Other Capital Expenditure

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Approval and Amendment Record

VERSION	AMENDMENT OVERVIEW
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Contents

1. Purpose of this document

This document explains and justifies our Other capital expenditure (capex) for Pipeline Services for the forthcoming access arrangement period (1 January 2018 to 31 December 2022). This document references other supporting documents in further detail. Unless otherwise stated, capex is presented in real 2017 dollars and is expressed in total costs for our Pipeline Services, which includes both our Reference Services and our Non-Reference Services. Total values shown in tables and referred to in the text of this document may not reconcile due to rounding.

The actual 2013 to 2015 capex detailed in this document does not include overheads, as this was reported separately to the AER in our Annual Regulatory Information Notices for these years, rather than being incorporated into each capex sub-category.

We note that our forecast annual revenue requirements for our Haulage Reference Services do not include returns on and of capex attributable to Non-Reference Services (including from major asset relocations) because they are based on our net capex only. This is because our capital contributions (and therefore the revenue that we receive from our major relocations) are netted off from our gross (pipeline services) capex forecast in developing our regulatory asset base for our Haulage Reference Services.

For clarity, Attachment 1 details how we have allocated the components of our asset costs between our different capex categories. We note that our Other capex forecast relates to our Supply Regulators and Valve Stations.

We have provided our Other Strategy documents to the AER with this Overview Document. The forecasts in these documents do not include labour escalators or overheads, whereas the forecasts in this Overview Document are total costs (unless otherwise stated). The following table reconciles the forecasts in the Other Strategy documents with those in this Overview Document and our Access Arrangement Information.

Table 1: Breakdown of 2018-22 capex forecasts by direct costs, overheads and escalations ($M, Real 2017)

Program	Strategy	2018	2019	2020	2021	2022	Total
Non-Piggable Pipeline Alteration Program	MG-SP-0001	1.0	-	1.5	-	1.5	4.0
Marker Post Replacement	MG-SP-0001	0.0	0.0	0.0	0.0	0.0	0.2
Hydraulic Regulator Replacement Program	MG-SP-0003	0.5	-	-	-	-	0.5
Obsolete Supply Regulator Replacement Program	MG-SP-0003	0.7	0.6	0.6	0.4	0.4	2.7
Valve Actuator Replacement	MG-SP-0003	0.0	-	-	-	-	0.0
Supply Regs - Misc. Program	MG-SP-0003	0.1	0.1	0.1	0.1	0.1	0.3
Environmental Noise Improvement Works	MG-SP-0003	0.0	0.0	0.0	0.0	0.0	0.1
Obsolete Consumer Regulator Replacement Program	MG-SP-0005	0.7	1.1	0.6	0.8	0.7	3.9
Gas Meter Room Remediation Program	MG-SP-0005	0.0	-	-	-	-	0.0
HP2 Syphon Removal Program	MG-SP-0011	0.1	0.1	0.1	0.1	0.1	0.3
District Regulator Isolation Valves Rectification Program	MG-SP-0011	0.2	0.2	-	-	-	0.3

Program	Strategy	2018	2019	2020	2021	2022	Total
Annual Program of Works – Misc. Allowance	MG-SP-0011	0.0	0.0	0.0	0.0	0.0	0.1
CPU Installations	MG-SP-0013	0.1	0.1	0.1	0.0	0.0	0.3
Test Points Installations	MG-SP-0013	0.1	0.1	0.1	0.1	0.1	0.4
Sacrificial Anodes	MG-SP-0013	0.0	0.0	0.0	0.0	0.0	0.1
Anode Beds	MG-SP-0013	0.1	0.1	0.1	0.0	0.1	0.3
Surge Protection	MG-SP-0013	0.0	0.0	0.0	0.0	0.0	0.1
Structural Engineering Rectification Program	MG-SP-0014	0.1	0.1	0.0	0.1	0.0	0.3
Equipment Enclosures – Miscellaneous works	MG-SP-0014	0.2	0.2	0.2	0.2	0.2	0.8
Vortex Heaters	MG-SP-0015	0.0	-	-	-	-	0.0
Large Recoverable Works	MG-PL-0002	5.9	5.9	5.9	5.9	5.9	29.5
Service Valve replacement – Fire Valves	MG-SP-0010	0.1	0.1	0.1	0.1	0.1	0.6
Total Direct (excluding escalations)		**9.9**	**8.5**	**9.3**	**7.8**	**9.2**	**44.7**
Overheads		0.6	0.5	0.5	0.5	0.5	2.7
Total including overheads (excluding escalations)		**10.5**	**9.0**	**9.8**	**8.3**	**9.8**	**47.4**
Escalations		0.1	0.0	0.1	0.1	0.1	0.4
Property and accommodation		0.4	0.1	0.1	0.1	0.1	0.9
Total including overheads and escalations		**10.9**	**9.2**	**10.0**	**8.5**	**10.0**	**48.7**

2. Structure of this document

This document is structured as follows:

- Section 3 details our Other capex profile for the previous, current and forthcoming access arrangement periods.
- Section 4 explains the nature and drivers of Other capex.
- Section 5 explains our actual Other capex in the current period.
- Section 6 explains our forecasting methodology for Other capex for the forthcoming period.
- Section 7 sets out our Other capex forecast for the forthcoming period.
- Section 8 explains why our Other capex forecast meets the new capex criteria in Rule 79.
- Section 9 details the supporting documentation relevant to our Other capex forecast.

3. Expenditure profile

This section provides an overview of the profile of our Other capex for the previous, current and forthcoming access arrangement periods.

Our capex for the previous and current periods is presented in Tables 1 and 2 below. Our forecast capex is shown in Table 3.

Table 2: Actual Other capex – 2008-2012 ($M, Real 2017)

	2008	2009	2010	2011	2012	TOTAL
AER Final Decision	3.4	3.2	4.4	6.0	3.6	**20.6**
Actual	1.3	1.4	1.5	1.8	1.2	**7.2**
Variance (Actual minus Final Decision)	(2.0)	(1.8)	(2.9)	(4.2)	(2.5)	**(13.4)**

Table 3: Actual Other capex –2013-2017 ($M, Real 2017)

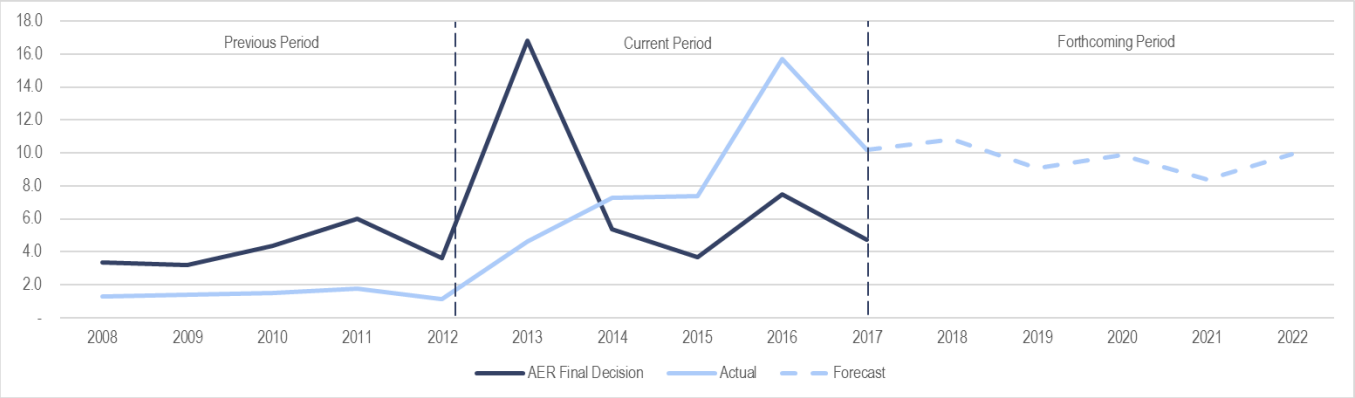
	2013	2014	2015	2016	2017	TOTAL
AER Final Decision	16.8	5.4	3.7	7.5	4.7	**38.1**
Actual / Estimated	4.6	7.3	7.4	15.7	10.2	**45.1**
Variance (Actual minus Final Decision)	(12.2)	1.9	3.7	8.2	5.4	**7.1**

Table 4: Forecast Other capex –2018-2022 ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Forecast for the 2018-22 access arrangement period	10.9	9.2	10.0	8.5	10.0	**48.7**

The information in the above tables is shown in graphical form below.

