site would enter the ponded depression and swampy area to the north of the site which is subject to poor water quality and offers little habitat potential for aquatic or amphibian species. Eastern Creek, into which the location drains, is generally ephemeral in the vicinity of the facility and heavily affected by agricultural and urban runoff. As such, the potential for sedimentation and water quality impacts in aquatic ecosystems down gradient from the proposed work location due to construction of the proposal is very limited.

All surfaces disturbed as part of construction would be stabilised and reinstated, either with grass or hardstand, at the completion of site activities to create a stable ground surface. There is minimal risk that any potential erosion issues would persist on site once stable ground surfaces had been re-established.

The position of the proposed work location on elevated ground relative to Eastern Creek and near the top of the catchment lowers the risk that the area in which the new pipework and apparatus would be installed would flood.

The proposal would involve some alteration of the ground surface including excavation and removal of soil to a depth of around 0.5 metres over an area of roughly 750 square metres to extend the existing bench and create a level area on which the new pipework and apparatus would be constructed. The changes to the existing surface level would be minor in the context of the wider catchment and would be unlikely to result in any significant change to the hydrology of the wider catchment. In the unlikely event that the site does flood, the excavations would increase floodplain storage capacity slightly and would not therefore result in any increases in flood levels or adverse impacts to flood behaviour in the vicinity of the facility.

The risk of encountering contaminated soils during construction is very low.

Maintenance of the proposed flow conveyance and control apparatus, particularly the dry gas filters, can require the removal of light hydrocarbons liquids from within apparatus housings. Plant and equipment required to carry out maintenance works can require refuelling on site. These activities increase the risk of spills on site and potential contamination of the soil and other surface materials. These activities occur very infrequently and the risk of large spills is low. The potential for significant and widespread soil contamination due to the operation of the proposal is therefore very low.

The proposal would not result in any significant impacts associated with soil, water, hydrology and flooding.

7.2.3 Mitigation and management measures

The following mitigation and management measures would be implemented to address potential soil and water impacts:

- The area of disturbance associated with the proposal would be limited to the greatest extent practicable to minimise the potential for erosion from site
- An Erosion and Sediment Control Plan (ESCP) would be prepared for the proposal in accordance with the requirements of *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004)(the 'Blue Book'). The ESCP would include as a minimum filtration devices installed immediately inside the fence at the low point on the northern perimeter of the facility
- All site stormwater control features would be identified prior to construction and appropriate controls and protection measures developed, documented in the ESCP and implemented during all works
- Onsite stockpiling of excavated material would be minimised
- All stockpiles of loose and erodible materials would be provided with suitable controls, for

example sediment fencing or filter socks, to prevent erosion

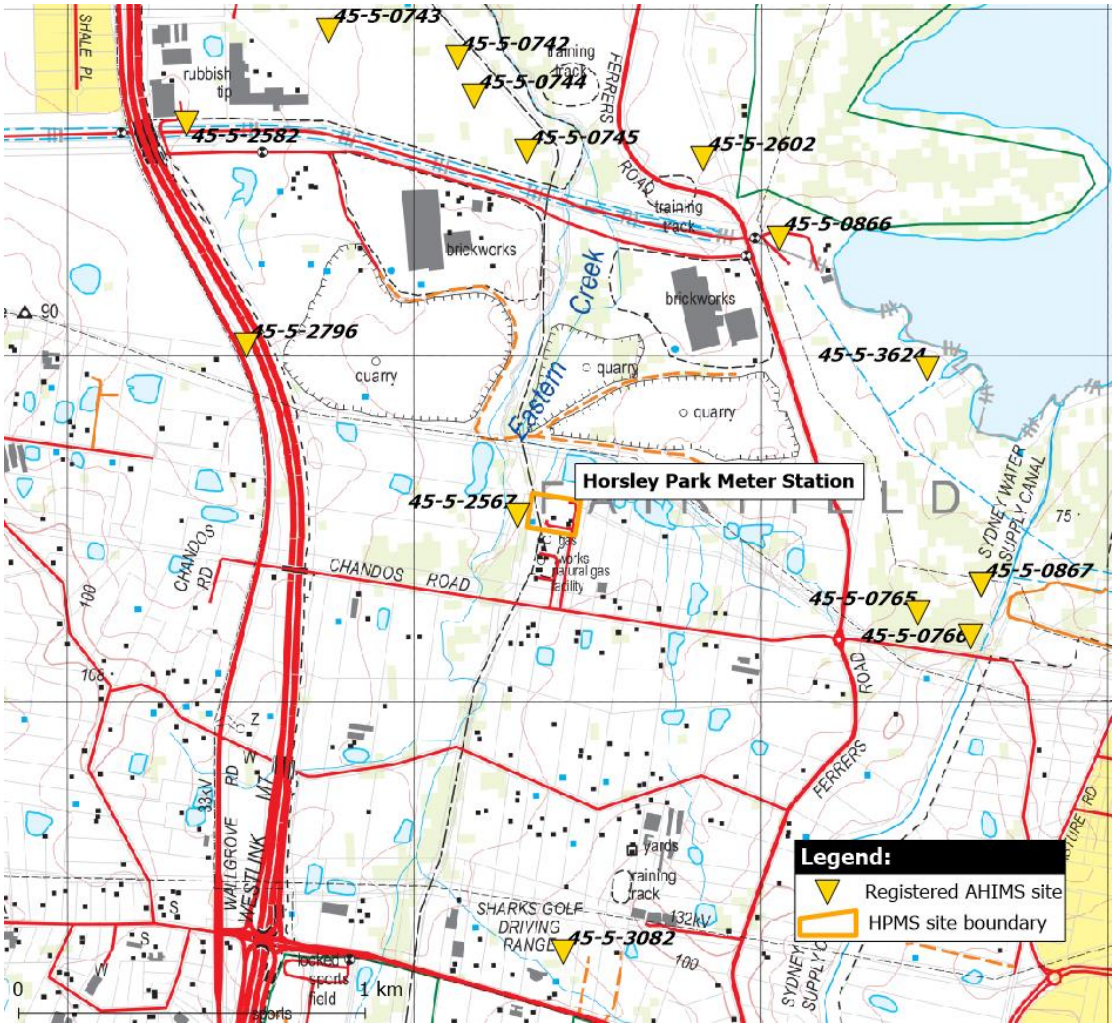
- Store and handle any hydrocarbons and other chemicals required to carry out the proposal in accordance with the relevant Safety Data Sheet (SDS) and product label to reduce the potential for spillage and potential spill volumes
- Refuel construction plant and equipment offsite at a suitable location wherever practicable to avoid the potential for soil contamination in work location and associated contamination of runoff water from site
- Use appropriate task-specific equipment during any onsite refuelling to minimise the potential for spillage and potential spill volumes, and
- Clean up any spills immediately, isolate and contain any potential contaminated material and dispose of at an appropriately licensed waste facility
- If any visual or olfactory evidence of potentially contaminated soils or other materials is uncovered all excavation work at that location would cease until the nature and extent of any potential issues were quantified and appropriate management and mitigations measures developed and implemented to protect the environmental and personnel health safety in accordance with relevant legislation and guidelines
- All surfaces disturbed as part of the proposal would be rehabilitated at the completion of construction to reinstate ground surface stability and reduce the potential for ongoing erosion from site, and
- The effectiveness of site restoration and rehabilitation activities would be monitored during routine facility visits by operational personnel. Corrective actions would be carried out as required to address any ground instability and erosion issues as required.

7.3 Aboriginal heritage

7.3.1 Existing environment

A Due Diligence Archaeological Assessment was carried out for the proposal by Biosis Pty Ltd in accordance with the requirements of *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). The assessment is provided as Appendix E to this document and summarised below. The assessment was carried out with involvement from the Deerubbin Local Aboriginal Land Council (LALC).

A search of the Aboriginal Heritage Information Management System (AHIMS) register was carried out for the project location. The search identified six (6) previously recorded aboriginal archaeological sites within the vicinity of the project area. Details of these are provided in Table 1 and the site locations are shown in Figure 7-4. The sites registered in the search area are mostly artefacts scatters.



Map Source: Land and Property Information. Aboriginal data source: NSW Office of Environment and Heritage

Figure 7-4 Registered Aboriginal sites in the vicinity of the location of the proposal

Site 45-5-2561 is an artefact scatter that is located around 20 to 30 metres to the west of the western boundary of the facility. The site was recorded in 1999 during the surveys carried out as part of the original impact assessment of the Eastern Gas Pipeline, of which the member of the Deerubbin LALC that attended the recent site survey was a participant. The site compromised of silica artefacts (one flake and one core) located on a vehicle track in a heavily disturbed market garden area. It was determined at the time that the presence of other intact subsurface archaeological matter would be unlikely due to the high level of ground disturbance. It is noted on the site card that a 'Consent to Destroy' with salvage was applied for under section 87 the *NSW National Parks and Wildlife Act 1974* and the location was disturbed during original construction of the Eastern Gas Pipeline. The site is, however, currently still recorded as 'valid' (intact) on the AHIMS register.

The next closest registered aboriginal sites are located around one kilometre from the facility and are not considered further in this assessment.

The field inspection of the proposal location was carried out with the presence of a member of the Deerubbin LALC. Ground surface visibility was generally very low due to dense grass cover and the

presence of paved surfaces, buildings and meter station infrastructure. The ground exposures that are evident around the bases of trees and along fences lines were inspected. No aboriginal objects were located within the existing facility and areas that would be disturbed as part of the proposal.

It was noted that the entire area has been highly disturbed through the installation of the gas meter station and associated infrastructure. It is evident that extensive excavation and earth movement has taken place across the whole site to create a level berm on which to construct the existing gas infrastructure.

7.3.2 Potential impacts

No aboriginal artefacts or areas of cultural potential were identified areas that would be affected by the proposal. Although the project area is located in an area of generally high potential for aboriginal sites, the high levels of previous ground disturbance mean that there is a low potential for other intact archaeological material to be present in the locations that would be disturbed as part of the proposal. It is therefore considered unlikely that the proposal would have any impact on features of aboriginal archaeological or cultural heritage significance.

A draft of the Due Diligence Archaeological Assessment was provided to the Deerubbin LALC for review and comment. The Deerubbin LALC confirmed the conclusions of the assessment.

7.3.3 Mitigation and management measures

The mitigation and management measures that would be implemented in the event that previously unidentified features of Aboriginal archaeological or cultural heritage significance are uncovered (unexpected finds) during the proposal include:

- All work in the vicinity of the unexpected find would cease
- The NSW Department of Planning, NSW Office of Environment and Heritage and the Deerubbin LALC would be contacted and advised of the unexpected find
- No works would recommence at that location until such time as the Department of Planning has determined the nature and significance of any finds and determined an approach for further work, in consultation with other agencies and Aboriginal stakeholders as required, and
- If the unexpected find involves skeletal remains the NSW Police would be contacted and advised immediately. No works would recommence that could further impact the remains unless approved and directed by the NSW Police.

7.4 Greenhouse gases and climate change

7.4.1 Types of greenhouse gas emissions

Greenhouse gas emissions (GHG) can be categorised into three main types:

- Scope 1: Direct emissions associated with the carrying out of an activity or the operation of a facility

- Scope 2: Indirect emissions created as a result of the generation of electricity used during the carrying out of an activity or the operation of a facility, and
- Scope 3: Indirect emissions generated in the wider economy as a consequence of the carrying out of an activity or the operation of a facility.

In the case of the proposal, Scope 1 GHG emissions are those generated during the combustion of fuels by the construction plant and equipment that would be used to carry out the proposal and the combustion of natural gas for heating purposes during the operation of the facility.

Scope 2 GHG emissions are those associated with the generation of any electricity used either during the construction or operation of the proposal.

All other GHG emissions are defined as Scope 3. In the case of the proposal these emissions would include the embodied energy of the materials and resources used to carry out the facility upgrade and the combustion of fuels associated with transportation of plant, equipment, materials and personnel to and from the location of the proposal.

7.4.2 Existing environment

The operation of the existing Horsley Park Meter Station results in GHG emissions directly through the combustion of natural gas in the water bath heaters and also indirectly through the electricity used by the facility and the transportation movements associated with facility operation and maintenance.

During operation of the existing facility the main Scope 1 GHG emissions are generated by the combustion of natural gas in three water bath heaters. The temperature of the gas decreases significantly during pressure reduction, which can lead to the steel of the pipework and apparatus becoming brittle which in turn affects the strength characteristics of the metal. To address this potential issue the temperature of the gas is increased by passing the pipework through water bath heaters prior to pressure reduction. The heaters combust natural gas to heat the water that the pipework passes through. This increases the temperature of the natural gas and reduces the potential for embrittlement.

Around 120,000 gigajoules of natural gas is combusted each year within the three water bath heaters on site. The emissions from natural gas combustion mostly consist of carbon dioxide. Small amounts of unburnt methane and nitrous oxide (N_2O), which are also GHG, are also present.

