GasNet Limited

Asset Management Plan

2020-2030

Version Control

Version	Date	Summary of Changes
1.0	1 Jul 2013	First Issue
1.1	18 Dec 2013	Appendix 3.1 Schedule 11b replaced with updated version (page 48) following discovery of errors in the original version (page 47). Further information available in Box 12 of Schedule 14 in GasNet's 2013 Disclosures pursuant to the Gas Distribution Information Disclosure Determination 2012.
2.0	30 Jun 2014	Annual review and update
3.0	30 Jun 2015	Annual review and update
4.0	30 Jun 2016	Annual review and update
5.0	28 Jul 2017	Comprehensive review and update to meet full AMP provisions of GDB ID Determination 2012.
6.0	27 June 2018	AMP Update published in error
7.0	7 November 2018	Annual Review and update
8.0	1 July 2019	Annual Update
9.0	30 June 2020	Annual review and update
9.0a	18 Dec 2025	DY2020 Resubmitted with updated nominal amounts S11a. & 11b.

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Disclaimer:

This Asset Management Plan (AMP) has been prepared and disclosed in accordance with the Gas Distribution Information Disclosure Determination 2012 – consolidated- 3 April 2018.

The information in this document has been prepared in good faith and represents GasNet Limited's (GasNet) intentions and opinions at the date of issue. To the best of its ability, the information provided is correct at the time of publishing.

GasNet has recently (April 2020) appointed a new GM. Management and the Board are currently undertaking a full scale review of long term asset management which may lead to changes in the expressed 2020 plan and beyond. Any changes implemented will be reflected in the next year's AMP.

None of GasNet Limited, its directors, officers, employees, shareholder or representatives accepts any liability whatsoever by reason of, or in connection with, any information in this document or any actual or purported reliance on it by any person.

GasNet may change any information listed in this document at any time post publishing.

1.0 INTRODUCTION

This Asset Management Plan (AMP) is progressively becoming the key planning document for the management of GasNet's natural gas infrastructure assets. It is published to both demonstrate to stakeholders that GasNet manages its assets in a manner consistent with industry best practice and to meet the requirements under the Gas Distribution Information Disclosure Determination 2012 – consolidated- 3 April 2018 (IDD).

This 2020 version of the AMP is the fifth to be published under the full provisions of the information disclosure requirements, whereas previous publications were produced under transitional provisions made available to GasNet.

Please note that all charts identify the 2020 disclosure year (our 2019-2020 year ending 30 June 2020); however where either there is no:

1. data applicable, or
2. audited data available as the disclosure year is incomplete, then

the data entry for 2020 will be one of zero, blank or forecast. Forecast may be a combination of actual (year to date to May 2020) and projected June 2020, or the budget for the item for the 2019-20 where this considered the best forecast at this time.

2.0 BACKGROUND AND OBJECTIVES

2.1 Company Background

GasNet is 100% owned by Whanganui District Council Holdings Limited, a Whanganui District Council "Council Controlled Trading Organisation". GasNet commenced trading on 1 July 2008 after purchasing the network (and metering) business from Wanganui Gas Limited. Previously GasNet had been operating as an independent trading division of Wanganui Gas Limited with responsibility for managing the network (and metering) assets for the company. On 30 June 2017 GasNet Limited and its parent Wanganui Gas Limited were amalgamated to become GasNet Limited.

GasNet's origins go back to the late 19th century when in 1879 Wanganui Gas Company Limited was formed as a private enterprise to reticulate manufactured gas within the city of Whanganui. All networks owned and operated by GasNet have been constructed to natural gas standards since 1970.

2.2 Gas Distribution Business

GasNet owns and operates five natural gas distribution networks in the Whanganui, Rangitikei and South Taranaki regions in the North Island of New Zealand.

In accordance with the Gas Act 1992, GasNet is defined as a "Gas Distributor" and under the IDD is a Gas Distribution Business (GDB).

2.3 Details on AMP Planning Period

The AMP planning period is 1 July 2020 to 30 June 2030.

2.4 Effective Date of Data in AMP

Except where otherwise specified, data contained within this AMP, typically shown in tables and graphs, is based on that which existed as at 31 May 2020.

2.5 Date Approved by Directors

GasNet's Board of Directors formally approved this AMP on 30 June 2020.

2.6 Stakeholder Interests

Stakeholder interests are considered within GasNet's asset management practices to provide a safe and reliable gas supply to all.

GasNet's asset management practices implicitly acknowledge the diversity of interests and are reviewed and modified over time in response to feedback from stakeholders, change in legal and/or regulatory requirements, and identified organisational practice improvement.

Any conflicting stakeholder interests are managed to ensure that appropriate levels of separation, accountability and authority are in place. Decisions are normally made based on the asset management drivers and if this fails to provide a solution, a decision is made at the appropriate level within management or the Board.

Whilst the occurrence of conflict with, or between, the needs of stakeholders seldom occurs, GasNet will apply the following considerations in resolving conflict:

- Safety of people and property
- Reliability of the gas supply
- Compliance with the law, industry standards and codes
- Fairness and equity to all parties
- Regulatory compliance

GasNet has identified the following stakeholders as having an interest in how GasNet manages its gas distribution assets:

Table 1 Stakeholders

Stakeholder	Interest
District and Regional Councils	Environmental impacts, local economic development and in the control of, and access to, assets in the road corridor.
Economic Regulator (NZ Commerce Commission)	Statutory obligations, economic efficiency, compliance and public disclosure of this AMP
Electricity and Gas Complaints Commissioner	Compliance with the Electricity and Gas Complaints Scheme.
Emergency Services and Civil Defence	Safety of public and their property, preparedness for emergency events
Gas Consumers	Delivery of a safe, reliable, efficient and product
Gas Retailers	Distribution of a safe, reliable, efficient supply of gas at minimum sustainable economic value.
GasNet Board of Directors	GasNet's performance in relation to its statutory obligations and their responsibilities as the governing body of the Company on behalf of the shareholder.
GasNet Employees	Implement GasNet's policies and procedures to maximise the utilisation and performance of its assets.
GMS owners	Provision of gas supply from the outlet of the gas network that meets agreed performance criteria
Industry Regulators (Ministry of Business, Innovation and Employment and Gas Industry Company)	Statutory obligations, economic efficiency, safety of employees and the public, industry best practice
Insurers	GasNet responsibly manages its assets and risks
KiwiRail	Control and access to assets in the rail corridor
Landowners	Landowners with GasNet assets on their property have interests in safety, easements, access requirements and property maintenance.
NZ Transport Agency	Control and access to assets in the State Highway road corridor.
Property developers	Connection policies and costs are fair and that plans for network extensions work within their needs.
Public	Safety and information
Service Providers and Contractors	Support services
Shareholder	Achievement of an adequate return on investment and being a good corporate citizen.
Transmission Company (First Gas Limited)	To deliver gas to each of the five Sales Gates that meets the gas specification and is odourised.
Other utility infrastructure asset owners	Identification of assets for both maintenance and development works, and to ensure that assets owned by GasNet and other asset owners that are in proximity, are managed through the knowledge of each other's whereabouts.

Stakeholder interests have been identified and accommodated in the asset management practices of GasNet through the following processes:

- The GasNet Board of Directors agrees to an annual Statement of Intent which details corporate strategy with respect to asset management planning.
- Corporate organisational goals and objectives support the establishment and completion of asset management projects consistent with corporate vision.
- Meetings and discussions with retailers, consumers, developers and landowners help to establish asset management policy and practices in regard to levels of service, charging regimes and network planning including the price/quality.
- Government and territorial authority legislation provides a key input into the way that asset management work is planned, designed and undertaken.
- Customer complaints provide valuable feedback on the quality of supply and influence the development of the Asset Management Plan.
- Consultation with interested parties over specific projects ensures that they are included in the Asset Management Plan as early as possible to allow sufficient planning to be undertaken.

- Operational and project performance reporting is provided to the Board of Directors on a monthly basis and includes contractor performance, project management performance and financial performance. This is used to establish future Asset Management Plan programmes and to compare progress against targets in each annual Asset Management Plan.
- GasNet's operational base and staff employed within the company are within the very communities that it serves so that it is not uncommon for information obtained through community channels to prove beneficial to GasNet to better understand the needs and issues that face consumers and other stakeholders in these communities.

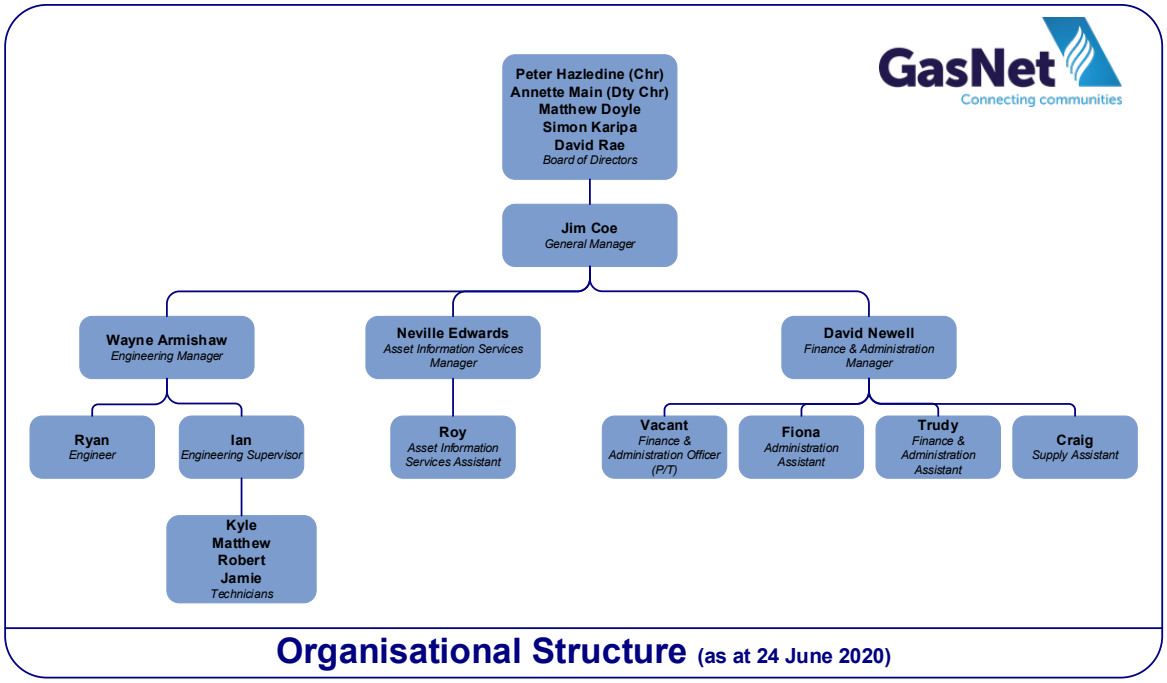
Regular periodic surveying of consumers has been identified as an opportunity for improvement but not yet implemented. Such feedback would provide valuable information on security and reliability of supply which assists in network planning.

2.7 Human Resources

2.7.1 Organisational Structure

GasNet employs fifteen full time staff to manage the day to day operations of the company, ten of which are office based and five field based. There are three functional sections of the company covering Engineering, Finance & Administration and Asset Information Services. Essential for a company the size of GasNet, within and across each section there is a focus on multi-skilling of personnel to provide cover for all areas in the event of absence, essential for a company the size of GasNet. All personnel are based at the company's Cook Street premises with the ten office personnel located in an open plan office, where the layout promotes a high level of intercommunication between sections.

GasNet's organisational structure is shown below.



Organisational Structure (as at 24 June 2020)

Financial and administrative support for the entire company is performed by a team of five (one vacancy) who also provide the initial point of contact with consumers and retailers for customer service and emergency response.

The Asset Information Services (AIS) section incorporates two persons who create, update, and manage the Company's asset records in the Work Management System (WMS), and spatially record assets in GasNet's electronic Geographical Information System (GIS).

The Engineering section employs two office based engineering personnel and the five field based personnel with responsibility for the field work associated with construction, operation and maintenance of all networks. GasNet has consciously retained its own direct labour workforce but does contract out work to external organisations. As a result, GasNet staff have a wealth of very long term engineering and operational experience within personnel reaching back some 30 years. Continued use of its own direct labour force ensures that in-house knowledge of GasNet's assets and their condition is retained and recorded, and a greater sense of personal ownership of the networks is realised.

Field activities requiring specialist skills, experience or equipment, or that are performed infrequently are typically provided by external organisations under contract. These activities include the civil construction activities of

excavation, backfilling, drilling and boring, and gas industry specialised works such as high pressure steel construction, welding and flow-stopping and cathodic protection. The infrequency of work in some of these disciplines and the few specialist personnel that are available in New Zealand to complete the work, make this the best option for the company.

2.7.2 Training and Competency

All positions within GasNet have specific competency requirements which are specified within the position description for each role. Annual personnel performance and development reviews provide the opportunity to review performance against the requirements of the role and to identify any further training that may assist with professional development and any change in the competency requirements of the position.

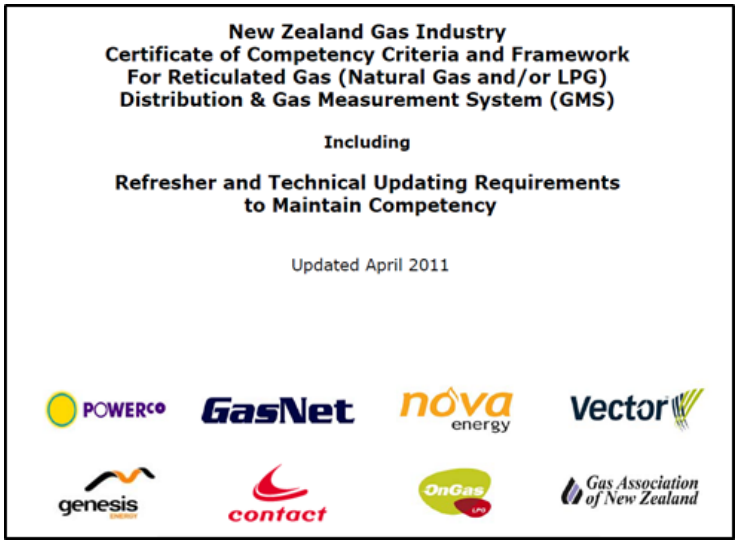
Recruitment processes ensure that candidates selected currently meet or have the ability to achieve the competencies required for the position. New employees are assessed against the competency requirements of the position and training gaps identified. A training plan is agreed to develop the individual's competency to meet the needs of the position. The company assesses the competency of an individual by the attainment of NZQA unit standards of learning achieved which collectively form qualifications, and relevant experience in performing associated activities.

All GasNet personnel employed to carry out field based network activities are trained in accordance with the GANZ Gas Industry Competency Protocol (GIP-009).

Regular refresher training is carried out in accordance with the requirements of GIP-009 to ensure currency of competence.

Engineering and other office based personnel hold qualifications relevant for their position and a number hold the National Certificate in Gas Marketing, Business and Administration – Gas Emergency Response.

Qualification and experience details for all personnel are kept in individual Personnel Files held by GasNet and recorded in Risk Manager.



2.8 Asset Management Accountabilities and Responsibilities

The asset management accountabilities and responsibilities for the key roles within GasNet are as follows:

Table 2: Accountabilities and Responsibilities

Role	Accountabilities and Responsibilities
Board of Directors	Accountable for the overall corporate governance of GasNet and to the shareholder for their actions. The governance role includes the setting of the Company's strategic direction. The Board reviews and approves the following asset management processes and plans: – Strategic Plan; – This Asset Management Plan; – Key Policies (health & safety, asset management, financial) – Annual operating and capital expenditure budgets; – Delegated financial authorities for GasNet management and other employees; – Major projects; – Risk Management Plan – Interim and Annual Reports; – Disclosure documents. The Board approves any operating expenditure purchase in excess of $50,000 and capital expenditure purchase in excess of $25,000.
General Manager	Accountable to the Board of Directors for recommending and implementing the strategic direction and for managing the day-to-day operations of GasNet.

Role	Accountabilities and Responsibilities (cont'd)
Engineering Manager	Responsible to the General Manager for ensuring that the gas distribution (network and measurement) systems are designed, constructed, operated and maintained to ensure the safe, reliable and efficient transportation of gas through its systems. The Engineering Manager is also responsible for the Public Safety Management System under GasNet's NZS7901:2008 certification.
Engineer	Responsible to the Engineering Manager for technical, planning & operational requirements associated with the design, construction, operation and maintenance of GasNet's gas distribution (network and GMS) system assets.
Engineering Supervisor	Responsible to the Engineering Manager for overseeing the construction, operation and maintenance of new and existing assets, and for the day to day management of employees, contractors and other service providers working on the assets.
Asset Information Services Manager	Responsible to the General Manager for managing the records and systems associated with the recording and management of GasNet's network asset records.
Finance & Administration Manager	Responsible to the General Manager for financial, administration and inventory functions of the company.
Technicians	Responsible to the Engineering Supervisor for completing the day to day construction, operation and maintenance activities on GasNet's gas distribution (network and GMS) system assets.

2.9 Asset Management Policy

GasNet's Asset Management Policy was last reviewed in June 2019 and approved by the Board of Directors on 17 June 2019. The policy takes guidance from the ISO 55000 series of asset management standards. The impact of this change has yet to be fully realised by GasNet but will be better understood as it works through these new standards.

2.10 Strategy and Delivery

GasNet has yet to develop a formal documented Strategic AMP but such thinking is evidenced throughout the organisation and its documentation. There are many examples of strategies both past and present that GasNet has implemented (some of which are described in this AMP), typically spanning a number of years that relate to the strategic management of its network assets.

GasNet recognises the value and benefit in centralising its strategies into one document and now plans to complete this task in conjunction with a company strategic planning review in the first quarter of the 2020-21 financial year.

2.11 Overview of Systems and Data

GasNet's information systems are extensive both in terms of hardware and software applications.

Each GasNet employee is assigned a PC; a desktop for office based personnel and either a tablet or Toughbook device with remote access for field based personnel. To strengthen resilience the company has invested in working from home hardware which provides for office systems to be moved from the office to home based environments within hours in a seamless transition without interruption to business.

All devices are connected to GasNet's IT network which is provided under a Service Level Agreement (SLA) with the Whanganui District Council (WDC). Under the terms of the SLA the WDC provide the following hardware and software support services:

Hardware Support

- All infrastructure hardware up to and including the hub at the GasNet building
- Data storage and retrieval
- Printing to network printers
- Internal and external email access
- Internet access
- Data and file access security
- Physical server and data security
- Network infrastructure maintenance
- File and data backup and recovery
- VPN access for remote working

Software Support

- Microsoft suite of applications (Windows, Office Suite, Project, Visio, Internet Explorer, Publisher)
- Finance One
- ANZ Online Banking (software)
- Payglobal
- Web Marshal

- Virus protection

The WDC has provided IT network services to GasNet, and its predecessor, for decades in a mutually beneficial arrangement, with the WDC as the "ultimate owner" having an interest in the Company and GasNet's need for IT services. The arrangement is a good fit for GasNet and provides access to services it may otherwise be unable to obtain, or that may not be cost effective for a smaller operation such as GasNet.

Based on this platform and with an extensive suite of software applications in current use, GasNet considers it is well placed to provide the ever increasing demand for information, particularly in light of the regulatory regime under which this AMP is developed.

The following table provides a summary of the main software applications currently in use.

Table 3 Software Applications

Application	Purpose
QuantumGIS (QGIS)	Capture, store, manipulate, analyse, manage, and present GasNet's network assets spatially in electronic format.
Finance One (Technology One)	Enterprise-wide control and integration of financial information including General and Job Ledger reporting, financial reporting and inventory (inward goods, stock issue, inventory management), with linkage to the payroll application PayGlobal.
Gas Registry (Gas Industry Company)	The central gas registry which stores and manages information to support the ready switching of gas customers between retailers on open access natural gas networks in New Zealand (GasNet, Powerco & First Gas).
IntraMaps (Digital Mapping Solutions)	Web based viewing application providing office and field access to GIS records of the network, and ICP information uploaded from the MIDaS application.
FieldGO (previously KernMobile NZ)	Web based works management and field data capture application.
MasterLink (Mercury)	Proprietary software associated with the Mercury Time of Use devices which log gas flow volume, pressure and temperature.
MIDaS (GasNet)	Developed in 2006 specifically for GasNet the MIDaS, or "Meter and ICP Data System" (MIDaS), application is the database of record for all ICP, retailer and consumer information, which is reconciled on a regular basis with the Gas Registry. All information that is attributed to an ICP is held in MIDaS. MIDaS also provides the throughput and associated billing information for invoicing retailers for network services provided.
OATIS (First Gas)	OATIS which stands for "Open Access Transmission Information System", provides access to historic volume throughput information for each of GasNet's 5 Sales Gates, and can be selected in daily or hourly increments.
PayGlobal	Payroll services including timesheet entry and leave management, with linkage to Finance One.
PMAC (Technology)	Proprietary software associated with the Cello devices which captures and manages the pressure and measurement data from remote monitoring sites (referred to in this AMP as Monitoring and Control Systems) in addition to over/under pressure alarms which are relayed to Technicians for first response.
Risk Manager (Impac)	Web based safety and environmental risk management application which captures stores and manages all risks identified by GasNet, integrated with incident investigation management and reporting.
Synergi Gas	Natural gas network modelling software used to analyse the gas distribution network through modelling of the network assets and application of pressure and flow scenarios to determine the effects on the network. The application provides information to facilitate design, planning and operating decisions.
TicketAccess (PelicanCorp)	Automated plan response to asset location enquiries.
Intranet (SharePoint)	Central access point to the latest version of key Company documents (i.e. Policies, Procedures, Safe Work Procedures (SWP's), Plans, Registers,

	Forms, Material Specifications, Material Safety Data Sheets (MSDS), etc.).

In addition to a wealth of information contained within the various applications and databases referred to above, GasNet has an extensive range of MS Excel spreadsheets and one MS Access database. Whilst ideally all data should be held within a managed software application, there are many instances where it is not cost effective to do so, typically due to the infrequency of use or the amount of information/data being held.

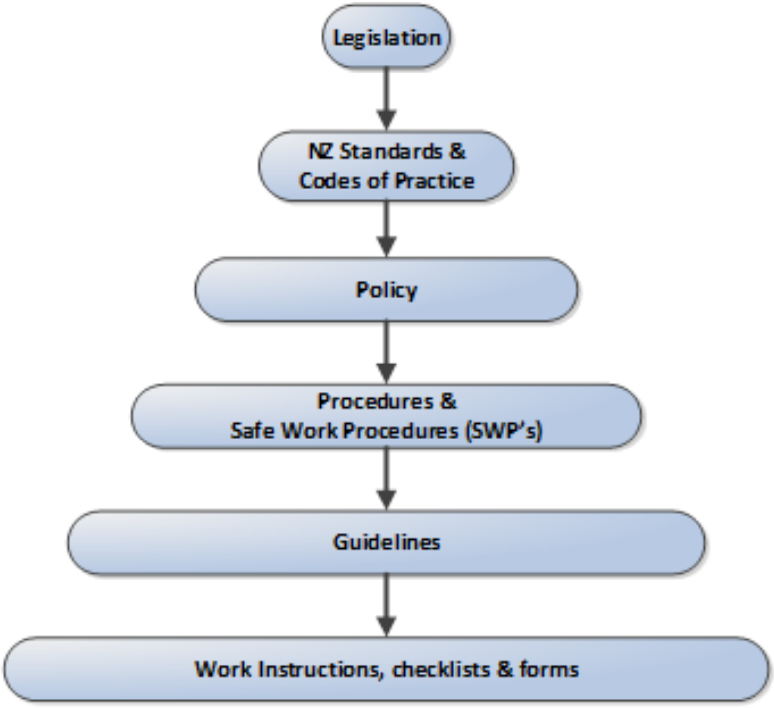
GasNet recognises that the Information Disclosure Determination 2012 (IDD) significantly increases the level of data capture, and information management and disclosure, GasNet considers itself well placed to ensure that it will continue to meet or exceed the demands on its information technology systems.

2.12 Overview of Asset Management Documentation, Controls and Review Processes

Much of GasNet's asset management documentation is integrated within other documentation and consequently there are few asset management specific documents. GasNet's Public Safety Management System (PSMS) is an example where the opportunity was taken to integrate asset management with the documentation developed for the safety management system, particularly relevant given many of the synergies between the requirements. The Risk Management Policy is a generic document encompassing all risks the Company either is or may be exposed to, as shown in the comprehensive risk matrix contained within the Policy.

With the significant increase in documentation over recent years it has been essential to ensure documents are subject to a control regime that guarantees the latest version of any document is available to those that need it, and also that it is clear which documents are in draft and which have been superseded. GasNet's Intranet provides the primary access point for key GasNet documentation, with the latest versions once approved being posted on the site. In addition, a suite of Registers, also available on the Intranet, provides the master list of documents and their status.

The following diagram illustrates the hierarchy of documents within the Company's Policy Framework. A document lower in the hierarchy cannot be inconsistent with a document higher in the order or precedence.



3.0 OVERVIEW OF ASSETS & CONSUMERS

GasNet's origins go back to the reticulation of manufactured gas within the city of Whanganui. Over the following decades as the city developed and grew so too did the gas infrastructure until the availability of natural gas in the late 1960's displaced the need for manufactured gas. Although much of the original infrastructure has been replaced, there still remains approximately 45 km of low pressure metallic mains in operation and subject of an on-going mains replacement activity. All networks owned and operated by GasNet have been constructed to natural gas standards since 1970.

In the years prior to the availability of natural gas the number of consumers and their use of gas varied dramatically and was in a state of significant decline. However with the availability of the cleaner natural gas and the higher operating pressures that it offered, there was a resurgence and growth over the following decades that has provided a degree of stability in terms of both the number of consumers connected and the volumes of gas that they use.

GasNet's assets and the consumers that it serves are co-dependent so it is critical that in managing its assets GasNet understands the current and future needs of these consumers, and to the extent that it can be achieved understands the future needs of its consumers.

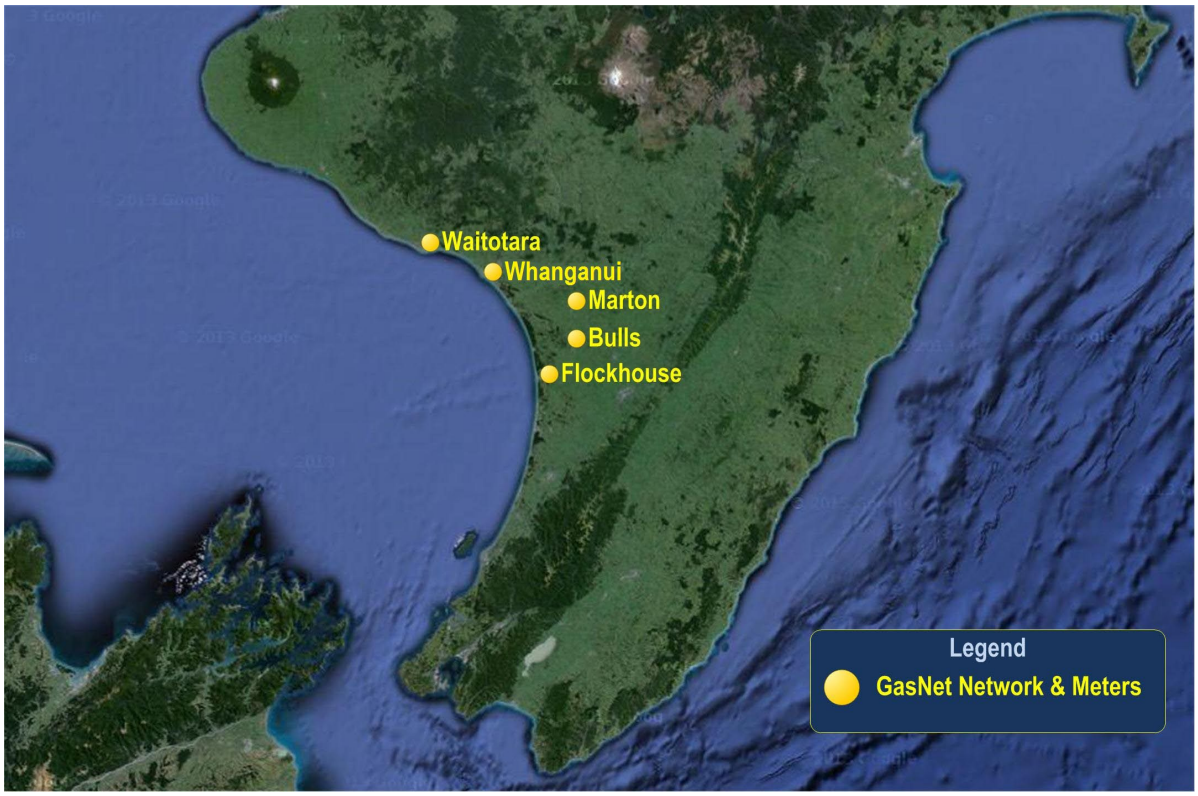
The following sections provide an overview of GasNet's assets and their geographical footprint, followed by an overview of the current and future consumer needs and demands.