Figure 1: Previous, current and forecast Other capex ($M, Real 2017)



An overview of our Other capex for the 2008 to 2012 period, and our performance against the AER allowance was provided in our 2012 access arrangement proposal. It is not necessary to examine these matters in any further detail here.

For the current access arrangement period, the AER's allowance included capex on several different activities including: network reconfiguration and improvement works (recoverable works) at Highett; pig rectification and syphon removal works; replacement of regulators, valves, and equipment enclosures; and property projects. We project that our actual expenditure will exceed the allowance by $7.1 million or approximately 19 per cent, primarily because of increased recoverable works which are driven by customers' requirements. Further analysis of the variance between actual and forecast capex is provided in Section 4 of this paper.

For the 2018 to 2022 period, we are forecasting a total of $48.7 million in Other capex. This reflects our expectation that recoverable works will continue at around the levels we incurred in 2015, and expect to incur in 2017, but below those we estimate for 2016.

4. Nature of expenditure

4.1. Definition of Other capex category

For the purposes of internal reporting and expenditure forecasting, Other capex consists of seven components or subcategories. These are defined in Table 5 below.

Table 5: Other capex subcategories

Subcategory of Other capex	Definition
Recoverable Works	This is expenditure relating to the relocation of assets undertaken at the request of a customer or some other third party. The costs of such works are recovered from the third party who requests them, and so these costs are not recovered through reference tariffs.
Property and accommodation	This subcategory covers the capital costs of fitting-out office space to accommodate our employees and contractors involved in delivering pipeline services.
Vehicles and tools	This subcategory covers capex on vehicles, tools and equipment.
Corrosion Protection	This subcategory includes capex on corrosion protection assets and services applied to the transmission, high pressure, medium pressure and low pressure steel piping systems located throughout our gas distribution system. This includes corrosion protection units, test points, anodes, and ancillary equipment.
Regulators, valves and equipment enclosures	This subcategory includes capex associated with the replacement of: • supply regulators (including district regulators, field regulators, above ground regulators, and city gates); small and large consumer regulators; • distribution valves (including removal of redundant syphons from the network); and • equipment enclosures, such as masonry buildings, pits, chain-wire fences, steel kiosks and gatic covers.
Gas Heaters	This subcategory includes capex associated with the replacement of the gas heater facilities located throughout our gas distribution network that are operating at pressures up to 8,700 kPa.
Pig rectification and marker posts	This subcategory includes capex associated with the rectification of pipelines so that internal inspection using an intelligent in-line inspection (or "pigging") tool can be accommodated. It also includes the installation of new, and replacement of old, marker posts.
Services	This subcategory includes capex associated with the retrofitting of existing gas services in bushfire risk areas with a fire valve designed to isolate fires from a fuel source

4.2. Regulatory obligations or requirements

Under Rule 79, capex is justifiable if, among other things, it is necessary:

- to maintain and improve the safety of services; or
- to maintain the integrity of services; or
- to comply with a regulatory obligation or requirement; or
- to maintain the service provider's capacity to meet levels of demand for services existing at the time the capex is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity).

The assets and facilities procured through our Other capex are critical to supporting our network and corporate functions. Those functions and, in particular, our network functions must be undertaken in accordance with the key regulatory obligations outlined in the table below.

Table 6: Key regulatory obligations

Regulatory instrument	Summary of obligations
Gas Safety Act 1998	The Gas Safety Act 1997 (the Act) makes provision for the safe conveyance, sale, supply, measurement, control and use of gas and to generally regulate gas safety. Under section 32 of the Act, we must manage and operate our facilities to minimise as far as practicable: (a) the hazards and risks to the safety of the public and customers arising from gas; and (b) the hazards and risks of damage to property of the public and customers arising from gas; and (c) the hazards and risks to the safety of the public and customers arising from: (i) interruptions to the conveyance or supply of gas; and (ii) the reinstatement of an interrupted gas supply. Division 2 of Part 3 of the Act sets out provisions relating to the preparation of, and compliance with, safety cases for gas facilities. Under these provisions, we must submit a safety case to Energy Safe Victoria (ESV) for each of our facilities. We must comply with a safety case that has been accepted by ESV.
Gas Safety (Safety Case) Regulations 1999	These Regulations detail requirements relating to, amongst other things, the purpose and content of safety cases. The Regulations require us to specify the safety management system being followed to ensure compliance with its obligations under section 32 of the Act (i.e. to ensure the safe and reliable supply of gas). Regulation 17 states that the safety management system for a facility must specify the means used or to be used by the gas company to ensure that the design, construction, installation, operation and maintenance of the facility and any modification of the facility (a) are adequate for the safety and safe operation of the facility; and (b) provide adequate means of achieving isolation of the facility or any part of the facility and pressure control in the event of an emergency; and (c) provide adequate means of gaining access for servicing and maintenance of the facility and machinery and other equipment; and (d) provide adequate means of maintaining the structure and operation of the facility; and (e) take into account the results of the formal safety assessment for the facility.
Victorian Gas Distribution System Code	The Code set out the minimum standards for the operation and use of the distribution system. Schedule 3 of the Code lists 23 Australian Standards relevant to distribution systems, or otherwise applicable to the operation of the Distribution System Code. For brevity, the Standards listed in the Code are not listed here, however it is noted that they relate to the design, construction, installation, maintenance, management and operation of gas distribution networks. We comply with these Australian Standards.
The Environment Protection Act 1970	The Environment Protection Act 1970 empowers the Environment Protection Authority (EPA) to issue regulations and other compliance instruments relating to protection of the environment. Areas covered by the legislation include: Clean Water; Clean Air; Control of solid wastes and pollution of land; Control of noise; Transport of prescribed waste; and Environmental audits. We have detailed plans to ensure that we comply with the EPA regulations.

Regulatory instrument	Summary of obligations
Counter-terrorism requirements	Part 6 of the Victorian Terrorism (Community Protection) 2003 Act, together with the following State and Federal Government documents set out requirements for protecting critical assets from acts of terrorism: • Department of the Prime Minister and Cabinet, Strong and Secure: A Strategy for Australia's National Security, January 2013; • Commonwealth of Australia National Counter-Terrorism Committee, National Guidelines for Protecting Critical Infrastructure from Terrorism, 2011. • Department of Premier and Cabinet, A Roadmap for Victorian Critical Infrastructure Resilience, December 2012.

4.3. Key drivers of our Other capex

The key expenditure drivers of this category of capex vary significantly across its constituent components. For instance, the drivers of property capex differ materially from those relating to regulators, valves and equipment enclosures. We discuss the drivers of each of the Other capex subcategories in turn below.

4.3.1. Recoverable works

Recoverable works relates to activities such as the relocation of assets, which is undertaken at the request of a customer or a third party. The recoverable works expenditure is therefore driven by customer or third party requests, and charged to the party making the request.

4.3.2. Property and accommodation

We require appropriately fitted-out office space to accommodate our employees and contractors involved in delivering network operations and planning, and corporate functions. The provision of 'fit for purpose' accommodation facilities for our staff is essential to ensuring that the business remains capable of delivering all services in accordance with customers' needs.

Our 2012 access arrangement proposal[1] explained our plans to implement a new businesses model, which entailed among other things, the in-sourcing of several key functions such as network planning, asset management and operations, and a range of corporate functions including regulatory, legal, corporate communications, finance, IT, and human resources. Up until June 2013, these functions were out-sourced to our primary service provider (Jemena Asset Management). Accordingly, the implementation of our new business model resulted in a significant increase in the number of internal staff and contractors to be accommodated in office premises.

The Boards of United Energy and Multinet Gas have approved an accommodation strategy enabling the companies to meet their joint requirements. United Energy detailed this in its "Capital Expenditure Overview – Non-Network General" document[2] that it submitted to the AER with its 2016-2020 Regulatory Proposal in April 2015. The AER approved United Energy's proposed capex in its Distribution Determination. For the same reasons as proposed by United Energy, we are now seeking the AER's approval of our share of the cost of the accommodation strategy.

[1] Multinet Gas, Gas Access Arrangement Review, January 2013-December 2017: Access Arrangement Information, March 2012, section 3.2, page 46.

[2] Available at https://www.aer.gov.au/system/files/United%20Energy%20-%20Capex%20overview%20-%20Non-network%20general%20assets%20-%20April%202015.pdf

4.3.3. Vehicles and tools

This subcategory includes capex on specialist tools and equipment, and a small fleet of vehicles required to support the safe and efficient delivery of services to customers. Investment in these assets enables us to maintain the safety and integrity of services to our customers.