Natural gas must be released from the facility from time to time during maintenance. There is no apparatus installed within the existing facility to allow the gas to be flared due to the inherent risks associated in igniting flammable gases. The natural gas is vented to the atmosphere during such activities. While difficult to quantify, the emissions occur infrequently and only small volumes of gas are released. It is anticipated that the volume of natural gas released during venting would be very minor compared to the overall GHG emissions from the water bath heaters.

The existing facility uses very little electricity compared to the volume of natural gas combusted. Scope 2 GHG emissions due to facility operation are therefore relatively low. Only limited transportation of equipment, plant, materials, and personnel to and from the facility is required

during facility operation and maintenance. Scope 3 GHG emissions are therefore relatively low also. Scope 2 and Scope 3 emissions during normal operation of the facility are negligible compared to Scope 1 emissions and are not considered further.

Scope 1 GHG emissions from the facility are estimated and reported by Jemena in accordance with requirements of the *National Greenhouse and Energy Reporting Act 2007*. The GHG emissions from the existing facility, as estimated for the 2012/2103 financial year using the methods and emissions factors documented in *National Greenhouse Accounts Factors* (Department of the Environment, 2013), are outlined in Table 7-1. To put these estimated emissions into context, the total estimated GHG emissions for Australia in the year 2012 as reported in the National Greenhouse Gas Inventory are 407,572,202 tonnes (as CO_2-e). The GHG emissions from the facility would represent around 0.000015% of total Australian GHG emissions. In this context the carbon dioxide emissions from the facility are small in terms of overall GHG emissions.

Estimates indicate that around 15% of total GHG emissions are generated by the transport sector. Given the location of the proposal within the wider Sydney metropolitan area and the proximity of the proposal to the Westlink M7 Motorway, the existing emissions from the facility would be unlikely to result in any significant contribution to local or regional GHG emissions.

Table 7-1 Estimated annual Scope 1 greenhouse gas emissions from the Horsley Park Meter Station

Unit	Maximum heating capacity (MW)	Energy Consumed (GJ)	Total GHG emissions (t CO_2-e)			Total GHG (t CO_2-e)
			CO_2	CH_4	N_20	
Heater 1	0.4	15,160	788	1.5	0.5	790
Heater 2	0.4	16,614	864	1.7	0.5	866
Heater 3	1.2	87,803	4,565	8.9	2.7	4,577
					Total	**6,233**

Source: Jemena

7.4.3 Potential Impacts

Construction

Construction of the proposal would result in GHG emissions. An assessment of potential GHG due to construction of the proposal has been carried out in accordance with the guidance and emission factors contained in *National Greenhouse Accounts Factors* (Department of the Environment, 2014) and *Greenhouse Gas Assessment Workbook for Road Projects* (Transport Authorities Greenhouse Group, 2013). The assessment considered the fuel that would be used by construction plant and equipment, the embodied energy of the main construction materials that would be used and GHG emissions associated with transport of materials, plant, equipment and personnel to from site over the duration of construction.

The majority of electricity required during construction of the proposal would be provided by on site generators negligible Scope 2 GHG emissions are anticipated. No scope 3 emissions have been considered in the assessment of GHG emissions due to construction.

A summary of the results of the assessment is provided in Table 7-2. Around three quarters of the estimated GHG emissions due to construction are Scope 3 emissions associated with the embodied energy in the construction materials. The rest of the estimated GHG emissions are direct and indirect emissions from fuel combustion associated with construction plant and equipment and transportation. Potential GHG emissions due to construction of the proposal are significantly lower than the GHG emissions due to the operation of the existing facility.

Table 7-2 Estimated GHG emissions due to construction of the proposal

Source of GHG emissions	Annual GHG emissions (t CO_2-e)
Scope 1	
Estimated fuel combustion from construction plant and equipment	98
Scope 2	
Electricity consumed	0
Scope 3	
Embodied energy of main construction materials:	
• Concrete	203
• Steel Structural	378
• Hardstand materials	2
• Bricks	39
Fuel combustion associated with transportation:	
• Heavy vehicles	22
• Light vehicles	88
Total:	**830**

Operation

An assessment of potential increases in GHG emission due to the operation of the proposal has been carried out in accordance with the guidance and emission factors contained in *National Greenhouse Accounts Factors* (Department of the Environment, 2014). The results of the assessment are outlined in Table 7-3.

Additional water heating apparatus would be installed as part of the proposal. Two heat exchangers would be installed to heat the gas within the new pipework prior to pressure reduction. The heat exchangers would use hot water provided by new boilers that would combust natural gas to generate heat. The emissions from the boilers would increase Scope 1 GHG emissions from the facility.

Table 7-3 Estimated annual increases in GHG emissions due to the operation of the proposal

Source of GHG emissions	Annual GHG emissions (t CO_2-e)
Scope 1 emissions	
Additional natural gas combusted by proposed heating apparatus	6,233
Scope 2 emissions	
Additional electricity consumed	241
Scope 3 emissions	
Embodied energy of main construction materials	0
Fuel combustion associated with transportation	0
Total:	**6,471**

Heating requirements and associated natural gas combustion increase with increasing gas flow through the facility. The boilers that would be installed as part of the proposal would have a maximum heating capacity of 1.4 megawatts which is similar to the heating output currently provided by the existing water bath heaters. The proposed and existing heating apparatus would therefore combust similar quantities of natural gas and result in similar GHG emissions in terms of composition and quantity.

At full gas throughput the potential Scope 1 GHG emissions from the facility would therefore double under the current proposal. Actual Scope 1 GHG emissions from the upgraded facility would, however, increase steadily over time gas flow through the facility increases in response to increased gas demand within the distribution network.

The proposal would also result in a substantial increase in electricity demand by the facility, which would result in increased Scope 2 GHG emissions. It is anticipated that the additional electricity demand from the upgraded facility would be around 32 kilowatts per hour. The potential increase in Scope 2 GHG emissions due to the proposal is outlined below in Table 7-3.

As the proposal would not substantially alter the movement of plant, equipment, materials and personnel to from the facility, no increases in Scope 3 GHG emissions are anticipated.

Almost all of the additional GHG emissions due the operation of the proposal would result from the additional combustion of natural gas associated with the new heating apparatus. The potential increase in Scope 1 GHG emissions due the proposal is significant relative to existing emissions from the facility. As the combustion of natural gas is an essential part of the gas conveyance process this potential impact is unavoidable.

Based on emission factors provided in *National Greenhouse Accounts Factors* (Department of the Environment, 2014) GHG emissions from the combustion of coal are around 70% higher than those generated by the combustion of natural gas. The majority of natural gas supplied by the distribution network is combusted for heating purposes. If the additional natural gas delivery is not increased, the shortfall may lead to increased used of electricity from coal combustion, with associated GHG

emission increases. In this regard, the proposal may actually provide a benefit in terms of overall GHG emissions.

So while the potential increases in GHG that would result from the proposal are significant relative to existing GHG emissions from the facility, the increases are considered justified based on the potential benefits provided by proposed upgrade.

7.4.4 Mitigation and management measures

The following mitigation and management measures would be implemented during the proposal to avoid and manage potential GHG emissions:

- Switch plant and equipment of when not in use
- Ensure that all construction plant and equipment is adequately serviced and maintained
- Investigate options for and use materials with a high recycled content (for example quarry products for hard stands and concrete) wherever practicable, and
- Reduce facility blow downs (frequency and volumes released) during maintenance to the greatest extent practicable.

7.5 Air quality

7.5.1 Existing environment

The location of the proposal is a semi-rural area located within a regional urban environment. The background air quality reflects this environment. Regional air quality is subject to factors such as seasonal variations, wind and temperature effects, varying potential pollutant sources such as vehicular emissions and industry and event type pollutant loads such as bushfires. As such, regional air quality can be highly variable in nature.

The nearest NSW EPA background monitoring station is Prospect which is located is William Lawson Park around six kilometres to the north east of the to the Horsley Park Meter Station. The air quality monitoring data from this site would be expected to show the influences depending on wind direction and atmospheric mixing height of:

- air emissions from the kilns at the brickworks located to the north
- NO_X and other emissions from the Wetherill Park industrial area, and
- NO_X and CO emissions from transport activities along the Westlink M7 Motorway and the M4 Western Motorway.

As described in the preceding section, the existing facility combusts natural gas. The combustion of natural gas results in the emission of carbon dioxide, carbon monoxide and oxides of nitrogen (NO_X). The emissions of carbon dioxide from the facility are assessed in Section 7.4 and are not considered further in this section. As natural gas does not contain any long chain hydrocarbons no particulates, smoke or other harmful products of incomplete combustion are generated.

The available data from the Prospect monitoring station for the most likely pollutants from the facility was accessed during the preparation of the Air Quality Impact Assessment for the proposal

(Appendix D) and provided in Table 7-4 below. It is noted that CO is not measured at the Prospect monitoring station.

Table 7-4 Background air quality

Pollutant	Average time	Concentration
NO_X (as nitric oxide (NO) and nitrogen dioxide (NO_2))	1 hour	94 µg/m^3
	Annual	18.8 µg/m^3

The emission of carbon monoxide (CO) and oxides of nitrogen (NO_X) from the existing facility is estimated and reported by Jemena as part of the National Pollution Inventory. Estimates for the existing facility for the 2012/2013 financial year calculated based on an annual natural gas usage of 2,321 tonnes per year are outlined in Table 7-5.

Table 7-5 Estimated annual emissions from the Horsley Park Meter Station

Substance	Estimated annual emissions (kg)
Carbon monoxide (CO)	4,220
Oxides of nitrogen (NO_X)	5,010

Source: Jemena

Emissions and air quality are affected by climatic conditions. The nearest weather monitoring station to location of the proposal is the monitoring station of Horsley Park, which is operated by the Bureau of Meteorology (BoM) (Station No. 067119). The station is located approximately 2.1 kilometres away from the location of the proposal and provides hourly weather data.

Typical atmospheric conditions at the location of the proposal are described in the Air Quality Impact Assessment of the proposal (Appendix F). Relevant information is summarised below.

The stability of the atmosphere, specifically how the temperature changes with altitude, affects how pollutants can disperse away from a source. The stability of the atmosphere at the location of the proposal was assessed using the Pasquill-Gifford classification system based on weather monitoring data. Worst case dispersion conditions from the site would be best associated with F-class stability, which describes conditions under which temperature inversions would occur, where winds are calm or absent and air close to the earth's surface cannot rise into the atmosphere due to the presence of warmer air layers above. Class "F" conditions are the most stable and least conducive to atmospheric dispersion of emissions.

The analysis of the site-specific meteorological data indicates the F-class dispersion conditions were present for approximately 13.9% of the time for the Horsley Park region. This suggests a reasonably moderate risk of enhanced impacts from emissions to due to the occurrence of this weather condition.

Wind rose plots for the year of 2008 were generated as part of Air Quality Impact Assessment based

on the weather data obtained from the BoM weather station of Horsley Park.

At Horsley Park, winds are prominent from the south-west at frequency of 23.7%. The average wind speed throughout the year of 2008 is 2.94 metres per second (m/s) with calms being present at 7.82% of the time.

In summer winds from the south-east become prominent at 20.1% followed by winds from the south (18.6%) and south-west (14.2%). Calms frequencies are at 7.53% whilst the average wind speed is 3.01 m/s.

Winds in autumn follow suit to the annual average wherein south-west (32%) wind is dominant throughout the season. Calms frequencies are recorded during this season at 6.16%. The average wind speed is 2.94 m/s. These well match the long term wind patterns, reporting similar wind patterns and calms frequency.

During winter wind patterns from autumn remain to be dominant but at frequencies of 31% (from south-west), 20% (from the west) and 18.5% (from the north-west). Average wind speed is seen to decrease during this period to 2.56 m/s with calms frequency increasing to 8.28%.

In spring, however, winds from the north, south-west and south-east become dominant at frequencies for 17%, 16% and 14% respectively. Average wind speed increases to 3.16 m/s and the calms frequency is at 5.22% which indicates better dispersion during this period.

Wind rose plots are provided in the Air Quality Impact Assessment which is included as Appendix F.

7.5.2 Criteria

Emission limits are outlined in *Protection of the Environment Operations (Clean Air) Regulation 2010* (the Clean Air Regulation). Part 5, Division 3 of the Clean Air Regulation applies to emission from non-scheduled premises, such as the Horsley Park Meter Station. The proposal falls within Group C as the facility is located within the Greater Metropolitan Area. The standards of concentration for pollutants from non-scheduled premises are provided in Schedule 6 to the Clean Air Regulation. Schedule 6 provides limits for solid particles and smoke only. As the combustion of natural gas does not generate solid particles or smoke these limits are not relevant to the existing facility or the proposed upgrade.