3.1 Gas Distribution Networks

3.1.1 Networks

GasNet owns and operates five discrete natural gas networks as shown in Figure 1 below. Each network is connected by a Sales Gate station to the First Gas Limited (previously Vector Limited) owned transmission pipeline. The five networks are known as Whanganui, Marton, Bulls, Waitotara, and Flockhouse.

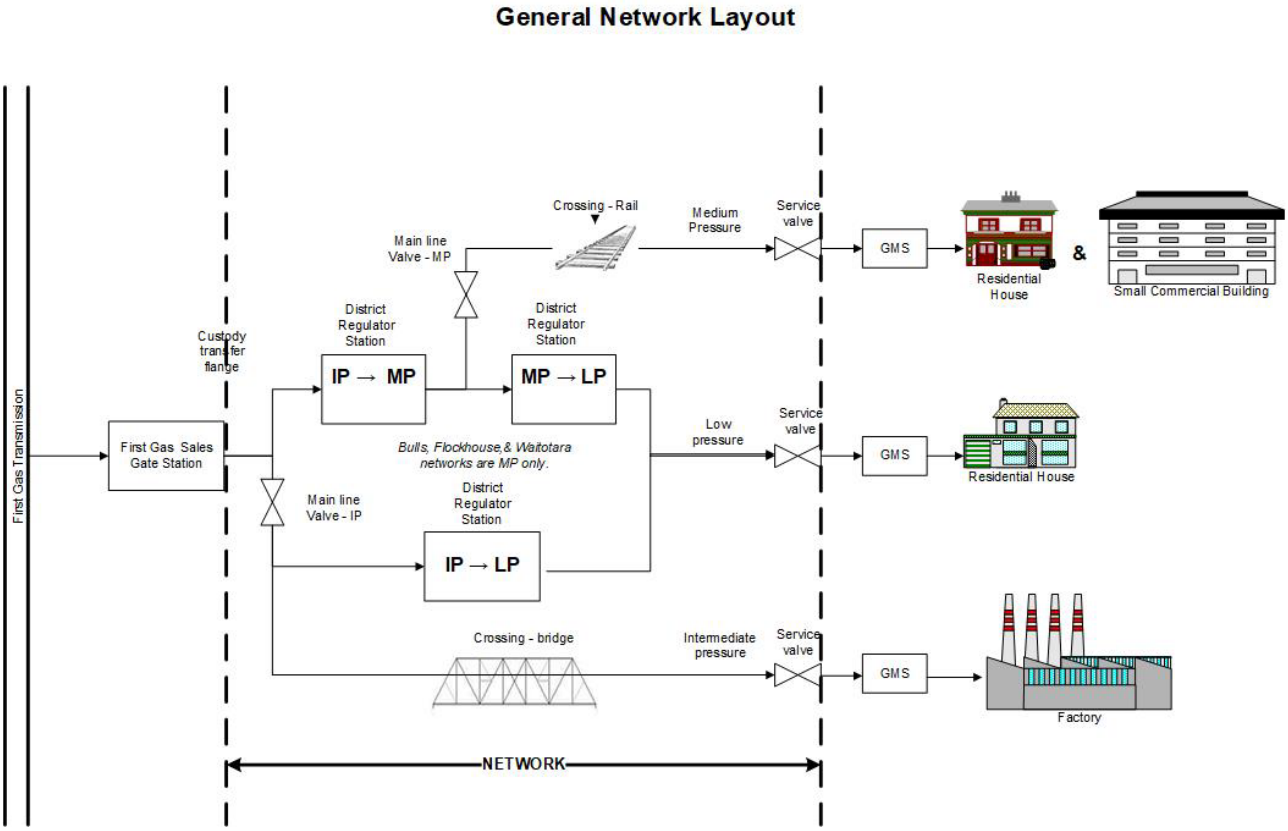
Figure 1: Network Locations



Each GasNet network begins at the designated outlet of each Sales Gate station and labelled 'custody transfer' point. Natural gas is transported through a combination of metallic and polyethylene pipes in the GasNet network, typically reducing in pressure to the consumer's property. The outlet of the gas service valve at a consumer's property represents the end of the network and the 'demarcation point' between network and Gas Measurement System (GMS) assets.

Figure 2 shows the configuration of a typical gas network indicating the demarcation points, the means of supplying gas at various pressures to industrial, commercial, and residential users, and the equipment required to operate the network.

Figure 2: General Network Layout



3.1.2 Network Assets

Each network comprises assets categorised as mains and services, district regulator stations, valves, and crossings, interconnected in a layout similar to that shown in Figure 2 above.

3.1.2.1 Mains

Mains are larger sized pipes which are used to transport volumes of gas from one point on the network to another for further distribution and use. They are principally installed underground, are constructed of either metallic or polyethylene material and transport gas at intermediate (IP), medium (MP), and low (LP) pressures.

IP mains are all steel construction while MP mains are generally constructed of polyethylene material. LP mains are a mix of materials including polyethylene and various metallic materials (welded or riveted steels, and cast or wrought irons).

3.1.2.2 Services

Services are generally smaller sized pipes which are used to transport volumes of gas from a main to a GMS installed typically on the consumer's property. Services are principally installed underground, and transport gas at intermediate (IP), medium (MP), and low (LP) pressures.

IP services are all steel construction while MP services are generally constructed of polyethylene material. LP services are a mix of materials including polyethylene and various metallic materials.

Services include the riser pipe which terminates the service pipe above ground level and also incorporates a service valve which is attached to the end of the riser pipe. The service valve is the demarcation point between the network and the GMS.

3.1.2.3 District Regulator Stations (DRS)

District Regulator Stations reduce and regulate the gas to suitable pressures to enable distribution across large areas. DRS are generally constructed of steel components and reduce pressures from IP to MP and/or LP, and MP to LP pressures.

DRS configurations include twin stream active/monitor regulation, single or twin stream active/monitor, worker/standby stream, and single stream worker only. The combination of the active, monitor, and single standby configurations provide for protection of the gas supply from an over or under pressure event following failure of a DRS component that could otherwise have resulted in a safety or interruption-to-supply incident.

The district regulator stations are categorised as DRS or mini DRS. Mini DRS generally supply only a limited number of consumers and are typically installed where the main fronting the properties is not suitable for individual service connections.

3.1.2.4 Main Line Valves (MLV)

Main line valves are installed in strategic locations to allow isolation of sections of the network for public safety in the event of an emergency, to isolate specific network assets such as DRS, to facilitate maintenance, or to allow further connection. MLVs are installed underground and in most cases are accessed via a chamber and lid through which a valve key may be inserted to operate the valve. There are three types of MLV: polyethylene ball valves, flanged steel ball valves, and flanged steel or iron plug valves.

3.1.2.5 Crossings

A Crossing refers to any section of main or service that passes under or over an area of special interest that has a different risk profile to that of other mains or services located in areas of a more general nature. Crossings include all mains that pass under railway lines or over rivers and streams, are mounted on bridge superstructures, or otherwise supported above the ground.

3.1.2.6 Corrosion Prevention & Cathodic Protection

A range of proprietary coating systems provide the primary means of protecting steel pipes and fittings from corrosion both above and below ground.

A secondary protection system for all underground IP and MP steel mains and services, known as Cathodic Protection (CP), is also installed which uses either an impressed current system, sacrificial anode system, or combination of both. Monitoring test points are positioned at strategic locations along the mains and at District Regulator Stations to enable measurement of the level of protection at that location. Routine CP monitoring checks are performed to confirm adequate levels of protection are maintained. Further information on the type and frequency of these maintenance checks can be found at section 5.8.

3.1.2.7 Monitoring and Control Systems

At various strategic locations across the IP, MP, and LP networks, Monitoring and Control Systems are installed to monitor and record network data. Generally a Monitoring and Control System utilises modem and internet connection to transmit time stamped data to a central collection point for analysis. Typically the Monitoring and Control System has the ability to transmit network alarms real time to operational personnel for action.

In addition to pressure and voltage Monitoring and Control Systems, GasNet has included in this asset category its one Network Metering Station located at the Rotokawau subdivision in Whanganui that is used to measure all gas entering a discrete area of residential housing. The Network Metering Station consists of a meter, associated data capture device, remote access telemetry and necessary valving, pipe work, etc.

Information captured from all Monitoring and Control System units can also be used in throughput modelling, consumption predictions, and as a valuable input to network design.

3.1.3 Physical Statistics

Below is a summary of GasNet's network assets covered by the AMP.

Table 4: Network Assets Physical Statistics

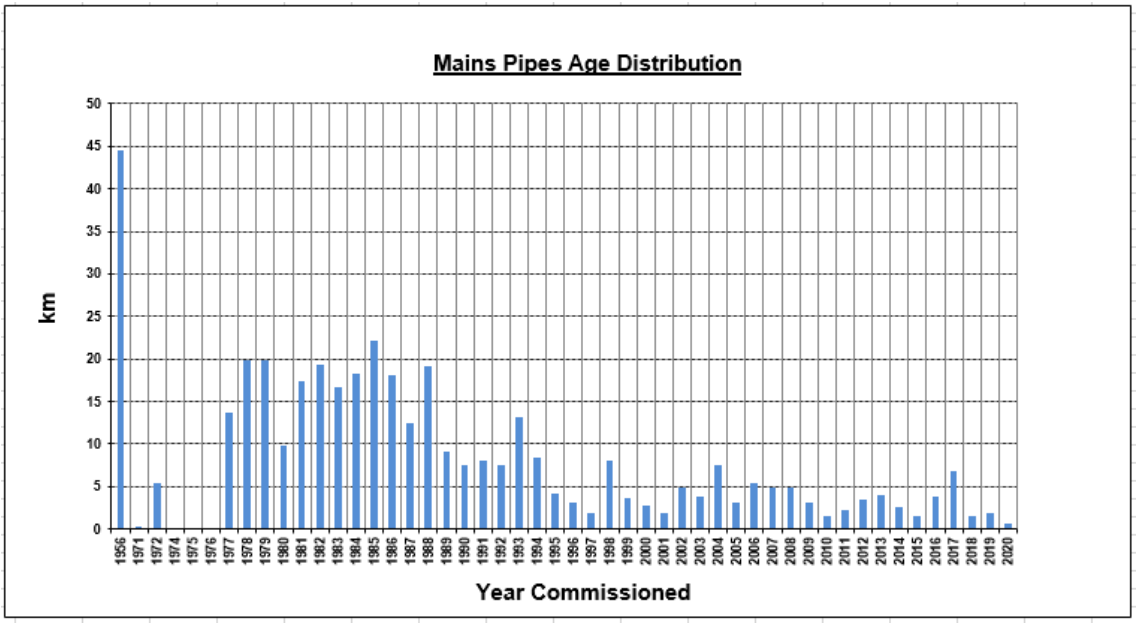
Asset	Number	Length (m)
Mains	-	401,772
Services	12,685	256,647
District Regulator Stations	15	-
Mini District Regulator Stations	9	-
Main Line Valves	165	-
Crossings	55	-
Cathodic Protection	2	-
Monitoring & Control Systems	48	-

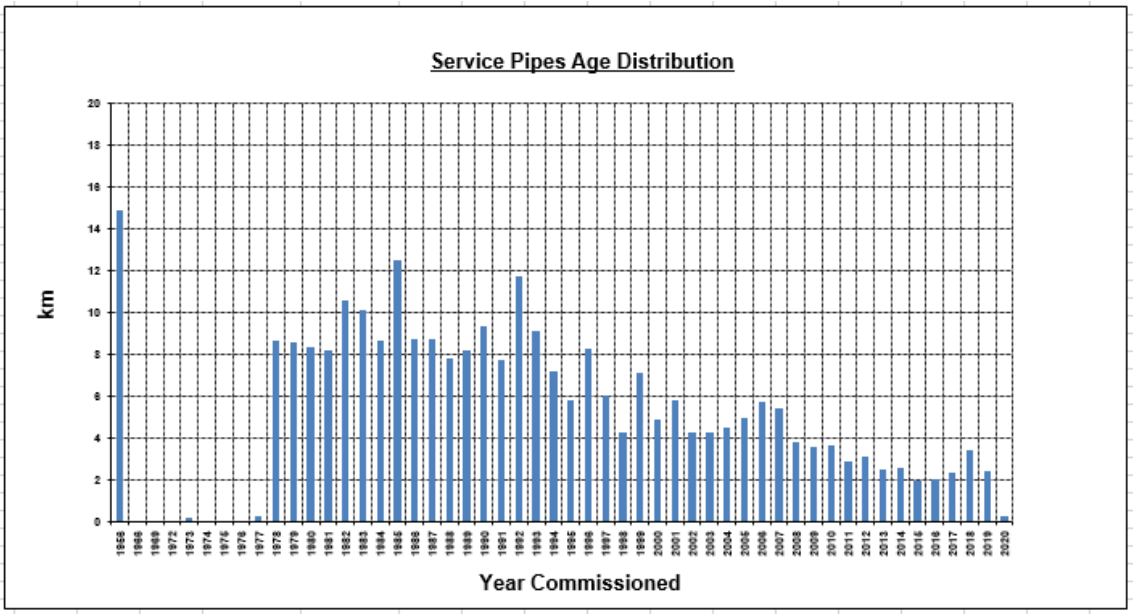
3.1.4 Asset Age Profiles

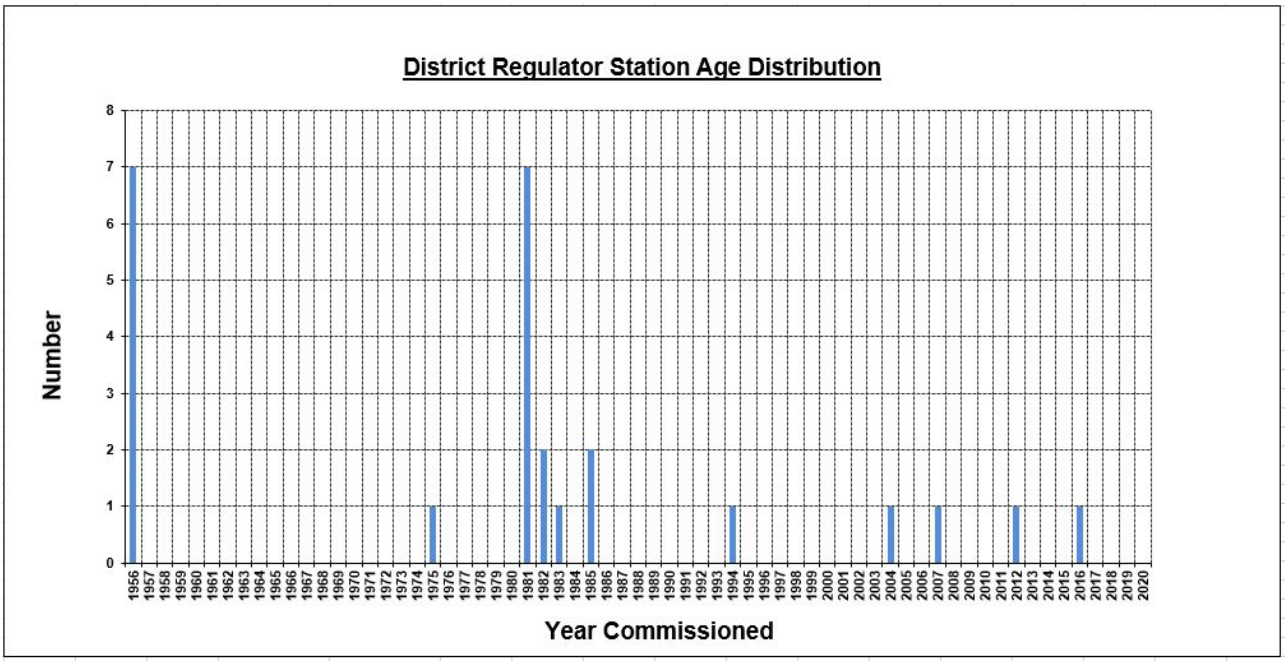
The following profiles are extracted from the most recent data sets available at the time of preparing this AMP. Assets which pre-date natural gas are populated with a default date of 1956 since identifying installation and commissioning dates for assets of that era has proven problematic due to insufficient records.

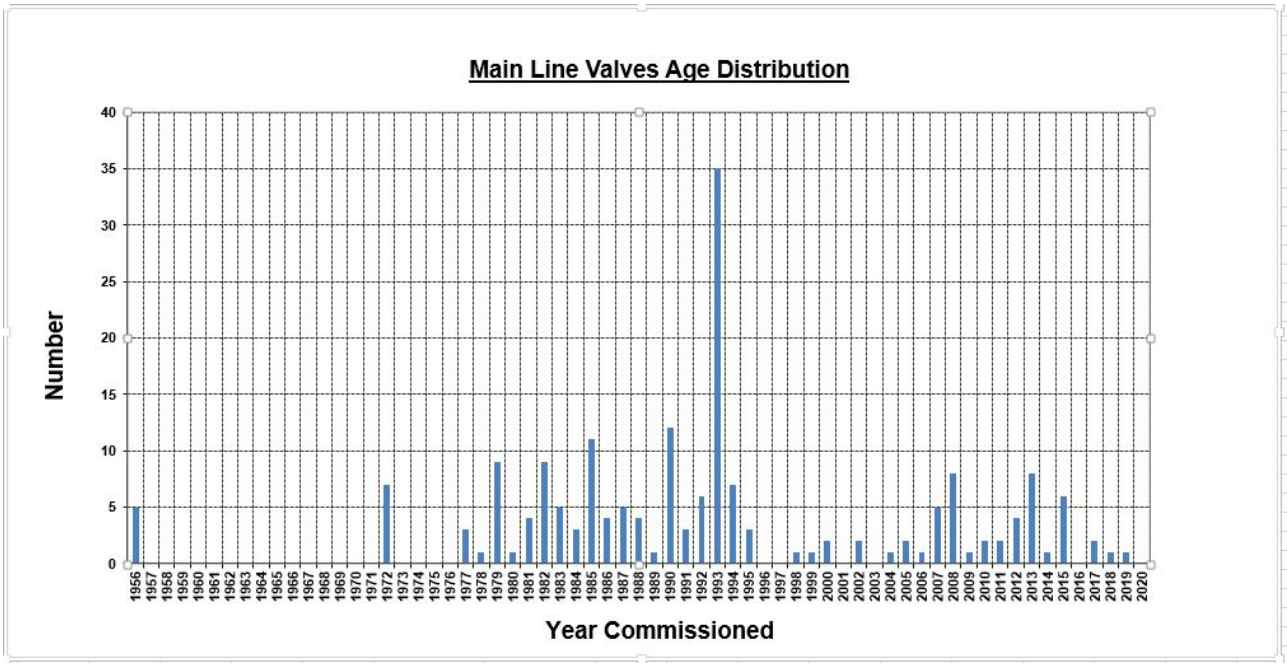
In respect of data accuracy for the pipe assets (mains, services, and crossings) it is judged that 50% of the installation dates are based on known information, while 50% are unconfirmed and based on assumptions made from other related records, or determined by a suite of rules.

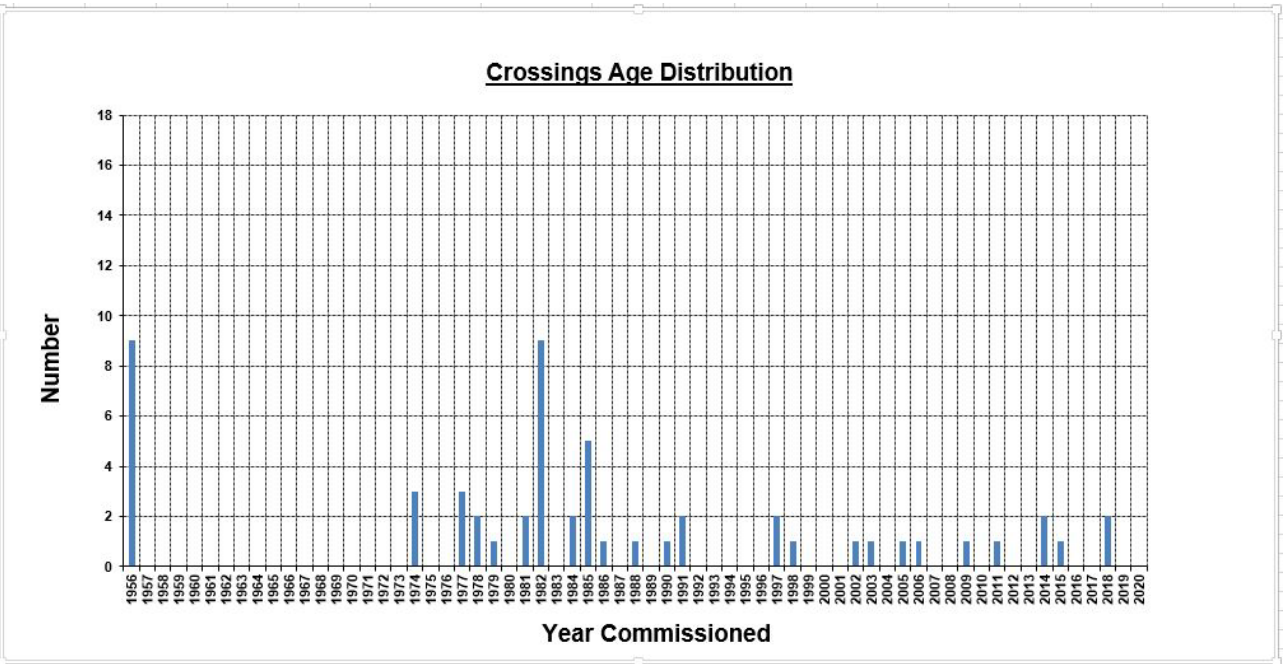
In many instances the service pipe to a consumer's premise comprises multiple sections of pipe that are not necessarily of the same installation date. The age profile then for services reflects the length of each service pipe component, rather than the number of services.






District Regulator Station Age Distribution
Number
Year Commissioned


Main Line Valves Age Distribution
Number
Year Commissioned



3.2 Gas Consumers & Utilisation

3.2.1 Consumer Overview

GasNet's networks provide gas to a wide range of consumers, from an extensive mass market consumer base comprising residential and small commercial consumers through to a few very large commercial and industrial consumers.

GasNet's contractual relationship and the associated obligations are with the energy retailers with whom consumers enter an agreement for their gas supply. Despite this, GasNet still has a good and purposeful relationship with consumers, an interest in ensuring that their needs are met, and in providing them with a safe and reliable gas supply.

GasNet offers the same level of service and quality to all consumers, and distinguishes them by their capacity needs rather than whether they are a residential, commercial, or industrial consumer. Because the capacity needs and demand profile for each consumer are key drivers behind GasNet's ability to deliver a safe and reliable gas supply, they form the basis of GasNet's asset management strategy and the pricing for its services.

3.2.2 Load Group Classifications

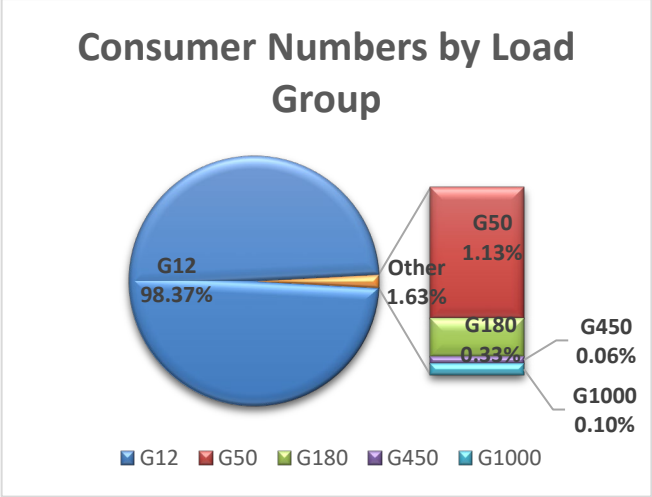
Consumers gas supplies are assigned to one of five Load Groups based on their maximum hourly demand as described in the following table.

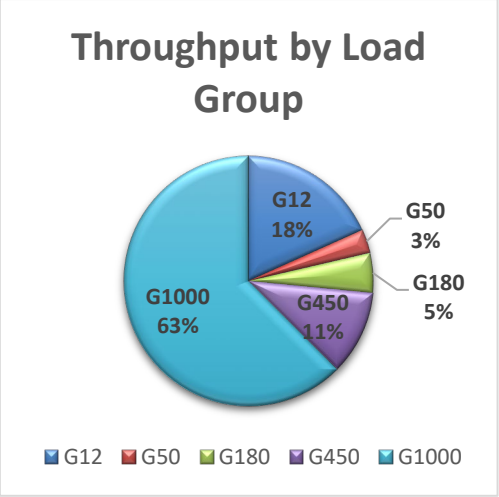
Load Group	Criteria	Consumers (No.)	Throughput (GJ)
G12	Up to 13 scmh	9794	244,666
G50	>13 and ≤ 50 scmh	113	41,049
G180	>50 and ≤ 180 scmh	33	68,950
G450	>180 scmh	6	145,884
G1000	Individually Priced	10	835,848
		9956	1,336,398

The reference to scmh in the above table is an industry standard term that relates to the volume of gas measured in Standard Cubic Metres per Hour, and the consumer numbers and throughput quantities are as reported in GasNet's annual disclosures for 30 June 2017. To assist with understanding, 5 scmh is the approximate volume of gas required to supply a typical instantaneous water heater operating continuously at maximum output.

3.2.3 Load Group Profiles

It is evident from the consumer numbers and throughput quantities for each of the Load Group categories shown in the table above, that consumers in the G12 group whose demands are the least make up the largest proportion of consumers while the number of consumers whose demands are greater, is relatively insignificant.

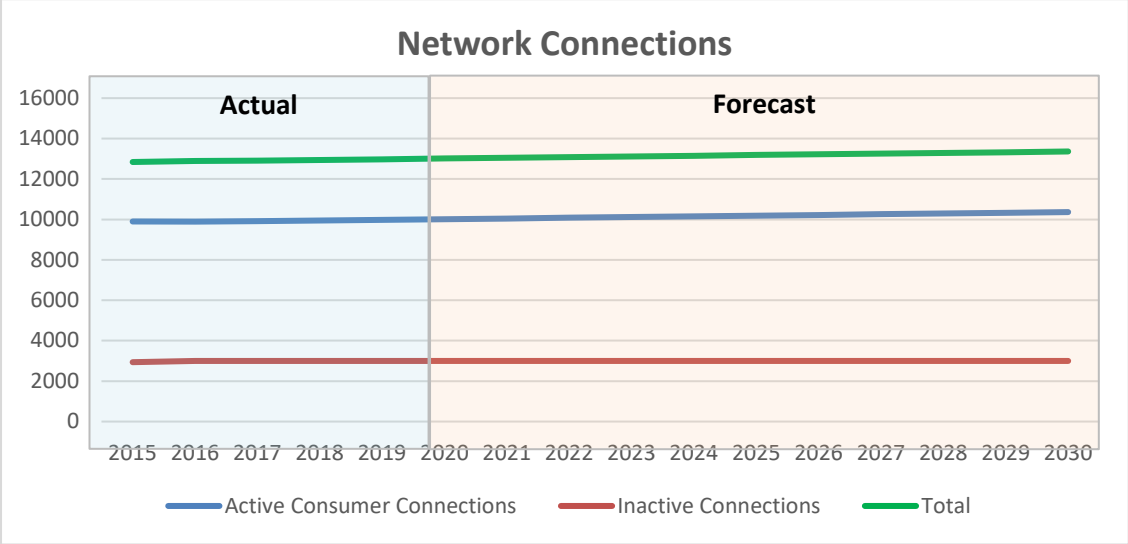




The situation where there is a very large number of consumers with small demand needs or a small number of consumers with very large demand needs can equally have a significant impact on GasNet's ability to maintain a safe and reliable supply of gas to all consumers. It is widely acknowledged that a single consumer whose demands are large can impact significantly on the network if their demand increases materially, but the same can occur if the collective gas demand increases dramatically for the larger population of predominantly residential consumers, such as can occur during severe weather events.