4.3.4. Corrosion Protection

Most of the metallic pipe work within our gas distribution area is subject to stray current from the DC railway and tramway traction systems. We must have an effective corrosion protection system in place to ensure that the safety and integrity of the network and services are maintained in accordance with Rule 79(2)(c)(i) and (ii). Our cathodic protection system currently consists of 197 cathodic protection units, of which 45 are high output units and 2516 test points.

A total of 802 km (or approximately 38.4 per cent) of our total distribution network length is cathodically protected. All of the transmission pipelines are cathodically protected. We assess the effectiveness of our cathodic protection systems in accordance with the requirements of Australian Standards AS 2832.1 (Cathodic Protection of Metals Part 1: Pipes and Cables).

Replacement of corrosion protection equipment is carried out when corrosion protection monitoring and testing results indicate the minimum level of protection stipulated in AS 2832.1 can no longer be provided by the existing installations. Items that require replacement may include impressed current cathodic protection units, test points, anode beds and miscellaneous other equipment.

4.3.5. Regulators, valves and equipment enclosures

Replacement of regulators, valves and equipment enclosures is required to maintain the safety and integrity of services to our customers, in accordance with Rule 79(2)(c)(i) and (ii). The table below summarises the key drivers of replacement capex for assets in this subcategory.

Table 7: Key drivers of replacement capex for regulators, valves and equipment enclosures

Asset type	Expenditure driver
Supply regulators	The replacement of supply regulators and associated components is primarily driven by: • Reduced ability of regulators to meet operational, safety and regulatory requirements. Drivers of the need for regulator replacement include failing to maintain lock-up and/or set pressure; internal or external gas leakage; and reduced operational capabilities - for instance, limited or no regulated by-pass facilities. • Obsolescence and lack of availability of spare parts. As critical replacement parts become unavailable, regulators and components can no longer be maintained to the prescribed scheduled levels and as such must be replaced with suitable units that have commercially available spare parts. In addition, there are a range of issues, potential hazards and risks associated with above ground supply regulators. These include: • Susceptibility of above ground sites to damage. Vehicular impact, although uncommon can have serious consequences. Vandalism is a problem, with graffiti and malicious damage occurring frequently. • Complaints from the public regarding noise and smell. • Exposure of above ground sites to environmental elements, leading to degradation of facilities. • Overhanging trees necessitate constant maintenance, and entail a risk of branches falling and damaging the facility. They also give rise to security issues as they make for easy unauthorised access to the site by climbing trees. Relocating the above ground installations to below ground sites eliminates the identified issues and provides an effective and viable long term solution for the operation and management of this asset type. Existing equipment is not suitable for below ground installation due to its age, type and configuration. Therefore, complete asset replacement is required.
Large consumer regulators	Like supply regulators, the main drivers of the replacement of large consumer regulators are: • Lack of availability of serviceable components. • Reduced ability of existing assets to meet operational, safety and regulatory requirements. • Lack of ability to meet capacity requirements.
Small consumer regulators	The replacement of small consumer regulators occurs when any of the following criteria are met: • When the regulator cannot pass the required / designed flow rate whilst maintaining specified outlet pressure. • When the regulator lock-up mechanism is tested and fails to operate correctly. • When the regulator is leaking or a fault is detected with the relief mechanism. • When the regulator is assessed as being in very poor condition, with failure imminent. Small consumer regulators are replaced under the Mains Replacement program, which involves upgrading existing low and medium pressure networks to high pressure standard.
Valves	Replacement and rectification of valves is required to ensure that they continue to operate safely and reliably.
Equipment enclosures	There are approximately 2,500 equipment enclosures located throughout our gas distribution system. Replacement capex is required to ensure the effective mitigation of safety risk to the public, personnel and property, and to maintain asset integrity, and reliability and quality of supply.

4.3.6. Gas Heaters

We design and select gas heaters to meet expected heat load over a 15-year horizon. Generally, it is not cost effective to install a heater that is designed to meet greater than the expected load over 15 years, as the capital cost is high and the heater would operate at less than ideal efficiency at low loads for many years, resulting in increased total life cycle costs. Replacement of gas heaters is driven by their performance in safely and reliably meeting current loads in accordance with Rule 79(2)(c)(i) and (ii).

4.3.7. PIG rectification and marker posts

To ascertain transmission pipeline integrity and condition, internal inspection utilising an intelligent in-line inspection tool (PIG) provides a thorough analysis of pipeline defects and locations, and identifies features such as general corrosion, pitting corrosion, circumferential gouging, axial gouging, mill defects, proximity of ferrous metal, and dents. Pigging is an important element of our Transmission Pipeline Integrity Management Plan, which is prepared in accordance with Australian Standard 2885.3:2012, and which aims to ensure maintenance of the safety and integrity of services in accordance with Rule 79(2)(c)(i) and (ii).

Capex to rectify pipelines for in-line inspection requires the replacement of tight radius bends to swept bends, to permit a PIG to pass. The removal of reduced bore valves is also required. A valve configuration at each end of the pipeline to allow a PIG launcher and receiver also need to be installed.

Pipe marker posts are used on both transmission and distribution assets to warn the public that a supply main is buried within the vicinity. The installation, maintenance and replacement of pipe marker posts is an ongoing program.

4.3.8. Services

We intend to introduce a new fitting onto existing services in bushfire prone areas. Doing so will reduce the risk of fire damage to personnel and property by reducing the fuel load to existing fires.

5. Current access arrangement period expenditure

5.1. Explanation of current period expenditure

Table 8 provides a detailed breakdown of the AER's allowance for Other capex for the current access arrangement period.

Table 8: AER allowance for Other capex ($M Real 2017)

Other capex subcategory	2013	2014	2015	2016	2017	Total
1. Recoverable works	10.7	2.8	-	-	-	**13.5**
2. Property and accommodation	3.6	-	-	-	-	**3.6**
3. Vehicles and tools	0.1	-	-	-	-	**0.1**
4. Corrosion Protection	0.2	0.2	0.2	0.2	0.2	**1.0**
5. Regulators, valves and equipment enclosures	1.6	1.6	1.7	2.3	1.4	**8.6**
6. Gas heaters	-	-	0.0	-	-	**0.0**
7. Pig rectification	0.7	0.8	1.8	5.0	3.1	**11.3**
Total	**16.9**	**5.4**	**3.7**	**7.5**	**4.8**	**38.1**

Table 9 shows our actual annual capex for the period in each of our seven subcategories.

Table 9: Actual annual Other capex ($M Real 2017)

Other capex subcategory	2013	2014	2015	2016	2017	Total
1. Recoverable works	2.5	6.1	6.4	11.8	6.3	**33.0**
2. Property and accommodation	1.7	0.4	0.2	0.9	0.5	**3.7**
3. Vehicles and tools	0.2	0.2	0.1	0.1	-	**0.5**
4. Corrosion Protection	0.1	0.1	0.1	0.3	0.4	**1.1**
5. Services and service renewals	-	-	-	-	0.0	**0.0**
6. Regulators, valves and equipment enclosures	0.1	0.3	0.5	1.9	3.0	**5.8**
7. Gas heaters	0.1	0.2	0.1	-	-	**0.4**
8. Pig rectification	-	-	-	0.7	0.0	**0.8**
Total	**4.6**	**7.3**	**7.4**	**15.7**	**10.2**	**45.2**

We expect that our actual capex for the current period will exceed the AER's allowance by $7.0 million.

The following sections provide an explanation of the outcomes delivered in the current access arrangement period.

5.1.1. Recoverable works

We expect that actual expenditure on recoverable works during the current access arrangement period will exceed the allowance by $19.5 million. Work completed consisted of network reconfiguration and improvement works at the Highett Outstation site. The gas infrastructure at the site is located on Crown Land which the Victorian Government is redeveloping for medium density residential use. To maximise the value of the site and to address safety concerns, most gas assets are being relocated away from the site.

As explained in section 4.3.1 the costs of recoverable works are charged to the party requesting or causing them, so the actual level of expenditure on recoverable works has no effect on reference tariffs.

5.1.2. Property and accommodation

As noted in section 4.3.2, our office accommodation and fit out capex in the current period has been driven by the need to accommodate the significant increase in internal staff and contractors following the in-sourcing of a range of functions under our new business model.

During the period, we undertook office accommodation and fit out projects to provide accommodation for Multinet Gas and United Energy personnel across two principal locations, being the main office at Pinewood, and a smaller office accommodating the CEO and various corporate functions at Nexus Park in Mulgrave. To achieve this, we undertook the following office accommodation and fit out capital works:

- Fit out of the Pinewood and Nexus offices including:
  - design and construction
  - project management
  - audio-visual fit out
  - video conference facilities
  - IT and communications infrastructure including external fibre
  - procurement and installation of telephone systems
  - power supply risk mitigation.
- Facilities capex for the Pinewood and Nexus offices including:
  - furniture
  - office equipment
  - work stations
  - cabling
  - other fixtures and fittings
  - security.