The document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA) provides guidance on methodology and thresholds that are to be used for the air impact assessment of a proposed development. This document provides limits for NO_X. The air quality criteria in the National Environment Protection Measure (NEPM) provide limits for CO. The operational air quality criteria for the facility and the proposal are provided below in Table 7-6.

Table 7-6 Relevant operational air quality limits

Pollutant	Averaging period	Criteria
NO_X	1 hour	246 µg/m^3
	Annual	62 µg/m^3
CO	8 hour	10 mg/m^3

7.5.3 Potential Impacts

Construction

Fuel combustion associated with the plant and equipment required to construct the proposal would generate emissions. The movements associated with the delivery of plant, equipment and materials and the movements of the construction workforce would also result in emissions. The emissions would consist of carbon dioxide, CO, NO_X, particulates and volatile organic compounds. The location of the proposal is in the vicinity of two motorways that would be major contributors to local air quality. Vehicle and plant movements associated with the proposal would be insignificant compared to the total vehicle movements along those motorways. Any contribution to local and regional air quality due to the vehicle and plant emissions during construction of the proposal would be negligible.

Construction of the proposal would require some minor excavations. Disturbance of the ground surface and exposure of soils may lead to dust generation during construction. Due to the distance of any sensitive receivers from the location proposal it is considered unlikely that dust from construction would reach or otherwise affect the amenity of any residents in the vicinity.

All vehicular movements outside the boundaries of the existing facility would occur on sealed or gravelled roads. The potential for increase dust generation to vehicular movements during construction of the proposal is therefore limited.

The construction of the proposal is therefore considered unlikely to result in any significant air quality impacts.

Operation

A quantitative air quality impact assessment has been carried out for the proposal in accordance with the requirements of *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA 2005) (the NSW EPA Approved Methods). The complete assessment is provided in Appendix F. All significant potential emissions from the operational of the proposal have been considered.

The air emission source was taken as the stack of the proposed 1.75 MW gas-fired boiler. It was assumed that the boiler stack would be nine metres high and 0.51 metres in diameter. A discharge velocity of 6.4 metres per second and an exit temperature of 200 degrees Celsius were also assumed.

The maximum heating capacity of the new gas-fired boiler proposed would be similar to the current heating levels of the existing facility. Emissions from the new boiler would be similar in composition to the emissions from the existing heating apparatus. Maximum potential emissions of CO and NO_X are therefore likely to double as a result of the proposal. The stack emission rates calculated by Jemena's engineers based on natural gas usage of 2,321 tonnes per year (as per Table 7-5) were assumed as the emission rates for the proposed boiler.

The emission modelling was carried out using the AUSPLUME (Version 6) modelling program which utilises consecutive meteorological data records to define the conditions for plume rise, transport, diffusion and deposition.

Meteorological data files from the nearest monitoring station operated by BoM were used in the modelling. Mixing heights and stability class were estimated using the methodology provided in the NSW EPA Approved Methods. Potential emission levels were modelled under the worst case (the most stable) atmospheric conditions.

Terrain effects were modelled in AUSPLUME using data supplied by the U.S. National Aeronautics and Space Administration (NASA) Shuttle Radar Topography Mission and the Egan-Half height processing approach.

Predicted 100th percentile incremental impacts in CO and NO_X pollutants at ground level were modelled at nine receptor points at various locations around the existing facility. The receptor points included residences, agricultural structures and the industrial facilities (for example brickworks).

The modelling predicts worst case increases in NO_X at the adopted receptors in the vicinity of the proposal of between 4.8 to 12.4 µg/m^3 (1 hour average) and 0.1 to 0.7 µg/m^3 (annual average) due to the operation of the proposed gas-fired boiler. The predicted atmospheric NO_X levels (background levels plus increases due to the facility) are predicted to be well within the relevant air quality criteria for NO_X outlined in Table 7-6.

The modelling predicts worst case increases in CO at the adopted receptors in the vicinity of the proposal of between 0.001 and 0.005 mg/m^3 (8 hour average) due to the operation of the proposed gas-fired boiler. While there is no background data for CO in the vicinity on the proposal the predicted increases are so small relative to the criteria of 10 mg/m^3 that any increases in CO due to the operation of the proposal are essentially negligible.

The predicted contributions of NO_X and CO to background levels at the closest residential receiver (187-201 Chandos Road) due the operation of the proposal are provided in Table 7-7. Predicted cumulative (worst case) concentrations on NO_X are also provided. A cumulative concentration of CO is not provided as there is no background data for this pollutant.

Table 7-7 Predicted ground level concentration at 187-201 Chandos Road

Pollutant	Averaging time	Notes	Predicted Concentration	Criteria	Units	Compliance
NO_X (as NO_2)	1 hour	Increase	12.3	246	µg/m^3	Compliant
		Cumulative[1]	77.1			
CO	8 hour	No background	0.004	10	mg/m^3	Compliant
		-[2]	-			

Notes: 1 With background levels included
2 No background data for CO available

Source: Benbow Environmental (2014)

The Air Quality Impact Assessment (Appendix F) concluded that the predicted air quality impacts from the proposed development are minimal and shall not exceed the criteria stipulated by the air quality guidelines. No additional management or mitigation actions were recommended in relation to potential operational emissions and air quality impacts from the upgraded facility.

7.5.4 Mitigation and management measures

The following mitigation and management measures would be implemented during construct and operation to address potential air quality impacts associated with the proposal:

- Construction plant and equipment would be switched off when not in use whenever practicable
- Areas of exposed soils would be minimised to the greatest extent practicable to minimise dust generation
- Stockpiles would be limited in height to reduce potential dust generation
- Water would be applied periodically to the unsealed surfaces as required if excessive dust generation is occurring
- Chandos Road in the vicinity of the site access would be cleaned as required to remove deposited soils and other loose materials likely to result in dust generation
- Emissions (stack) monitoring would be carried at the commencement of operation of the gas-fired boiler to confirm the input data and assumptions used during the dispersion modelling to confirm the accuracy of model results
- Additional dispersion modelling would be carried out if the stack emissions are found to be significantly higher than model inputs. Modelling results would be compared to operational air quality criteria, and
- If any additional dispersion modelling carried out indicates air pollutants levels approach the relevant air quality criteria, additional investigations would be carried out and additional controls and management measures identified and implemented with the assistance of relevant specialists as required.

7.6 Noise and vibration

7.6.1 Existing environment

While the location of the proposal is in a regional urban environment the areas immediate adjacent to the facility are semi-rural area in nature with characteristic low background noise levels. The existing facility generates noise due to the gas flow through above ground pipes and fittings and the operation of other apparatus, such as the water bath heaters. The apparatus present with the greatest potential for noise generation, the regulators and the metering equipment, is housed in open-roofed masonry enclosures to attenuate the noise generated. Other sources of noise in the vicinity include the other gas facility to the south of the Horsley Park Meter Station which is associated with the Central Trunk, the quarrying and brick/tile manufacturing activities carried out to the north and the noise associated with traffic along Chandos Road and the Westlink M7 Motorway to the south and west respectively.

Unattended noise monitoring was carried out by Marshall Day Acoustics at the southern boundary of the existing facility and on Chandos Road as part of the preparation of a Noise Impact Assessment for the proposal (Appendix G). It was observed that the prevailing noise environment was typical of a rural location with occasional distant road traffic audible along with intermittent road traffic on Chandos Road. Minimum ambient and background noise levels as determined from the unattended noise monitoring are outlined in Table 7-8.

Table 7-8 Measured ambient and background noise levels in the vicinity of the Proposal

Location	Minimum Background Noise Level $L_{A90(15\ minutes)}$ (dB)			Minimum Ambient Noise Level $L_{Aeq(15\ minutes)}$ (dB)		
	Day 7am – 6pm	Evening 6pm – 10pm	Night 10pm – 7am	Day 7am – 6pm	Evening 6pm – 10pm	Night 10pm – 7am
Southern Site Boundary	47	49	46	51	51	48
Chandos Road	45	44	40	61	61	56

Attended noise monitoring was carried out at the Horsley Park Meter Station by Forster OHS in 2009 to determine noise exposure levels within the facility in accordance with the requirements of *AS 1269-1998: Occupational Noise Management*. The study measured the noise levels produced by the noise emitting apparatus on site. A summary of the average noise levels and noise level ranges for each item is provided in Table 7-9. From the data a cumulative average noise level of 91 dBA and a cumulative maximum noise level 96 dBA from the existing facility can be assumed.

Table 7-9 Noise levels for existing apparatus at the Horsley Park Meter Station

Item	Average noise level (dBA)	Noise level range)dBA)
Central Trunk Meter Skid	69	67-71
Central Trunk Regulation Skid	85	79-89
Water Bath Heater 1 (small)	79	77-83
Water Bath Heater 2 (small)	79	76-82
Water Bath Heater 2 (large)	88	78-94
Central Trunk Launcher Trap	76	75-77
Smithfield Lateral Regulation Skid	84	75-88

Source: Noise Survey Metering Station – Horsley Park & Smithfield (Forster OHS, 2009)

From time to time natural gas has to be released from sections of the existing facility, typically when replacement of certain components is required. Referred to as 'blow downs', the natural gas releases generate noise levels between 130-140 dBA. These events typically occur for no more than a few minutes each time and may occur on average once or twice a year. It is not practicable to attenuate the noise from blow downs.

The closest sensitive receivers to the location of the proposal are residences located along either side of Chandos Road, as shown in Figure 7-5. The closest residences to the location of the proposal, Residences 1, 6 and 7, are located around 300 metres to south and southeast. With the exception of occasional blow downs, the existing facility is not audible at the closest residences.

The existing facility does not contain any equipment or apparatus or processes that generate significant vibration levels.

Cadastral data: Land and Property Information. Imagery: Jemena Limited

Figure 7-5 Noise sensitive receivers in the vicinity of the location of the proposal

7.6.2 Criteria

Construction

Noise goals (limits) for construction, referred to as noise management levels (NMLs), are defined in the *Interim Construction Noise Guideline* (DECCW, 2009) (ICNG). NMLs are related to the rating background levels (RBLs) for a particular location, determined in accordance with the NSW *Industrial Noise Policy* (NSW EPA, 1999) (the INP). Specific NMLs are defined for the day time (7am to 6pm), evening (6pm to 10pm) and night-time (10pm to 7am) periods. The NMLs adopted for the purpose of this assessment, based on the most conservative background noise monitoring results at the southern boundary of the facility, are outlined in Table 7-10.

The ICNG outlines that persons undertaking work should aim to keep $L_{Aeq(15\ minute)}$ noise levels within the relevant NMLs.

Table 7-10 Noise management levels (NMLs) for the proposal

Descriptor	Period		
	Day 07:00 – 18:00	Evening 18:00 – 22:00	Night 22:00 – 07:00
Noise management level definition	RBL + 10	RBL + 5	RBL + 5
Noise management level (NML)	57	59	56

Operations

The INP sets noise goals for operational noise from fixed facilities. The INP considers both intrusive (short-term) noise impacts and noise amenity. As with the ICNG, the noise goals developed in accordance with the INP are related to the RBLs for the location. The intrusive noise criterion is defined as relevant RBL plus five dB. The acceptable noise level criteria for amenity are defined for different noise receivers in various contexts in Table 2.1 of the INP.

Operational noise criteria for the proposal, determined in accordance with the requirements of the INP, are outlined in Table 7-11 below. In this case the intrusiveness criteria is not considered to be applicable and the amenity criteria have been adopted as the most appropriate goals for all periods.

Table 7-11 Construction and operational noise criteria for the proposal

Criteria		Period		
		Day 07:00 – 18:00	Evening 18:00 – 22:00	Night 22:00 – 07:00
Intrusive criteria	Definition	RBL + 5	RBL + 5	RBL + 5
	Criteria	52	54	51
Amenity criteria	Definition	From Table 2.1 in the INP	From Table 2.1 in the INP	From Table 2.1 in the INP
	Criteria	41	41	38

7.6.3 Potential impacts

Construction

Typical construction scenarios were identified for the proposal as shown in Table 7-12. The scenarios assume all items of plant are operating concurrently at peak sound power levels and are considered to be highly conservative. Based on Table 7-12 a maximum worst case cumulative sound power level of 109 dBA has been adopted for the assessment of potential construction noise impacts.

Worst case potential construction noise impacts for the residences in the vicinity for each indicative work scenario are outlined in Table 7-13. It is noted that the majority of construction activities would be scheduled within standard day time construction hours. The predicted construction noise levels at each residence in the vicinity of the location of the proposal are therefore compared to the day time NML. It is noted, however, that the predicted noise levels due to construction are expected to be well within the NMLs for day time, evening and night-time periods at all residences in the vicinity.

The risk of any significant construction noise impacts due to construction of the proposal is therefore very low.