3.2.4 Connection and Consumer Numbers

The total number of connections across all networks has changed little in recent years, increasing typically by 50 per year. Acknowledging the numerous influences outside GasNet's control that will dictate the level of new connections in future years, it has been assumed that the total number of connections will increase by similar amounts on an annualised basis. The net annual increase is the difference between the number of new connections made in the year minus the number of connections that are permanently disconnected from the network, typically where consumers no longer require a gas supply on their property.

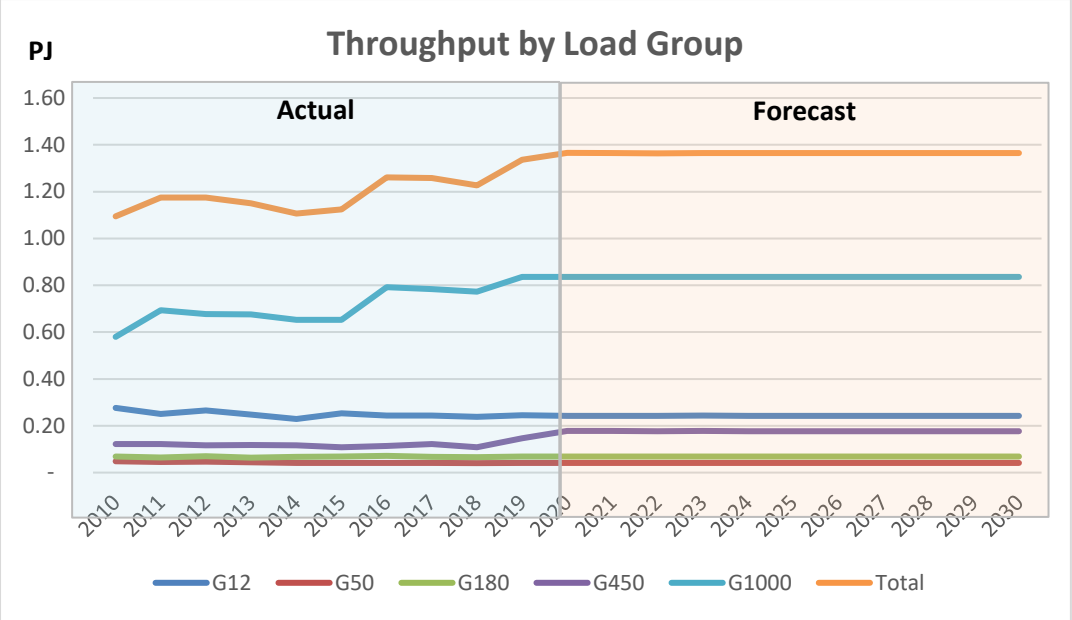


In the above graph "Active Consumer Connections" relates to live gas connections where a gas meter is installed and gas is able to flow, and "Inactive Connections" are those connections that have been temporarily disconnected from the network so that gas is unable to flow irrespective of whether a meter is installed or not.

3.2.5 Network Throughput

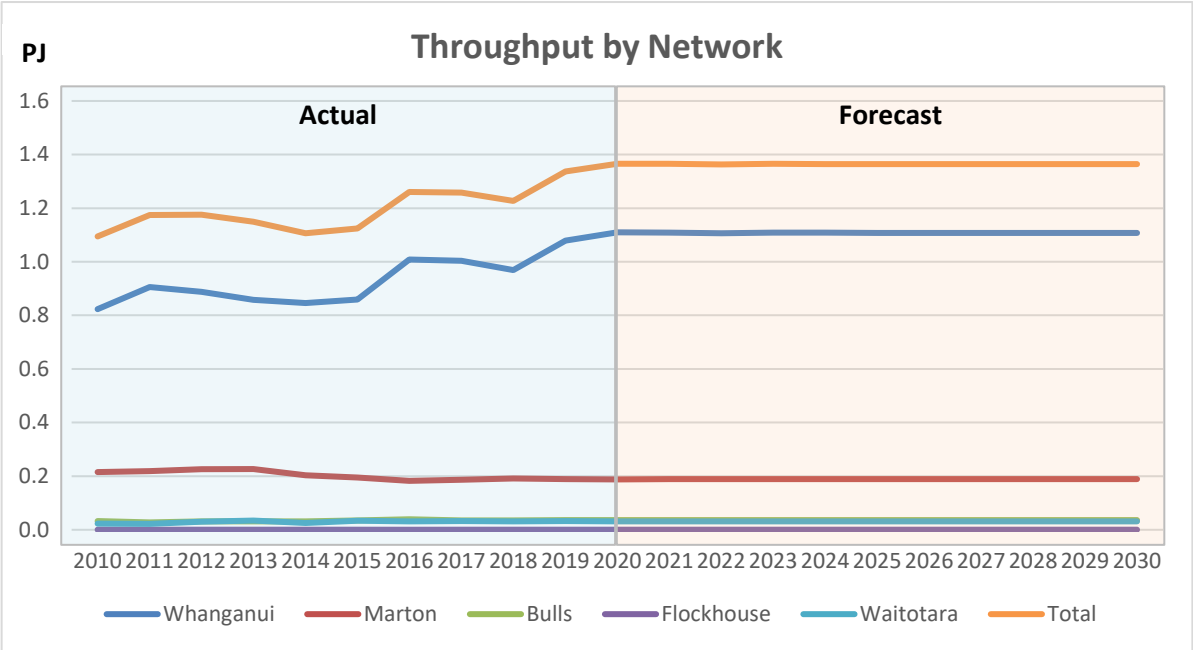
The volume of gas transported through GasNet's networks has increased noticeably in recent years due almost entirely to the commissioning of two new Open Country Dairy whole milk powder plants in Whanganui, the first in 2010 and the second in 2015. Both of these plants are supplied directly from the Whanganui Intermediate Pressure network and being located in close proximity to the Sales Gate meant there was sufficient capacity available to supply the increase in demand without need for system reinforcement. Both supplies are within the G1000 Load Group.

Had it not been for the two Open Country Dairy plants, the throughput in recent years would have remained around the historic 1PJ level.



In March 2018 the Whanganui District Council commissioned its new Waste Water Treatment Plant (WWTP) in Whanganui which utilises natural gas for sludge drying. The new gas supply was commissioned in September 2017 for pre-commissioning trials with usage expected to increase progressively until reaching full production during 2019.

Forecasting future network demand can be difficult and problematic. Whist large loads such as that associated with the two Open Country Dairy plants are an exception and do not come along very often; they do provide a good example of how difficult it can be to anticipate growth in consumer demand, both for existing and future consumers. With the two Open Country Diary plants up to full operation the ten year forecast demand includes provision for the full planned WWTP load and otherwise stable usage across all Load Groups thereafter.



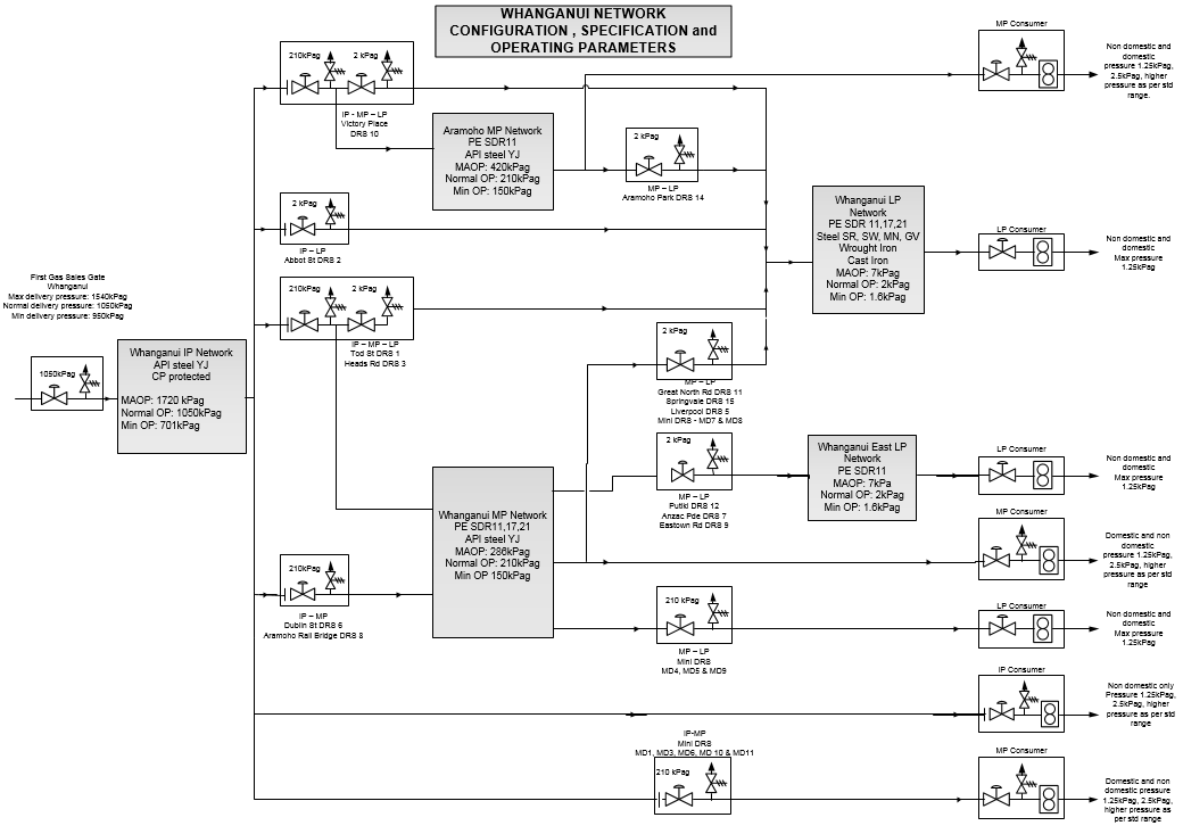
Similarly the throughput within each of GasNet's five networks shows relative stability amongst all but Whanganui, with the impact from the two Open Country Dairy plants and the future WWTP obvious on the Wanganui network profile.

4.0 ASSETS COVERED

4.1 Whanganui Network

The Whanganui network transports natural gas at intermediate (IP), medium (MP), and low (LP) pressures. Figure 3 is illustrative of the configuration, specification and operating parameters of this network.

Figure 3: Whanganui Network Configuration



4.1.1 Intermediate Pressure (IP) System

The IP system shown in Figure 4 below is generally designed as a single arterial pipeline from the Sales Gate station to Castlecliff in the west and to Aramoho in the north, with reinforcement looping of the industrial areas. It is currently operating at 1050 kPag.

The system was originally designed to supply major industrial consumers and DRS were located at points along the pipeline matching adverse demand requirements. As looping of system sections exists to reinforce industrial demands, the balance of the system is reliant on the integrity of these sections of the IP mains to provide continuous supply.

4.1.1.1 IP Summary Physical Statistics

Intermediate pressure system physical statistics are summarised in Table 5 below.

Table 5: Whanganui IP System Physical Statistics

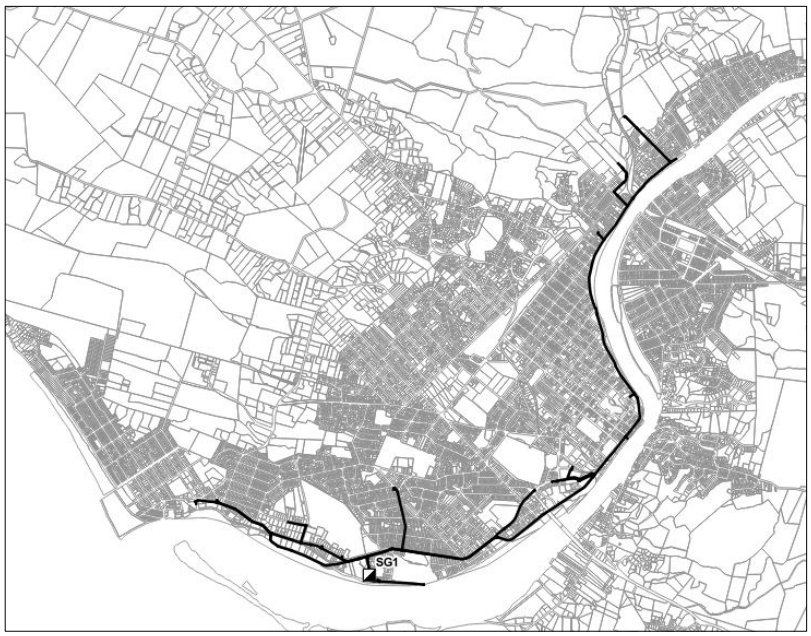
Asset	Number	Length (m)
Mains	155	20,462
Services	35	1,122
District Regulator Stations	6	-
Mini District Regulator Stations	4	-
Main Line Valves	30	-
Crossings	14	-
Cathodic Protection	1	-
Monitoring & Control Systems	7	-

4.1.1.2 IP Mains

The IP mains are constructed of steel API specification line pipe coated with yellow coloured polyethylene material (known as yellow jacket pipe). The steel pipe is weld jointed at 6 or 12 metre intervals, and terminates at stations or other equipment with welded flanges. The IP mains are generally installed underground by open trenching method and are fully electrically insulated.

In Figure 4, the IP mains are shown as a black line. The Whanganui Sales Gate station is shown as "SG1".

Figure 4: Whanganui Intermediate Pressure System



Following the introduction of natural gas to Whanganui in 1973, the IP system was constructed. Reinforcement looping of the network was built in the early 1980s during a period of significant network growth. Further improvements in supply were achieved with the interconnection of two critical Intermediate pressure mains that together transport the bulk of the gas to the Whanganui network thus ensuring a reliable supply to consumers is maintained during the planned network crossing upgrades or any event that could compromise the integrity of either main.

The IP mains contain gas at the highest of the network pressures and accordingly are constructed under appropriately high standards. The API steel pipe used in construction is high specification steel, jointed using strictly controlled welding processes and the resulting pipe joints are tested by radiographic examination and then tested under pressure prior to the introduction of gas. The API specification that the pipe is required to meet provides for a pipe wall thickness sufficient to allow for the maximum pressure that the pipe may experience in its life with a significant factor of safety applied.

IP mains are rated in good condition based on the limited evidence of some assets that have been sighted during construction activities and results from the scheduled coating surveys. Typically the highest risks to these assets are third party damage and corrosion.

4.1.1.3 IP Services

The IP services are connected to mains using a variety of methodologies and are always terminated above ground with a welded flange. All IP services are electrically insulated and isolated from the main and from the GMS. IP services are constructed of API specification line pipe and meet similar construction standards as IP mains.

IP mains are rated in good condition based on the limited evidence of some assets that have been sighted during construction activities and results from the scheduled coating surveys. Typically the highest risks to these assets are third party damage and corrosion.

4.1.1.4 IP District Regulator Stations (DRS)

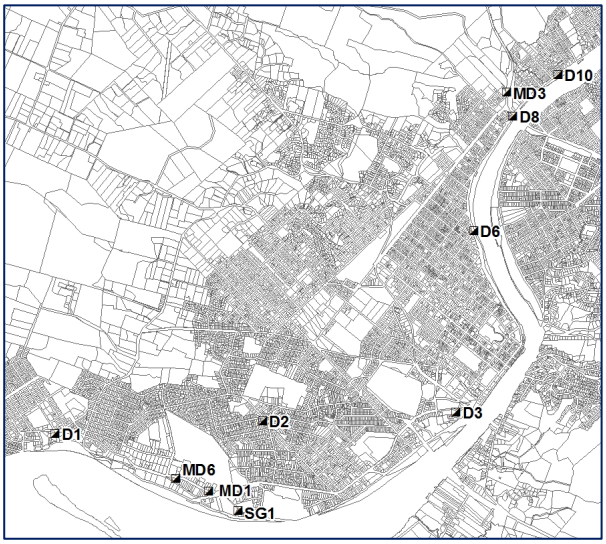
DRS configurations include twin stream active/monitor regulation, single or twin stream active/monitor, worker/standby stream, and single stream worker only. The mini DRS are generally configured as single stream worker only.

The condition of IP DRS's is generally good with most showing normal signs of deterioration due to age. Some of the components from which the IP DRS's are constructed are becoming obsolete while others require replacement parts that are becoming uneconomic and/or difficult to procure, so that they are being replaced with a modern equivalent. The installation of any replacement equipment requires modifications to the design.

Some station enclosure roofs are showing signs of corrosion and replacement programmes in place for 3 years will be ongoing. Enhancements to the station enclosure in 2019 provided the DRS with additional protection from interference and improve public safety

In Figure 5, DRS are shown prefixed with a “D” and the smaller mini DRS with “MD”. The Sales Gate station is shown as “SG1”.

Figure 5: Whanganui Intermediate Pressure DRS



4.1.1.5 IP Main Line Valves (MLV)

MLV’s are used to split sections of looped network, isolate strategic assets such as crossings and DRS, and isolate branch connections off the main arterial pipeline. MLV’s are located principally underground, in pits or chambers that are accessible from the surface for insertion of valve keys to enable their operation. IP MLV’s are flanged ball or plug types constructed of steel or iron material.

IP MLV’s are rated in good condition based on records made at the periodic inspection and operation of valves. Evidence of the condition of MLV is limited to external condition and the operability of valves that are accessible from the surface. Iron plug valves that are installed in above ground pipework and exposed to the environment tend to become hard to operate and require additional maintenance, if excessive force is required for operation replacement is necessary. It is planned to replace three such valves installed at the Whanganui Sales Gate during 2020/21. Risks to MLV include road contractors tar sealing over the top of the lids making them inaccessible, and the ingress of surface debris making access difficult.

4.1.1.6 IP Crossings

Crossing types include bridge, stream, aboveground and rail. Each type of crossing is constructed to meet the specific risk profile of the environment in which the gas asset is located. IP crossing construction can include casing and vents, roller support mounts, thermal expansion joints, and other specialist fittings.

IP Crossings are rated in good condition based on the limited evidence of some assets that have been sighted during construction activities. Condition assessment of crossings can be difficult for various reasons e.g. the location of the pipeline is typically relatively inaccessible, it is laid under a major asset that cannot be disturbed, or it is inserted within a casing that prevents access for inspection. Uncased crossings that are above ground such as those spanning streams at higher risk due to their exposure to environmental conditions, are assessed for condition by visual inspection. Typically the highest risks to these assets are third party damage and corrosion.

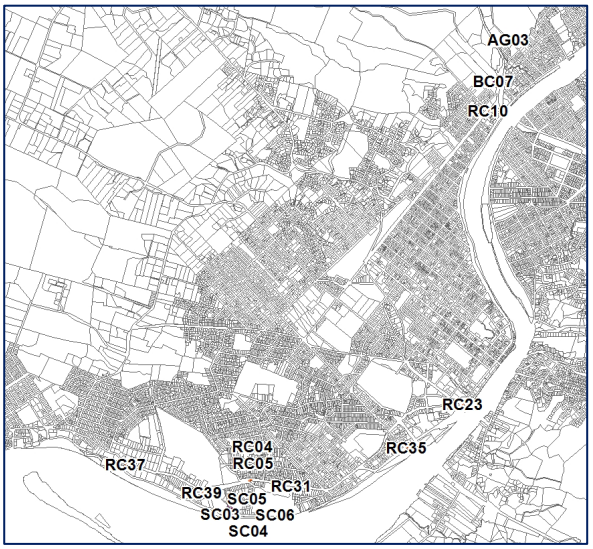
Third party damage can occur as a result of the normal operation of the asset that is being crossed, e.g. railway, road, bridge or another utility utilising the same crossing. In this example, damage of IP crossings can be brought about by external loads, movement, vibration and electrical currents imposed by the asset crossed. Cased crossings can mitigate some of these effects by providing mechanical protection to the carrier pipe but casings may also adversely affect the integrity of the carrier pipe by shielding cathodic protection current to the pipe, or reducing the cathodic protection or CP effectiveness on the pipe in the vicinity of the crossing.

Maintenance of IP crossings is generally organised to coincide with leakage surveys that are scheduled on a 3-6 month frequency and the annual close inspection of above ground pipework. Minor corrosion repairs are completed as found on an annual basis.

In 2018, three IP stream crossings were replaced and relocated from above ground to underground location in order to minimise risks associated with exposure to both environmental conditions and third party interference.

In Figure 6, bridge crossings are shown prefixed with “BC”, stream crossings with “SC”, above ground crossings with “AG”, and rail crossings with “RC”.

Figure 6: Whanganui Intermediate Pressure Crossings



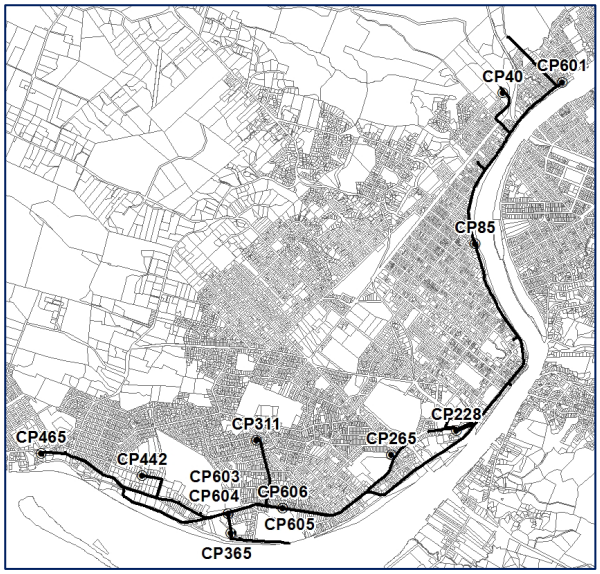
4.1.1.7 IP Cathodic Protection System

The Whanganui Cathodic Protection system comprises a combination of impressed current and sacrificial anode systems. The IP mains constructed in the 1970's when natural gas was first introduced to Whanganui were protected by sacrificial anodes installed at regular intervals along the buried steel mains, each with its own test point at ground level for monitoring purposes.

In the mid 1980's a new impressed current system was installed adjacent to the Sales Gate comprising a rectifier supplied from the local electricity network and a sacrificial anode bed installed in the Whanganui River bed. Whilst for a variety of reasons a number of the original sacrificial anodes have been permanently disconnected from the system over the years, a number still remain in service operating in conjunction with the impressed current system.

In Figure 7, cathodic protection monitoring test points are shown prefixed with "CP" and the IP mains shown as a black line.

Figure 7: Whanganui IP Cathodic Protection Test Points



4.1.1.8 IP Monitoring and Control Systems

IP monitoring is a part of the wider network electronic pressure and CP monitoring system. Operational conditions are checked at various points on the IP system and data is sent daily to a central monitoring station. The equipment is configured to monitor for critical minimum IP system parameters and if compromised will activate alarms which are transmitted to monitoring software that notifies operational personnel. GasNet has installed pressure monitoring telemetry at key demand sites.

4.1.2 Medium Pressure (MP) System

The MP system shown in Figure 8. below is generally designed in a grid configuration with mains connected wherever pipes cross. The system is constructed predominantly of polyethylene with four sections of API steel, being designed with a maximum allowable operating pressure of 286 kPag and is operating at 210 kPag.

Construction of the MP system commenced in 1977 with API steel mains installed between DRS. Further development of the MP system brought the benefits of higher pressure distribution. Much of the MP system has been constructed by inserting the newer PE pipe into the older (pre natural gas) metallic pipes.

In 1989 a decision was taken to cease refurbishment (reconditioning) of LP metallic mains and instead insert them with polyethylene pipe and thereby be able to increase the operating pressure to MP. Alternatively GasNet would replace them with polyethylene pipe of the same size and continue to operate them at LP.

4.1.2.1 MP Summary Physical Statistics

Medium pressure system statistics are summarised in Table 6 below.

Table 6: Whanganui MP System Physical Statistics

Asset	Number	Length (m)
Mains	-	109,050
Services	2,661	54,268
District Regulator Stations	7	-
Mini District Regulator Stations	5	-
Main Line Valves	101	-
Crossings	11	-
Cathodic Protection	1	-
Monitoring & Control Systems	12	-

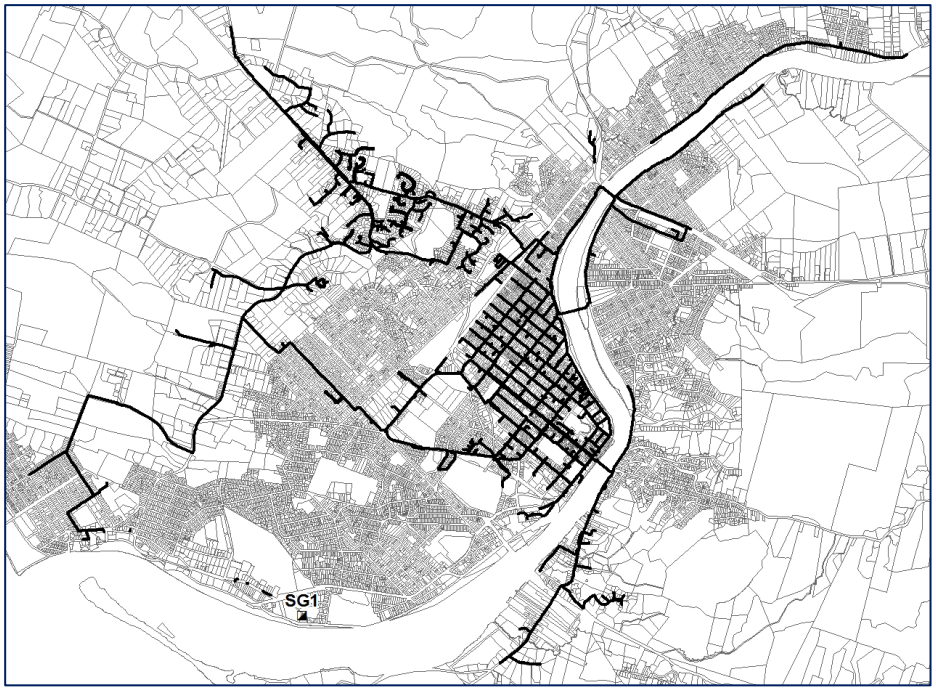
4.1.2.2 MP Mains

The MP mains are almost entirely constructed of polyethylene pipe with a small amount of API specification line pipe coated with yellow jacket. The first polyethylene pipe installed was high density polyethylene, (HDPE) and it continued to be installed until the introduction of medium density polyethylene (MDPE). Thereafter all further construction used MDPE as this proved to be a more durable pipe material.

The risks associated with the polyethylene MP mains in general include polymer material issues (explained below), third party damage, and historic joint quality.

In Figure 8, the MP mains are shown as a black line. The Sales Gate station is shown as “SG1”. Some lengths of MP mains appear separated from the bulk of the mains as they are fed from a mini-DRS (not shown).

Figure 8: Whanganui MP System



The condition of MP mains and the polyethylene pipe systems installed is thought to be related to age; early PE installations used first generation HDPE materials the properties of which offered limited resistance against severe environmental and operating conditions. Early manufacturing, site construction and installation practices were manual and prone to human error. There are only a very few recorded incidents of failure of the early HDPE material and each failure has been on medium pressure pipe where a mechanical squeeze off operation had previously been performed. These brittle pipe mechanical failures are typically slit-type fractures that lie parallel to the pipe's extrusion direction. Circumferential hoop stress (due to gas pressure) in the pipe wall is the driving force for crack opening. There are no recorded failures of this type on the low pressure 2 kPa networks because it is believed that there is insufficient hoop stress in the pipe to propagate cracking. We will continue to monitor further incidents to better understand if pipe condition is more related to the mechanical treatment of the pipe rather than age.

From mid-1980's the company used MDPE material, rated to PE80 which provides improved resistance to stress cracking and crack propagation. The risks associated with this pipe material are more likely to be associated with the manual jointing processes used at the time of installation. The condition of this pipe is considered to be good.

The installation date and the pipe wall thickness (SDR rating) of the polyethylene main pipes were not well documented prior to the implementation of the GIS but further work is planned to identify both attributes.

The condition of MP mains constructed of API specification line pipe coated with yellow jacket is good and has cathodic protection installed to provide corrosion protection.

4.1.2.3 MP Services

MP services are constructed of predominantly polyethylene material installed directly or inserted in older metallic type service pipes. The majority of MP services to residential properties are 25 mm internal diameter.