During the current regulatory period, we expect that our total capex on office accommodation and fit out will be $3.7 million, compared with the AER's allowance of $3.6 million.

5.1.3. Vehicles and tools

Under our current business model, our two service providers are responsible for procuring and managing the vehicles they require to deliver maintenance and other field services to us. In addition, we have an in-house fleet of three

vehicles which are used exclusively by our own personnel. In relation to tools, a small amount of capex was incurred during the current period to acquire gas detection equipment.

In aggregate, our total expenditure in this category exceeded the AER's allowance, although the total expenditure was modest at $0.5 million over the five-year period.

5.1.4. Corrosion Protection

During the current access arrangement period we:

- Installed new low output corrosion protection units (CPUs);
- Replaced existing low output CPUs;
- Relocated existing low output CPUs;
- Installed new test points;
- Installed new, and replaced existing sacrificial anodes; and
- Installed new low output and high output anode beds.

Our actual expenditure of $1.1 million on corrosion protection during the current access arrangement period was consistent with the AER's allowance.

5.1.5. Regulators, valves and equipment enclosures

Overall, we expect that our capex on this sub-category of capex will be about $2.8 million below the AER's allowance.

Regulators

During the current period, we undertook a variety of large consumer regulator projects including the replacement of Jeavons J125, Grove 11308, Reliance 1803M, and Rockwell 441 regulators.

Many supply regulator projects were completed, including the replacement of regulators, insulation union replacements, pilot replacements, TP control loop upgrades, and slam shut panel upgrades.

Equipment enclosures

During the current access arrangement period we have undertaken miscellaneous minor works and rectification works on our equipment enclosure assets to ensure the effective mitigation of safety risk to the public, personnel and property, and to maintain asset integrity, and reliability and quality of supply.

In August 2014, we commissioned an independent structural engineering review of the condition of our most critical equipment enclosure sites. Generally, these are above ground regulator sites with masonry buildings and compounds. Following the completion of that review we commenced rectification works at several sites across the network. We have now completed rectification works at the following sites:

- 17-23 Hutton St, Dandenong;
- 14 Noel St, Brighton East;
- South Melbourne Yard; and
- Toorak Road outstation (Masters retail hardware) at Hawthorn East.

As noted in section 6.8, we plan to continue these rectification works at other sites over the forthcoming regulatory period. Our capex on equipment enclosures for the period was consistent with the AER's allowance.

5.1.6. Gas heaters

In the current access arrangement period, we expect that our capex on gas heaters will exceed the AER's allowance by $0.4 million. We completed miscellaneous minor capital works at Gembrook Water Bath Heater; Yarra Glen Heater; and Lang Lang City Gate Heater.

5.1.7. Pig rectification

During the current access arrangement period we have carried out rectification works on the South Gippsland Pipeline to enable the pipeline to be pigged including modifying pipework and installing a regulator at the Lang Lang CTM and the manufacture of a portable pig trap and a pig launcher.

Investigation works have been carried out on Murrumbeena to Highett Pipeline, Dandenong to Edithvale Pipeline and Rowville to Ferntree Gully Pipelines. Capital works are being initiated for 2017 on the Rowville to Ferntree Gully Pipeline.

We expect that our capex on this subcategory will be about $10.5 million below the AER's allowance.

5.1.8. Services

During the current access arrangement period we have carried out retrofitting of 200 services with fire valves. Expenditure in this subcategory was not provided in AER's allowance.

6. Developing our expenditure forecasts

This section explains our method of forecasting Other capex for the next period.

6.1. Recoverable work

As noted in section 4.1, recoverable work is capex relating to the relocation of our assets that is undertaken at the request of a customer or some other third party. In accordance with the requirements of Rule 92, the costs of such work are allocated to and recovered from the party who requests the work. Accordingly, our forecasts of recoverable work capex do not affect reference tariffs.

As detailed in Table 17, we forecast that our recoverable works will continue at around the levels we incurred in 2015, and expect to incur in 2017, but below those we estimate for 2016. We forecast that our total recoverable works for the forthcoming access arrangement period will be $31.5 million, compared with our estimate of $33.0 million for the current access arrangement period.

6.2. Property and accommodation

Our method for developing our property and accommodation capex forecasts is as follows:

- Our forecasts of accommodation requirements are based on current and projected employee head-count, and the depreciation profile of existing furniture and fittings.
- Floor space requirements are determined in accordance with industry benchmark standards. These standards also reflect applicable occupational health and safety requirements.
- Cost estimates for future work (which includes, amongst other things, office fit out, office equipment, furniture and other facilities) reflect competitive market rates based on costs incurred recently for similar work.

As already noted, our office accommodation capex during the current access arrangement period has been driven by the implementation of our new business model. For the forthcoming access arrangement period, our forecast of office accommodation requirements reflects our assessment of:

- The on-going in-house staff and contract resources required to continue to manage the current two service provider / two region business model efficiently; plus
- Any changes in resource requirements arising from future initiatives aimed at improving the value of the services we provide, and the efficiency of current operations.

6.3. Vehicles and tools

Our tools capex forecast is based upon recent actual historical capex. Our vehicles capex forecast reflects the programmed replacement of two of our three fleet vehicles in the forthcoming regulatory period. The replacement of vehicles is scheduled to minimise the total cost of ownership.

Our vehicles and tools capex forecast for the forthcoming period is set out in Section 7.1.

6.4. Corrosion Protection

As explained in section 4.3.4, replacement of corrosion protection equipment will be carried out when corrosion protection monitoring and testing results indicate that the stipulated level of protection can no longer be provided by the existing installations, or when there exists faulty or defective assets. Accordingly, our decisions on the precise timing and scope of work to replace or install additional corrosion protection equipment is informed by the results of our testing and monitoring activities.

Our forecast volume of work (shown in the table below) is based on analysis of actual work completed over the current period, plus the latest available information from tests and monitoring.

Table 10: Corrosion protection works program

Program	Activity	2018	2019	2020	2021	2022
Cathodic protection unit (CPU) installations	New low output units	2	2	1	-	-
	Replace high output units	2	2	2	-	-
	Replace low output units	-	-	-	-	-
	Relocations	3	3	3	3	2
Test point installations	New units	10	10	9	9	9
	Replacement units	7	7	7	7	7
Sacrificial anodes	New units	2	2	2	2	2
	Replacement units	6	6	6	6	6
Anode beds	Replace high output units	2	5	2	1	2
	Replace low output units	3	3	3	3	3
Surge protection	Install units	20	20	20	20	20

Table 11 below provides a summary of the rationale for our proposed corrosion protection works for the forthcoming access arrangement period.

Table 11: Explanation of corrosion protection works program

Program	Explanation
CPU installations	Impressed current CPUs are required when the output required to maintain an adequate level of cathodic protection cannot be supplied by a simple connection to a Magnesium anode. They can be classified as low output and high output units, with high output units requiring more anodes and a bigger geographical footprint. New high output units (classified as generating an output of 2 Amp or more) are no longer installed on the network. New low output units are installed when survey results indicate there is a need for an additional area of protection. Replacement of units is required when sites are no longer able to provide an adequate level of protection, or if there is some failure of componentry or substandard condition of above ground equipment. There are also several pole mounted cabinets installed on the network which present a safety hazard for field personnel, and these are being relocated to ground locations for ease of access.
Test points	Test points are required to ensure cathodic protection can be monitored in smaller geographical footprints. These are required as our network grows and the replacement of steel mains with polyethylene effectively isolates some parts of the steel network. The installation of new test points is dependent on detection of gaps in coverage, however some allowance must be made for replacement of test points due to third party damage or construction activities. In addition to this, test points and cross bonding are also utilised in mitigating the risks from stray current. These test points will be determined via gaps in coverage, or other asset/traction drainage requirements.