Table 7-12 Typical construction scenarios and cumulative sound power levels

Scenario	Equipment	Max L_{Aeq} sound power levels SWL ($L_{Aeq\ (15minute)}$) (dBA)	No .of items	Cumulative Sound Power Level, SWL (dBA)
Site excavation	Excavators (20t)	104	2	109
	Tipper truck	97	2	
	Backhoe (7.5t)	104	1	
Concrete pours	Concrete truck	106	1	109
	Concrete pump	106	1	
Site deliveries	Semi-trailer	106	1	108
	Flatbed truck	100	1	
	Franna	99	1	
	Telehandler	92	1	
Mechanical installation	Mobile Crane (100t)	101	1	109
	Telehandler	92	1	
	Semitrailer	106	1	
	Excavator (20t)	104	1	
	Compressor (250 cfm)	92	1	

Table 7-13 Predicted construction noise levels

Residence	Distance from site (m)	Sound pressure level at receiver, SPL (dBA)	Noise Management Level (dBA)	Predicted exceedance of NML (dBA)
1	318	40	57	-
2	362	39	57	-
3	375	38	57	-
4	492	35	57	-
5	391	38	57	-
6	298	41	57	-
7	300	41	57	-
8	614	32	57	-
9	558	33	57	-
10	631	32	57	-

Residence	Distance from site (m)	Sound pressure level at receiver, SPL (dBA)	Noise Management Level (dBA)	Predicted exceedance of NML (dBA)
11	625	32	57	-
12	577	32	57	-

Various activities would be carried out during construction of the proposal that generate vibration. These activities would typically be associated with compaction of the earth to provide stable foundations for the new apparatus and pipework that would be installed as part of the upgrade. Vibrations typically diminish rapidly with increasing distance from source. Any vibrations generated during construction would therefore be unlikely to affect the structural integrity of the buildings or infrastructure within the existing facility.

The closest vibration sensitive receivers in the vicinity of the location of the proposal are the residences located along Chandos Road. Due to the large distances between the nearest residences and the facility it is unlikely any vibrations generated during construction would be perceptible at these locations. Construction of the proposal would not result in any significant vibration impacts.

Operation

The following noise sources would be added to the existing facility as part of the proposal:

- a regulator, and
- boilers.

Masonry walls would be constructed around each of these features to reduce noise propagation. While these would be roofless structures the masonry walls would significantly reduce the lateral propagation of operational noise. It is noted that heat exchangers are proposed rather than water bath heaters that are currently present. This is because the exchangers generate significantly lower noise emissions. As any noise generated by the heat exchangers would be significantly lower than the noise levels from the other apparatus and would not likely contribute to overall operational noise levels from the upgraded facility they have not been considered further in this assessment.

For the purposes of the Noise Impact Assessment a worst case scenario was adopted that conservatively assumes all duty and stand-by equipment operating at full capacity concurrently. The potential operational noise levels were predicted on the boundary of the nearest noise receptor: the residence at 187-201 Chandos Road.

An assessment of the potential operational noise impacts of the upgraded facility on the most affected noise sensitive receiver is provided in Table 7-14. The results show that predicted noise level from the upgraded facility would be compliant with the applicable noise limits, determined in accordance with the INP, during all periods of the day. Noise levels at all other noise sensitive receivers (residences) in the vicinity would be less than the predicted noise levels at 187-201 Chandos Road due to increase separation distances.

Table 7-14 Predicted operational noise levels from the upgraded Horsley Park Meter Station

Receptor location	Predicted noise level (LAeq) (dB)	INP Noise Limit (dB)			Exceedance
		Day 07:00 – 18:00	Evening 18:00 – 22:00	Night 22:00 – 07:00	
187-201 Chandos Rd	29	41	31	38	-

Blow down of the new apparatus and pipework that would be installed as part of the proposal would be required from time to time and would add to the frequency of existing blow downs carried out for the facility. While operational noise levels from the facility are measured as averages over 15 minute periods ($L_{Aeq(15\ minute)}$) and the blow down events are typically completed within one to two minutes, it is still anticipated that the blow down events would exceed the operational noise criteria at the residences in the vicinity due to the magnitude of the noise levels generated. The proposal would therefore result in an increase of events that exceed the relevant operational noise criteria at sensitive noise receivers in the vicinity. It is not practicable to significantly reduce the noise levels associated with blow down events.

It is noted that blow downs are manually instigated activities that occur during maintenance work within standard day time construction hours. Noise from blow downs that occur within the existing facility would already be considered part of the existing acoustic environment by noise receivers in the vicinity of the facility. The proposal would only result in small number of additional blow down instances per year (if at all) and would not introduce a completely new type of noise event to the local area. The potential operational noise impacts associated with an increased number of blow downs due to the proposal are therefore not considered significant.

The risk of significant impacts due to operational noise from the upgrade facility is very low.

No new equipment or apparatus with the potential to generate significant vibration levels would be installed as part of the proposal. No vibration impacts are therefore anticipated due to the operation of the proposal.

7.6.4 Mitigation and management measures

The mitigation and management measures that would be implemented for the proposal to minimise potential noise impacts are outlined below:

- Construction activities likely to generate noise above the relevant noise management levels at the nearest residences would be limited to between 7am and 6pm Monday to Friday and 8am to 1pm on Saturdays
- Machinery would be switched off when not in use wherever practicable
- The potentially affected residents would be notified prior to commencement of construction. The contact details of an appropriate site person would be provided for community queries and complaints
- Any complaints received from the community regarding noise impacts would be entered into Jemena's Incident Management System, investigated and addressed promptly, and
- Compression breaking would be banned in the vicinity of the facility for all heavy vehicle

associated with the proposal. The need to avoid compression breaking would be included in a Project Induction that would be delivered to all personnel (including drivers) prior to their involvement in the proposal.

As no vibration the impacts are anticipated due to proposal, no mitigation and management measures are proposed for vibration.

7.7 Traffic and access

7.7.1 Existing environment

The Horsley Park Meter Station is located on Chandos Road, which is a local road through a semi-rural area of Western Sydney. Chandos Road does, however, provide an east to west link between Wallgrove Road and Wetherill Park and site observations indicates that it is subject to reasonable traffic volumes during morning and afternoon peak times consisting of both light and heavy vehicle movements. At other times, Chandos Road is subject to low traffic volumes.

Chandos Road intersects with Wallgrove Road around one kilometre to the west of the Horsley Park Meter Station. Wallgrove Road is an important arterial road and is subject to high a volume of light and heavy vehicle movements. Wallgrove Road also connects to the Westlink M7 Motorway the M4 Western Motorway which are heavily trafficked by both light vehicles and heavy vehicles and provide fast and efficient road-based access to the wider Sydney region and beyond.

Under normal operating conditions the existing facility is unmanned and requires only infrequent vehicular access. Increased site access would be required during facility maintenance activities. Vehicular movements during these activities may include light vehicles trips associated with personnel movement and also heavy vehicles trips associated with site deliveries. Such activities occur infrequently. Due to low traffic volumes on Chandos Road, the limited numbers of vehicles that would access the site during maintenance activities and the temporary nature of the work, facility operation and maintenance would be unlikely to result in congestion, increased travel times or restrictions in property access along any roads in the vicinity of the facility.

7.7.2 Potential impacts

The majority of site access would occur directly along Chandos Road from Wallgrove Road. The proposed upgrade would result in increased light and heavy vehicle movements along these roads. The increased vehicle movements would be generated by deliveries of new pipework and apparatus, construction equipment and materials, the removal of waste materials, excess construction materials and equipment at the completion of construction and the movements of the construction and commissioning workforce.

It is anticipated that the proposal would generate around 200 additional heavy vehicle movements to and from the site in total. These additional vehicle movements would occur over the six month construction and commissioning period. The proposal would also likely generate up to 40 additional light vehicle movements to and from the site each day. Due to the low existing traffic volumes along Chandos Road is it unlikely that the increase in light and heavy vehicle movements associated with

the proposal would result in increased congestion, reductions in travel times or property access restriction for any other vehicles using the road. The additional vehicle movements that would be generated during construction of the proposal would be unlikely to result in any significant impacts on Wallgrove Road or in the wider road network.

Any increases in vehicle movements associated with the proposal would be limited to the construction and commissioning period. Once the upgrade works are complete it is anticipated traffic volumes and conditions along Chandos Road and the wider road network would return to existing conditions.

The proposal is not anticipated to result in any significant temporary or long term traffic or property access related impacts.

7.7.3 Mitigation and management measures

The following mitigation and management measures would be implemented during the proposal to manage and avoid potential traffic and access impacts:

- A Traffic Control Plan (TCP) would be developed for the proposal in accordance with the relevant Australian Standards. The TCP would specify controls, such as signage and reduced vehicle speeds as appropriate that would be implemented along Chandos Road in the vicinity of the facility during the construction of the proposal
- Details of the TCP and safety awareness training would be included in the Project Induction delivered to all personnel associated with the proposal prior to involvement, and
- All parking and associated with the proposal would occur within that Jemena owned land. No parking would occur along Chandos Road associated with the proposal.

7.8 Public safety and hazards

7.8.1 Existing environment

Operational safety through design

The transmission and control of high pressure natural gas can be hazardous if not adequately managed. Sudden uncontrolled releases of pressurised gases can be dangerous and natural gas is flammable. The inherent risks associated with natural gas facilities such as the Horsley Park Meter Station are recognised during the facility planning and design process.

The main philosophies that have been adopted to avoid potential high risk situations associated with the operation of the existing facility are to eliminate the potential risks through design and to ensure appropriate quality control during construction.

The existing facility has been designed and constructed in accordance with the requirements of Australian Standards *AS2885.1 Design and construction of Pipelines gas and liquid petroleum* and *AS4041-2006 Pressure piping*. These standards have been developed to ensure that the facilities designed in accordance with them are safe.

The design of the facility was subject to risk assessments in accordance with the relevant standards at the time to ensure that potential hazards and risks were identified and taken into account in the design process.

Individual components of the facility were pressured tested to levels near the theoretical maximum strength of the materials prior to installation to ensure structural integrity.

All the welds used in the pressure piping within the facility are subject to non-destructive testing using x-rays during construction to ensure integrity. All pressure piping and fittings are coated to limit environmental exposure of metal surfaces and potential corrosion. The underground components of the facility are protected against corrosion using cathodic protection systems.

The maximum allowable operating pressure (MAOP) of the facility was established during the project planning phase of the Eastern Gas Pipeline and the existing facility has been designed accordingly. The MAOP is set at a level well below the theoretical and tested structural limits of the components. The facility and the Eastern Gas Pipeline in general is operated at pressure levels below MAOP. The design philosophy and control systems in place ensure that the pressure cannot exceed the MAOP.

The operation of the facility is controlled, operated and monitored continuously via telemetry at the Control Room for the Eastern Gas Pipeline using a supervisory control and data acquisition (SCADA) system. The Control Room is manned 24 hours a day, seven days a week, 365 days a year.

Numerous valves have been included in the pipework of the facility within the individual components of the facility to allow the facility to be isolated in the event of an emergency or to take sections and components out of service for maintenance and repairs as required. The main types of valves and details about their function and operation are outlined below:

- Station Limit Valves (SLVs) – these valves can be actuated remotely from the Control Room to isolate the facility from the pipelines to which it is connected. There are three SLVs which are located on station inlet and on the station outlet connections to the Central Trunk and the Smithfield Lateral pipelines
- Pressure Control Valves (PCVs) and Flow Control Valves (FCVs) – these valves, which are located within the regulators, control the flow of gas through the facility. They operate automatically to regulate gas flow, including closing off automatically and safely when abnormal flow and pressure conditions are detected. These valves can also be actuated remotely from the EGP Control Room
- Slam Shut Valves (SSV) – these valves slam shut automatically under certain gas conditions and are installed as a failsafe measure. One SSV is installed on each of the two pipe runs within each regulator within the facility, and
- Manually actuated valves – these valves, which require manual operation, are installed in the pipework throughout the facility to enable all components of the facility to be isolated to carry out maintenance and repairs as required.

The locations of the SLVs, PCVs, FCVs and SSVs in the existing facility are shown in Figure 7-6.