The condition of the MP services constructed of polyethylene material is good with inserted services being provided additional mechanical protection against risk of third party impact and vegetation damage.

MP services include the gas riser pipes which terminate the gas service pipe above the ground level and usually beside the consumer's house. A service valve is installed on top of the gas riser pipe and represents the demarcation point between the service connection and the network.

Early polyethylene service pipes terminated with a preformed metal riser incorporating a machine jointed compression fitting and the riser was butt fused to the service pipe during installation. The service valve was then screwed onto the threaded metal riser; corrosion protection was achieved with the use of pipe wrap tapes.

More recently PE services are terminated by bending the polyethylene pipe upwards to form a riser and at the end of the pipe, crimping a threaded nipple to which a service valve is then fitted.

The riser constructions all use a metal fitting between the polyethylene pipe and the service valve. Typically this metal fitting is the limiting factor for the condition of the service.

Riser condition inspections are routinely completed in conjunction with other network and metering projects carried out by the company and where problems are identified the risers are wrapped or changed. A project has been initiated to inspect all of the standby service risers - risers where no meter is installed - over a five year period to ensure their integrity is maintained. It has been determined that because these installations have no meter installed and are not routinely visited they are at a higher risk of interference and damage.

There are currently three types of service valves installed on MP services, around 20% of which have iron plug valves, but the majority are ball type valves with brass body, stainless steel ball, and plastic seats requiring minimal maintenance. Some types of plug valve are not self-lubricating and can be subject to galling and seizure. These types of valve are replaced with ball valves during network maintenance activities, metering activities and also when reported by Gasfitters. The standby riser inspection project described above will also identify valves that require replacement.

4.1.2.4 MP District Regulator Stations (DRS)

DRS configurations include twin stream active/monitor regulation, single or twin stream active/monitor, worker/standby stream, and single stream worker only. The mini DRS are generally configured as single stream worker only.

The condition of MP DRS's is generally good with most showing normal signs of deterioration due to age. Some of the components from which the MP DRS's are becoming obsolete while others require replacement parts that are becoming uneconomic and/or difficult to procure, so that they are being replaced with a modern equivalent.

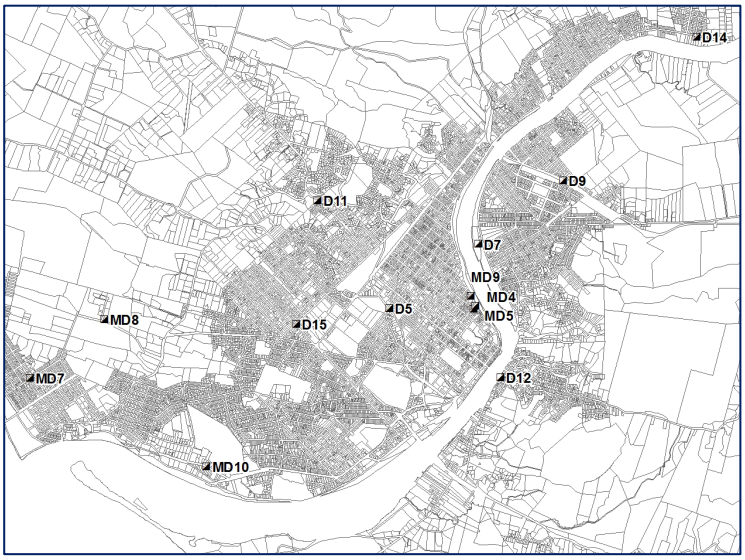
The installation of any replacement equipment requires modifications to the design.

Some station enclosure roofs are showing signs of corrosion and replacement programmes in place for 3 years will be ongoing.

Presently planning is underway for one DRS to be decommissioned due to redundancy resulting from system reinforcement.

In Figure 9, full sized DRS are shown prefixed with a "D" and the smaller mini DRS with "MD". Each location is marked with a symbol.

Figure 9: Whanganui Medium Pressure DRS



4.1.2.5 MP Main Line Valves (MLV)

MLV's are used to split sections of the central business district, isolate strategic assets such as crossings and DRS, and isolate branch connections off the main arterial pipeline. MLV's are located principally underground, in pits or chambers that are accessible from the surface for insertion of a valve key to enable their operation. MP MLV's are ball or plug types constructed of steel or polyethylene material.

Most MP MLV's are made of polyethylene material and are in good condition but require monitoring to ensure they remain accessible. Risks to MLV include road contractors tar sealing over the top of the lids making them inaccessible, and the ingress of surface debris making access difficult.

4.1.2.6 MP Crossings

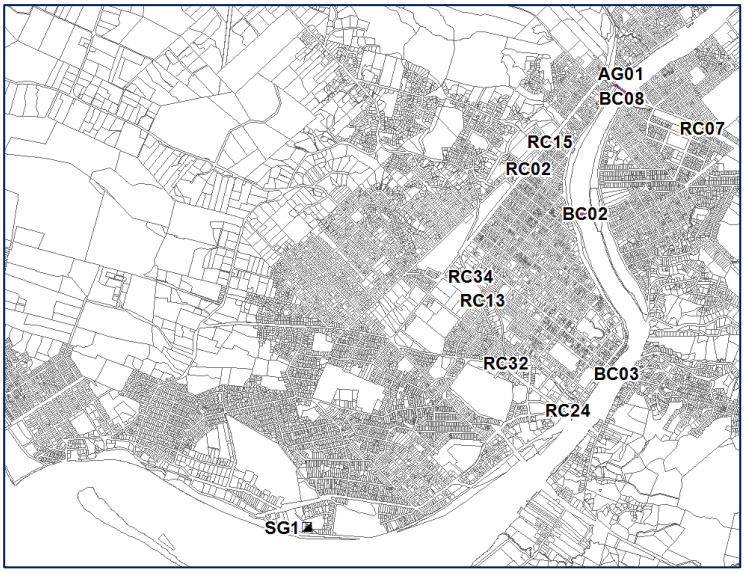
Crossing types include bridge, stream, aboveground and rail. Each type of crossing is constructed to meet the specific risk profile of the environment in which the gas asset is located. MP crossing construction can include casing and vents, roller support mounts, thermal expansion joints and other specialist fittings.

The condition of the MP crossings are generally good based on the limitations of assessing condition of cased and underground crossings.

Whanganui has three medium pressure crossings of the Whanganui River, all installed on separate bridges. The inspection and maintenance of these crossings is difficult and an assessment of future maintenance needs is planned for 2020/21.

In Figure 10, bridge crossings are shown prefixed with "BC" and rail crossings with "RC". The Sales Gate station is shown as "SG1".

Figure 10: Whanganui Medium Pressure Crossings

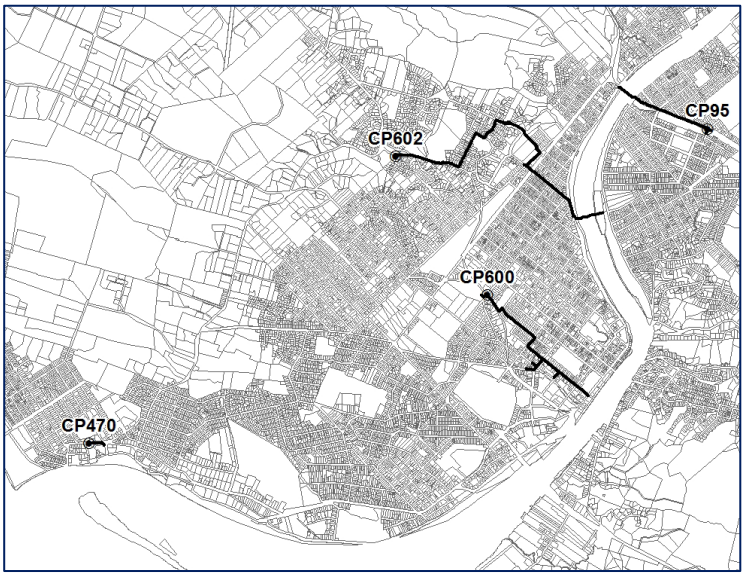


4.1.2.7 MP Corrosion Prevention

The majority of the MP network is polyethylene material with inherent corrosion resistance, however the underground metallic MP mains pipes are protected from corrosion by Cathodic Protection.

In Figure 11, Cathodic Protection monitoring test points are shown prefixed with “CP” followed by a number and the MP metallic mains are shown as a black line.

Figure 11: Whanganui MP CP Test Points



4.1.2.8 MP Monitoring and Control Systems

MP network monitoring is a part of the wider network electronic pressure monitoring system. Operational conditions are checked at various points on the MP system and data is sent daily to a central monitoring station. The equipment is configured to monitor critical minimum MP system parameters and if compromised will activate alarms which are transmitted to monitoring software that notifies operational personnel. GasNet has installed pressure alarm telemetry at a number of large demand sites which are also monitored.

GasNet has included in this asset category its one dedicated network Monitoring Station that meters and records the volume throughput into a discrete section of the network made up of residential consumers only. The data provided by the station is transmitted to GasNet monitoring station daily for analysis.

4.1.3 Low Pressure (LP) System

The LP network shown in Figure 12 below is generally constructed in a grid configuration, with LP mains connected wherever pipes cross. The system pre-dates the introduction of natural gas and includes mains and services constructed of many different materials. The system has a design maximum allowable operating pressure of 7 kPag and is operating at 2 kPag.

4.1.3.1 LP Summary Physical Statistics

LP system statistics are summarised in Table 6 below.

Table 7: Whanganui LP System Physical Statistics

Asset	Number	Length (m)
Mains	-	222,891
Services	9156	186261
District Regulator Stations	-	-
Main Line Valves	17	-
Crossings	15	-
Cathodic Protection	-	-
Monitoring & Control Systems	17	-

4.1.3.2 LP Mains

With the introduction of polyethylene pipe, rehabilitation projects began replacing the metal mains and services with PE. Network development plans of the time were to construct new polyethylene mains and services to medium pressure construction standards but remain on low pressure and when significant areas had been completed, to up-rate the operating pressure to medium pressures.

In the early 1990s GasNet embarked on a project involving insertion of the original larger diameter LP mains and services with smaller diameter PE pipes. The immediate benefits of the higher (MP) pressure were realised and the cost of construction was reduced. This method became the favoured method for future mains rehabilitation for the areas where MP was available and it could be completed without compromising the LP network.

In Figure 12, the LP mains are shown as a black line. The Sales Gate station is shown as "SG1". Some lengths of LP mains appear separated from the bulk of the mains as they are fed from a mini-DRS (not shown).

Figure 12: Whanganui Low Pressure System

Older, pre-natural gas LP mains were constructed of a variety of metallic materials such as cast and wrought irons and various steels manufactured in lengths from 9 feet to 30 feet depending on the material. These LP mains were installed to levels that allowed condensates within the coal gas to drain to a low point where a siphon was installed to collect the liquid which could later be pumped out. The mains were all mechanically jointed using the bell and spigot method for cast iron mains and compression couplings for other types.

Table 8: Whanganui LP Mains by Material

LP Mains Material	Length (m)	% of Total
PRE-NATURAL GAS (Original manufactured gas network)		
Cast Iron	14363	6.44%
Galvanised	6,410	2.88%
Mannesmann Steel	9,831	4.41%
Spiral Riveted	3,478	1.56%
Steel	2,073	0.93%
Spiral Welded	5,826	2.61%
Wrought Iron	636	0.29%
POST-NATURAL GAS (Built to modern day standards)		
Polyethylene	173,086	77.65%
API Steel (PE Coated)	7,175	3.22%
Total	222,891	100.00%

4.1.3.3 LP Mains Condition

Polyethylene mains that make up 77.7% of all LP mains are understood to be in good condition. The minimal stress placed on the material from the low internal gas pressure and the fact that the polyethylene systems are designed and installed to meet medium pressure Standards ensures that the gas escapes are very few in number.

Cast iron pipes are generally in reasonable condition for their age, with many pipe to pipe joints having been encapsulated over the years to prevent leakage. An extensive programme of joint encapsulation was undertaken immediately following the introduction of the dry natural gas to the manufactured gas network in the early 1970's, with initial leakage reported at 82% UFG (Unaccounted for Gas). The bell and spigot joints on the cast iron mains contained a hemp seal which relied on the wet manufactured gas to keep the joint gas tight. The unfortunate consequence of introducing the dry natural gas was that many of the joints dried out and with pipe sections being typically around 3m in length, leakage became a significant issue until it came under control a few years later. Joint leakage is less of a concern nowadays and whilst it does occur from time to time, it does not prevent the safe on-going operation of the LP cast iron network. The leakage rates for this material remain high compared to that of polyethylene material.

Spiral riveted main used in network is thought to have been manufactured in Whanganui around 1900. The steel pipe used in its manufacture was 3.17mm thick and 300mm wide in long lengths spiral bent to form pipes. A riveting machine drilled and installed rivets in the laps of the steel material to form a pressure tight pipe. The pipe was then immersed in a hot asphalt and tar bath which provided a corrosion protected coating. The material has shown a good level of resilience but there have been occasions where leaks have occurred due to corrosion where the coating has been removed for jointing (pipe joints occur roughly every 10m). Where the pipe is subjected to movement there is a risk that the rivets holding the laps in the steel can become loose and allow the laps to come apart forming a leak. This pipe is presently the material with the highest risk of leakage. Spiral welded pipe superseded spiral riveted pipe from the early 1950's when it was thought to have been first used. The spiral welded pipe was superior with continuous welded seams instead of riveted seams but the limitation of these pipes is the corrosion of the unprotected ends and the mechanical Gibaulted jointing systems used at the time.

The other LP pre-natural metallic gas mains comprise a range of unwrapped bare steel, galvanised and wrought iron materials whose condition is varied so these pipes are being progressively replaced.

The risks associated with the older type metallic mains include leakage of joints caused by ground movement as a result of earthquake, traffic movement, road maintenance, or construction activities. Leakage by corrosion is also a risk factor.

In 2020 after a Council water main ruptured and damaged a polyethylene gas main the Whanganui low pressure network was flooded with water. The operation required to remove the water from the older metallic mains was difficult as pigging operations were not possible. As a result two sections of metallic main were replaced with polyethylene and there are plans for further replacement in 2020/21.

Where possible our mains replacement works have been completed in conjunction with other utility replacement work such as water main renewals, road maintenance and reconstruction works, and drainage work. GasNet's close association with local council has provided a very good conduit to planning for joint replacement by sharing trenches. Historically gas and water mains were laid together by the local council, and in similar alignment using the same materials and practices. This has resulted in some gas mains requiring replacement at the same time as the water main.

Working together with the local council has achieved benefits including savings in mains' replacement costs resulting from sharing trenching and reinstatement costs, good public and stakeholder relationships, and a reduction to the inconvenience for road users

4.1.3.4 LP Services

LP services supplying gas from the LP mains to the consumer's property are constructed of either metallic or polyethylene material. Older metallic services (which make up less than 4% of the total number) were constructed of various steels and irons that pre-date natural gas. The metallic service pipes have been replaced under various programs over a number of years and this process will continue. Since its introduction, polyethylene has been used with few exceptions for LP services.

LP service pipes are typically 25 mm internal diameter for standard service connections but for longer length or higher capacity services, larger diameter pipes are used.

LP services include the gas riser pipes which terminate the gas service pipe above the ground level and usually beside the consumer's house. A service valve is installed on top of the gas riser pipe and represents the demarcation point between the service connection and the network

Early polyethylene service pipes terminated with a preformed metal riser incorporating a machine jointed compression fitting and the riser was butt fused to the service pipe during installation. The service valve was then screwed onto the threaded metal riser; corrosion was prevented with the use of pipe wrap tapes.

More recently PE services are terminated by bending the polyethylene pipe upwards to form a riser with a threaded nipple crimped at the end of the pipe, to which a service valve is then fitted.

The riser constructions all use a metal fitting between the polyethylene pipe and the service valve. Typically this metal fitting is the limiting factor for the condition of the service.

Riser condition inspections are routinely completed in conjunction with other network and metering projects carried out by the company and where problems are identified the risers are wrapped or changed. A five year project has been initiated to inspect all of the standby service risers (risers where no meter is installed) to ensure their integrity is maintained. Because these installations have no meter installed and are not routinely visited they are at a higher risk of interference and damage.

There are currently six types of service valves installed on LP Services, with brass and iron plug valves of various types being used from the pre-natural gas until present times. The majority of service valves are ball type valves comprising a brass body, stainless steel ball and plastic seats requiring minimal maintenance. The brass and some iron types of plug valve are not self-lubricating and can be subject to galling and seizure. These types of valve are replaced with ball valves during network maintenance activities, metering activities and also when reported by Gasfitters.

The standby riser inspection project described above will also identify valves that require replacement.

4.1.3.5 LP Main Line Valves (MLV)

MLVs are utilised for the isolation of strategic assets such as crossings and DRS and are located principally underground, in pits or chambers that are accessible from the surface for the insertion of a valve key to enable their operation. MLVs are ball or plug types constructed of steel or polyethylene material.

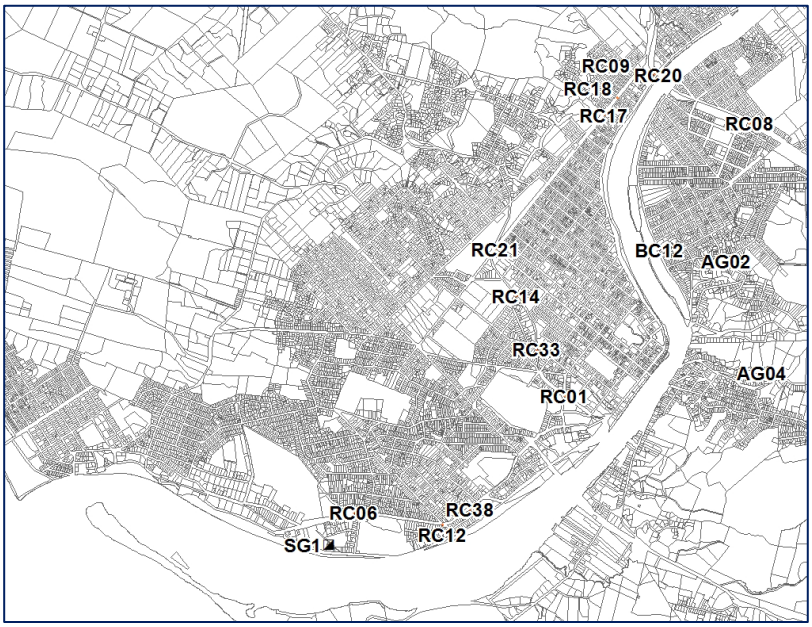
4.1.3.6 LP Crossings

Crossing types include bridge, stream, aboveground and rail. Each type of crossing is constructed to meet the individual specific risk profile of the environment which the gas asset is crossing. LP crossing construction can include casing and vents, roller support mounts, thermal expansion joints and other specialist fittings.

Pre natural gas LP crossings are constructed of a variety of metals including Mannesmann, galvanised, and spiral riveted steels, wrought and cast irons. These older crossings are typically uncased and some jointed by mechanical compression couplings making them a higher risk of leakage. At present their condition remains within their serviceable life but because of their location and risk profile they warrant an increased level of leakage monitoring and will be subject to replacement within 10 years.

In Figure 13, Bridge crossings are shown prefixed with “BC”, above ground crossings with “AG” and rail crossings with “RC”. There are currently no Low Pressure Stream Crossings (SC) in the Whanganui area. The Sales Gate station is shown as “SG1”.

Figure 13: Whanganui Low Pressure Crossings



4.1.3.7 LP Corrosion Prevention

There is no Cathodic Protection applied to metallic steel LP assets. Typically installed prior to natural gas in the manufactured gas era, corrosion protection of these pipes is either by a bitumen coating or pipe wrap. As these metallic pipes are typically isolated from each other with non-conducting polyethylene pipe and as they are being progressively replaced it is considered uneconomic and impractical to provide supplementary corrosion protection with sacrificial galvanic anodes. For discussion of other corrosion prevention methods please refer to section 3.1.2.6 above.

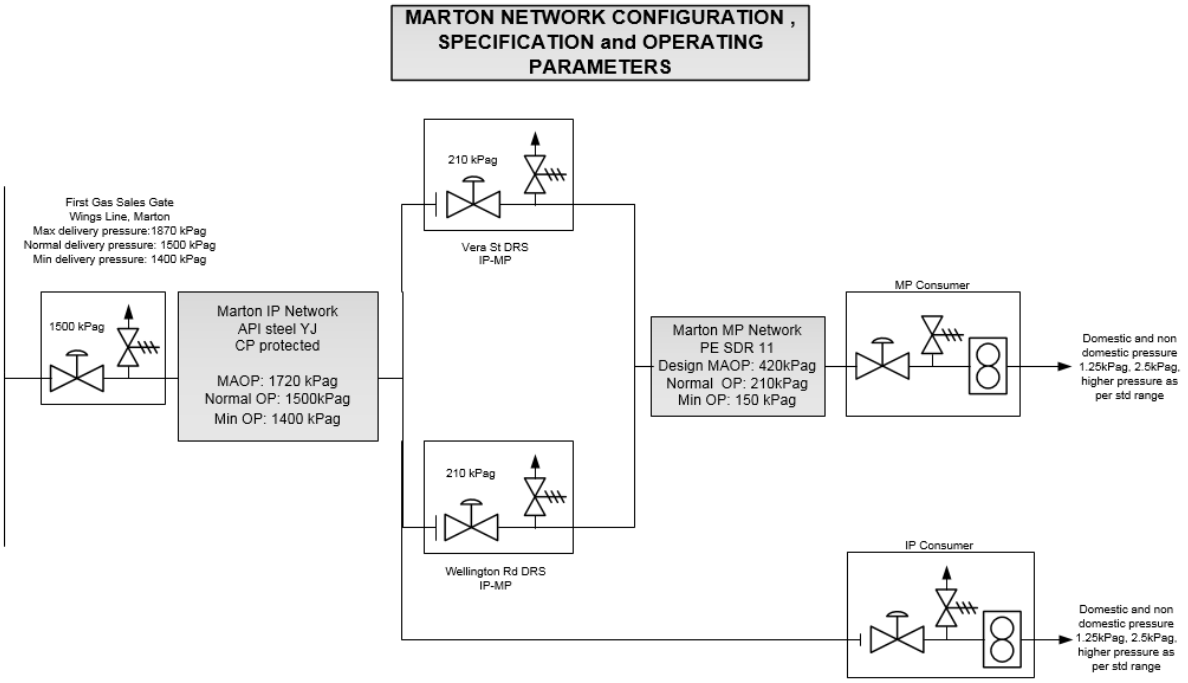
4.1.3.8 LP Monitoring and Control Systems

LP network monitoring is a part of the wider network electronic pressure monitoring system. Operational conditions are checked at various points on the LP system and data is sent daily to a central monitoring station. The equipment is configured to monitor critical minimum LP system parameters that if compromised will activate alarms which are transmitted to monitoring software that notifies operational personnel.

4.2 Marton Network

The Marton network transports natural gas at intermediate (IP) and medium (MP) pressures. Figure 14 is illustrative of the configuration, specification and operating parameters of this network.

Figure 14: Marton Network Configuration



4.2.1 Intermediate Pressure (IP) System

4.2.1.1 IP Summary Physical Statistics

Marton IP system statistics are summarised in Table 9 below.

Table 9: Marton IP System Physical Statistics

Asset	Number	Length (m)
Mains	-	3,422
Services	2	54
District Regulator Stations	2	-
Main Line Valves	3	-
Crossings	5	-
Cathodic Protection	1	-
Monitoring & Control Systems	2	-

4.2.1.2 IP Mains

The IP system shown in Figure 15. below, is generally designed as an arterial pipeline from the Sales Gate station in Wings Line to Wellington Road. The IP system constructed from 1982 onwards, is yellow jacket API steel pipe designed for a maximum allowable pressure of 1720 kPag and is operating at 1500 kPag.

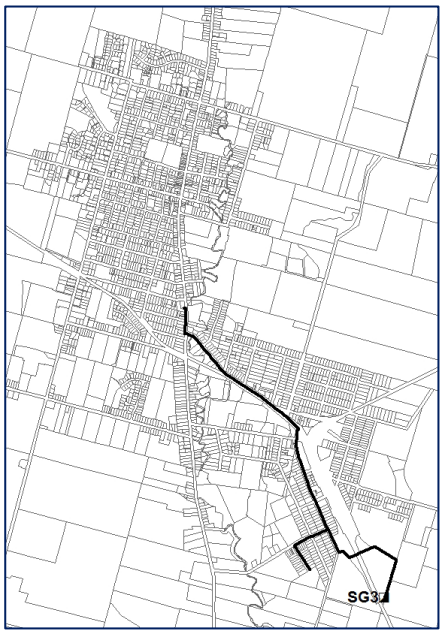
The IP system was originally constructed to supply industrial consumers, and two DRS were strategically located at points along the pipeline. IP mains are rated in good condition based on limited evidence of assets that have been sighted during construction activities and the results of coating survey.

Direct Current Voltage Gradient (DCVG) survey is a technique to assess the effectiveness of corrosion protection on a buried pipeline. A DCVG survey was completed by an independent external party in 2019 and five defects

were found in the pipeline coating over the 3.4km of pipeline surveyed. Two defects are planned for excavation and further inspection. Typically the highest risks to these assets are third party damage and corrosion.

In Figure 15, the IP mains are shown as a black line. The Sales Gate station is shown as “SG3”.

Figure 15: Marton IP System



4.2.1.3 IP Services

All services are constructed of yellow jacket API line pipe and connected to mains with service saddle connections and terminate above ground with a welded flange. These services are electrically insulated from the main and from the station (DRS or GMS) pipe work to which they interface.

IP services are rated in good condition based on limited evidence of assets that have been sighted during construction activities and the results of coating survey. Typically the highest risks to these assets are third party damage and corrosion.

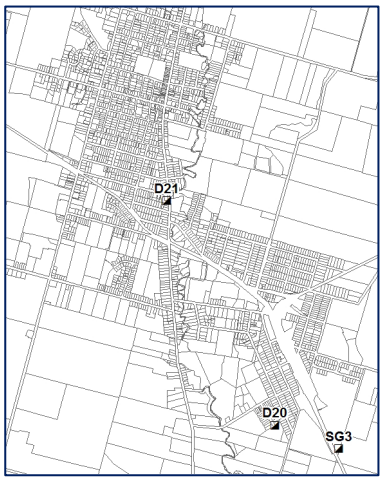
4.2.1.4 IP District Regulator Stations (DRS)

There are two DRS that are located close to the downstream extremities of the IP network and reduce the IP to MP for further reticulation within Marton. The DRS are constructed of steel material and are of twin stream configuration providing backup in the event of active stream equipment failure.

The condition of IP DRS is generally good with most showing signs of normal deterioration with age, but as parts become obsolete, serviceability will become an issue. Enhancements to the station enclosure in 2019 provide the DRS with additional protection from interference and improve public safety.

In Figure 16, DRS are shown prefixed with a “D”. The Sales Gate station is shown as “SG3”.

Figure 16: Marton IP DRS



4.2.1.5 IP Main Line Valves (MLV)

MLV's are used to split sections of looped network, isolate strategic assets such as crossings and DRS, and isolate branch connections off the main arterial pipeline. MLV's are located principally underground, in pits or chambers that are accessible from the surface for the insertion of a valve key to enable their operation. IP MLV's are flanged ball or plug types constructed of steel or iron material.

IP MLV's are rated in good condition based on records made at the periodic inspection and operation of valves. Evidence of the condition of MLV is limited to what can be seen externally, and those valves that are accessible from the surface. Risks to MLV include road contractors tar sealing over the top of the lids making them inaccessible, and the ingress of surface debris making access difficult.

4.2.1.6 IP Crossings

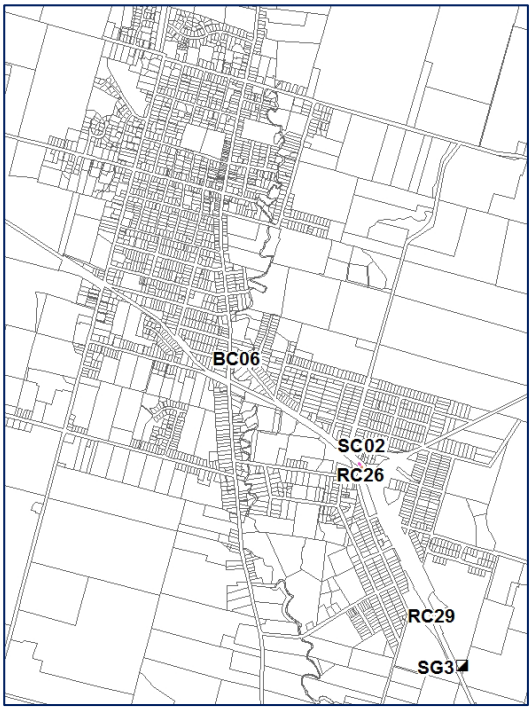
Crossing types include bridge, stream, aboveground, and rail crossings. Each type of crossing is constructed to meet the individual specific risk profile of the environment which the gas asset is crossing. IP crossing construction can include casing and vents, roller support mounts, thermal expansion joints and other specialist fittings.