Program	Explanation
Sacrificial anodes	Sacrificial galvanic anodes are used where a smaller current and footprint is required to maintain protection levels. The need for new or replacement sacrificial anodes arises where surveys detect gaps in coverage, which could be a result of changing electrochemical conditions in the area or an anode in the existing area being corroded or used up. These beds typically consist of 2 to 4 magnesium or zinc anodes. Anodes are also used to maintain protection on cased crossings, where protective steel casing is installed around a pipe that experiences frequent overhead stress such as railway lines or tram crossings. The steel casing which provides structural protection does not form part of the steel network but it still requires cathodic protection especially if near stray current.
High output and low output anode bed replacement	These anode beds are typically utilised with impressed current systems. Low output beds consist of 1 to 2 silicon iron anodes, while the high output beds use around 10 anodes. These anodes need to be replaced regularly as they are continuously consumed to protect the pipe. These anodes also have a longer lifespan compared to the lower cost magnesium anodes due to the impressed current.
Surge protection	There are electrical sources that may create a hazard on a pipeline, though various mechanisms that may transfer electrical current to the pipeline. Such currents may originate from lightning, earth fault currents on adjacent power transmission structures, or from induced voltages due to both fault and load currents in high voltage power lines, cables or DC and AC traction systems. Electrical surges on the network may lead to: • electrical arcing which may be an ignition source for escaping gas; • damage to insulating fittings such as isolating flanges, coupling, unions and monolithic joints; • electrocution of field crew working on pipe; • damage to pipe coatings; and • usage of one-off insulating equipment such as spark gaps. While there are measures - such as safety mats - in place to protect personnel, we must undertake ongoing work to ensure that our surge protection systems remain fully effective in safeguarding against all the hazards noted above. In the forthcoming regulatory period, we plan to replace the varistor / spark gap combination at several regulator pits, cathodic protection units and insulating flanges.

Our corrosion protection capex forecasts are derived by applying unit rates (based on competitive market prices) to the volume forecasts set out in Table 11. Our capex forecasts are set out in section 7.1.

6.5. Supply regulators

Our forecast of supply regulator capex is a bottom up build of the estimated cost of addressing the expenditure drivers described in section 4.3.5. Specifically, regulator family replacement is forecast having regard to the availability of spares and the current level of regulator family exposure. Each family of regulators requiring replacement has a detailed schedule for its replacement. The replacement schedules prioritise the decommissioning of higher risk and obsolete supply regulators within an acceptable period.

District Regulators installed prior to the formation of the Gas and Fuel Corporation have limited or no regulated by-pass facilities. These sites no longer meet our standards and require re-work/replacement to meet current operational requirements. We have identified all such sites that require replacement, and work is prioritised to target those sites where regulators are no longer supported by manufacturers. Most these sites are planned to be replaced as part of Pipeworks program. The remaining substandard district regulators will be replaced as part of the Obsolete Regulator Replacement program.

We plan to complete the following capital works programs over the forthcoming regulatory period, to ensure that we meet out regulatory obligations under the Gas Distribution System Code, which requires us to comply with Australian Standards AS 4645 and AS 2885:

- Hydraulic Regulator Replacement Program;
- Obsolete Supply Regulator Replacement Program;

- Environmental Noise Improvement Investigation Program;
- Valve Actuator Replacement; and
- Miscellaneous Works.

Capex for the forthcoming period is expected to be dominated by the Obsolete Supply Regulator Replacement Program. This program targets a variety of regulator families which are planned to be replaced over the next 6 years. Our forecast volume of work for the forthcoming regulatory period is shown in the table below.

Table 12: Supply regulator replacement program

Program	2018	2019	2020	2021	2022
Hydraulic Regulator Replacement Program (Units replaced)	1	-	-	-	-
Obsolete Supply Regulator Replacement Program (Units replaced)	6	5	5	4	4
Environmental Noise Improvement Investigation Program (Units of work)	-	-	-	-	-
Valve Actuator Replacement (Units replaced)	1	-	-	-	-
Miscellaneous Works (Units of work)	-	-	-	-	-

Table 13 below provides a summary of the rationale for our proposed supply regulator replacement works for the forthcoming regulatory period.

Table 13: Explanation of supply regulator works program

Program	Explanation
Hydraulic Regulator Replacement Program	This program targets Welker Jet regulators and Jetstream regulators for replacement. The Welker Jet regulators were first installed in the network in 1960s. They comprise a complex system that provides good performance at high flows and low temperatures. Hence this regulator (and a similar make known as Jetstream) had been selected for City Gate installations in the past. Recently the manufacturer of the inner valve, which is actuated to control flow (and therefore pressure) has changed its process and is unable to make this rubber component to the required standard. This has resulted in numerous failures of this component, which now has a very short life span. We have 6 Welker Jet regulators installed on both legs of Seville East, Korumburra and Gembrook City Gates. The Jetstream regulator is very like the Welker Jet. The regulator has a hydraulic fluid that is utilised to control pressure. This fluid is susceptible to the ingress of gas and over time this changes the overall properties of the fluid so that it becomes more compressible. This creates poor control and reduces the pressure regulation functionality. Both regulator types also rely on Bristol Controllers for control. These controllers are on an open loop control system which vents gas to atmosphere as part of the control process. As a result, the use of these regulators contributes a relatively small component to network emissions and UAFG which in today's emissions focussed environment is inconsistent with industry good practice. The primary drivers of this replacement program are to maintain safety, and to maintain reliability and security of supply.

Program	Explanation
Obsolete Regulator Replacement Program	The replacement of certain regulator models and configurations installed across the network has been an ongoing program. In the forthcoming regulatory period, we plan to selectively replace obsolete Fisher 298 regulators, Grove regulators, and Reynolds regulators. These regulators have been targeted for replacement as OEM spare parts are becoming difficult and expensive to procure. The manufacturers have indicated that the production of certain soft spares will cease for these models and it will be difficult for us to maintain these regulators to a satisfactory level in the near future. By proactively replacing these obsolete regulators, we can build up a suitable level of strategic spares for the remaining population of the obsolete regulator models which are still operating in the network. The primary drivers of this replacement program are to maintain safety, and to maintain reliability and security of supply. Further details are provided below.
Obsolete Regulator Replacement Program	**(a) Fisher 298 regulator** The 298T-ET regulator was installed during the time of the Gas and Fuel Corporation. Operation of this regulator over many years has revealed it to be susceptible to poor lock-up (Internal leakage). Lock-up relies on a small rubber seal located directly in the gas flow-path which is susceptible to damage. This regulator is also susceptible to cage erosion. An alternative regulator design with seals placed out of the gas flow-path rectifies this problem. The production of the Fisher 298 regulator model ceased many years ago and getting spare parts is proving to be difficult and expensive each year. The current lead time on orders exceeds 12 weeks and manufacturers are not providing assurances regarding the spare parts availability over the next 5 to 10 years. This poses a risk of supply interruption to the customer in the event of a regulator breakdown as the spare parts to repair the regulator are not readily available. The Fisher 298 family of regulators is proposed to be replaced with suitably sized Norval regulators (for the HP and MP system) and with Axial regulators for the 840 kPa HP2 systems.
Obsolete Regulator Replacement Program	**(b) Grove regulators** There are Grove Regulators currently operating in the distribution system which are installed with tube 201-03029-814. As these tubes are no longer in production, Grove has recommended tube 201-03024-814 as a replacement. Availability of sleeves and the subsequent fitting of these sleeves has been an issue, with field operators reporting that these sleeves do not fit into the body. Given these issues, we plan to replace the highest risk Grove regulators. As part of this replacement program, only TP-TP, TP-HP, TP-MP sites have been shortlisted for replacement based on their risk profile. Other sites may be chosen for replacement if the risk profile changes or if a breakdown occurs in any site fitted with a Grove Regulator. This replacement program will enable us to have a suitable set of strategic soft spares which can be used in the event of breakdown of other operational Grove regulators on the network.
Obsolete Regulator Replacement Program	**(c) Reynolds regulators** The Reynolds 670, 688 and 678 regulators are no longer in production and spare parts were unavailable at the end of 2001. Regulators which are currently kept in the 'graveyard' stores are being stripped of soft spares and useful hardware to maintain spares for the remainder of in-service regulators on the network. These regulators are now being targeted for replacement as part of the Obsolete Regulator Replacement program. Some of these regulators will be decommissioned as part of the Sub-Standard District Regulator Decommissioning Program (which is part of the Pipeworks program) and hence they are not included as part of this replacement program. The Obsolete Regulator Replacement Program only targets the regulators which are not covered as part of Pipeworks projects in the forthcoming regulatory period.