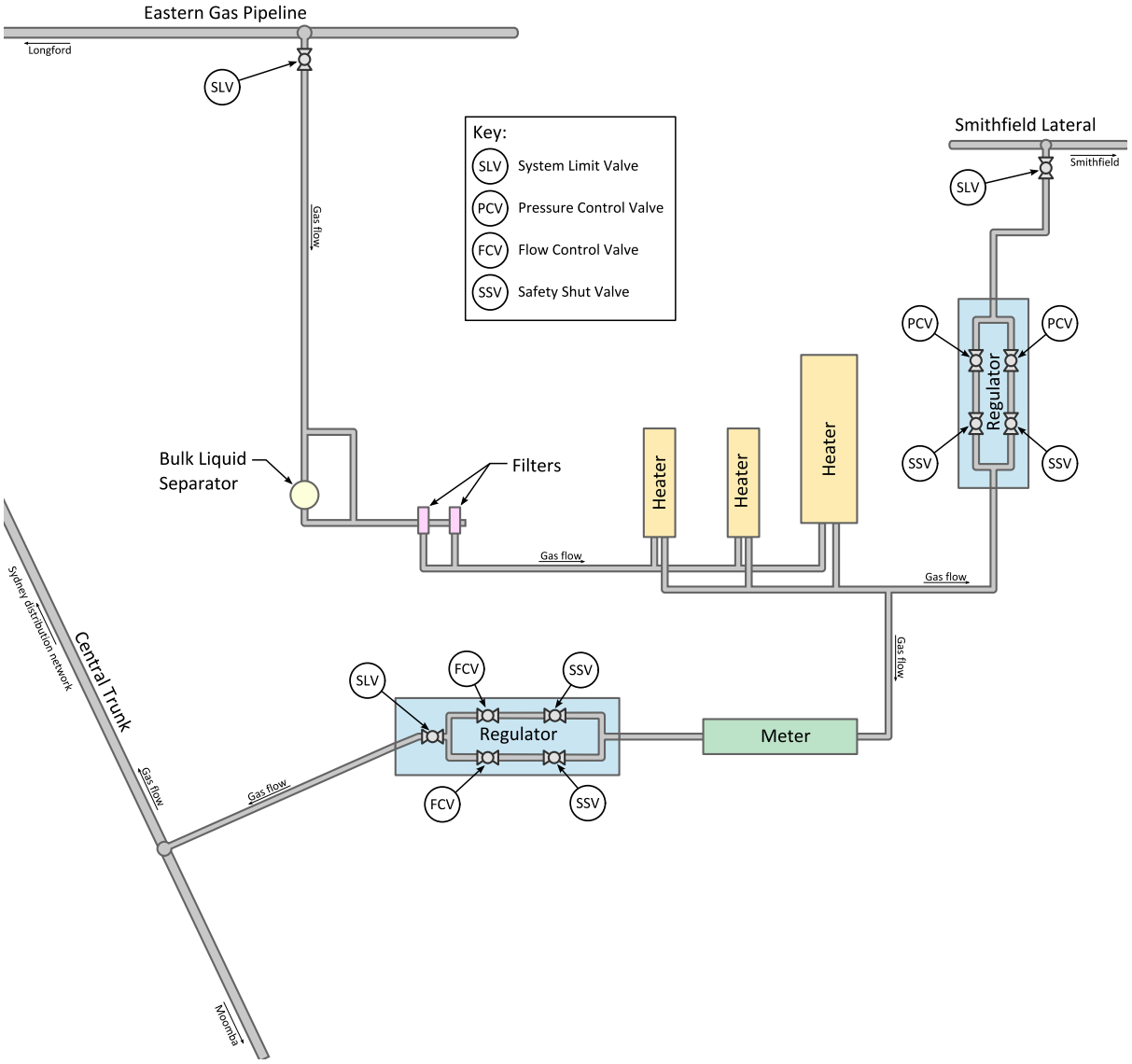


Figure 7-6 Automatic and remotely operated valves within the Horsley Park Meter Station

The facility has been designed and constructed with redundancy so that it is serviceable. A program of scheduled inspections, testing and preventative maintenance is adopted for the facility. The program is designed based on Jemena's long history operating high pressure pipelines and facilities to ensure that any potential issues are addressed in a preventative manner before they can become actual hazards.

Emergency Response and Management

While the facility has been designed and constructed and is operated, monitored and maintained to reduce potential safety risks it is recognised that potentially hazardous situations could still occur.

Emergency situations involving the Eastern Gas Pipeline and all associated facilities, including the Horsley Park Meter Station, are managed in accordance with an Emergency Response Management Plan (ERMP) (Jemena document *GTS-599-PA-EM-001 EGP Emergency Response Management Plan*).

Key components and requirements of the plan in relation to the Horsley Park Meter Station are outlined below.

Event types

The ERMP considers three main types hazard events: incidents, emergencies and crises. The three levels are defined in ac based on the potential level of severity in accordance with a matric define din the ERMP. The response to each level and the teams and personnel that are involved are dependent of the event type.

Response teams

The ERMP establishes an Incident Management Team (IMT) and an Emergency Management Team (EMT). Responses to incidents normally require the partial or full activation of the IMT, along with partial activation of key EMT functional members. The EMT is activated to support the IMT and manage the issues that will arise from emergency situations. The EMT is activated to respond to emergencies and crises.

The ERMP contains position guidelines for all key personnel positions within IMT and EMT. The guidelines define the specific responsibilities, tasks and actions that must be performed by each position during an incident or emergency.

Activation of response

The EMT Emergency Response Manager holds the key responsibility regarding incidents and emergencies. The EMT Emergency Response Manager is supported in the role by the EGP Control Room and other key emergency response personnel as defined in the ERMP. The main process that is followed in the event of an incident or emergency to activate Jemena's ERMP and response is outlined below:

- The Control Room becomes aware of an event either from telemetry or direct contact from Jemena operational personnel or external stakeholders
- The Control Room notifies the EMT Emergency Response Manager
- The EMT Emergency Response Manager reviews that details and decides whether the event is an incident or an emergency based on the level of severity, as defined in the ERMP
- If the event is classified as an incident an IMT Site Controller identified and despatched to the location and the IMT is activated to deal with the incident
- If the event is classified as an emergency is the EMT Emergency Manager activates the EMT to deal with the emergency, including contacting other stakeholders, such as emergency services.

Every potential incident is different. Under the ERMP the EMT Emergency Response Manager or the IMT Site Controller review the specific details of the situation and coordinate an appropriate response with support from specialist Jemena engineering, operational and other personnel as required.

Agency and emergency services communications

Jemena's emergency response arrangements envisage the partnership and active involvement of

multiple responders in all facets of dealing with an incident. The ERMP includes the requirement to contact and involve various external stakeholders as required including emergency services, government agencies, statutory authorities and industry participants. The ERMP acknowledges Jemena is not classified as an emergency service and so is legally obliged to conform to direct, non-negotiable instructions from emergency service personnel such as Fire and Rescue NSW.

Both the IMT and EMT contain defined personnel whose responsibilities are to provide and coordinate site level communications and information management, including liaison with emergency services and other third party responders attending the incident site.

The ERMP contains a list of the external stakeholders (including emergency services) that must be contacted in the event of an incident or emergency, defines the situations in which they must be contacted and provides relevant contact information.

Plans and procedures

The ERMP contains a contingency plans for events involving pipeline damage, pinholes (leaks) and ruptures (among other potential incidents and emergencies). These contingency plans outline the processes that must be followed in the event of these situations. The EMRP also contains and references a full set of EGP emergency response procedures that cover all manner of potential events that could result in incidents or emergencies.

Exercises and simulations

Annual incident and emergency exercises are completed for the Eastern Gas Pipeline to test incident and emergency preparedness and response. The functions of the exercises and simulations are to:

- provide suitable training for the key personnel within the EMT and IMT
- to rehearse and improve the company's incident response capability, and
- to provide a means for identifying changes that must be made to keep the strategy and/or actual responses current.

The ERMP is reviewed bi-annually as a minimum to reflect any lessons learned from incident and emergency exercises situations in addition to changes to organisational structure, personnel and facilities.

7.8.2 Potential Impacts

Operation

The philosophies of eliminating potential risks associated with the upgraded facility through design and ensuring appropriate quality control during construction would also be adopted for the proposal.

The additional flow conveyance, control and metering apparatus and associated pipework that would be installed as part of the proposal would be designed and constructed designed in accordance with the requirements of Australian Standards *AS2885.1 Design and construction of Pipelines gas and liquid petroleum* and *AS4041-2006 Pressure piping*.

The risks associated with the proposed upgrade have been assessed through Safety Management Studies in accordance with the requirements of *AS2885.1 Design and construction of Pipelines gas and liquid petroleum*. Hazard and Operability Studies (HAZOP) are underway and would be completed before the facility design is finalised.

The pipework and apparatus would be subjected to similar integrity tests prior to installation as the existing facility. Key welds subject to high pressures would be subject to non-destructive (x-ray) testing to confirm their integrity. The new apparatus and pipework would be operated below the MAOP, which is well below the theoretical maximum strength of the materials used.

The existing Station Limits Valves would remain unaffected by the proposal and would also allow isolation of the new gas infrastructure. New Safety Shut Valves (SSVs) and Flow Control Valves (FCVs) would be installed on each of the pipe run within the new regulator. These valves would enable the new gas infrastructure within the facility to be isolated and shut down as required. The existing and proposed additional valves are shown in Figure 7-7.

Key components of the upgrade facility would be connected to the existing SCADA system and would be monitored, controlled and operated from the existing EGP Control Room. The program of scheduled inspections, testing and maintenance currently in place for the facility would be amended include the new facility components. The ERMP for the EGP and the processes therein would remain relevant to the upgraded facility and would be amended as required to include an updated description the facility.

The proposal would increase the amount of high pressure natural gas pipework and apparatus within the existing facility. The preliminary Safety Management Study and Hazard and Operability Study indicate that the overall risk profile of the facility would not change as a result of the proposal. The potential for risks to public safety and hazard levels increasing due to the proposal is very low.

A Preliminary Hazard Analysis (PHA) has been prepared for the proposal in accordance with the requirements set out in the *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (NSW Department of Planning, 2011) (refer to Section 6.2 and Appendix C). The identified risks were compared with the risk criteria in use in NSW, as specified in *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Landuse Planning* (NSW Department of Planning, 2011b) (HIPAP4). The PHA indicates that the proposal would comply with the relevant risk criteria for hazardous development.

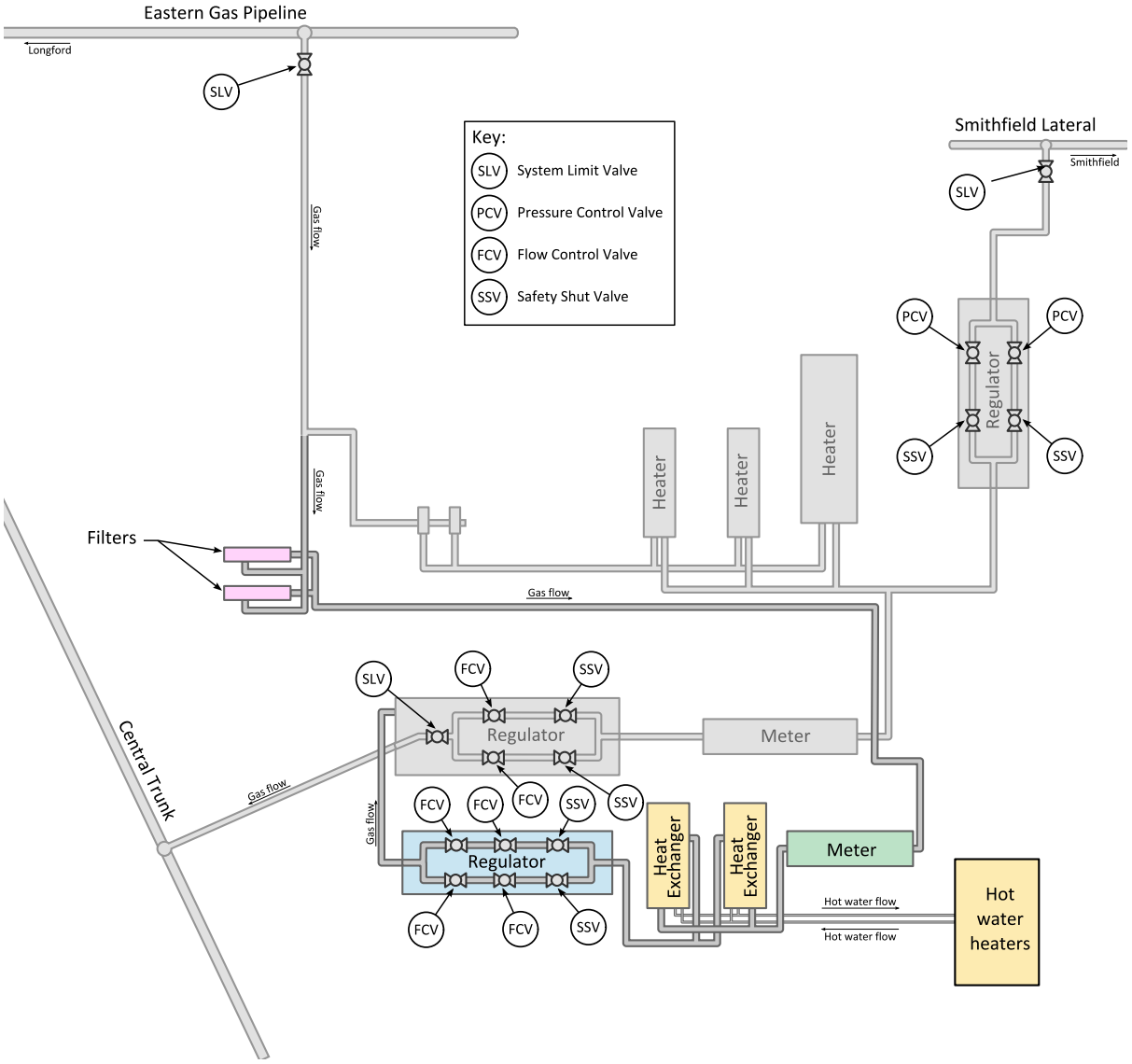


Figure 7-7 Automatic and remotely operated valves within the Horsley Park Meter Station

Construction

Construction activities associated with the proposal would occur within the boundaries of the existing facility, which is fenced and not accessible by the general public. The facility itself is located at the end of a private access road driveway that extends approximately 200 metres from Chandos Road to the facility gate. The risk of the construction plant and equipment interacting with the general public is therefore negligible. Construction of the facility does not involve the use and storage of large volumes or amounts of hazardous materials. The risk of spills or releases of hazardous substances during construction which could affect the adjacent areas/residents and the general public is very low.