Condition assessment of IP Crossings can be difficult for various reasons e.g. the location of the pipeline is typically relatively inaccessible, it is laid under a major asset that cannot be disturbed, or it is inserted within a casing that prevents access for inspection. Uncased crossings that are above ground such as those spanning streams at higher risk due to their exposure to environmental conditions, are assessed for condition by visual inspection. Typically the highest risks to these assets are third party damage and corrosion.

In Figure 17, bridge crossings are shown prefixed with a "BC", Stream Crossings with "SC", and rail crossings with "RC". The Sales Gate station is shown as "SG3".

Crossings can be a source of safety risk to the public, in that an exposed gas pipe crossing a waterway or an elevated area could be used as a means for persons to cross. In 2019 a crossing in Marton was identified as having increased likelihood of being used in this manner. A project has been planned for 2020/21 to construct a safety fence to discourage public access to the Crossing.

Figure 17: Marton Intermediate Pressure Crossings

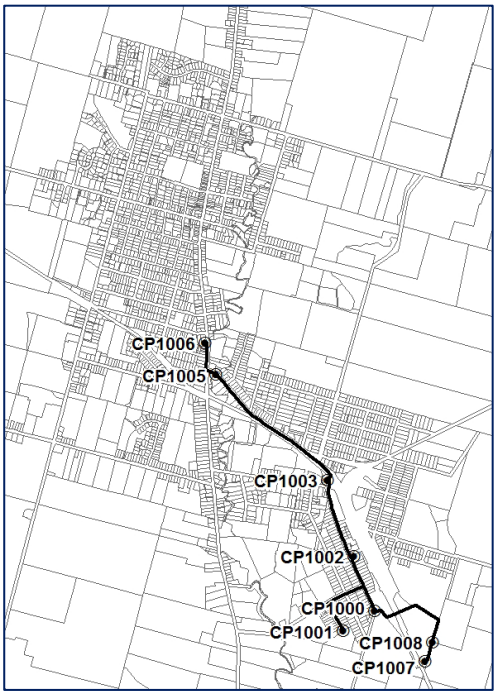


4.2.1.7 IP Corrosion Prevention

Cathodic Protection is applied using sacrificial anodes installed along its route.

In Figure 18, Cathodic Protection monitoring test points are shown prefixed with a "CP" followed by a number and the IP mains are shown as a black line.

Figure 18: Marton IP CP Test Points



4.2.1.8 IP Monitoring and Control Systems

IP monitoring is a part of the wider network electronic pressure and CP monitoring system. Operational conditions are checked at various points on the IP system and data is sent daily to a central monitoring station. The equipment is configured to monitor for critical minimum IP system parameters and if compromised will activate alarms which are transmitted to monitoring software that notifies operational personnel. GasNet has installed pressure alarm monitoring at a number of large demand sites.

4.2.2 Medium Pressure (MP) System

4.2.2.1 MP Summary Physical Statistics

Marton MP system statistics are summarised in Table 10 below.

Table 10: Marton MP System Physical Statistics

Asset	Number	Length (m)
Mains	-	26,096
Services	655	15,597
District Regulator Stations	-	-
Main Line Valves	10	-
Crossings	8	-
Cathodic Protection	-	-
Monitoring & Control Systems	3	-

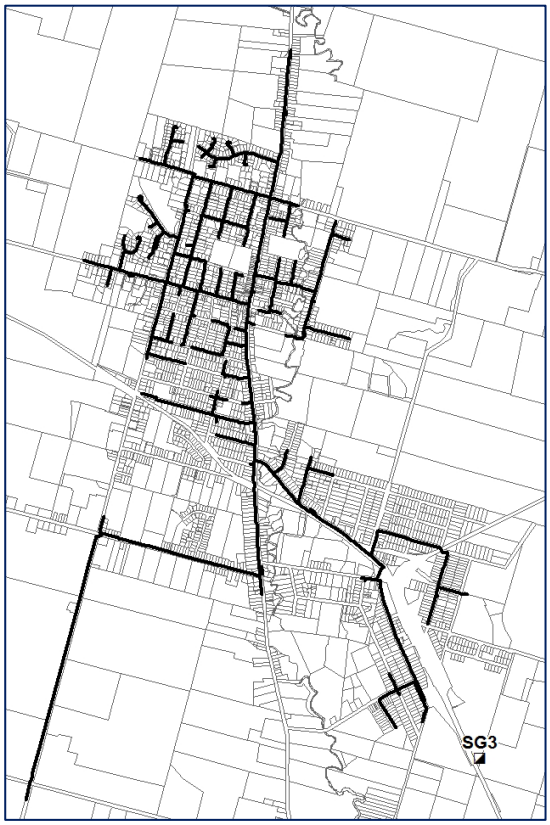
4.2.2.2 MP Mains

The MP network in Marton is constructed of polyethylene mains interconnected to a grid configuration. The mains have design maximum allowable pressure of 420 kPag and are operating at 210 kPag.

The risks associated with the polyethylene MP mains in general include polymer material issues in early HDPE material, third party damage, and historic joint quality. Further discussion on these aspects of MP services can be found in the Whanganui MP Mains section.

In Figure 19, the MP mains are shown as a black line. The Sales Gate station is shown as “SG3”.

Figure 19: Marton MP System



4.2.2.3 MP Services

MP services in Marton are constructed of predominantly polyethylene and are installed directly in the ground by open trench or drilling methods. The services are constructed with a design MAOP of 420 kPag and are operating at 210 kPag. MP services to residential properties are 10 mm or 25 mm diameter while non-domestic range between 10-50 mm. MP services are connected to the Polyethylene main by service saddle and terminate at the service riser with a mechanical crimp fitting.

Polyethylene service pipes terminate with either a pre formed metal riser incorporating a machine jointed compression fitting or a mechanical crimp installed on site. Each of these metallic components present a potential risk of corrosion and are duly inspected whenever visited for network or metering work. As part of a project to inspect all of the standby service risers (risers without meters installed) over a five year period all visible service components will be inspected and remedial action taken if required. Further discussion on MP services can be found in the Whanganui MP services' section.

The condition of the MP services constructed of polyethylene material is rated to be good.

4.2.2.4 MP Main Line Valves (MLV)

MLVs are used to split sections of the network, isolate strategic assets such as crossings and DRS, and isolate branch connections off the main arterial pipeline. MLVs are located principally underground, in pits or chambers that are accessible from the surface for the insertion of a valve key to enable their operation. MP MLV are ball or plug types constructed of steel or polyethylene material.

MLV are constructed of polyethylene material and are in good condition but require monitoring to ensure they remain accessible. Risks to MLV include road sealing contractors tar sealing over the top of the lids making them inaccessible and the ingress of surface debris making access difficult.

4.2.2.5 MP Crossings

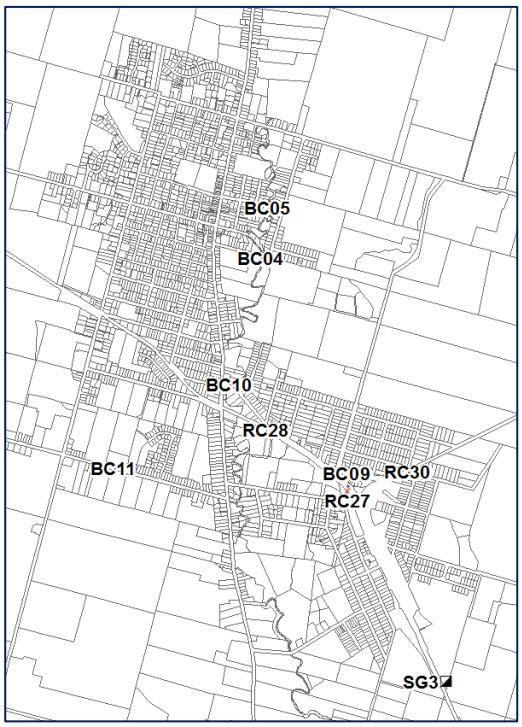
Crossing types include bridge, stream, aboveground and rail. Each type of crossing is constructed to meet the individual specific risk profile of the environment which the gas asset is crossing. MP crossing construction can include casing and vents, roller support mounts, thermal expansion joints and other specialist fittings.

The condition of the MP crossings are generally good based on the limitations of assessing condition on cased and underground crossings.

Crossings can be a source of safety risk to the public, in that exposed gas pipes crossing a waterway or an elevated area could be used as a means to cross. In 2019 two crossings in Marton were identified as having increased likelihood of being used in this manner. A project has been planned for 2020/21 to construct safety fencing to discourage public access to the Crossings.

In Figure 20, bridge crossings are shown prefixed with a “BC” and rail crossings as “RC”. The Sales Gate station is shown as “SG3”.

Figure 20: Marton Medium Pressure Crossings



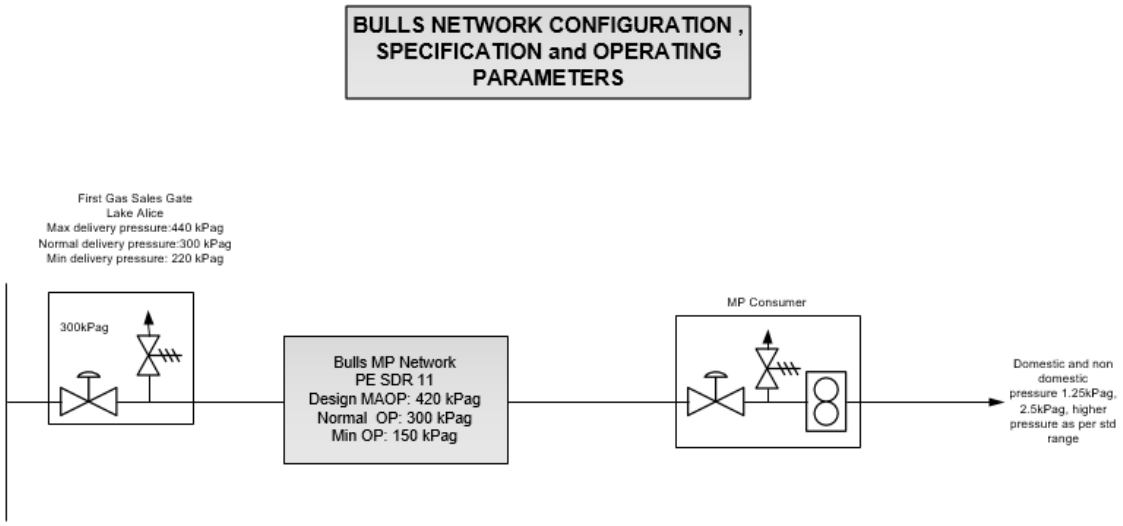
4.2.2.6 MP Monitoring and Control Systems

MP monitoring is a part of the wider network electronic pressure monitoring system. Operational conditions are checked at various points on the MP system and data is sent daily to a central monitoring station. The equipment is configured to monitor for critical minimum MP system parameters and if compromised will activate alarms which are transmitted to monitoring software that notifies operational personnel. GasNet has installed pressure alarm monitoring at a number of large demand sites.

4.3 Bulls Network

The Bulls network transports natural gas at medium (MP) pressures. Figure 21 is illustrative of the configuration, specification and operating parameters of this network.

Figure 21: Bulls Network Configuration



4.3.1 Medium Pressure (MP) System

4.3.1.1 MP Summary Physical Statistics

Bulls network statistics are summarised in Table 11 below.

Table 11: Bulls Network Physical Statistics

Asset	Number	Length (m)
Mains	-	14,735
Services	169	6,178
District Regulator Stations	-	-
Main Line Valves	2	-
Crossings	2	-
Cathodic Protection	-	-
Monitoring & Control Systems	4	-

4.3.1.2 MP Mains

The Bulls MP system shown in Figure 22 was installed to supply consumers in Bulls Township including a CNG station. The design incorporates a single arterial main constructed in 1987 which was installed from the Sales Gate station at Lake Alice, traversing rural land to the west side of Bulls township. The mains are all constructed of polyethylene and the network is supplied direct from the Sales Gate with no District Regulator Stations (DRS). It is understood that these mains are all MDPE and in good condition. Risk assessment work in 2019 identified that this critical main is subject to increased risk due to the remoteness of the pipeline and also farming activities. Projects are planned for 2020/21 to relocate a section of this main where it traverses private property and to enhance signage along the route. The main has a design maximum allowable pressure of 420 kPag which is operating at 300 kPag. The network within the township is generally designed with arterial mains having little interconnection. The development of a meat processing plant on the outskirts of Bulls has replaced the CNG load.

In Figure 22, the MP mains are shown as a black line. The Sales Gate station is shown as “SG4”.

Figure 22: **Bulls Network**

4.3.1.3 MP Services

MP services are constructed of predominantly polyethylene material installed directly in the ground by open trench or drilling methods. MP services are constructed with a design MAOP of 420 kPag and are operating at 300 kPag. MP services to residential properties are 10 mm or 25 mm diameter while non-domestic range between 10-50 mm. MP services are connected to the polyethylene main by service saddle and terminate at the service riser with a mechanical crimp fitting. A Mains pressure uprating exercise completed in 2014 involved inspection of all risers and service valves and any remedial work required was completed at that time. The condition of MP services is rated as good.

4.3.1.4 MP Main Line Valves (MLV)

The MLV's are used to segregate sections of arterial pipeline supplying the town of Bulls and are located principally underground, in pits or chambers that are accessible from the surface for the insertion of a valve key to enable their operation. MP MLV's are ball or plug types constructed of steel or polyethylene material.

MLV are constructed of polyethylene material and are in good condition but require monitoring to ensure they remain accessible. Risks to MLV include road sealing contractors tar sealing over the top of the lids making them inaccessible and the ingress of surface debris making access difficult.

4.3.1.5 MP Crossings

The Bulls MP network contains an under stream crossing which is shown in Figure 23. The crossing has been constructed to meet the individual specific risk profile of the stream environment which the gas asset is crossing. The condition of the MP stream crossing is considered good based on evidence collected during remedial flood repair work carried out in 2011. A further section of main that lies in an area that is a path for flood water has been identified as requiring protection work which is planned for 2020/21.

The stream crossing is shown as "SC01" and the Sales Gate station is shown as "SG4".

Figure 23: **Bulls MP Crossings**

4.3.1.6 MP Monitoring and Control Systems

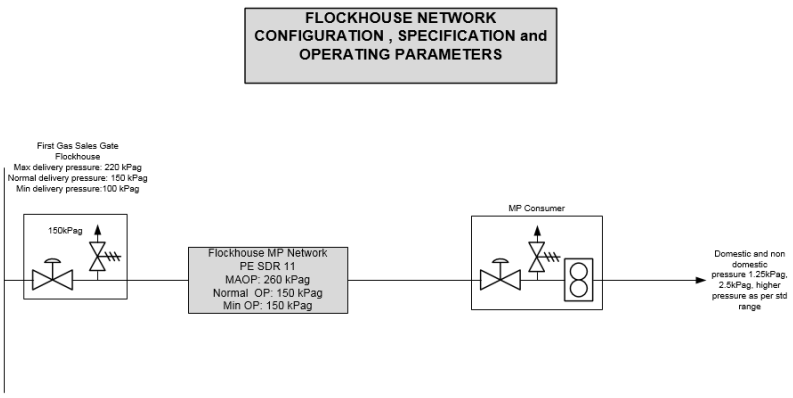
MP monitoring is a part of the wider network electronic pressure monitoring system. Operational conditions are checked at various points on the MP system and data is sent daily to a central monitoring station. The equipment is configured to monitor for critical minimum MP system parameters and if compromised will activate alarms which are transmitted to monitoring software that notifies operational personnel. GasNet has installed pressure alarm monitoring at a number of large demand sites.

4.4 Flockhouse Network

The Flockhouse MP network was primarily installed to supply a large agricultural training centre and grain dryer, with both domestic and commercial connections offered to properties along the pipe route. The network is supplied direct from the Sales Gate at MP with no DRS connected.

Figure 24 is illustrative of the configuration, specification and operating parameters of this network.

Figure 24: Flockhouse Network Configuration



4.4.1 Medium Pressure (MP) System

4.4.1.1 MP Summary Physical Statistics

Flockhouse MP system statistics are summarised in Table 12 below.

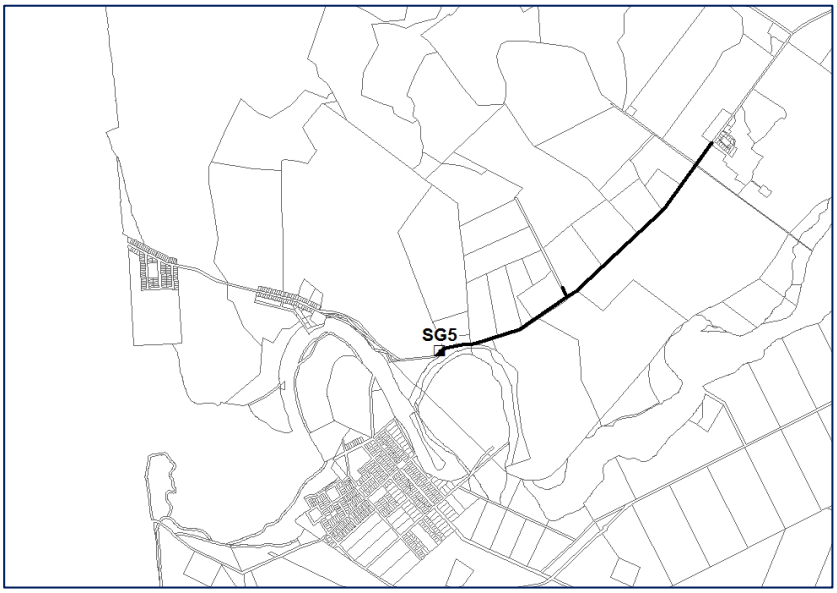
Table 12: Flockhouse Network Physical Statistics

Asset	Number	Length (m)
Mains		3,438
Services	8	949
District Regulator Stations	-	-
Main Line Valves	-	-
Crossings	-	-
Cathodic Protection	-	-
Monitoring & Control Systems	-	-

4.4.1.2 MP Mains

The polyethylene main installed in 1986 is a single arterial main from the Flockhouse Sales Gate north along Parewanui Road to the Flock House Estate. The main has a design MAOP of 420 kPag and is operating at 150 kPag. In Figure 25, the MP mains are shown as a black line. The Sales Gate station is shown as "SG5".

Figure 25: Flockhouse Network



4.4.1.3 MP Services

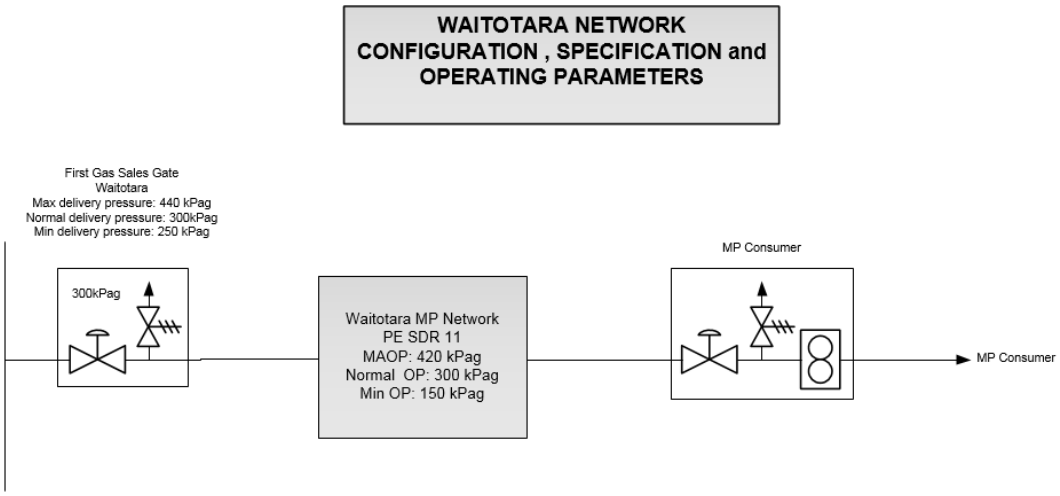
MP services are constructed of predominantly polyethylene material installed directly in the ground by open trench or drilling methods. MP services are constructed with a design MAOP of 260 kPag and are operating at 150 kPag. MP services to residential properties are 10 mm or 25 mm diameter while non-domestic range between 10-50 mm. MP services are connected to the polyethylene main by service saddle and terminate at the service riser with a mechanical crimp fitting.

4.5 Waitotara Network

The Waitotara MP system was constructed to supply a meat processing plant only. The design incorporated a single PE arterial main from First Gas Sales Gate station at Waitotara north through rural farmland to the plant. The network is supplied direct from the Sales Gate with no DRS connected.

Figure 26 is illustrative of the configuration, specification and operating parameters of this network.

Figure 26: Waitotara Network Configuration



4.5.1 Medium Pressure (MP) System

4.5.1.1 MP Summary Physical Statistics

Waitotara MP system statistics are summarised in Table 13 below.

Table 13: Waitotara Network Physical Statistics

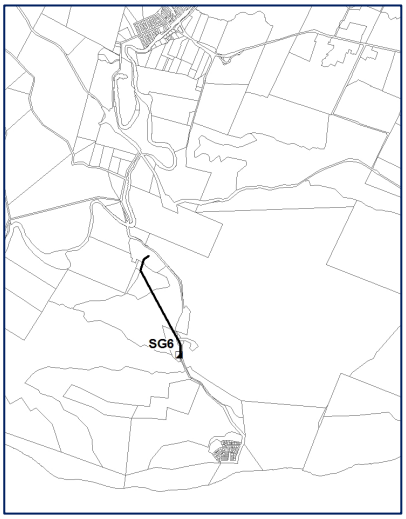
Asset	Number	Length (m)
Mains	-	1,678
Services	1	78
District Regulator Stations	-	-
Main Line Valve	-	-
Crossings	-	-
Cathodic Protection	-	-
Monitoring & Control Systems	1	-

4.5.1.2 MP Mains

The single PE arterial main from First Gas Sales Gate station to the meat processing plant was installed in 1987 and has a design MAOP of 420 kPag and is operating at 300 kPag.

In Figure 27, the MP main is shown as a black line. The Sales Gate station is shown as “SG6”.

Figure 27: Waitotara System



4.5.1.3 MP Services

The single arterial main terminates at the meat processing plant and a single smaller diameter pipe provides the service connection.

4.5.1.4 MP Monitoring and Control Systems

There is no discrete network monitoring equipment installed but the Time of Use (TOU) equipment installed at the GMS has integral network monitoring equipment that provides remote network monitoring functionality.

4.6 Non-Network Assets

GasNet owns a range of non-network assets outlined as follows.

4.6.1 Computer Hardware & Software

GasNet owns all office & vehicle based computer hardware, mobile and smart phone devices, with network infrastructure and server support services provided under contract by the Whanganui District Council

GasNet owns its MIDaS application which provides ICP, consumer and billing information. As well we have a wide range of software applications under licence, the most notable being FinanceOne, IntraMaps, FeildGo and Synergi.

Further detail on GasNet's computer hardware and software can be found in section 2.11.

4.6.2 Leasehold Improvements

GasNet does not own any property, other than that directly related to the network, with its Whanganui premises in Cooks Street leased from the Whanganui District Council. Costs incurred in relation to GasNet's premises are therefore leasehold improvements which have been made with the most notable including office alterations, and provision of a security system and fire alarm.

4.6.3 Miscellaneous Plant & Equipment

GasNet owns tools and equipment that are required for construction, operations and maintenance activities of the networks.

The major items of tooling include;

- Polyethylene pipe squeeze equipment.
- Polyethylene butt and electrofusion jointing machines.
- Gas detection and survey equipment.
- Emergency lighting and ancillary items.
- Pipe and cable locators.
- Air compressors.
- Generators.
- Road compactors and breakers.
- Road signs and safety barriers.
- Spray booth and bead blaster.
- Confined Space entry and rescue equipment.

Much of the equipment requires regular testing and recertification by accredited laboratories.

With GasNet striving to maintain or exceed industry best practice in all areas of network activities, the continual investment in tooling that incorporates the latest technologies is seen as an important strategy.

4.6.4 Office Equipment

There are 10 office based personnel that are provided with fully equipped work stations furniture and equipment, along with a range of ancillary equipment such as lockers, shredder, meeting room conference phone and white board. Additional equipment has been purchased to provide for home work stations for office personnel.

4.6.5 Vehicles

GasNet's fleet of seven vehicles are all owned by the company and are utilised to meet operational and capital activities across the five networks. Some vehicles are customised to enable field staff on site access to specialised equipment necessary to undertake planned works and to respond to call-out and emergency situations.

The fleet consists of;

- 2005 Ford Transit Jumbo Van Long Wheel Base
- 2006 Ford Transit Jumbo Van Long Wheel Base
- 2006 Ford Courier Extra Cab Ute
- 2010 Nissan Urvan
- 2014 Ford Ranger Super Cab Ute
- 2016 Mitsubishi Triton Double Cab Ute
- 2018 Ford Transit Jumbo 470E Van
- 6 x Trailers

5.0 NETWORK RELIABILITY AND INTEGRITY

5.1 Functional Requirements

Network reliability is delivered through systems developed by GasNet to manage the planning, design and construction phases of the operation. The systems have been developed using gas distribution network standards NZS5258 and AS/NZS4645. These standards are intended to provide for the protection of the general public, gas distribution network operating personnel and the environment, and to ensure safe and reliable operation of gas distribution networks that reticulate gas to consumers.

The functional requirements of our networks include providing an integrated supply system capable of meeting consumer demands, as forecast by gas retailers, taking into account safety, operating conditions and the environment to which the system is exposed. The functional requirements to ensure safety, including security of supply and integrity of the gas network include those listed below;

- Planned operational life.
- Capacity management and security-of-supply parameters.
- Composition and properties of gas to be transported.
- Degradation of elements of the gas distribution network.
- Failure mode requirements (e.g. leak before rupture, limiting potential for full flow escapes at higher pressures).
- Fitness for purpose of materials.
- Competency of personnel.
- Criteria for response to incidents and emergencies.

5.2 Network Design

Designs for new sections of, or modifications to, the network systems are in accordance with safety, and demand, operating in the environment conditions to which the system is forecast to be exposed.

The overall design requirements are to ensure that:-

- the hazards and risks identified in the hazard identification and control process are eliminated or reduced to as low as reasonably practical and
- functional requirements are met

To achieve these requirements system design is based on the requirements of AS/NZS 4645.

5.3 Network Pressure Control

The Sales Gates where gas enters GasNet's networks from the upstream transmission system, are designed, installed and maintained by the transmission system operator to meet nominated supply conditions. This includes the levels of over-pressure protection.

Once gas has entered GasNet's network the pressure is managed and controlled. The pressure control systems limit the pressure within each section of the system to the specified maximum allowable operating pressure (MAOP) and the overpressure protection is effective in the event of equipment malfunction. Network Pressures are set to ensure minimum supply pressure in all parts of the system at all times and the MAOP is not exceeded at any time. The MAOP for each system is listed in GasNet's Safety and Operating Plan.

District Regulator Stations on the networks reduce network pressures from one pressure system to another. Overpressure protection is provided either by relief valves, active and monitor regulators or automatic shut off devices depending on station location, supply alternatives, environmental factors and operating conditions. The District Regulator Stations operational and overpressure protection pressure settings are specified in the relevant Design Sheet for each station.

The level and frequency of routine inspections and maintenance of all district regulator stations are determined in accordance with GasNet's Network and GMS Maintenance Plan. Currently the maintenance regime is based on predictive and preventative strategies.

District Regulator Stations Periodic Maintenance schedule			
Monthly	**Yearly**	**4 Yearly**	**8 Yearly**
Site and security, leakage inspection, pressure and odour level measurements	Functional check of equipment, test safety and standby equipment, filters check	Limited equipment overhaul.	Full equipment overhaul.