Program	Explanation
Environmental Noise Improvement Investigation Program	In 2004, we initiated a study involving noise testing of 30 supply regulator sites. The results gained have been used to develop an Environmental Improvement Plan (EIP) – Gas Noise, completed in July 2005. A correlation study was conducted to extrapolate the data gained from the study across the entire population of our supply regulator sites. As a result, a further 26 sites were tested. Engineering solutions for the identified 'noisy' sites have been implemented. There is, however, an ongoing risk of non-compliance with State Environment Protection Policy N-1 (Control of Noise from Commerce, Industry and Trade) and the possibility of receiving complaints from residents situated within proximity to supply regulator sites. In addition, transmission pipeline fed Field Regulators and City Gates must comply with Australian Standard AS 2885.3. Currently some silenced new regulators are being trialled to determine the benefit from the additional cost of installation. The use of silenced regulators is considered during the design stage of every new or replacement regulator. An annual capital budget allocation is maintained to address ad-hoc noise related issues and to continue development of noise abatement solutions. The program over the forthcoming regulatory period is based on addressing high exceedance sites first, and coordinating noise mitigation works with augmentation projects.
Valve Actuator Replacement Program	Audco valves (Model HW) have been installed in conjunction with newer style valve actuators previously, with the valve being greased inadequately. This results in the valve requiring more frequent inspection and maintenance to ensure safe and correct operation. Replacing the existing valve actuators with an appropriate unit will provide increased over-pressure protection operation. The primary driver of this replacement program is to maintain safety. Sites at which actuators require reworking or replacing are D.T.S. - Highett and Hedge End Road.
Miscellaneous works	Miscellaneous works include any refurbishment or replacement of supply regulators and their associated components such as valves, thermowells, filters, strainers, and monolithic insulation joints. These works are usually undertaken as a discrete project, and where possible they are aligned with scheduled maintenance activities. As supply regulator components vary widely with regard to age, type, function and utilisation, these works are determined on a case-by-case basis. The main drivers of these works are the need to maintain security of supply to the network. Further details are provided below. **(a) Hazardous Area Dossiers** Supply regulators with SCADA or electrical equipment are considered Hazardous Areas under Australian Standards. These standards require us to maintain a dossier with a full description of the hazards and potential ignition sources. Maintaining these dossiers with the latest standards and changes to individual sites is an ongoing project. **(b) District Regulator Sense Lines** The level of District Regulator capacity utilisation has led to the need to relocate regulator sense lines to outside of the enclosure, allowing more accurate pressure control during high/low conditions. This modification is performed on an 'as required' basis. **(c) Huber Yale Insulation Unions** Insulation unions are installed in supply regulator stations together with insulating flanges to ensure the electrical separation of structures. The Huber Yale insulation unions were installed over a number of years and have been found to fail under moderate fault conditions. This is due to a relatively small external spark gap that is susceptible to dirt and moisture accumulation. These insulation unions will be replaced as part of any capital programs pertaining to that site as this provides the most efficient approach to addressing this issue. **(d) Slam Shut Panels** The increased utilisation and reliance on SCADA control at Field Regulators and City Gates has uncovered a hidden failure mode. The use of SCADA control on both regulator runs has masked the traditional drop in outlet pressure when a regulator run reaches maximum capacity. If the older style Slam Shut Panel closes the "B" Leg Actuator, then the station is forced to run only on the "A" Leg unless it is manually reset. Therefore, it is planned to replace the older style Slam Shut Panels with newer versions to eliminate the failure mode noted above.

Our supply regulator capex forecasts are derived by applying unit rates (based on competitive market prices) to the volume forecasts set out in Table 12. Our capex forecasts are set out in section 7.1.

6.6. Large and small consumer regulators

6.6.1. Large consumer regulators

Our forecast of capex for large consumer regulators is a bottom-up build of the estimated costs of:

- The planned replacement of certain regulator models and configurations to:
  - ensure that network safety and reliability are maintained, our regulatory compliance obligations are met, and pipeline services are delivered at the lowest sustainable cost;
  - ensure that the necessary spare parts are available (through in-house inventory and through suppliers) to return a regulator to service in the event of a failure;
  - optimise maintenance expenditure;
  - rationalise the range of regulator models and configurations to reduce the burden on staff training.
- Routine replacement or refurbishment of existing assets, where:
  - serviceable components are no longer available;
  - consumer and network driven gas load / pressure changes are expected to cause components to exceed original design ratings; and
  - old sites which no longer meet current industry standards or our standards require re-work/replacement to meet current operational requirements. For instance, older gas meter rooms which would have been built to Gas and Fuel Corporation standards are planned to be proactively inspected and rectified to ensure that they meet current Australian safety standards and building codes.

Our forecast volume of work for the forthcoming regulatory period is shown in the table below. Scheduling of the replacement works has been timed to coincide with the scheduled overhaul maintenance package (QCH activity type in SAP) for each site. However, it is important to note that the regulator models which are targeted are no longer in production, and the availability of their spare parts will influence the timing of the replacement of certain models.

Accordingly, some regulators may either be replaced ahead of schedule or deferred to later years, depending on the availability of spare kits.

Table 14: Large consumer regulator replacement program - showing number of units to be replaced

Existing Regulator Model to be replaced	2018	2019	2020	2021	2022	Replacement Regulator Model
Dival 250 – LBP	4	3	1	1	4	Dival 600
Dival 250 – LTR	7	12	11	8	9	Dival 600
Dival 100	11	25	10	15	9	Dival 500
Rockwell 243 RPC	0	2	2	0	0	Dival 500
Fisher 298	7	4	3	7	5	Norval
Grove	0	0	0	1	0	Reval 182 / Axial
Reliance 2002M	5	13	2	5	7	Dival 600

Table 15 below provides a summary of the rationale for our proposed large consumer regulator replacement works for the forthcoming regulatory period.

Table 15: Explanation of large consumer regulator replacement program

Existing Regulator Model	Explanation
Fisher 298 regulator	The production of the Fisher 298 regulator model ceased many years ago and obtaining spare parts is proving to be difficult and expensive. The current lead time on orders exceeds 12 weeks and manufacturers are not providing assurances regarding the availability of spare parts over the next 5 to 10 years. This poses a risk of supply interruption to the customer in the event of a regulator breakdown as the spare parts to repair the regulator are not readily available. Depending on the load requirements of the consumer, the replacement of the Fisher 298 regulators with a smaller regulator would be a much more cost effective strategy than an overhaul at 10.5 years. This also reduces the quantity of the Fisher 298s deployed within our network, and the dependence on the spare parts in the future. Given these considerations, we plan to replace the Fisher 298 regulators with Norval regulators as and when the scheduled overhaul maintenance package (QCH activity type in SAP) of these units is due over the next 5 years.
Dival regulators	The Dival direct actuating regulator has been installed on new connections for at least 20 years. Early models have had lock up issues. The Dival 100 family (LBP, LTR and LMP), Dival 250-LBP and Dival 250-LTR models are also experiencing issues with availability of spare parts. We plan to replace the Dival 100 family of regulators with Dival 500 regulators as and when the scheduled overhaul maintenance package (QCH activity type in SAP) of these units is due. The Dival family of regulators is currently on an 18-month operational check maintenance schedule.
Rockwell 243 regulators	The Rockwell 243 RPC regulators have been installed on the gas network since 1989. The availability of OEM spare parts for the Rockwell 243 RPC regulators is now limited and so we have a plan in place to replace these regulators over the 7-year period commencing in financial year 2016/17.
Grove regulators	There is a small population of 8 Grove regulators installed in Industrial & Commercial metering facilities. Spare parts for the Grove model 80, 81, 82 and 83 are not readily available and are expensive to procure. The Grove family of regulators are planned to be replaced with suitable sized Reval 182 or Axial regulators as shown in Table 4 2.

Existing Regulator Model	Explanation
Reliance 2002M regulators	The over pressure protection for the sites installed with a Reliance 2002M model is a pressure relief valve and this is not deemed to be a satisfactory method of over pressure protection as per current our standards. Hence, these regulators are planned to be replaced with suitable Dival 600 regulators over the next 5 -10 years as and when they are due for maintenance.

Our large consumer regulator replacement capex forecasts are derived by applying unit rates (based on competitive market prices) to the volume forecasts set out in Table 14.

In addition to the replacement works, we are also planning to complete our Gas Meter Room Remediation program in 2018, which commenced in 2014 following the completion of a field compliance audit by ESV. The ESV's audit, along with subsequent internal audits identified the need for works to rectify sub-standard meter rooms across our network, to ensure that they meet current Australian safety standards and building codes. Our capex forecast contains an allowance of $25,000 to complete this work in 2018.

Our capex forecasts are set out in section 7.1.

6.6.2. Small consumer regulators

Small consumer regulators are replaced as part of the Pipeworks program, so our practice is to undertake breakdown maintenance (as operating expenditure) only. No separate capex forecast is required for small consumer regulators.

6.7. Valves

Our forecast of valve replacement capex is based on a bottom up build, having regard to the age of the assets, and the extent to which we can be confident of their condition and their ability to operate safely and effectively.