The main risk to public safety associated with construction, as identified in the environmental risk assessment carried out for the proposal (refer to Section 6 and Appendix B) is associated with construction plant and equipment entering and leaving the facility access road from/to Chandos

Road. Chandos Road is used as a local backway between Wallgrove Road and Wetherill Park. The road can become quite busy, particularly during the morning and afternoon peak periods. Heavy vehicles and other construction-related traffic slowing to enter the facility access and entering the flow of traffic from the access road have the potential to increase the risk of collision on Chandos Road.

With the exception of traffic leaving and entering the facility location, construction has a very low potential to create hazard and threaten public safety. The potential public safety hazards associated with construction traffic leaving and entering the facility can be adequately managed using signage and through awareness training. The potential for significant public safety impacts due to construction of the proposal is low.

7.8.3 Mitigation measures

The following mitigation and management measures would be implemented to manage potential public hazard and safety impacts during construction and operation of the proposal:

- The additional facility components would be designed and constructed designed in accordance with the requirements of *Australian Standards AS2885.1 Design and construction of Pipelines gas and liquid petroleum* and *AS4041-2006 Pressure piping*
- All new apparatus would be connected to existing operational control systems operated as part of the Eastern Gas Pipeline
- The Emergency Response Management Plan and Safety and Operating Plan (including maintenance and inspections schedules) and for the Eastern Gas Pipeline would be updated to include the upgrades Horsley Park Meter Station, and
- All future works within the upgraded facility would be carried out under the Permit to Work system.

7.9 European heritage

7.9.1 Existing environment

Searches for heritage items within or in the vicinity of the location of the proposal were carried within the following documents and using the following registers, datasets and search tools:

- *Horsley Park Local Environmental Plan 2013*
- *State Environmental Planning Policy (Western Sydney Parklands) 2009*
- The NSW Heritage Register
- The NSW Heritage Inventory
- The EPBC Protected Matters Search Tool, and
- The Register of the National Estate.

Listed features of European heritage conservation significance in the vicinity of the location of the proposal are provided in Table 7-15.

There are no known features of European heritage conservation significance within the site

boundary of the Horsley Park Meter Station. The soils within the existing facility have been subject to significant levels of disturbance due to past agricultural practices (market gardens) and during construction of the Eastern Gas Pipeline and the facility itself.

Table 7-15 Listed features of European heritage significance near the proposal

Name	Location	Source of listing	Distance from proposal (m)
Prospect Reservoir and surrounding land	Horsley Park, Prospect and Wetherill Park	State Heritage Register Register of the National Estate	800
Spotted Gum forest	Corner of Chandos Road and Ferrers Road, Horsley Park	State Environmental Planning Policy (Western Sydney Parklands) 2009	800

7.9.2 Potential impacts

The listed features of European heritage conservation significance in the vicinity of the location of the proposal would not be directly or indirectly affected by the proposal. Due to the significant soil disturbance that has occurred due to past agricultural and construction activities it is considered highly unlikely that any intact subsurface relics would be present in the locations that would be disturbed as part of the proposal.

The proposal would not have any impact of features of European heritage conservation significance.

7.9.3 Mitigation and management measures

The following mitigation and management measures would be implemented in the event that previously unknown items of features of European heritage conservation significance are uncovered during the proposal:

- All work in the vicinity of the unexpected find would cease
- The NSW Department of Planning would be contacted and advised of the unexpected find, and
- No works would recommence at that location until such time as the Department of Planning has determined the nature and significance of any finds and determined an approach for further work, in consultation with other agencies and parties as required.

7.10 Visual impact

7.10.1 Existing environment

The location of the proposal is semi-rural in nature and contains visual elements typical of agricultural areas including pastured areas, agricultural dams, market gardens, sheds, greenhouses, residences and areas of native vegetation. The area does, however, features dominant visual

elements that are not consistent with the semi-rural character of the local area. These visual elements include the two natural gas facilities, the electricity transmission infrastructure running east-west to the north of the site and a very large stockpile of overburden material around 30 to 40 metres in height to the north associated with the quarrying and tile manufacturing activities that occur at that location. The facility is shown in Plate 7-1.

The closest residences to the location of the proposal are around 300 metres to the south and south-east on Chandos Road (refer to Figure 7-5). The facility is partially or completely obscured from many of the closest residences by the other gas facility to the south, other residences, agricultural buildings and structures, topography, native vegetation and vegetation planted along the inside of the perimeter fence on the eastern side of the existing facility. A view of the location of the location of the proposal from Chandos Road is provided in Plate 7-2.

Plate 7-1 Photo of the facility

Plate 7-2 View of the facility from Chandos Road showing the facility associated with the Central Trunk on the left

7.10.2 Potential Impacts

Due to the distance of the residential receivers to the existing facility and the lack of other viewpoints from publicly accessible places, it is unlikely that proposed additions to the Horsley Park Meter Station would be noticeable.

As the proposal would involve upgrading an existing gas facility and there is another gas facility to the south, the additional apparatus and pipework that would be installed is considered to be in context with the existing visual and landscape character of the area.

The proposal would not have any significant impact on landscape character or the visual amenity of the resident with line of sight to the facility.

7.10.3 Mitigation and management measures

The following mitigation and management measures would be implemented during the proposal to limit impacts the landscape character and visual amenity:

- General site cleanliness and condition would be monitored on a daily basis during the work and appropriate actions taken as required to address any issues identified, and
- The existing vegetation along the inside of the eastern perimeter fencing site would be protected during the works to maintain visual screening for the facility.

7.11 Socio-economic impacts

7.11.1 Existing environment

The gas that flows through the Horsley Park Meter Station is supplied to large numbers of small residential customers and also large scale industrial and commercial customers. Natural gas is a key commodity and the availability of natural gas as an energy source is a requirement and constraint for many forms of industry. The industries that use natural gas contribute to the economy and provide benefits to the wider community. Natural gas is also an economic energy source for heating for many residential customers. The availability of natural gas can therefore have a significant impact on the socio-economic wellbeing of the state.

The existing pipelines and distribution networks in Eastern Australia and issues associated with current and future gas supply into the Sydney distribution network are described in Section 2.1. All gas within the Sydney distribution network and beyond passes through the gas facilities in Horsley Park. Without the proposed upgrade to Horsley Park Meter Station there is therefore a very real possibility that future gas supplies into the Sydney distribution network would be restricted.

7.11.2 Potential Impacts

The proposal involves additions to an existing gas facility and does not require the expansion of land required for that facility. It is unlikely that the proposal would affect the any commercial activities, for example agriculture, that occur in the vicinity of the facility in any way. The proposal would not adversely affect the socio-economic status of the local area and region in general.

If the proposed alterations to the Horsley Park Meter Station do not occur, future natural gas supply gas into Sydney distribution network will be constrained further. This will result in restriction of gas supplies for existing customers and would also limit the potential for existing industrial and commercial customers to expand existing operations or for new natural gas dependent industries to develop. This may lead to adverse economic and social impacts. Gas restrictions and shortages may result in loss of amenity for residential gas customers and may result in increased adverse economic and associated social impacts.

The proposal would therefore result in positive socio-economic impacts. Not proceeding with the proposal could result in significant adverse socio-economic impacts if an alternative solution to increasing gas supply into the Sydney distribution network is not implemented.

7.11.3 Mitigation and management measures

As no adverse socio-economic impacts are anticipated as a result of total, no mitigation and management measures are proposed.

7.12 Waste and resources

7.12.1 Existing environment

The existing Horsley Park Meter Station does not generate significant amounts of waste. The various existing waste streams are described below.

The existing facility includes a bulk liquid separator that was installed as part of original construction. Natural gas contains small amounts of liquid hydrocarbons which must be removed. Bulk liquid separators perform that function. Existing facilities upstream of the Horsley Park Meter Station also have similar equipment. As a result there are negligible amounts of liquid hydrocarbons present in the gas by the time it reaches the Horsley Park Meter Station. The quantities of liquid hydrocarbons are so insignificant that the separator would be removed as part of the proposal.

The existing facility includes gas filters to remove any solid debris that may be present within the gas. The debris, referred to as pipeline dust, is mostly iron oxides and particles from exposed metal surfaces within the pipeline at pipe joint locations. The filters consist of banks of plastic and fabric filter cartridges.

Under normal operating conditions the filter cartridges that have been filled are removed and replaced annually. The removed cartridges are placed into 205 litre capacity HAZMAT drums. Typically only one drum is filled when the cartridges are replaced. Once the used filter cartridges are removed the internal services of the filter housing are cleaned using the rags, degreasers and water before the new filter cartridges are installed. The oily rags, dirty water and any other potentially contaminated materials are also placed into the HAZMAT drum. The HAZMAT drums are removed from site by a suitably licensed waste contractor for disposal at a suitably licensed waste facility.

Once every 5 to 10 years an internal gauge is sent through the pipeline in the gas stream to clean internal surface and detect any integrity issues. As the gauge comes into contact with the internal surfaces of the pipeline it generates larger than usual amounts of pipeline dust that ends up in the filters. During such operations more filter cartridges need to be replaced and three to four HAZMAT drums might be filled. Increased levels of pipeline dust are also present for three to four months following the completion of internal inspections. The filters are inspected two to three times during this period and cartridges are replaced as required. Usually one HAZMAT bin is filled during each inspection.

From time to time maintenance is required on various parts of the other gas conveyance and flow control apparatus present on site. This may require the removal and replacement various components including seals, lubricants, gauges and measurement devices. Maintenance occurs very infrequently and does not generate significant volumes of waste. The majority of waste generated from maintenance classified as general solid waste and disposed of accordingly. Any potentially contaminated wastes are placed in HAZMAT drums and removed from site by a suitably licensed waste contractor for disposal at a suitably licensed waste facility. The volume of wastes generated during maintenance is typically very small.

The existing facility has small office which is used occasionally by Jemena operational personnel. The wastes produced from the facility are typical office wastes and include wastepaper, toner

cartridges and general rubbish. Only small volumes are generated. This waste is collected regularly by a licensed waste contractor and disposed of at a suitably licensed waste facility.

The main resource used by the facility during normal operation is the natural gas combusted within the water bath heaters. The amount of natural gas used by the existing water bath heaters represents around 0.1% of the total capacity of the Eastern Gas Pipeline. This use of natural gas for this purpose facilitates the availability of this resource to the wider community.

As the facility predominantly uses gas as its energy source it uses very little electricity.

7.12.2 Potential impacts

The majority of waste generation due to the proposal occur during the construction phase. An area of approximately 750 metres would need to be excavated to extend the existing level surface on which the existing infrastructure is located to create an area on which to install the new apparatus and associated pipework. It is anticipated that around 320 m³ of soil would need to be excavated. The excavated material would be classified in accordance with the NSW *Waste Classification Guidelines Part 1: Classifying Waste* (DECCW, 2008) and disposed of at a suitably licensed waste facility or diverted for reuse if appropriate.

The other wastes generated during construction would include materials such as wooden pallets, empty containers, plastic and other wrapping and packaging materials, pipe offcuts and general refuse. Waste materials with recycling potential would be stored separately and diverted to appropriate waste recycling facilities. Other waste materials would typically be placed in skip bins and removed from site by a suitably licensed waste contractor for disposal at an appropriately licensed waste facility. It is not anticipated that significant volumes of general construction waste would be generated by construction.

Any soils that become contaminated by spills of hydrocarbons and other liquids or any other potentially contaminated materials would be collected and placed in HAZMAT bins, which would then be removed from site by a suitably licensed waste contractor for disposal at a suitably licensed waste facility. Significant volumes of fuels, lubricants and other hydrocarbons would not be stored on site. It is considered unlikely that significant volumes (in excess of one cubic metre) of contaminated soils or other potentially contaminated materials would be generated by the proposal.