Continuous system pressure surveillance is carried out by GasNet's network monitoring system at key locations with low and high pressure alarms providing an automated alert and subsequent response by a GasNet Technician. With its introduction in 2007 the monitoring system provides a wealth of electronic historic pressure information; prior to this and going back to the 1980's, paper based pressure recordings were printed from

pressure chart recorders. The combination of historic pressure and real-time pressure information is a useful planning tool and enables a better understanding of the trends in demand and the identification of potential pressure or capacity issues. It is expected that the information will be extremely beneficial as a comparator with the output from GasNet's Synergi Gas network modelling application.

5.4 Network Flow Management

Network Flows are currently predicted on historic demand with forward looking forecast demands based on information provided by Gas Retailers.

There is currently no provision to measure flow patterns within GasNet's networks although a project is planned for the installation of equipment at DRS to enable measurement of flow. The equipment will interface into existing telemetry equipment installed at DRS to log and transmit the data to a central computer. The measurement, collection and subsequent analysis of this data within GasNet's network analysis simulation software will assist future network design, provide utilisation information and aid emergency planning.

5.5 Gas Quality

Gas contained within and supplied from GasNet's network is required to comply with NZS 5442 Specification for Reticulated Natural Gas. This ensures that the gas is suitable for transportation through the network and metering systems and for use in appliances designed for natural gas.

The specification sets limits on characteristics and components and these are monitored by the transmission system operator before gas is accepted into their network.

The transmission system operator is required to notify GasNet if there are any variations in quality that could lead to a limit being exceeded. In the event that non-specification gas was supplied or could be expected to be supplied into the network systems GasNet would decide whether to continue to supply consumers or to curtail supplies based on safety considerations. It is acknowledged that in the event that this should occur, GasNet would not be isolated and that the effect would likely impact on larger operators and systems on the same transmission system. In this case it is expected that the event would involve multiple parties (transmission, network and meter owners/operators, gas retailers and consumer representatives).

5.6 Gas Odorisation and Detection

Gas within and supplied from GasNet's networks is odorised to ensure that it is detectable at a level at least equivalent to one fifth of the lower explosive limit for natural gas, a requirement of Regulation 16 of the Gas (Safety and Measurement) Regulations 2010.

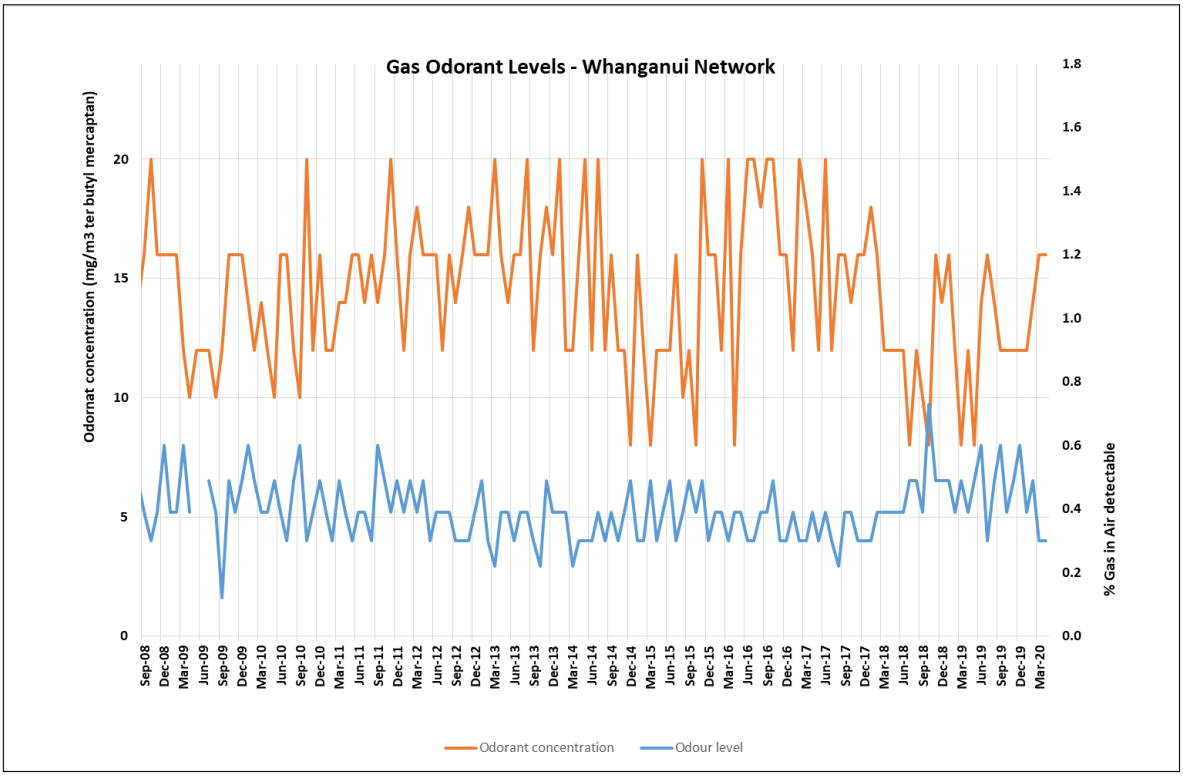
Odorant is injected by the transmission system operator to give the gas a distinctive and unpleasant odour prior to receipt of the gas into GasNet's network. The odour levels and odorant concentrations are set in accordance with the requirements of NZS 5263 to ensure minimum levels are exceeded at the extremities of all of the networks. The odorant used is tertiary butyl mercaptan.

Monitoring of both odour level and odorant concentration is carried out at Sales Gates by the transmission system operator and at strategic points throughout the network by GasNet. All metering work completed by the company requires a check that odorant can be detected by the Technician. Any exceptions are reported immediately they are detected and action is taken to notify GasNet and to restore levels to normal as rapidly as possible. An annual review is carried out by GasNet to ensure that the defined locations where samples are taken for odour tests are deemed to be representative of the current network configuration.

The Gas Transmission Interconnection Agreement sets out the arrangements for odorisation monitoring.

If odour fade or masking is detected the Network Emergency Plan is in place to ensure such events are managed and that appropriate actions are taken.

The following graph shows the odour level and odorant concentration measurements taken at a site representative of the network in Whanganui. The odour level measurements shown all exceed 0.9% gas in air limit i.e. one fifth of lower explosive limit for natural gas and the odorant concentration measurements are 3 mg/m3 or above. The number of non-compliant odour tests is a key safety performance indicator referenced in section 6.0.



5.7 Leakage Management

A leakage management programme involving routine system survey and response arrangements for classification and repair of public reported escapes is in place to ensure that any leakage is minimised. The frequency and methods of survey is determined according to the risk level. All leaks located by survey are classified and actions taken accordingly.

Leakage Survey Schedule						
Asset	**Monthly**	**3 Monthly**	**6 Monthly**	**12 Monthly**	**2 Yearly**	**5 Yearly**
Mains pipes				Mains located in high population density areas incl. CBD's, public meeting places, schools, hospitals and rest homes	All Low Pressure metallic	All Mains
Stations (Sales Gates and DRS)	All Stations					
Line valves				All valves		
Special crossings		Crossings with mechanical joints	All crossings			

5.8 Cathodic Protection

External corrosion on buried steel pipe is mitigated by a range of methods which for GasNet's Whanganui and Marton Intermediate and Medium Pressure systems includes Cathodic Protection (CP). The description of the company's CP systems is provided in section 3.1.2.6.

These systems are designed, operated and maintained in accordance with AS 2832.1. Monitoring of system performance is completed in accordance with GasNet's Network and GMS Maintenance Plan GNZ-003.

New construction work on Intermediate and Medium Pressure steel pipe is first designed by GasNet's Engineer and reviewed by a specialist CP Technician from First Gas Limited who also conduct annual ON-OFF surveys and periodic DCVG surveys.

Cathodic Protection Periodic Maintenance Schedule			
Weekly	**3 Monthly**	**12 Monthly**	**As Required**
Review of CP voltage monitoring and alarm limits (CP voltage logged at 15 minutes intervals and alarms monitored 24/7).	Rectifier site checks and On testing at representative points of the networks.	On/Off testing at representative points throughout network.	Full Direct Current Voltage Gradient (DCVG) survey of networks.

5.9 Public Reported Escapes

Facilities for the public reporting of gas escapes are available 24 hours a day 7 days a week.

All reports of gas leakage are acted on as quickly as possible and personnel are despatched to make safe any unsafe situation and to locate and assess any leaks detected.

First response to network leakage reports is provided by a GasNet Technician trained in emergency response to industry standards. After business hours GasNet's after hour's service provider receives all phone calls and contacts the rostered Technician to provide the emergency response.

The time taken to answer calls, and to attend on site are key indicators of emergency management performance which are recorded and monitored by GasNet. These measures along with the number of public reports of gas escape are reported in sections 6.1 and 11.1.

5.10 Leakage review and analysis

Records of leakage reports and leakage surveys are analysed annually or more frequently if leakage levels alter to determine any changes in the risk level. Increase in leakage trends may require a reassessment of the hazard and action taken to mitigate the risk. Analysis is a key information feed into the asset replacement programme. Trends such as the correlation of leak reports to main pipe construction material provides such information.

5.11 Mains and Services

Mains and services were historically designed, constructed, maintained and decommissioned under the standards of the day. From 1989 to 2016, NZS5258 Distribution Networks provided recommended minimum standards for design, fabrication, installation, inspection, testing, operation and maintenance of gas distribution systems where the maximum working pressure did not exceed 2000kPa.

Presently the AS/NZS4645 set of Standards covers the design, construction, operation, maintenance and decommissioning of gas distribution networks and provides performance based framework for their management to ensure that deliverability and integrity are able to be maintained.

In particular wall thickness and depth of cover are key elements of the design to ensure these safety requirements are met. Where appropriate the requirements for wall thickness and depth of cover are increased above the minimum to provide extra protection. All buried intermediate pressure steel systems are designed to be protected from corrosion by cathodic protection.

For mains and services designed in accordance with the requirements for Plastic systems only polyethylene material is used.

Services to individual consumers are designed in accordance with the AS/NZS4645 which includes requirements to minimise the risk of escaping gas entering any buildings. The mains and services requirements are consistent with Section 4.8 of AS/NZS 4645.

5.12 Materials and components

Materials and components used in the construction and maintenance of the network assets are purchased, stored, handled and delivered in accordance with agreed specifications and procedures to ensure that they are suitable for the intended operating environment and life cycle.

Materials are purchased in accordance with GasNet's Technical Specifications for Materials and Equipment. The specifications contained within this document generally comply with Standards equivalent to or listed in either AS/NZS 4645.2 or AS/NZS 4645.3 as appropriate.


GasNet

REGISTER OF TECHNICAL SPECIFICATIONS

FOR THE PURCHASE OF MATERIALS AND EQUIPMENT

Please note that printed copies are uncontrolled and may not be current. Always refer to the most recent version posted on the GasNet Intranet.

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6.0 SERVICE LEVELS

6.1 Key Performance Indicators (KPI's)

GasNet has actively collected a range of performance statistics for many years, some of which having been reported under previous disclosures, and whilst the content of what will be reported in future AMP's has yet to be finalised, the graphs are provided in the interim.

For consistency all tables cover the nine years up until 30 June 2019 but a number of the earlier datasets include both Network and GMS data, a legacy of the Company's previous reporting requirements and the requirements under the now superseded Gas Information Disclosure Regulations 1997. Whilst some datasets are clearly network only, others are not. It is therefore planned to disaggregate the combined datasets wherever practical to do so and include them in future AMP publications.

Network performance for previous years, for both planned and unplanned outages, are shown in the following graphs. The key indicators used are those now required under the IDD and include:

- System Average Interruption Duration Index (SAIDI) in minutes per ICP (connections) x 1000;
- System Average Interruption Frequency Index (SAIFI) in outages per ICP (connections) x1000;
- Customer Average Interruption Duration Index (CAIDI) in minutes per outage.

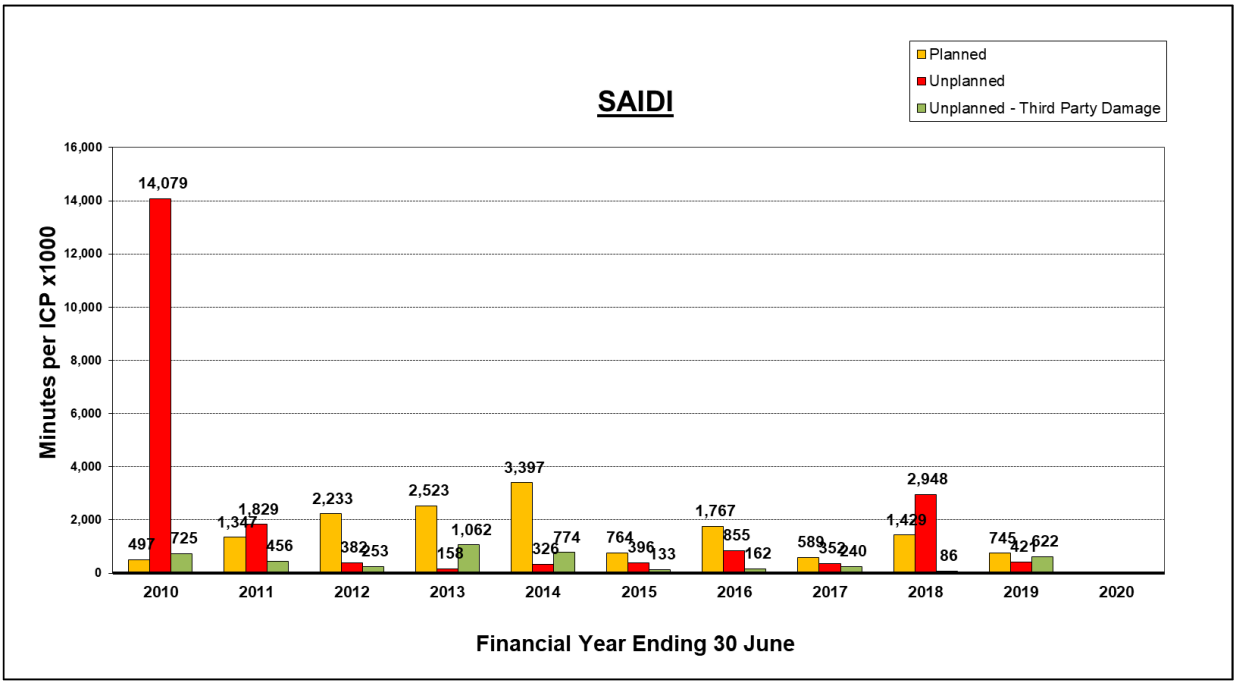
The data shown applies only to outages caused by unplanned or planned outages on GasNet's network and does not include outages caused by the Transmission Company or other upstream parties.

In 2017 when GasNet's 30 June 2017 disclosures were being prepared it was identified that previous SAIDI & SAIFI disclosures had been understated by a factor of 1,000. As previous publications of GasNet's AMP had been based on these disclosures the tables in the AMP's were also in error.

Apart from small changes due to rounding the CAIDI disclosures are not affected as the errors effectively cancel out, given that CAIDI = SAIDI/SAIFI.

Further information on these errors and the corrected disclosure schedules can be downloaded from www.gasnet.co.nz/gasnet-disclosures

The following graphs are based on the corrected indices and updated to include 2019 information.



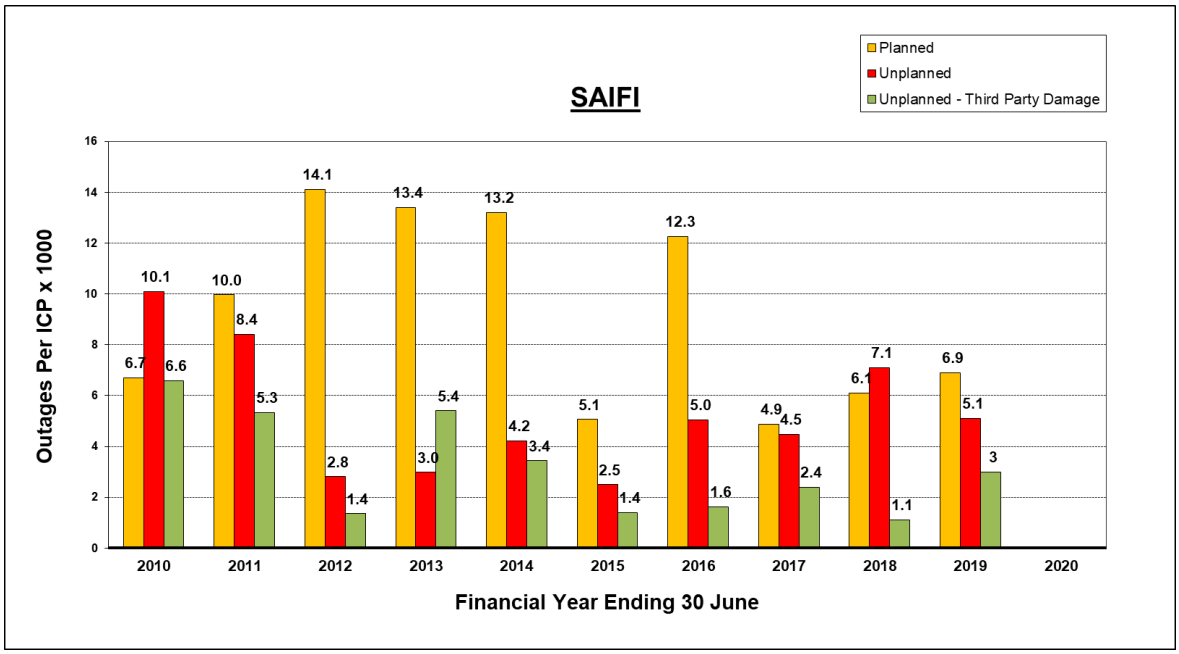
SAIDI is the measure of how long the average consumer has been without their gas supply during a particular year x 1000.

The high duration of unplanned outages which occurred in 2009/10 and which also flowed through to the beginning of the 2010/11 year was attributed to a single incident where a pressurised water pipe failed, eroding a hole in a gas service pipe and filling the service and gas mains with water causing blockage and loss of supply to an entire area in St Johns Hill, Whanganui.

In April 2018 a similar event occurred where pressurised water infiltrated a low pressure gas service pipe and connected mains interrupting gas supply to twenty four properties for around one day while the source of the water was found, repairs made and dewatering of the main completed. The total duration of unplanned interruptions for the period to June 2018 was significantly higher that of the previous years since 2009 and the number of supplies affected also greater than 2017, predominately due to this single event.

During February 2020 the Company's low pressure network suffered damage when a high pressure water main burst and ruptured a low pressure gas main, flooding approximately 9 kilometres of gas mains and 283 gas service pipes with water. The significant number of properties involved and the extended period of time taken to remove the water from the pipes and restore supplies will impact adversely on SAIDI in the 2021 update of this Plan.

Planned interruptions will increase in the 2020/21 planning period due to the proposed increase in mains condition renewal work with the associated changeover of customer service pipes onto new mains. This will adversely impact SAIDI in the 2022 update of this Plan



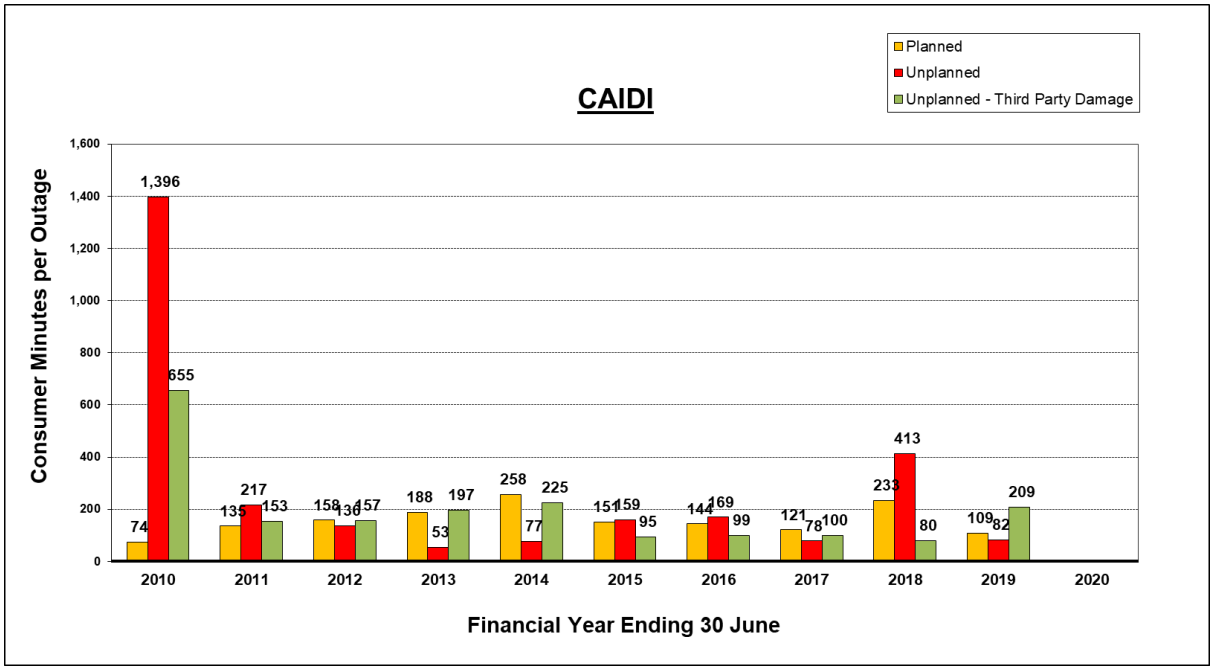
SAIFI is the measure of the number of times a consumer will experience an interruption to their gas supply during a particular year (x1000).

For the reasons outlined above under SAIDI, the high number of unplanned outages which occurred in 2009/10 was dominated by the St Johns Hill water ingress incident which occurred in late June 2009. Similarly in 2014/15 a low number of planned interruptions was the result of fewer service disconnections during that period.

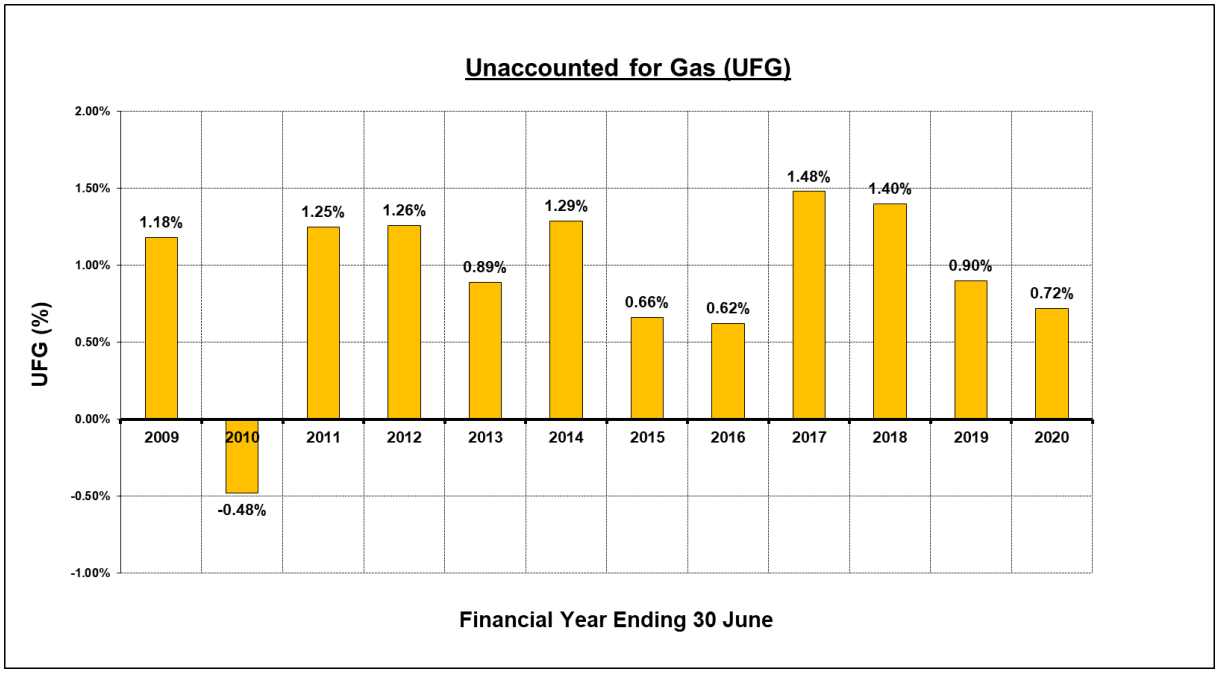
The relatively high number of unplanned interruptions in 2018 was predominantly attributable to the April 2018 event involving water infiltration into gas mains as outlined above.

During February 2020 the Company's low pressure network suffered damage when a high pressure water main burst and ruptured a low pressure gas main flooding approximately 9 kilometres of gas mains and 283 gas service pipes with water. The significant number of properties involved will impact adversely on SAIFI in the 2021 update of this Plan.

Planned interruptions will increase in the 2020/21 planning period due to the proposed increase in mains condition renewal work with the associated changeover of customer service pipes onto new mains. This will adversely impact SAIFI in the 2022 update of this Plan

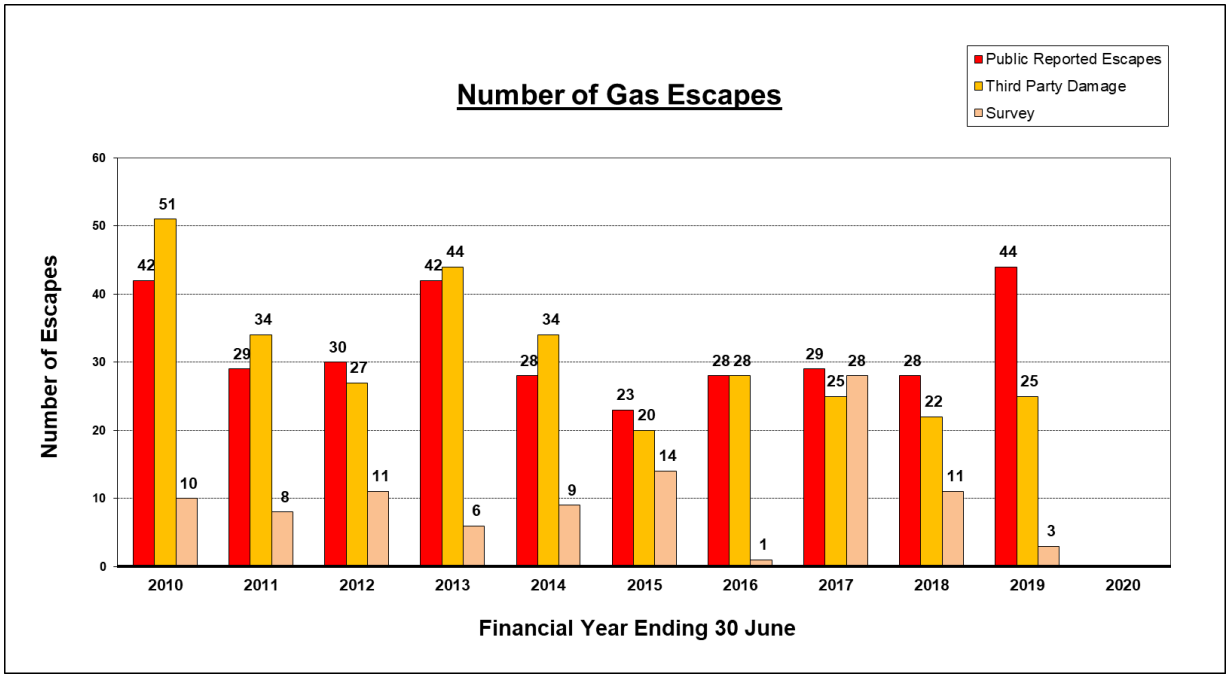


ICAIDI is the measure of how long an interruption to the gas supply lasted on average during a particular year.



Unaccounted for Gas, or UFG, is the difference between the total volume of gas entering the system at the Sales Gates less the total volume of gas exiting the network i.e. sum of the gas entering the meter at the Gas Measurement System installed on consumers' properties.

There are many factors that can effect UFG and whilst losses will occur as the gas is transported through the network (Technical Losses), there are a number of other non-network factors than can create adverse UFG quantities e.g. accuracy of the meter in the GMS, or the fact that retailers are required to estimate monthly sales to consumers due to the cyclic nature of meter readings. The value of UFG as a measure of network performance should not be undervalued but considered alongside other measures such as the number of gas escapes as shown in the following table.