In the forthcoming access arrangement period we plan to complete the following capital programs to ensure that we meet out regulatory obligations under the Gas Distribution System Code, which requires us to comply with Australian Standards AS 4645 and AS 2885:

- HP2 Syphon Removal Program;
- District Regulator Isolation Valves Rectification Program; and
- Miscellaneous Valve Replacement / Rectification works.

Further information on these programs is provided below.

6.7.1. Syphon removal

Historically, syphons were installed to extract liquid from HP2 pipelines prior to the introduction of natural gas. These facilities are now redundant and are generally in low risk areas. In some cases, however, stress on the fitting increases if roads are built above the syphon, increasing the likelihood of leaks. The most cost effective solution is to remove the syphons from service, prioritising those facilities that represent the highest risk.

A Safety Management Study workshop was conducted in 2014 to assess risks associated with the integrity of the syphon and from accidental damage. The workshop agreed that the risk level from failure (i.e. a broken gasket or corrosion) was low, however damage to the syphon from civil works was assessed as an Intermediate risk. To address this risk, we have a program in place to identify those syphons that are likely to be defective and perform inspection to ascertain integrity of each type, and to replace high-risk syphons so that we minimise safety risk as far as practicable.

The main concern about regarding syphons is their likelihood of being damaged due to third party works, and the lack of available repair methods. Depending on where a leak occurs, a cut out is the only option as hot welding may not be safe on the aged steel of the syphon where the wall thickness cannot be guaranteed. For this reason and the

obsolete nature of syphons on the de-licensed HP2 pipelines, a program to remove them from service over future years is planned.

The priority for removal will be based on location risk factors, depth of cover, maintenance history and ability to obtain cost synergies from multiple removals at one time. Our expenditure forecasts contain an allowance for the removal of two syphons per annum based on the outcomes of the risk assessment for each site.

6.7.2. District Regulator Isolation Valves Rectification Program

The primary function of the isolation valves installed on district regulators is to provide the ability to isolate the regulator in the event of a gas leak or a failure of the pressure regulation equipment without interrupting supply to customers. A number of District Regulators are known to have ineffective isolation valve locations. In these cases, pipe work and/or valve construction or valve relocation is required to ensure safe and correct operation.

There are three known locations (Spencer Road, Stevensons Road, and Bowen Crescent) where distribution mains have been connected to the regulator inlet main, downstream of the isolation valve. Under this configuration, either the regulator can no longer be isolated due to the presence of the distribution main, or, when the regulator is isolated, the areas downstream of the distribution main experience inadequate or total loss of supply.

This configuration does not permit isolation of the supply regulator without losing supply to the customers who are connected downstream of the isolation valve, and this arrangement is not consistent with accepted good industry practice. Accordingly, this program aims to carry out rectification works at the three locations noted above to ensure that these locations are compliant with current network design philosophy and engineering standards.

Additional instances where connections downstream of isolation valves have been performed can be expected to be found during maintenance and upgrading activities during the forthcoming regulatory period. Therefore, an allowance has been included in the expenditure forecast for the rectification of any similar contraventions which may be identified over the course of the period.

6.7.3. Miscellaneous Valve Replacement / Rectification works

Miscellaneous works typically include any refurbishment or replacement of distribution valves and any associated pipework. These works are usually undertaken as a project, and where possible they are coordinated with scheduled maintenance activities. The need for these works is determined on a case-by-case basis.

An example of such work is the Dandenong Rd Valve Pit Removal project, which we plan to be complete in 2017. This involves the removal of line valve T17LV-04 (installed on the HP2 / Delicensed Dandenong to West Melbourne pipeline) and its replacement with a like for like sized steel main. This line valve is in a pit just before the right hand turning lane on the outbound section near the intersection of Burke Rd and Dandenong Rd (opposite Monash University). The Gatic lid cover for this pit has failed structurally twice in the past 10 years and is now posing a hazard for the motorists and our gas assets beneath it. The concrete pit walls and the supporting beams are also not in good condition and hence the line valve installed inside this pit will be cut out and the section replaced with a like for like sized steel main.

Apart from this project, capex required for miscellaneous works is typically low, and hence an annual allowance of $20,000 has been included in the capex forecast for the forthcoming regulatory period.

The primary drivers for miscellaneous refurbishment or replacement of distribution valves are to maintain safety and reliability.

6.8. Equipment enclosures

We plan to complete two capital works programs during the forthcoming regulatory period, to ensure that we comply with our regulatory obligations under the Gas Distribution System Code (Australian Standards AS 4645 and AS 2885. The programs are:

- Structural Engineering Rectification Works Program; and
- Miscellaneous Works.

As noted in section 5.1.4, we obtained an independent structural engineer's report on the condition of our equipment enclosures in 2014, and we subsequently commenced a rectification works program to address the issues identified. Our capex forecast includes an allowance to continue our structural engineering rectification works program at an estimated total capital cost of $250,000 over the forthcoming access arrangement period, at the sites listed in the table below.

Table 16: Timing and location of planned equipment enclosure rectification works

Site Name	2018	2019	2020	2021	2022
606 Balcombe Rd, Blackrock		✓			
14 Noel St, Brighton East	✓				
19 Plantation Avenue, Brighton East		✓			
26 Teddington Rd, Hampton		✓			
Masters Hardware, Toorak Rd, Hawthorn East	✓				
Russell St, Springvale		✓			
17 Webb Avenue, Springvale			✓		
Dandenong Terminal Station					✓
Dandenong Terminal Station Open Shed					✓

In addition to the rectification works listed above, our capex forecast for equipment enclosures includes an allowance for miscellaneous works of $250,000 per year. This forecast is consistent with recent historical levels of expenditure. Miscellaneous capital works typically include rectification and replacement of a broad range of equipment enclosures such as:

- Masonry buildings;
- Concrete Pits;
- Chain Wire fences;
- Steel kiosks;
- Gatic Covers;
- SCADA cabinets; and
- Weld mesh fencing.

6.9. Heaters

As noted in section 4.3.6, the need for replacement of gas heaters is driven by an assessment of their performance in safely and reliably meeting current loads. All the heaters in our network are performing well within requirements, and this is expected to remain the case over the forthcoming period. On this basis, we do not expect the need for replacement expenditure on heaters to arise over the forthcoming period. However, we intend to install a small

number of vortex heaters designed to achieve higher operational efficiency at 2 regulating stations. The forecast for this were based on historical expenditure.

6.10. PIG rectification and marker posts

As noted in section 4.3.7, pigging is an important element of our Transmission Pipeline Integrity Management Plan, which identifies the pipelines that must be rectified to enable a PIG device to be used. Our forecast of PIG rectification capex is a based on a bottom up estimate of the costs of rectifying the identified pipelines.

The installation of marker posts is a key control to prevent third party damages on the transmission and distribution network. The installation, maintenance and replacement of pipe marker posts is an ongoing program.

6.11. Services

As noted in section 4.3.8, these fire valves are crucial in improving the safety in bushfire prone areas. Our forecast of installing these fire valves are based on spatial analysis of the volume of feasible installations per annum and costs provided from equipment suppliers.

7. Forthcoming access arrangement period expenditure

7.1. Expenditure forecasts

Table 17 details our forecast Other capex for the forthcoming access arrangement period.

Table 17: Other capex forecast ($M, Real 2017)

	2018	2019	2020	2021	2022	Total
1. Recoverable works	6.3	6.3	6.3	6.3	6.3	**31.5**
2. Property and accommodation	0.4	0.1	0.1	0.1	0.1	**0.9**
3. Vehicles and tools	-	-	-	-	-	**-**
4. Corrosion Protection	0.3	0.4	0.3	0.2	0.2	**1.3**
5. Services and service renewals	0.1	0.1	0.1	0.1	0.1	**0.6**
6. Regulators, valves and equipment enclosures	2.7	2.3	1.5	1.7	1.6	**9.9**
7. Gas heaters	0.0	-	-	-	-	**0.0**
8. Pig rectification	1.1	0.0	1.6	0.0	1.7	**4.5**
Total	**10.9**	**9.2**	**10.0**	**8.5**	**10.0**	**48.7**

7.2. Efficiency of our Other capex

All our capex in this category is assessed and executed in accordance with the principles underpinning our Asset Management Plan[3]. This plan provides an integrated and structured framework to guide the development, coordination and execution of asset creation and maintenance activities to optimise the total lifecycle costs, risk and performance of our assets and operations.