During operation of the proposal the wastes generated by the new flow conveyance control apparatus would be similar to those already generated by the facility. As two additional filters would be installed as part of the proposal the potential waste stream associated with the filter replacement would double. As filter replacement occurs only infrequently, however, and significant volumes of waste are not generated by this activity this increase is not considered significant.

The existing office facilities would not be subject to additional use once the upgrade works are complete. It is unlikely that the wastes generated by the use of the office facilities would change as a result of the proposal.

The main resources that would be used to construct the proposal would include the steel associated with the new flow conveyance and control apparatus and associated pipework, quarry products to

create new hardstand surfaces, concrete to create stable footings for the new apparatus and plinths for the connecting pipework, polymer and resin coatings for new pipework and apparatus and bricks to construct the new masonry noise attenuating structures. The volumes of these additional resources required to construct the proposal are not considered to be significant in terms of overall supply and would not limit resource availability for other purposes.

During the operational phase of the proposal the additional heating apparatus that would be installed would have the potential to consume an additional 120,000 gigajoules of natural gas year. To put this into context this represents less than 0.3% of the total additional throughput that would be provided by the upgrade. The total potential gas usage by the upgraded facility would represent about 0.16% of the total upgrade capacity of the Eastern Gas Pipeline. The additional gas that would be used by the upgraded facility is considered insignificant in terms of additional resource use. The additional resource use is considered justified due to the benefits the proposal would provide to the Sydney distribution network in terms of increased supply capacity and natural gas availability.

It is therefore considered unlikely that the proposal would result in any significant adverse impacts associated with increased waste generation and resource availability. The proposal would provide an important beneficial impact by maintaining the existing and the increasing the future supply potential of natural gas, an important energy resource, into the Sydney distribution network.

7.12.3 Mitigation and management measures

The following mitigation and management measures would be implemented during the proposal to minimise potential impacts associated with waste generation and resource use:

- The volumes of wastes generated by the proposal would be minimised to the greatest extent practicable
- The use of recycled and reclaimed material would be investigated and such materials would be sourced for use where appropriate
- Potential recycling and reuse options would be considered for all waste streams likely to be generated by the proposal
- Where potential reuse and recycling options are identified, suitable receptacles would be provided for all waste streams that could be diverted for recycling and reuse
- All wastes generated by the proposal would be classified in accordance with the NSW *Waste Classification Guidelines Part 1: Classifying Waste* (DECCW, 2008) and disposed of at a suitably licensed waste facility, and
- HAZMAT bins would be provided on site for any potentially contaminated wastes that might be generated by the proposal.

Once construction of the proposal is complete, waste from the upgraded facility would be managed in accordance with existing facility waste management practices.

7.13 Utilities and infrastructure

7.13.1 Existing environment

The main utility infrastructure at the location of the proposal is the Horsley Park Meter Station itself. The existing gas infrastructure within the facility and the pipelines to which it connects are described in Section 1.6.

The Central Trunk pipeline (underground) passes across under the south western corner of the Horsley Park Meter Station. The outlet of one of the existing regulators is connected to the Central Trunk within the existing facility via underground pipework.

The Eastern Gas Pipeline (underground) is located along a north-south alignment to the west of the Horsley Park Meter Station. The pipeline turns to the east near the north western corner and enters the facility. The pipeline terminates at an aboveground vessel that is used to retrieve the internal gauges that are passed through the pipeline periodically clean and inspect the condition of the pipeline.

The Smithfield Lateral pipeline commences within the Horsley Park Meter Station. It commences at an aboveground vessel in the north eastern corner of the facility that is used to insert and launch internal pipeline gauges. To the east of the pipeline gauge launcher the pipeline declines and enters the ground, leaves the facility and proceeds to towards Smithfield. The outlet of the other existing regulator within the Horsley Park Meter Station connects to the Smithfield Lateral to the east of the gauge launcher via underground pipework.

The Horsley Park Meter Station is connected to the local electricity and telecommunications networks on Chandos Road via services that run along the access road for the facility.

A similar natural gas facility is located to the immediate south of the Horsley Park Meter Station. That facility, referred to as the Horsley Park Trunk Receiving Station, is associated with the Central Trunk pipeline and is also operated and maintained by Jemena. The facility contains a pipeline gauge launcher and a gauge receiver for the Central Trunk. Pressure reducing apparatus is located within the facility that is used to supply gas into the local secondary pressure (1050 kPa) distribution network (underground) that runs along Chandos Road.

95% of all the natural gas delivered into the Sydney distribution network and beyond passes through these two facilities.

Around 125 metres to the north of Horsley Park Meter Station is an easement containing high voltage electricity transmission lines that traverse an east-west alignment. The transmission lines supply electricity from the TransGrid Sydney West Substation on Old Wallgrove Road, Eastern Creek.

Poles and overhead power and telecommunications infrastructure run along the southern side of Chandos Road. Underground water supply infrastructure and sewerage is likely located in the road reserve of Chandos Road to supply and service the residences along the road.

7.13.2 Impact Assessment

Construction

Construction of the proposal would occur while the existing facility is operational. Construction activities and construction plant movements within the facility have the potential to interact with and damage operational gas infrastructure if not managed appropriately. If existing infrastructure is damaged sections of or the entire facility may need to be isolated or shut down. Depending on the gas demand within the distribution network at the time, such incidents may affect gas supply from the facility.

Jemena operates many high pressure gas facilities and has robust safety systems and procedures to protect the gas infrastructure and the people working in the vicinity of it. All works within operational facilities are subject to work permits and supervised by appropriately qualified and experienced personnel. A detailed construction safety risk assessment would be carried out to ensure that all potential risks associated with construction within the facility are identified. Appropriate mitigation measures would be developed and implemented during construction to ensure that all identified risks are appropriately managed and the overall risk to the facility is as low as reasonably possible.

The new gas infrastructure would need to be connected into existing live (pressurised) pipework. This is typically done using specialist connection fittings (referred to as “hot taps”) that allow the connections to be made while the pipe is in service without gas escape or loss of supply. Such activities are carried out by specialist personnel in accordance with existing and tested Jemena procedures. The risk that the connections would impact gas supply from the facility is low.

The electricity supply to the facility would be upgraded as part of the proposal. This would likely include the installation of standard 3 phase 400V industrial connection equipment on an existing power pole on Chandos Road and potentially an upgrade of the electrical lines between the new equipment and the facility. The electricity supply system upgrade would be carried out by suitably qualified and approved persons with approval from Endeavour Energy. It is unlikely that electricity supply in the vicinity would be disrupted during the installation and connection process. No other works would be carried out as part of the proposal that would be likely to affect the electricity supply infrastructure located on the southern side of Chandos Road.

The Horsley Park Trunk Receiving Station is located on a separate property to the Horsley Park Meter Station and the facility is fenced. Construction of the proposal would not impact the other gas facility. Construction would not occur in the vicinity of the electricity transmission infrastructure to the north of the Horsley Park Meter Station. No changes would be required to any water supply or sewerage infrastructure within Chandos Road. The risk of any significant impact to the utility infrastructure outside the boundary of the Horsley Park Meter Station site is very low.

Operations

The purpose of the proposal is to add additional gas conveyance and control infrastructure within the boundaries of the existing Horsley Park Meter Station to increase the deliverability natural gas into the Sydney distribution network from the Eastern Gas Pipeline. The proposal would have a

positive impact on the supply of gas in this regard.

The design philosophy for the upgraded facility would be developed to ensure that the facility would continue to operate and supply gas in the widest range of possible circumstances and scenarios. The new gas infrastructure would be connected into existing operational systems that are used to control the existing facility. The operation of the facility would be monitored and controlled remotely from the EGP Control Room. Existing inspection, testing and preventative maintenance schedules would be updated to include the new gas infrastructure to minimise the potential for station down time and potential supply issues.

The additional electricity usage by the upgraded facility would be dependent on station load. The risk that the additional electricity used by the upgraded facility would result in electricity shortages elsewhere in the network is very low.

Operation of the upgraded facility would not have any significant adverse effect on the operation of the Horsley Park Trunk Receiving station to the south.

7.13.3 Mitigation and management measures

The following mitigation and management measures would be implemented to ensure that potential impacts to utility infrastructure and services are minimised:

- Ensure that a construction safety risk assessment is carried out to identify all potential risks to the existing gas infrastructure within the facility during to construction. Develop and implement suitable mitigation measures (for example designated working areas and barriers) to manage all identified risks appropriately and ensure that the overall risk to the facility during construction is as low as reasonably possible
- Obtain necessary permits from the EGP Control Room for all works within the facility and ensure that the works are carried out strictly in accordance permits requirements
- Ensure adequate supervision of all construction activities within the boundaries of the facility by suitably experienced and qualified Jemena persons at all times, and
- Ensure that the proposed augmentation of the local electricity network to supply the upgrade facility is approved by Endeavour Energy and the work carried out by suitably qualified and experienced persons.

8 Long term management

8.1 Existing operational management

8.1.1 Operational and maintenance systems

The Eastern Gas Pipeline and all associated facilities including the Horsley Park Meter Station are maintained according to the requirements of *AS 2885.3-2012 Pipelines - Gas and liquid petroleum - Operation and maintenance*. The work management system that is adopted is documented in a Safety and Operating Plan which is reviewed and updated regularly.

A risk management approach is adopted in establishing the operations and maintenance systems for the pipeline and associated facilities. The risks associated with the operation and maintenance of the EGP are identified by relevantly experienced key personnel based on Jemena's extensive history operating and maintaining high pressure natural gas assets. The risk assessments for the pipeline and associated facilities are reviewed and updated regularly. The full Safety Management Study for the Eastern Gas Pipeline is formally reviewed every five years.

The identified risks are mitigated through structured operations and maintenance systems that include the following:

- implementation of an appropriate organisational structure, with identified roles and responsibilities
- provision of appropriate and timely training for employees and contractors
- establishment of systems of communication so that all employees and contractors are aware of relevant issues relating to the pipeline and facilities and have the opportunity to provide input
- review of all proposed changes in accordance with change management and document control procedures
- planning and control of all works through appropriate work permits and a system of standard operating procedures
- maintenance and inspection schedules to ensure the integrity of the pipeline and facilities
- development of a robust design bases for new apparatus that provide the safe operating parameters and ensure the continual integrity of the asset, and
- surveillance of the pipeline and associated facilities to identify instances of unacceptable risk.

Documented procedures and work instructions have been developed to manage high risk operations and maintenance activities. Documented procedures are also used where specific compliance with company or equipment manufacturer requirements must be followed. Operational and maintenance activities are scheduled within Jemena's works management system.

Life cycle management planning is adopted to ensure continued integrity and safe operation of the facility. Lifecycle management planning results in asset maintenance and asset replacement activities which fall into one of three categories:

- Planned (preventative and integrity management) maintenance: maintenance activities carried out to a predetermined schedule of works
- Unplanned (reactive) maintenance: work carried out in response to reported problems or defects, and
- Replacement: major work which restores an asset to its original capacity or required condition.

Planned maintenance is adopted as the primary method of ensuring the integrity and ongoing safe operation of the Eastern Gas Pipeline and associated facilities, including the Horsley Park Meter Station. Preventative maintenance provides the basis for the planned maintenance works in Jemena's works management system. Preventative maintenance covers the following areas:

- standards
- safety systems
- mechanical inspections and maintenance
- electrical and instrumentation inspections and maintenance, and
- site management.

Maintenance frequency and requirements are developed according to code requirements, equipment vendor specifications and Jemena's experience with similar assets and as identified in risk assessment processes.

To maintain structural integrity, a pipeline and associated facilities must remain leak tight and operate within design parameters. The pipeline, facilities and various control systems are designed so that they are able to withstand all identifiable forces and threats to which they may be subject during the life of the pipeline. The integrity of the pipeline is ensured by various features and systems that address the physical nature of the pipeline including:

- protective coatings
- pipeline wall thickness and corrosion
- easement maintenance and patrol surveillance
- pipe supports and interfaces
- valves and fittings
- pressure and temperature control and protective equipment
- gas measurement systems
- SCADA and communications systems, and
- engineering change.

An annual pipeline condition report is produced which outlines the maintenance and inspections carried out in each calendar year. Assessment of the condition report identifies actions proposed for the following year to address integrity issues and recommend further inspection works. These actions become additional planned work activities in Jemena's work management system.

8.1.2 Operational monitoring and control systems

The pipeline is monitored and controlled from the EGP Control Room through a distributed supervisory control and data acquisition (SCADA) system. The EGP Control Room is located in Melbourne and functions and is manned 24 hours per day 365 day per year.