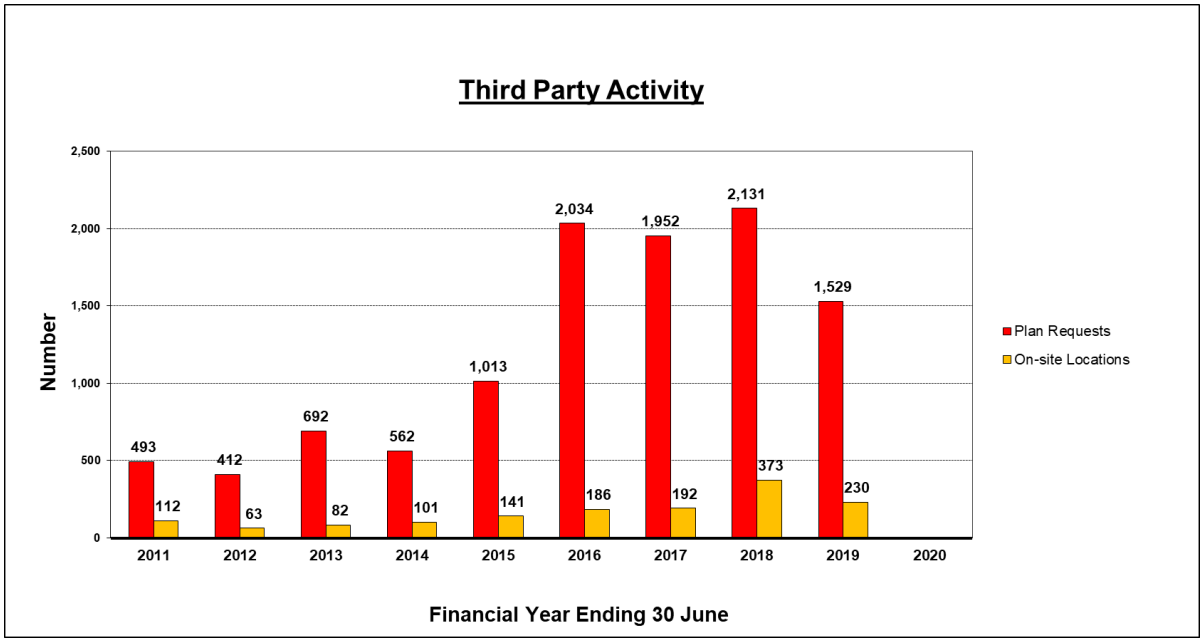
The number of gas escapes found by Survey methods increased in 2012/2013 from previous years due to a change in the leakage survey procedures. Prior to 2013/2014 leak surveys were arranged by area, i.e. the network was divided up into similar sized areas and surveys completed on a 4-5 year cycle. In 2013/2014 the leak survey procedures were changed to include a specific survey of all low pressure metallic pipes in Whanganui. This survey targets assets that are at a higher risk of leakage.

Third party is the term used to refer to people and organisations, outside of GasNet. In most instances third parties are contractors installing and maintaining other utilities' assets, but it does include home and property owners.

For the last two decades up until 2011 Whanganui had seen unprecedented activity within the road corridor as the Whanganui District Council undertook separation of its stormwater and wastewater systems. Requiring major excavations in most of the Whanganui streets the increase in activity inevitably resulted in an increase in enquiries about and damage to GasNet's buried pipes. Ironically just as the project completed around 2011, the government's fast-tracked Ultra-Fast Broadband project commenced with target completion planned within five years. Upon completion of the core UFF infrastructure in 2015 the connection of customers commenced bringing with it a significant amount of third party contractor works within customer properties. The marked increase in plan requests is largely due to this connection work.

The number of third party damage incidents have been steadily declining despite the increasing activity in the road corridor and in public property. This is thought to be attributable in part to the following in initiatives;

- Good relations with Contractors.
- Improvements in accuracy of company asset plans.
- Automated plan issue.
- Fast response to contractors queries on site
- Membership of established plans request service
- Most Contractors are well established in Whanganui and understand the process.



In June 2014 GasNet joined the beforeUdig service, which enables anyone undertaking excavation works to obtain information on the location of underground pipes and cables in and around any proposed dig site, helping to protect themselves and assets during these works. It provides a 'one stop shop' for contractors to communicate their planned activities with utilities and asset owners by providing a single point of request for information as to where underground assets are located.

Subsequently GasNet subscribed to Ticket Access DP in December 2016 to provide a fully automated plan issue service to parties requesting GasNet plans via the beforeUdig service. The system provides the party with a plan or set of plans covering the area requested almost instantly at any time of the day or night.

A program has been initiated to improve records of gas service pipe locations identified as requiring further information. The 5 year program will capture the additional location information of around 600 service pipes.

The 2018 data indicates that parties are requesting more on site Locations per plan request than previously.

GasNet plans have a good level of detail and accuracy and in most cases are the best information that can be provided. Feedback from Contractors requesting on site Locations from GasNet has suggested that Contractors may be using the Location service as a means to shortcut good excavation practices.

In 2019 the company questioned contractors on why in some cases they had requested a Location before they had been provided with Plans. Each request for a Location was assessed by GasNet and where the Plans showed a good level of detail the request for Location was discouraged.

A survey was conducted over 3 months in 2019 where the Technician conducting Location services for a Contractor answered a series of questions relating to that Location job to determine what value it added over and above the plans issued. The results of the survey are yet to be analysed but will assist in the review of the service.

The challenge for GasNet over the next few years will be to minimise the damage to its network which can only be achieved by working closely with the contractors and taking the appropriate corrective actions when adverse events occur.

6.2 Quality of Supply

Currently GasNet has the following project under consideration:

Project or programme	Description
Low pressure network pressure uprating	Network pressure up-rating involving raising the Whanganui low pressure network pressure from 2 to 5 kPag to enhance the quality of supply at the ICP which allows the consumer additional choice of appliances as many new appliances require 2.5 kPag With the development of Synergi models of the Whanganui low pressure network completed further analysis can be undertaken to determine if uprating the low pressure network is the most cost effective and beneficial solution to providing additional capacity to the network and providing elevated pressure to consumers. Further analysis, planning and risk assessment will be completed during 2020/21 before a decision is made to proceed with pressure uprating programmes.

6.3 Other reliability, Safety and Environment

Currently GasNet has the following projects and programmes in planning:

Project or programme	Description
District Regulator Station Isolation valve project	Installation of isolation valves on all DRS. Includes valves on outlet and inlet mains to provide complete isolation of gas to DRS in the event of an emergency incident.

7.0 NETWORK DEVELOPMENT PLANNING

7.1 General

The network systems are developed through planning, design and construction phases to eliminate or reduce to as low as reasonably practicable all hazards and risks identified in the hazard identification and control process, and to meet functional requirements. Functional requirements include the provision of an integrated supply system capable of meeting consumer demands at all times, as forecast by gas retailers, taking into account safety, operating conditions, and the environment to which the system is exposed.

7.2 Network Resilience in a Low-Carbon Economy

GasNet recognises that the ever increasing focus on climate change and the drive to a low carbon future brings both increased risk and opportunity to its long term investment in its natural gas infrastructure.

Whilst GasNet remains committed to promoting the benefits that natural gas provides as a transitional fuel to a low carbon future, it also recognises that the long-term efficiency and viability of its infrastructure will be dependent upon the extent to which consumers continue to use gas and the availability of gas to supply them.

GasNet will continue to monitor the regulatory and social environment within which it operates and focus on issues that could/would impact materially on its business and stakeholders. It is expected that GasNet's infrastructure investment and the manner in which it is managed and operated will evolve as the direction and impact of the low-carbon future becomes clearer, as too will future publications of its AMP.

7.3 System Growth

Asset Type	Commentary
INTERMEDIATE PRESSURE	
Main pipe	No growth forecast.
Service pipe	Little or no growth forecast.
Stations	No growth forecast.
Line valve	No growth forecast.
Special crossings	No growth forecast.
MEDIUM PRESSURE	
Main pipe	There has been an increased level of residential housing development over the past two years with projects in Bulls, Marton and Whanganui including gas reticulation within their plans. Growth is forecast to remain steady at current levels. Whanganui District Council Planners have indicated long term residential developments in Otamatea West and the Springvale, Whanganui which will be serviced by medium pressure gas reticulation. The Otamatea West area has sufficient capacity for growth and the Springvale area will benefit from a proposed strategic link to Gonville where connection to a DRS will provide a reinforcement for future growth and improve the security of supply.
Service pipe	Number of new services is expected to remain stable due to increasing consumer demand for gas instant hot water offset by a reducing demand on space heating due to alternatives, in particular heat pumps.
Stations	The number of assets are not planned to increase but modifications to existing Stations is planned to incorporate network metering equipment.
Line valve	Some increased level of growth with the planned construction of a strategic medium pressure link of Gonville to Springvale.
Special crossings	Nothing planned
LOW PRESSURE	
Main pipe	There has been an increased level of residential housing development in the past two years. The high level of existing urban reticulation limits the potential for growth
Service pipe	Growth to remain stable due to increasing consumer demand for gas instant hot water being offset by a reducing demand on space heating due to alternatives, in particular heat pumps.
Line valve	Some increased level of growth with the planned sectionalisation of the low and medium pressure networks for emergency network management.
Special crossings	Nothing planned

OTHER ASSETS	
Monitoring and control systems	Additional pressure and flow monitoring devices are planned for installation in 2020/21. These will assist in the validation of network models identifying present or future capacity constraints and to enhance the network pressure alarm system.
Cathodic protection systems	Nothing planned
Other assets (other than above)	Nothing planned

7.4 Identified Material Network Development Programmes

7.4.1 Network

Currently GasNet has the following network programmes in place:

Programme	Description
Subdivisions	GasNet has for a number of years worked collaboratively with those driving development of new subdivisions (or further stages of existing ones) to provide natural gas reticulation to potential end-users.
MP link of Whanganui River bridges	The strategic link of 3 Whanganui River bridges to reinforce MP supply will provide the ability to isolate any bridge crossing where a bridge crossing has been lost or where a maintenance event requires the shutdown of a bridge and its crossing. Provides a grid configuration which will increase capacity of MP network allowing network growth to be made into all areas. Project has been long term commencing in early 1990s and has taken advantage of trench sharing opportunities with other utilities. Main laying was completed in 2018 with the linking of two bridges and there remains a few metres of steel main to be linked on the third bridge to complete the project. This work is planned for 2020/21 year.
Gonville-Springvale Strategic MP link	High residential gas loads on the Springvale low pressure system have resulted in the significant pressure fluctuations on the medium pressure system that supplies the Springvale DRS. Installation of a strategic link main from the Abbot Street DRS in Gonville to Springvale and modifications to the DRS will reinforce gas supply to the Springvale area. The proposed main will be laid in stages as construction of new residential developments in the area proceed. The main will bring medium pressure into the centre of the large residential development providing for elevated pressure to be supplied to consumers who would otherwise be connected to the existing low pressure network.
Network Signage Upgrade	In 2019 the company reviewed its requirements for signage and in doing so produced a comprehensive Signage Plan. The Plan encompasses the requirements of network Standards AS/NZS 4645 and AS/NZS 2885, Local Authority and meets the requirements of AS1319 - Safety Signs for the Occupational Environment. GasNet is planning to upgrade all network signage to meet the requirements of the Signage Plan during the 2020/21 period.

7.4.2 Non-network

Project	Description
Asset Management Systems development	The company plans for further development of its asset management systems to continue in 2020/21 with the purchase and implementation of an Asset Management software solution.

7.5 Identified Material Network Development Projects

7.5.1 Network

Currently GasNet has the following network projects in place:

Project	Description
Network Analysis - DRS monitoring project	Installation of equipment at DRS to enable measurement of flow. The equipment will interface into existing telemetry equipment installed at DRS to log and transmit the data to a central computer. The measurement, collection and subsequent analysis of this data will assist future network design, provide utilisation information and aid emergency planning. The project may involve significant modification to DRS installation to fit the new measurement equipment.
Network Analysis – Evaluation Tool **Network Analysis – Evaluation Tool (continued)**	Following the evaluation and subsequent purchase of proprietary Synergi Gas network analysis software in late 2014, the implementation process commenced with manipulation of the GIS data, the primary data source for the model. At the same time that this work was being undertaken GasNet used the application for design of networks within residential developments in Whanganui and extensively for design of the Papamoa, Bay of Plenty network in 2016. In 2017-18 the network modelling was refined and finalised, with basic modelling of the Flockhouse, Waitotara, and Bulls networks completed. A review undertaken in 2018 by the software supplier DNV GL Software Consulting concluded that “Based on the settings shown the model converts with no issues and will run a steady state with no errors. The data in the model is all feasible” and “In summary, this model has been configured and converted correctly”. Development work continued with the Marton network model completed in 2019 and it is expected that the Whanganui Network base model will be completed by 30 June 2020. Further work planned for 2020/21 includes; - Generation of templates for the various Regulating Station configurations; - Verification of Synergi modelling by collecting real time data from the network for comparison; - Inclusion of real time data from TOU devices. - General development and continual improvement of all of GasNet’s networks models.

7.5.2 Non-network

Currently GasNet has no non-network projects in place.

8.0 LIFECYCLE ASSET MANAGEMENT PLANNING (MAINTENANCE AND RENEWAL)

8.1 General

The Networks are operated to safely manage the risks identified in the hazard identification, risk assessment and control process and to meet functional requirements. The functional requirements include the provision of an integrated supply system capable of meeting consumer demands at all times as forecast by gas retailers and responding to emergency situations as and when they arise. All system operational activities are carried out in accordance with the GasNet's Safety and Operating Plan.

8.2 Asset Replacement and Renewal

Asset Type	Commentary
INTERMEDIATE PRESSURE SYSTEM	
Main pipe	Nothing planned
Service pipe	Nothing planned
Stations	Some existing station equipment has become obsolete or in other cases replacement parts are becoming uneconomic to procure, requiring replacement with a modern equivalent. One DRS will be replaced within the next 5 years and others planned to be modified for installation of new equipment. Some station enclosure roofs are showing signs of corrosion and a replacement program has been in place for 3 years to replace roofing materials and in some cases modify roof structures to provide for additional head room. The programme will continue in 2020/21 with the roof on one DRS to be replaced.
Line valve	Many valves are not accessible from the surface of the ground and require excavation. Valves identified as strategic to have chambers (risers and lids) installed to enable easy access. There are a few valves installed above ground, which although very robust tend to seize up over time due to both the environmental conditions and the drying nature of gas. It is proposed to replace three such valves in 2020/21 at the Whanganui Sales Gate installation with modern equivalent ball valves.
Special crossings	The 100mm and 150mm diameter mains pipes that crossed an open watercourse adjacent to the Whanganui Sales Gate were renewed and relocated under the water course in 2019. No further work is planned at this time.
MEDIUM PRESSURE SYSTEM	
Main pipe	Works planned to identify quantity and location, and to test material to determine life remaining.
Service pipe	A programme commenced in 2018/19 involving inspection of service riser pipes that do not have meters installed. The inspection is primarily intended to confirm integrity of these assets but will also provide for asset information collection. It is planned to complete the survey over a 5 year period with all service risers inspected by 30 June 2023. The 2020/21 inspection was deferred due to a major network incident and the COVID19 Pandemic.
Stations	Some regulator equipment installed is becoming obsolete requiring replacement with a modern equivalent. Installation of replacement equipment requires modifications to the design. Station enclosures will require refurbishment over 5-10 years.
Line valve	Nothing planned

Special crossings	Pipelines crossing rivers and streams are typically attached to bridges and other structures suspended over the water. The access to these pipes to inspect and/or maintain them is difficult, often requiring specialist personnel and equipment. There are pipeline crossings over the Whanganui River at three of the city bridges. It is acknowledged that each of the crossings require some level of maintenance but due to access issues the extent of the maintenance required can be difficult to establish other than that identified through routine inspections. The Aramoho rail bridge crossing is difficult to access with the pipeline slung under the walkway making assessment of maintenance requirements challenging. It is proposed to assess the future maintenance needs of all three bridges and to introduce budgets in following years to complete any works required. An aerial survey of the Aramoho Rail Bridge MP crossing was completed by OPUS in 2019/20 using a drone. The survey was not completely successful because the pipeline could not be viewed around its complete circumference and further survey is planned. Two Whanganui river bridge crossing constructed of steel have planned corrosion remediation and protection works planned in the next 5 years.

LOW PRESSURE SYSTEM	
Main pipe	Older pre natural gas metallic LP mains are replaced with modern polyethylene materials. The replacement of the metallic LP mains is prioritised on past and existing leakage patterns and involves all metal types. The strategy for replacement of pre natural gas low pressure metallic pipes is to be fully documented as discussed in other sections of this AMP but the Company's 2020/21 Annual Plan has provided for an increase in the rate of replacement.
Service pipe	Metallic services are replaced by polyethylene when the main is replaced. Forecast increasing number of older metallic service replacement on the basis of risk identified. Service pipes located under buildings are high priority for relocation and are replaced and/or relocated as identified. A programme commenced in 2018/19 involving inspection of service riser pipes that do not have meters installed. The inspection is primarily intended to confirm integrity of these assets but will also provide for asset information collection. It is planned to complete the survey over a 5 year period with all service risers inspected by 30 June 2023. The 2020/21 inspection was deferred due to a major network incident and the COVID19 Pandemic.
Line valve	Nothing planned
Special crossings	Mechanically jointed LP metallic rail and bridge crossings have an elevated safety risk profile and are planned for replacement over the next 10 years.

OTHER ASSETS

Monitoring and control systems	Nothing planned
Cathodic protection systems	After a period of substantial utility construction work and significant coating damage causing the CP system to be compromised, our Cathodic Protection specialists recommended a Direct Current Voltage Gradient (DCVG) survey be completed on all systems. A survey of all cathodically protected pipelines in Whanganui and Marton has commenced and is proposed to be completed over three years. A full DCVG survey was completed of the Marton network by an independent external party in 2019 and five defects were found in the pipeline coating over the 3.4km of pipeline surveyed. Two defects are planned for excavation and further inspection. It is proposed to complete a DCVG survey of half of Whanganui's cathodically protected IP and MP network during the 2020/21 period.

8.3 Identified Material Lifecycle Asset Management Programmes

8.3.1 Network

Currently GasNet has the following network programmes in place:

Programme	Description

Replacement of LP non PE	Replacement of LP non PE mains and services. The metals used in the LP network include wrought and cast irons, spiral riveted, spiral welded, Mannesmann and galvanised steels. Mains constructed of each of these materials have their own characteristics. Steel mains are likely to be in good condition provided the coating is intact and joints are sealed and the cast iron mains are generally in good condition provided the joints are sealed. The replacement of the metallic LP mains is prioritised on past and existing leakage patterns and involves all metal types. The strategy for replacement of pre natural gas low pressure metallic pipes is to be fully documented as discussed in other sections of this AMP but the Company's 2020/21 Annual Plan has provided for an increase in the rate of replacement.
LP crossings	Review of the condition of these assets and where deemed necessary refurbish accordingly
Replacement of service valves	Various types of service valve have been installed on the network over time. Each type of service valve has characteristics that make it more or less suitable for the present duty. Some identified types of valves are replaced when other work is being conducted at the ICP. A program will be developed to identify the type of service valve installed at each ICP and a program for the replacement if required
Riverbank erosion threats to IP assets	There have been a number weather events since 1990 that have caused erosion of the river bank in areas where GasNet's pipes are located. The areas that have had most impact on the gas network are in the upper section of Somme Parade where gas pipes have either been relocated from the river side of Somme Parade to the side of the road furthest away from the river or the Whanganui District Council has completed stabilisation work to retaining the ground to secure assets. During the river flood event in 2015 further erosion occurred in Somme Parade in the vicinity of Aramoho Rail Bridge where ground movement due to erosion has come close to the Intermediate pressure gas mains. After the 2015 event the Whanganui District Council advised that there would be remedial works completed in the area to retain the riverbank to prevent further erosion but in 2017 it was confirmed that there were no plans for riverbank stabilisation. GasNet subsequently commissioned Opus International Consultants to carry out an assessment of the stability of a section of the riverbank in the vicinity of Aramoho Rail Bridge, and to report on the risk of pipelines installed in this area. The report received in April 2018 identified a number of issues that require further consideration and assessment of options for remedial actions which include the relocation of pipes and or ground stabilisation work. After again confirming in 2020 that no remedial action is planned by WDC it appears likely that any remedial work identified by GasNet will be for its own assets. During 2020/21 further design and planning will be completed by GasNet and consultants to identify a strategy and plan to manage and monitor the situation including future funding requirements for any remedial activities that might be required. The area is being monitored and in the event that the situation changes and remedial works become urgent then additional funds may be provided, reallocated from other projects, or a combination of both.

8.3.2 Non-Network

Currently GasNet has the following non-network programmes in place:

Programme	Description
Safety Management System	GasNet has a legislative requirements to implement and maintain a safety management system dealing with public safety and public property protection from gas distribution system related activity. This is a strategic programme involving many aspects of operations and associated safe work practices.
Regulatory	Following legislative changes, GasNet has implemented a number of Commerce Commission Determinations applicable to GDBs of which information disclosure is but one. This is a strategic programme involving many aspects of business practices, documentation and reporting.

8.4 Identified Material Lifecycle Asset Management Projects

8.4.1 Network

Currently GasNet has the following network projects in place:

Project	Description
Data capture of asset information	GasNet is expanding the asset data types and attributes thereof that it captures. Within the project planner, there is an undertaking to increase field team based data capture 'at source', and via work package documentation enhancements.

8.4.2 Non-network

Currently GasNet has the following non-network projects in place:

Project	Description
Vehicle fleet	On-going replacement of vehicle fleet – GasNet's fleet of vehicles are utilised to meet operational and capital activities across the five networks. Some vehicles are customised to enable field staff on site access to specialised equipment necessary to undertake planned works and to respond to call-out and emergency situations. The replacement of a large van is proposed in the 2020/21 Annual Plan.

9.0 EXPENDITURE

9.1 Management of Actual Costs

GasNet captures all of its costs, both in Opex and Capex, in its General and Job Ledgers held in its financial management system Finance One. The chart of accounts and costing systems provide for separation of Opex and Capex and are reported separately.

Costs are allocated to the appropriate General or Job Ledger at source, with timesheets for personnel, requisitions for all inventory issued from GasNet's in-house store, and invoices for goods and services received.

Where General and Job Ledger accounts relate directly to GasNet's regulated network activities these costs are mapped directly to the relevant regulatory categories. Where accounts include costs that are either shared across both the regulated and unregulated activities, or do not directly relate to either activity, these costs are allocated to the relevant regulatory categories typically by applying proxy allocators.

The actual Opex and Capex costs reported in this section and throughout this AMP are as they have been reported by GasNet and publicly disclosed on its website in accordance with the Commerce Commission Gas Distribution Information Disclosure Determination 2012 – consolidated- 3 April 2018.

9.2 Explanation of Graphs

The graphs shown within this section present actual expenditure incurred by GasNet as disclosed up to and including its latest disclosures, and forecast expenditure (in constant prices) for the current year plus the following 10 year planning period, consistent with its latest AMP disclosure schedules as shown in Appendix 2.1.

9.3 Operational Expenditure (Opex)

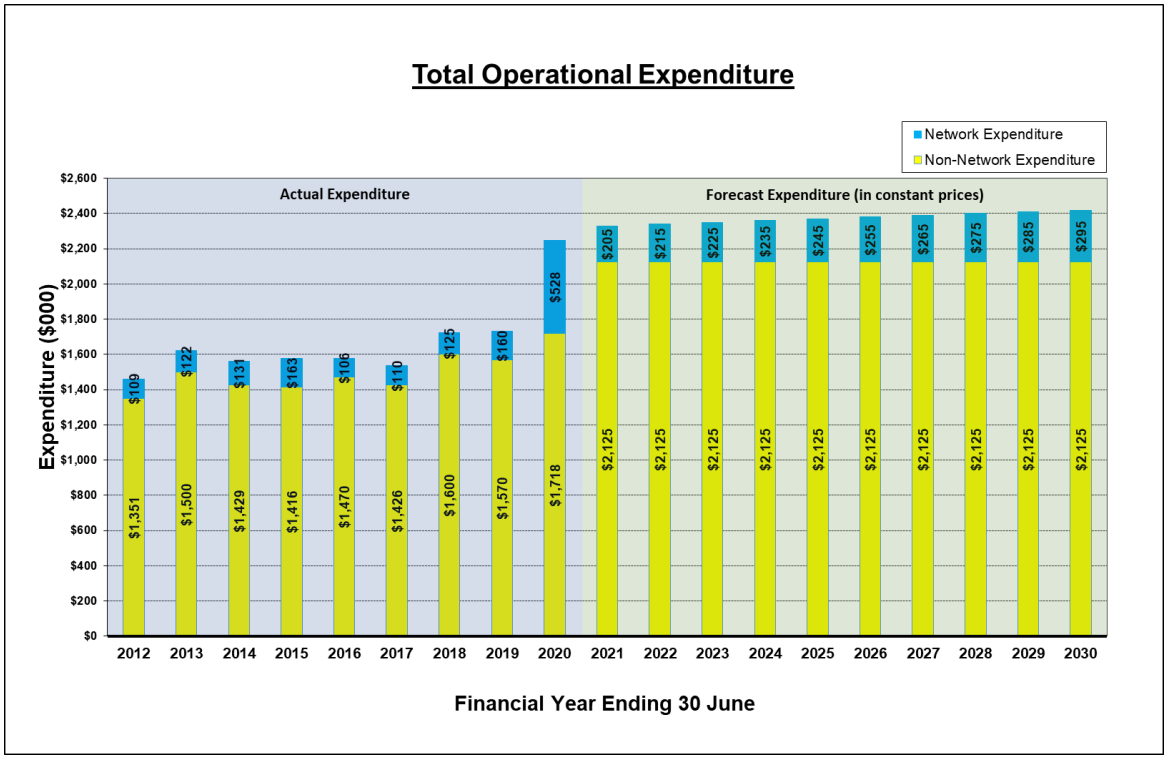
9.3.1 Total Operating Expenditure

Operational Expenditure, also referred to as Opex, are those costs incurred by GasNet in the operation and maintenance of its network. Costs related to asset creation and renewal are treated as Capital Expenditure, or Capex.

Operational Expenditure is reported within the following categories and subcategories, consistent with the latest information disclosure requirements.

- Network
  - Service Interruptions, Incidents and Emergencies
  - Routine and Corrective Maintenance and Inspection
- Non-network expenditure
  - System Operations and Network Support
  - Business Support

Described and analysed in greater detail in the following sections, the total Operational Expenditure is shown in the following graph.

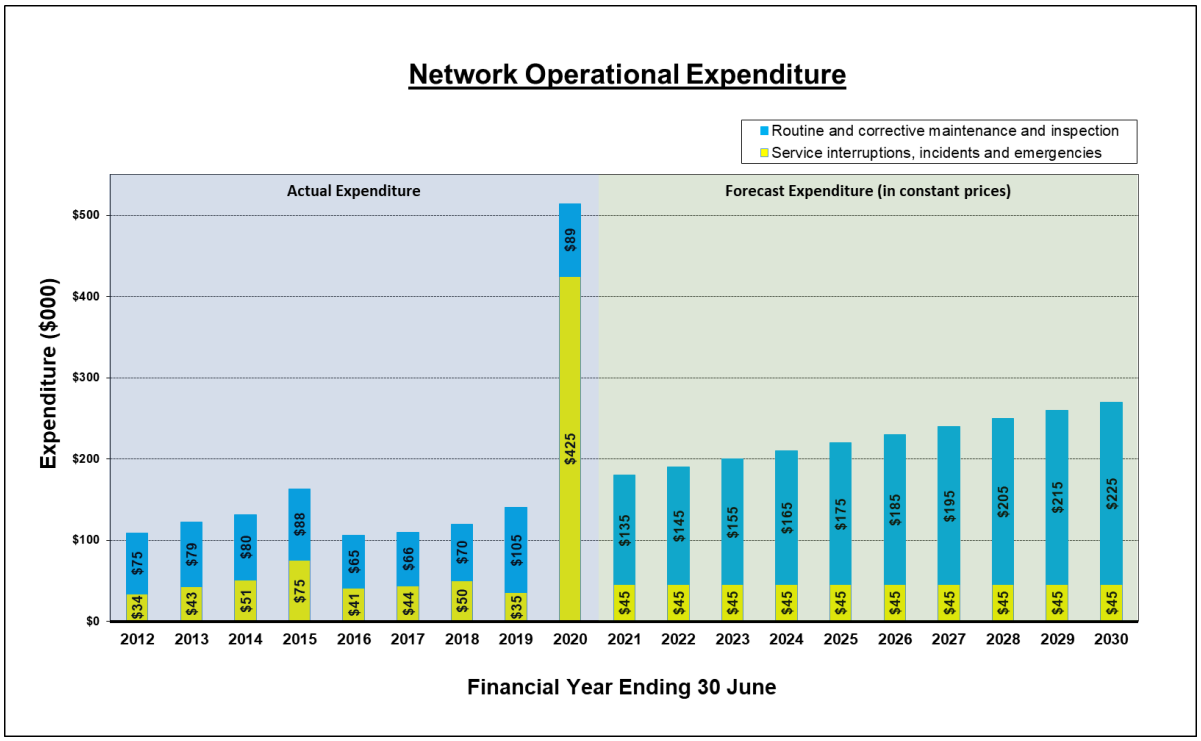


GasNet's historic and forecast total expenditure is relatively uncomplicated reflecting its stable operation and cost structure and activity base. Dominated by non-network expenditure at around 93%, any material change in business activity either within GasNet's regulated network business or it unregulated metering business could change the allocation of costs to each.