Work is delivered through our Operational and Management Services Agreements (OMSAs), which provide for the construction and maintenance activities on the gas distribution network. Following a competitive tender process, OMSAs were put in place with two separate service providers. The OMSAs provide strong incentives for both service providers to deliver their services to us efficiently, and for the charges levied under the contracts to reflect those efficient costs. In addition, these contracting arrangements enable competition by comparison for small scale activities, whilst also enabling both service providers to compete directly for larger projects. In short, our contracting arrangements ensure that all works are delivered efficiently.

The information presented in this overview document demonstrates that our Other capex is efficient. Our Other capex:

- Provides for the efficient replacement of key facilities such as corrosion protection systems, regulators, valves, and equipment enclosures, to enable us to provide services safely, reliably and at the lowest total sustainable cost; and
- Provides essential functions that support and facilitate the efficient and safe delivery of services to our customers, including the provision of recoverable works requested by customers and appropriate office accommodation for our staff.

[3] Further details are provided in Document № MG-PL-0005, Multinet Gas Network Asset Management Plan.

7.3. Benefits of expenditure to customers

Asset replacement expenditure that falls within this category is driven by the need for us to comply with our regulatory obligations and to maintain safety and service standards. The non-network capital resources we procure provide essential support for the efficient delivery of reliable and safe reference services.

In undertaking asset replacement works, and in procuring necessary non-network resources, we aim to meet our requirements at minimum total cost. Customers benefit from the proposed expenditure as it enables us to continue to deliver services safely and efficiently.

8. Meeting Rules requirements

This section explains and justifies our Other capex forecast against the new capex criteria set out in Rule 79. It therefore demonstrates that our Other capex forecast is conforming capex which should be approved by the AER as part of its final decision for our forthcoming access arrangement period.

8.1. The new capex criteria

Rule 79 defines the new capital expenditure criteria as follows:

(1) Conforming capital expenditure is capital expenditure that conforms with the following criteria:

  (a) the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;

  (b) the capital expenditure must be justifiable on a ground stated in subrule (2).

(2) Capital expenditure is justifiable if:

  (a) the overall economic value of the expenditure is positive; or

  (b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or

  (c) the capital expenditure is necessary:

    (i) to maintain and improve the safety of services; or

    (ii) to maintain the integrity of services; or

    (iii) to comply with a regulatory obligation or requirement; or

    (iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

  (d) the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).

(3) In deciding whether the overall economic value of capital expenditure is positive, consideration is to be given only to economic value directly accruing to the service provider, gas producers, users and end users.

(4) In determining the present value of expected incremental revenue:

  (a) a tariff will be assumed for incremental services based on (or extrapolated from) prevailing reference tariffs or an estimate of the reference tariffs that would have been set for comparable services if those services had been reference services; and

  (b) incremental revenue will be taken to be the gross revenue to be derived from the incremental services less incremental operating expenditure for the incremental services; and

  (c) a discount rate is to be used equal to the rate of return implicit in the reference tariff.

(5) If capital expenditure made during an access arrangement period conforms, in part, with the criteria laid down in this rule, the capital expenditure is, to that extent, to be regarded as conforming capital expenditure.

(6) The AER's discretion under this rule is limited.

8.2. How the forecast meets the new capital expenditure criteria

The information presented in this overview document and its supporting documents demonstrates that our proposed Other capex is consistent with a prudent service provider, acting efficiently and in accordance with good industry practice to achieve the lowest sustainable cost of providing services, as required by Rule 79(1). In the proposed capex is necessary to comply with the following provisions of the National Gas Rules:

- Rule 79(2)(c)(i) – The forecast capex relating to corrosion protection, regulators, valves, equipment enclosures and PIG rectification is required to maintain safety by, amongst other things, reducing the incidence of gas leaks to the extent practicable, thereby mitigating both the hazards and risks to the safety of the public and the risk of property damage associated with gas supply;
- Rule 79(2)(c)(ii) – The forecast capex across all subcategories is required to maintain the integrity of services by:
    - ensuring we have effective corrosion protection systems in place;
    - ensuring that we have in-line inspection systems in place as per the company's Transmission Pipeline Integrity Management Plan, which is prepared in accordance with Australian Standard 2885.3:2012;
    - replacing regulators, valves and equipment enclosures that are unsafe, life-expired or obsolete; and
    - procuring non-network resources that support the safe and efficient delivery of services to all customers.

Given the above, our Other capex forecast for the 2018 to 2022 access arrangement period is consistent with the National Gas Objective, in that it promotes efficient investment in natural gas services that is in the long-term interests of consumers in terms of price, quality, safety, reliability and security of supply of natural gas services.

9. Supporting documentation

The following documents support our Other capex forecast for the forthcoming access arrangement period.

- Capital Expenditure Overview Paper - Other capex
- Supply Regulator Strategy (MG-SP-0003)
- Large Consumer Regulator Strategy (MG-SP-0005)
- Distribution Valve Strategy (MG-SP-0011)
- Corrosion Protection Strategy (MG-SP-0013)
- Equipment Enclosure - Strategy (MG-SP-0014)
- Gas Heater Strategy (MG-SP-0015)
- Distribution Service Strategy (MG-SP-0010)

Glossary

Abbreviations	
Act	*Gas Safety Act 1997*
AER	Australian Energy Regulator
CEO	Chief Executive Officer
CPU	Corrosion protection units
CTM	Custody transfer meter
EPA	Environment Protection Authority
ESC	Essential Services Commission of Victoria
ESV	Energy Safe Victoria
HP	High pressure
OMSA	Operational and Management Services Agreements
LP	Low pressure
MP	Medium pressure
M	Million
NGR	National Gas Rules
OEM	Original equipment manufacturer
TP	Transmission pipeline
UAFG	Unaccounted for gas

Attachment 1 – Allocation of Asset Costs between Capex Categories

Expenditure Category		Capital Allocations							
		Transmission & Distribution Mains	Services	Cathodic Protection	Meters[4]	Supply Regulators / Valve Stations	SCADA	IT Systems	Other
Mains Replacement	Planned and reactive replacement of distribution mains	Yes: 1. LP to HP replacement 2. MP replacement 3. Early Generation High Density Polyethylene pipe replacement 4. Reactive mains replacement.	Yes: 1. Where of a suitable standard reconnecting service after mains replacement 2. Replacement as part of the mains replacement program 3. Unplanned services renewal (i.e.~$1m pa) – not related to proactive Mains Replacement programs	No	No	Yes, installation of new supply regulators and valves	No	No	No
Customer Connections	Residential and C&I Connections	Yes, installation or extension of mains related to a new connection	Yes, installation of new service	No	Yes, purchase of new meters and installation of meters for new connections (excluding as part of the digital meter trial). (Note – purchases of new meters were previously part of Meters Capex.)	No	No	No	No

[4] For the purposes of capital allocation Meters is inclusive of the consumer service regulator.

		Capital Allocations							
Expenditure Category		**Transmission & Distribution Mains**	**Services**	**Cathodic Protection**	**Meters[4]**	**Supply Regulators / Valve Stations**	**SCADA**	**IT Systems**	**Other**
Meters Replacement	Planned and unplanned replacement of existing metering fleet	No	No	No	Yes, purchase of new meters: 1. to replace a failed meter; 2. to seed the time-expired meter program; and 3. for digital meter trial	No	No	No	No
Augmentation	Project to increase the capacity of the network	Yes, demand related mains augmentation	No	No	No	Yes, demand related regulator augmentation	No	No	No
Information Technology	-	No	No	No	No	No	No	Yes, complete IT program	No
SCADA	-	No	No	No	Yes, for vortex flow meter installations associated with supply regulators	No	Yes, complete SCADA program	No	No

		Capital Allocations							
Expenditure Category		**Transmission & Distribution Mains**	**Services**	**Cathodic Protection**	**Meters[4]**	**Supply Regulators / Valve Stations**	**SCADA**	**IT Systems**	**Other**
Other capex	Supply Regulators – Replacement	No	Fire valve program	No	No	Yes, 1. integrity related supply regulator upgrades 2. Network valve repayment	No	No	No
	Network Valves	No	No	No	No	Yes, All network valve programs	No	No	No
	Recoverable works	Various, assets created depend on project							
	Corrosion Protection	No	No	Yes, complete CP program	No	No	No	No	No
	Services / Meters	No	No	No	No	No	No	No	No
	Gas Heaters	No	No	No	No	Yes, installation / replacement of heating installations	No	No	No

		Capital Allocations							
Expenditure Category		Transmission & Distribution Mains	Services	Cathodic Protection	Meters[4]	Supply Regulators / Valve Stations	SCADA	IT Systems	Other
	Pigging Capex	Yes, Non-piggable pipeline alteration program	No	No	No	No	No	No	No