Each pipeline facility, including the Horsley Park Meter Station, is locally controlled by dedicated Remote Terminal Units (RTUs) which communicate back to the central SCADA system. The Horsley Park Meter Station is designed to be unmanned and loss of communication with SCADA does not impact safe operation and control of the site. The SCADA system includes multiple levels of redundancy and is connected to the pipeline and facilities via a dedicated data communication network.

The system retrieves information on pipeline operating conditions and allows control of plant and pipeline equipment systems remotely from the EGP Control Room. The systems and processes that are monitored and controlled include cathodic protection systems, pressures, temperatures, valve status, metering selections, alarms, gas quality, flow rates, condition monitoring, site entry and pipeline inspection gauge signalling.

8.2 Operational management post-upgrade

The design basis for the Horsley Park Meter Station upgrade has been developed in accordance with all relevant standards to ensure that ongoing safe operation of the upgraded facility. Various risk assessments have been carried out for the upgraded facility to identify all credible threats and ensure that they are addressed in the design process and ongoing operational and maintenance systems. Relevant components of the risk assessments would be incorporated into the risk assessments for the Eastern Gas Pipeline. The updated risk assessments would be reviewed required in accordance with existing Jemena review cycles.

The existing work management system for the Eastern Gas Pipeline would be amended to include the new apparatus that would be installed within the Horsley Park Meter Station as part of the proposed upgrade. New procedures and work instructions relevant to the additional apparatus and upgraded facility would be developed and added to Jemena's work management system as required. The existing planned maintenance schedules would be amended to include relevant additional preventative maintenance requirements and integrity inspections for the new apparatus and associated systems.

The proposed upgrade would be designed so that all new key components are connected into the existing SCADA system. The operation of the upgrade facility would be monitored and controlled from the EGP Control Room using the existing systems and processes currently in place.

No significant changes are therefore required to the existing operational, maintenance, monitoring and control systems associated with the Eastern Gas Pipeline and the Horsley Park Meter Station to ensure the ongoing safe operational of the upgraded facility in the long term.

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9 Environmental management

A Construction Environmental Management Plan (CEMP) would be prepared for the proposal prior to commencement of construction. The CEMP would be prepared in accordance with *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004) and would reference relevant procedures and systems from Jemena's corporate Health, Safety and Environmental Management System, which is aligned with ISO14001, guidelines, legislation and project approval conditions. The CEMP would be implemented and compliance with the plan monitored during construction.

The Eastern Gas Pipeline and the Horsley Park Meter Station are currently operated and maintained in accordance with existing environmental, safety and operational management plans. These plans would be updated to include the new components that would be installed as part of the proposal.

A summary of the mitigation and management measures that would be implemented during the proposal to manage potential environmental impacts is provided in Table 9-1

Table 9-1 Summary of mitigation and management measures

No.	Mitigation and management measure
General	
G1	Prepare and implement a Construction Environmental Management Plan prepared in accordance with Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004) that includes the following mitigation and management measures as a minimum
Biodiversity	
B1	Limit all works and access to within the existing fenced site perimeter and access driveway.
B2	Review the trees in the vicinity of the site entrance from the perspective of clearance for deliveries of large plant and equipment. If potential clearance issues are identified, favour selective pruning of lower limbs rather than complete removal.
B3	Any tree limb pruning would be carried out by a suitably qualified and experience arborist.
B4	Limit surface disturbance to reduce erosion and potential sedimentation impacts in aquatic ecosystems down gradient from the work location.
B5	Install appropriate sediment filtration devices inside the lowest point of the facility fence line to intercept runoff from site and filter out sediment.
B6	Implement fuel and chemical storage and use mitigation and management measures to reduce the risk of impact to aquatic ecosystems down gradient from the proposed work location.
Soil, water hydrology and flooding	
SW1	The area of disturbance associated with the proposal would be limited to the greatest extent practicable to minimise the potential for erosion from site.

No.	Mitigation and management measure
SW2	An Erosion and Sediment Control Plan (ESCP) would be prepared for the proposal in accordance with the requirements of *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004)(the 'Blue Book'). The ESCP would include as a minimum filtration devices installed immediately inside the fence at the low point on the northern perimeter of the facility.
SW3	All site stormwater control features would be identified prior to construction and appropriate controls and protection measures developed, documented in the ESCP and implemented during all works.
SW4	Onsite stockpiling of excavated material would be minimised.
SW5	All stockpiles of loose and erodible materials would be provided with suitable controls, for example sediment fencing or filter socks, to prevent erosion.
SW6	Store and handle any hydrocarbons and other chemicals required to carry out the proposal in accordance with the relevant Safety Data Sheet (SDS) and product label to reduce the potential for spillage and potential spill volumes.
SW7	Refuel construction plant and equipment offsite at a suitable location wherever practicable to avoid the potential for soil contamination in work location and associated contamination of runoff water from site.
SW8	Use appropriate task-specific equipment during any onsite refuelling to minimise the potential for spillage and potential spill volumes.
SW9	Clean up any spills immediately, isolate and contain any potential contaminated material and dispose of at an appropriately licensed waste facility.
SW10	If any visual or olfactory evidence of potentially contaminated soils or other materials is uncovered all excavation work at that location would cease until the nature and extent of any potential issues were quantified and appropriate management and mitigations measures developed and implemented to protect the environmental and personnel health safety in accordance with relevant legislation and guidelines.
SW11	All surfaces disturbed as part of the proposal would be rehabilitated at the completion of construction to reinstate ground surface stability and reduce the potential for ongoing erosion from site.
SW12	The effectiveness of site restoration and rehabilitation activities would be monitored during routine facility visits by operational personnel. Corrective actions would be carried out as required to address any ground instability and erosion issues as required.
Aboriginal heritage	

No.	Mitigation and management measure
AB1	The mitigation and management measures that would be implemented in the event that previously unidentified features of Aboriginal archaeological or cultural heritage significance are uncovered (unexpected finds) during the proposal include: – All work in the vicinity of the unexpected find would cease – The NSW Department of Planning, NSW Office of Environment and Heritage and the Deerubbin LALC would be contacted and advised of the unexpected find – No works would recommence at that location until such time as the Department of Planning has determined the nature and significance of any finds and determined an approach for further work, in consultation with other agencies and Aboriginal stakeholders as required, and – If the unexpected find involves skeletal remains the NSW Police would be contacted and advised immediately. No works would recommence that could further impact the remains unless approved and directed by the NSW Police.
Greenhouse gases and climate change	
GG1	Switch plant and equipment of when not in use.
GG2	Ensure that all construction plant and equipment is adequately serviced and maintained.
GG3	Investigate options for and use materials with a high recycled content (for example quarry products for hard stands and concrete) wherever practicable.
GG4	Reduce facility blow downs (frequency and volumes released) during maintenance to the greatest extent practicable.
Air quality	
AQ1	Construction plant and equipment would be switched off when not in use whenever practicable.
AQ2	Areas of exposed soils would be minimised to the greatest extent practicable to minimise dust generation.
AQ3	Stockpiles would be limited in height to reduce potential dust generation.
AQ4	Water would be applied periodically to the unsealed surfaces as required if excessive dust generation is occurring.
AQ5	Chandos Road in the vicinity of the site access would be cleaned as required to remove deposited soils and other loose materials likely to result in dust generation.
AQ6	Emissions (stack) monitoring would be carried at the commencement of operation of the gas-fired boiler to confirm the input data and assumptions used during the dispersion modelling to confirm the accuracy of model results.
AQ7	Additional dispersion modelling would be carried out if the stack emissions are found to be significantly higher than model inputs. Modelling results would be compared to operational air quality criteria.
AQ8	If any additional dispersion modelling carried out indicates air pollutants levels approach the relevant air quality criteria, additional investigations would be carried out and additional controls and management measures identified and implemented with the assistance of relevant specialists as required.

No.	Mitigation and management measure
Noise and vibration	
NV1	Construction activities likely to generate noise above the relevant noise management levels at the nearest residences would be limited to between 7am and 6pm Monday to Friday and 8am to 1pm on Saturdays.
NV2	Machinery would be switched off when not in use wherever practicable.
NV3	The potentially affected residents would be notified prior to commencement of construction. The contact details of an appropriate site person would be provided for community queries and complaints.
NV4	Any complaints received from the community regarding noise impacts would be entered into Jemena's Incident Management System, investigated and addressed promptly.
NV4	Compression breaking would be banned in the vicinity of the facility for all heavy vehicle associated with the proposal. The need to avoid compression breaking would be included in a Project Induction that would be delivered to all personnel (including drivers) prior to their involvement in the proposal.
Traffic and access	
TA1	A Traffic Control Plan (TCP) would be developed for the proposal in accordance with the relevant Australian Standards. The TCP would specify controls such as signage and reduced vehicle speeds as appropriate that would be implemented along Chandos Road in the vicinity of the facility during the construction of the proposal.
TA2	Details of the TCP and safety awareness training would be included in the Project Induction delivered to all personnel associated with the proposal prior to involvement.
TA3	All parking and associated with the proposal would occur within that Jemena owned land. No parking would occur along Chandos Road associated with the proposal.
Public safety and hazards	
PS1	The additional facility components would be designed and constructed designed in accordance with the requirements of Australian Standards AS2885.1 Design and construction of Pipelines gas and liquid petroleum and AS4041-2006 Pressure piping.
PS2	All new apparatus would be connected to existing operational control systems operated as part of the Eastern Gas Pipeline.
PS3	The Emergency Response Management Plan and Safety and Operating Plan (including maintenance and inspections schedules) and for the Eastern Gas Pipeline would be updated to include the upgrades Horsley Park Meter Station.
PS4	All future works within the upgraded facility would be carried out under Jemena's Permit to Work system.
European heritage	

No.	Mitigation and management measure
EH1	The following mitigation and management measures would be implemented in the event that previously unknown items of features of European heritage conservation significance are uncovered during the proposal: – All work in the vicinity of the unexpected find would cease – The NSW Department of Planning would be contacted and advised of the unexpected find, and – No works would recommence at that location until such time as the Department of Planning has determined the nature and significance of any finds and determined an approach for further work, in consultation with other agencies and parties as required.
Visual impact	
V1	General site cleanliness and condition would be monitored on a daily basis during the work and appropriate actions taken as required to address any issues identified.
V2	The existing vegetation along the inside of the eastern perimeter fencing site would be protected during the works to maintain visual screening for the facility.
Waste and resources	
WR1	The volumes of wastes generated by the proposal would be minimised to the greatest extent practicable.
WR2	The use of recycled and reclaimed material would be investigated and such materials would be sourced for use where appropriate.
WR3	Potential recycling and reuse options would be considered for all waste streams likely to be generated by the proposal.
WR4	Where potential reuse and recycling options are identified, suitable receptacles would be provided for all waste streams that could be diverted for recycling and reuse.
WR5	All wastes generated by the proposal would be classified in accordance with the NSW Waste Classification Guidelines Part 1: Classifying Waste (DECCW, 2008) and disposed of at a suitably licensed waste facility.
WR6	HAZMAT bins would be provided on site for any potentially contaminated wastes that might be generated by the proposal.
Utilities and infrastructure	
UI1	Ensure that a construction safety risk assessment is carried out to identify all potential risks to the existing gas infrastructure within the facility due to construction. Develop and implement suitable mitigation measures (for example designated working areas and barriers) to manage all identified risks appropriately and ensure that the overall risk to the facility during construction is as low as reasonably possible.
UI2	Obtain necessary permits from the EGP Control Room for all works within the facility and ensure that the works are carried out strictly in accordance permits requirements.
UI3	Ensure adequate supervision of all construction activities within the boundaries of the facility by suitably experienced and qualified Jemena persons at all times.

No.	Mitigation and management measure
UI4	Ensure that the proposed augmentation of the local electricity network to supply the upgrade facility is approved by Endeavour Energy and the work carried out by suitably qualified and experienced persons.

10 Conclusion

An analysis of the current gas supply situation on the eastern seaboard of Australia indicates that the future gas supply into the Sydney distribution network is constrained and that gas supply could fall significantly below gas demand as early as 2016 if nothing is done. As the Eastern Gas Pipeline is not subject to same constraints at other potential gas sources for Sydney, it is a practicable way of maintaining existing gas supplies within an increasing the potential futures gas supplies to the Sydney distribution network. The existing Horsley Park Meter Station, however, is currently operating at contractual capacity and is constraining natural gas supply from the Eastern Gas Pipeline.

The primary objective of the proposal is to increase deliverability of natural gas into the Sydney distribution network from the Horsley Park Meter Station Upgrade. The proposal would increase the ability the Eastern Gas Pipeline by 120 terajoules per day, which is a significant increase.

The assessment of potential impacts associated with the proposal indicates that no significant environmental and amenity impacts would occur. Any adverse environmental and amenity impacts associated with the proposal would be more than adequately outweighed by the socio-economic benefits associated with increasing potential gas supply into the Sydney distribution network. On this basis, the overall impact of the proposal would be beneficial in terms of state and regional environmental and economic planning objectives.

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