9.3.2 Network Opex

Service Interruptions, Incidents and Emergencies expenditure is attributed to unplanned events or incidents on GasNet's networks. Although there are a range of scenarios that could apply under this category, the majority relate to the initial response, make safe and repair activities associated with unplanned leakage caused by third party interference or premature failure of a pipe of fitting.

Routine and Corrective Maintenance and Inspection expenditure relates to planned inspection, testing and maintenance activities on GasNet's networks. Described in greater detail in section -, these activities typically cover the scheduled inspection and maintenance of GasNet's District Regulator Stations, crossings, service valve and risers, odorant testing and leakage surveys.



With GasNet's network operational expenditure driven by planned maintenance activities and unplanned events and incidents, it is not surprising to see variation in actual expenditure year on year. Recognising that the planned maintenance work is more predictable and therefore forecasting should be more accurate than its counterpart, the forecast expenditure reflects an expectation based on continuation of the current maintenance policies and practises, along with an estimate for those activities that are less able to be anticipated by GasNet, such as third party interference damage. As an example and as discussed in greater detail in section 6.0 of this AMP, the increase by third parties working in the road corridor is reflected in the number of location services requested, which has respectively increased the risk of damage to the network by those parties.

In February 2020 GasNet's network suffered a significant third party damage event when a pressurised water main ruptured, damaging a polyethylene gas pipe and flooding 9km of low pressure gas mains and 339 service pipes. The works required for removal of the water and reinstatement of the low pressure network impacted significantly on network operational expenditure over the subsequent months.

Immediately following the final network restoration work the COVID-19 worldwide pandemic situation impacted on the company with restrictions placed on company activities. Non-essential activities were deferred including a significant portion of the capital works programme resulting in additional unplanned operational expenditure with staff only able to complete routine safety related activities.

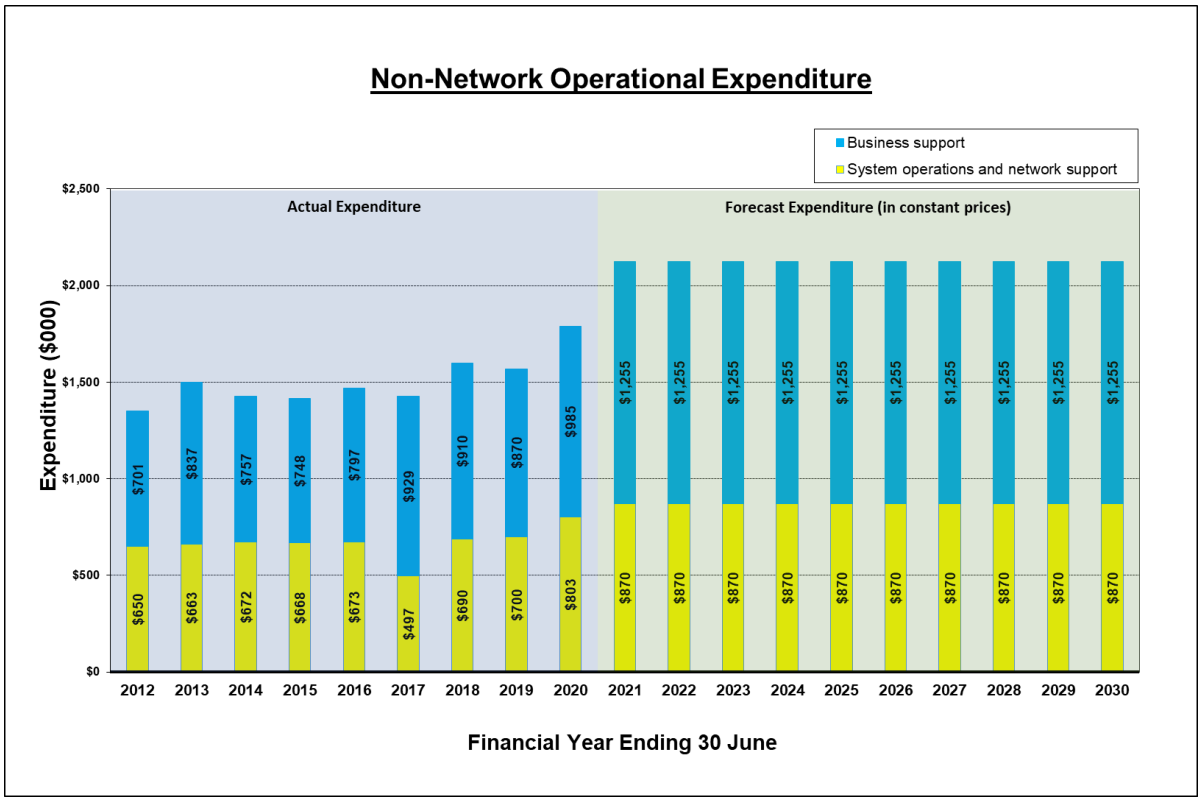
The additional network operational expenditure costs related to the above events will be evident in future updates of this Plan.

9.3.3 Non-network Opex

System Operations and Network Support relates to management of the network and incorporates costs associated with the personnel, vehicle, telephony, information technology, tools and equipment calibration and

location services for the three operational sections within GasNet but excluding Corporate i.e. General Management, Engineering, Asset Information Services and Finance & Administration.

Business Support relates to GasNet's corporate activities and include corporate related costs excluded from those costs attributed to System Operations and Network Support above, as well as all Director, finance, audit, legal, consulting, regulatory compliance, marketing, occupancy and human resource related costs.



As a major contributor to GasNet's total operational expenditure, GasNet's non-network expenditure can be seen as the reason for the total costs being as straightforward as they are, with both historic and forecast expenditure reflecting the stable operation and costs, evidenced by the trend in historic costs for these expenditure categories.

9.4 Capital Expenditure (Capex)

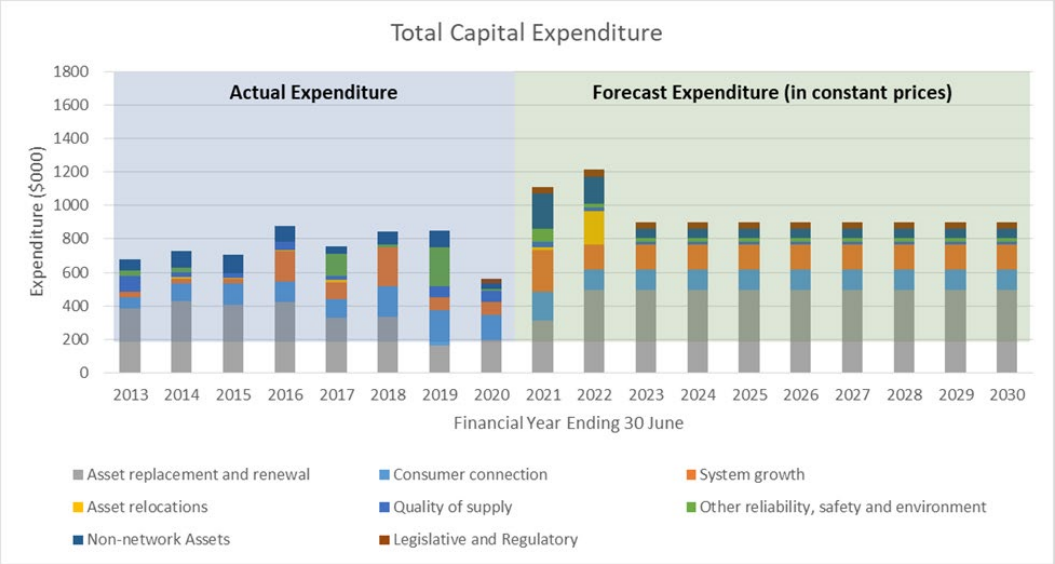
9.4.1 Total Capital Expenditure

Capital Expenditure, also referred to as Capex, are those costs incurred by GasNet in the creation and renewal of its assets, as opposed to operations and maintenance of the assets which are referred to as Operational Expenditure, or Opex.

Capital Expenditure is reported within the following categories and subcategories, consistent with the latest information disclosure requirements.

- Customer Connection
- System Growth
- Asset Replacement and Renewal
- Asset Relocations
- Reliability, Safety and Environment
    - Quality of Supply,
    - Legislative and regulatory, and
    - Other reliability, safety and environment
- Non-network Assets

Described and analysed in greater detail in the following sections, the total Operational Expenditure is shown in the following graph.



9.4.2 Customer Connection Capex

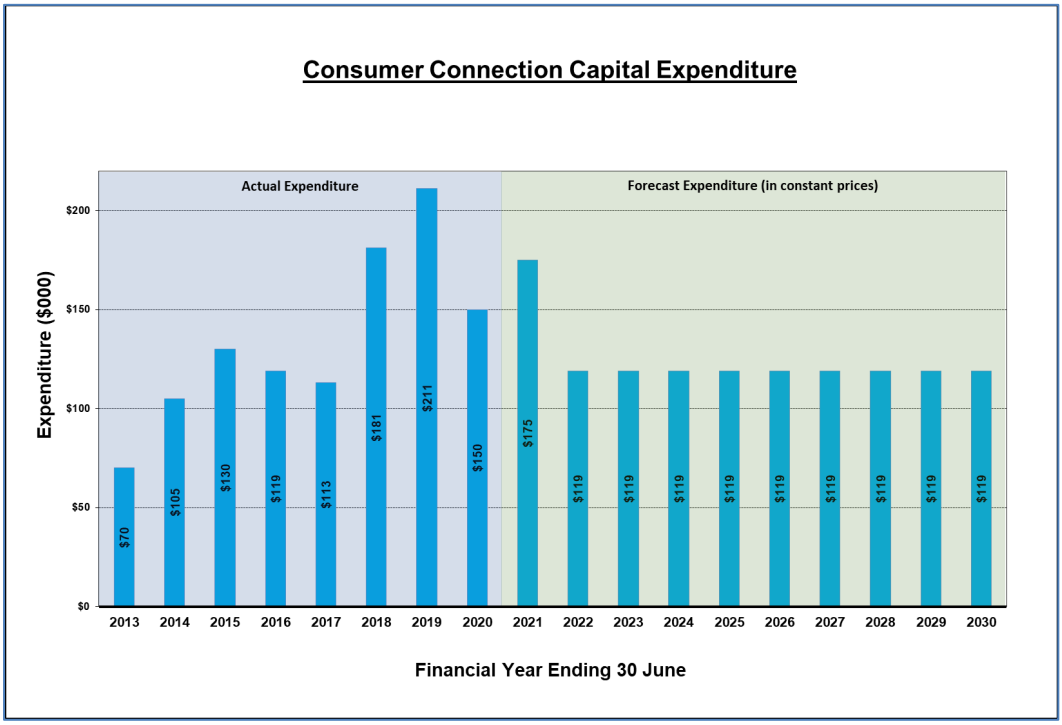
These costs relate to capital expenditure associated with the connection of new consumers to the network and comprises the cost of the service pipe, the connection to the main pipe and the riser and valve assembly at the termination point, usually the inlet of the meter installation on the consumer's property.

The demand for new connections is subject to many influences of which only a few are within GasNet's ability to control. Land development and the release of new residential properties has historically been very low in the areas served by GasNet's existing infrastructure, typically resulting in less than 1% annual growth in connections.

By comparison, the rate of commercial and industrial connections is much smaller and by their nature are more difficult to predict and incorporate in any long term forecast.

GasNet's forecast which is shown in the following graph is based on estimates for Residential and Commercial/Industrial consumer connections which reflect recent historic trends and known future developments.

A step increase in 2018 was due to an increase in demand for new gas connections, with 104 commissioned in 2018 and then 118 in 2019.



9.4.3 System Growth Capex

System Growth expenditure relates to the provision of additional capacity where there is a change in demand on GasNet's network. This can take the form of a new mains extension or upgrade of existing assets to accommodate new consumer connections, or growth in demand on the network from existing consumers.

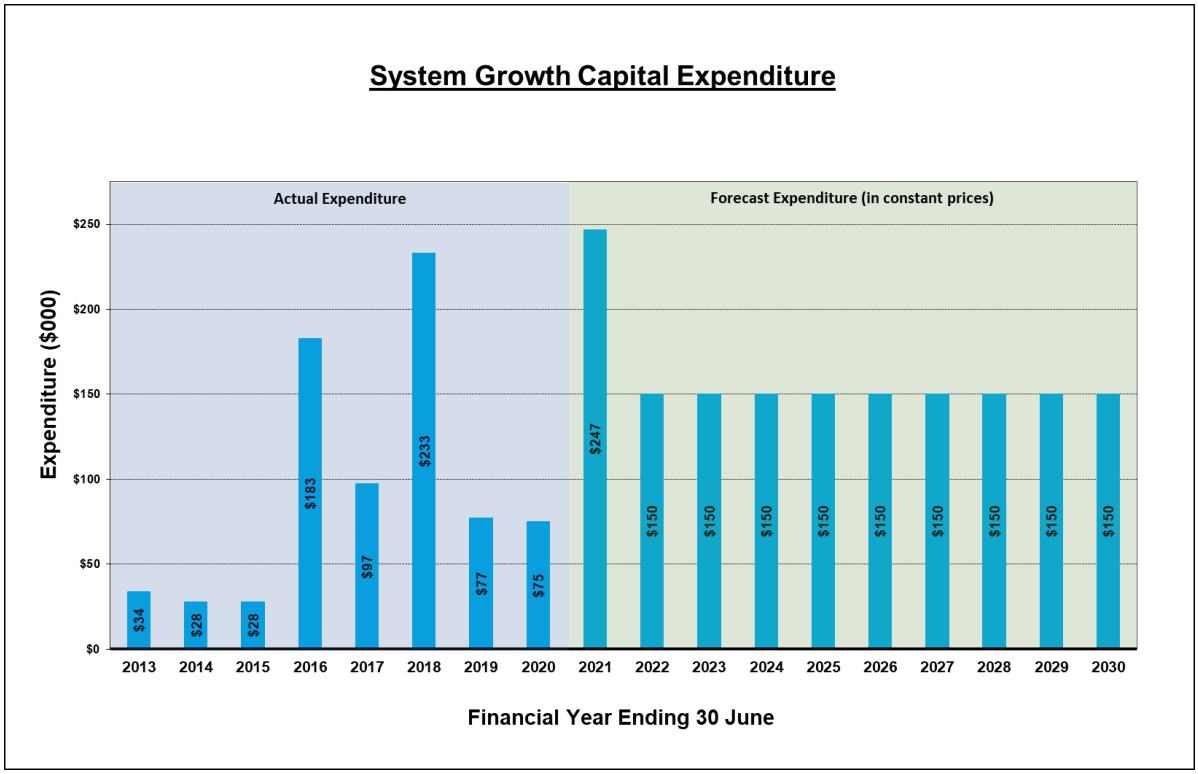
GasNet's historic expenditure has been related typically to reticulation of new subdivisions although the global financial crisis in 2007/08 saw a dramatic reduction in land development in Whanganui.

The notable increase in 2017 and 2018 is due to the main extension associated with supply of gas to the Whanganui District Council's new Waste Water Treatment Plant which will use gas for sludge drying in what is expected to be an almost 24/7 operation. At a total estimated cost of $386,000 incurred over two consecutive financial years in 2017 and 2018, the 4km main extension of 100mm PE was commissioned in September 2017.

In 2019 a system reinforcement project in Hakeke Street Whanganui involved the installation of 500 metres of new Medium pressure to provide additional capacity to the Eastown Road District Regulator Station.

The increased level of new housing development in Whanganui and Marton in 2019 and into 2020 is driving an increased level of expenditure in this area as new mains are installed within the developments during construction of roads. The 2020/21 Annual Plan provides an increase in expenditure in this area due to the number and scope of additional projects including;

- Construction of the first stages of a new medium pressure strategic main that will link Gonville to Springvale. Estimated at $67K for the first two stages the link will provide additional capacity to the MP network in Springvale to meet demands of residential development improving network security of supply.
- Linking of two isolated ends of the medium pressure network in Hereford Street, Marton to improve network capacity security of supply in an area of a large residential development.
- Extension of the medium pressure network in conjunction with the construction of the new Fitzherbert Avenue road corridor. The extension will bring a medium pressure gas supply into the heart of a large residential development area.



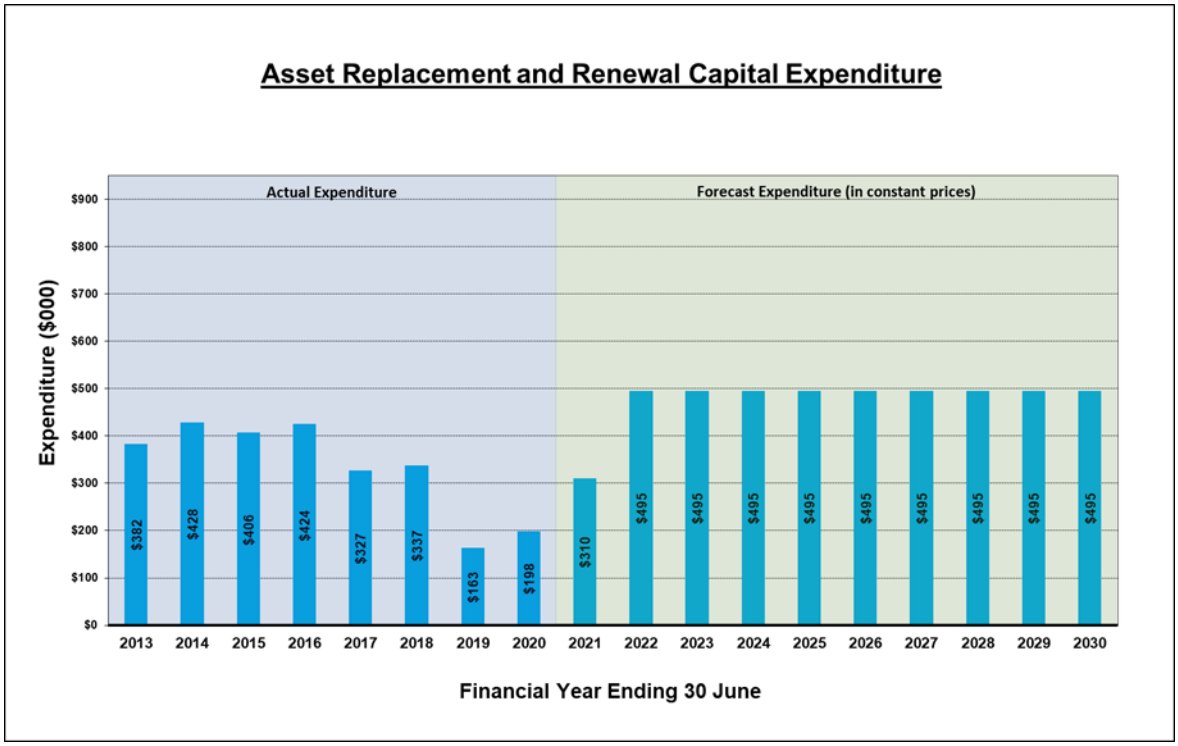
9.4.4 Asset Replacement and Renewal Capex

Asset renewal expenditure relates to the replacement of assets due to their condition, typically as they reach the end of their asset-life cycle, but also to maintain asset integrity in order to preserve security or quality of supply standards.

Although traditionally the focus has been on the replacement of GasNet's pre-natural gas metallic low pressure pipes, other assets are replaced as required.

Described in greater detail under section 8.0, the replacement of metallic pre-natural gas low pressure assets will be increased from 2020/21 and is expected to continue at a higher rate throughout the current 10 year plan and

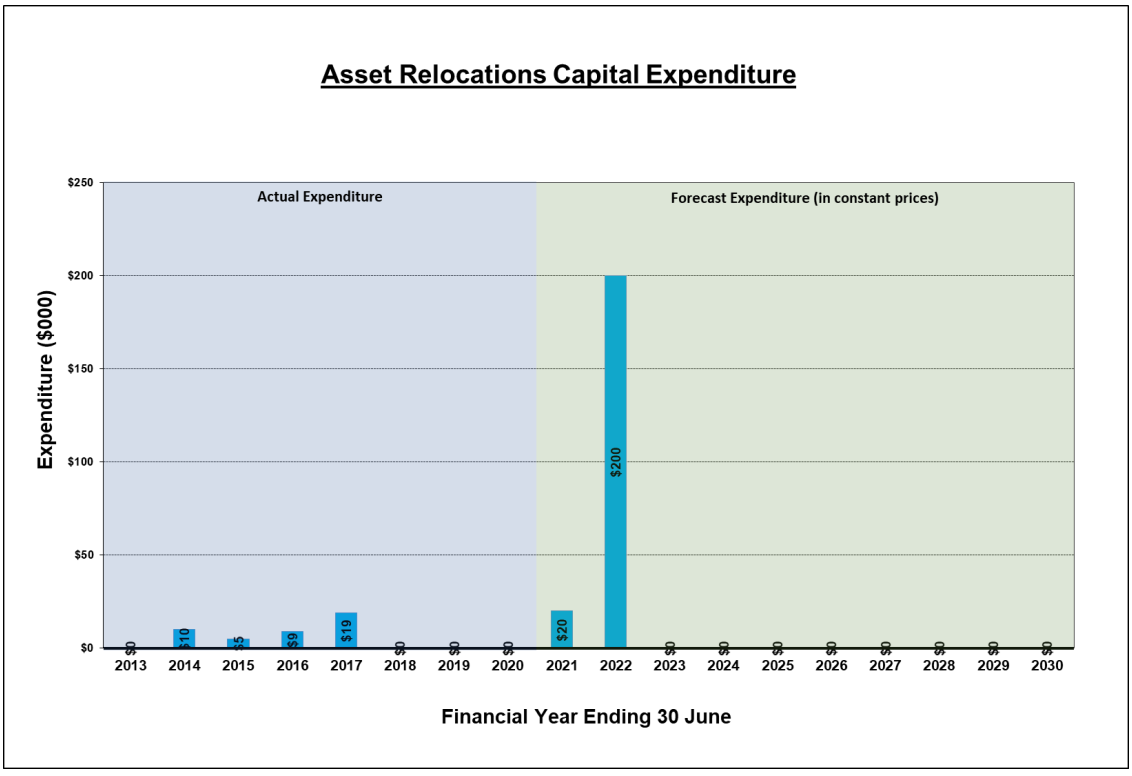
beyond. Assets will remain in service until such time as they are either identified as being in a condition where failure is highly likely or imminent, or where quality of supply is likely to be affected, such as UFG losses.



9.4.5 Asset Relocations Capex

Asset Relocations relates to third party requests for GasNet to move its assets, typically due to road reconstruction or where another utility is replacing its assets and GasNet's assets are in their way. Assets can be relocated permanently or temporarily during construction. Relocations also occur when a consumer requests relocation of the meter installation on their property, usually achieved by GasNet relocating its service riser.

Accurate forecasting of expenditure is problematic due to the short term planning and notice of works that might trigger an asset relocation request to GasNet. Despite this the historic expenditure for asset relocations indicates low activity with the nil forecast reflecting that trend.



9.4.6 Reliability, Safety and Environment Capex

This activity brings together the following activities;

- Quality of Supply,
- Legislative and regulatory change, and
- Other reliability, safety and environment considerations

Quality of Supply relates to expenditure which might be needed to improve reliability of either the network, service standards, or security of supply.

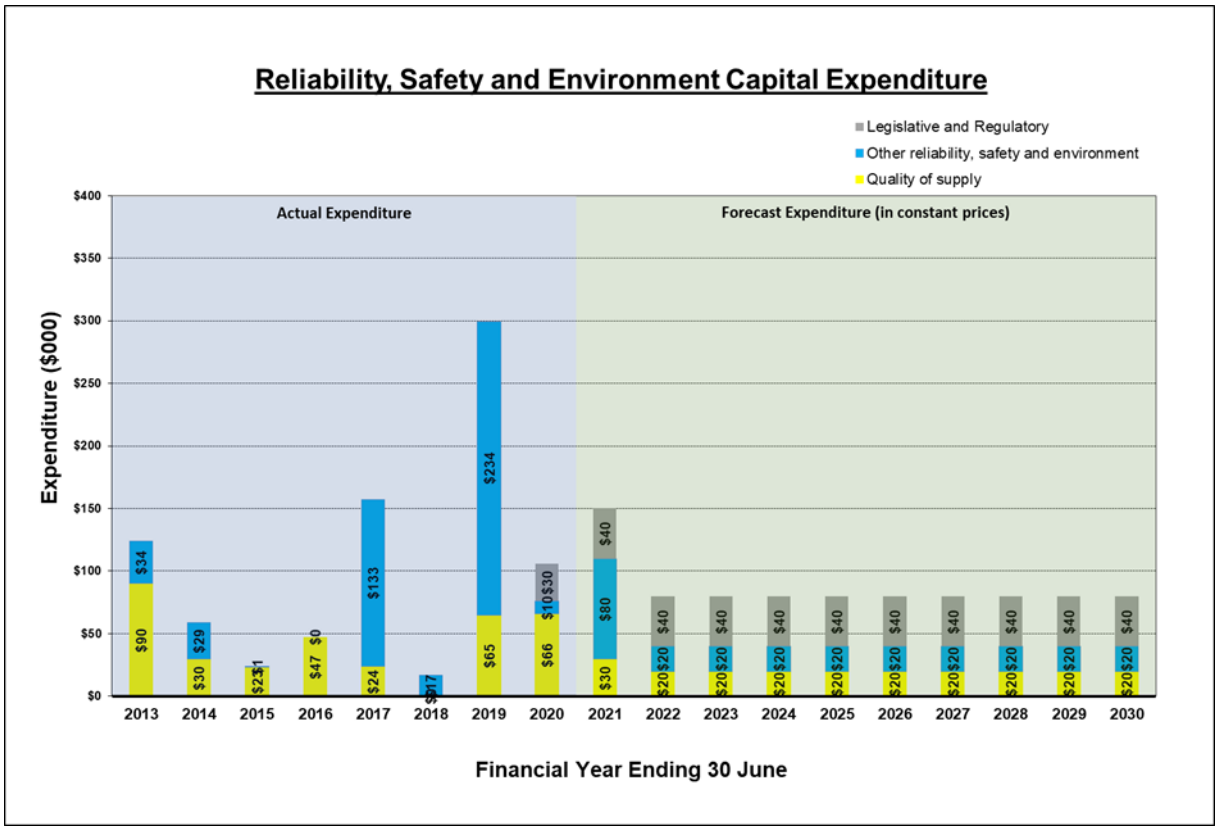
Legislative and regulatory expenditure relates to a new regulatory or legal requirement that necessitates modification of the network assets either through creation of new or modification to existing assets. Historically this has resulted in no activity or expenditure incurred, and as no future activity has been identified the forecast reflects this.

Other reliability, safety and environment considerations relates to improvements in the safety of the network for any and all persons, or to mitigate potential or real environmental impacts of GasNet's network assets.

Activities under this group are typically project specific and identified as such.

Major expenditure was incurred in 2017 with $135,000 associated with the interconnection of the two intermediate pressure pipelines which exit the Whanganui Sales Gate and supply virtually the entire Whanganui network. The two pipes of differing sizes and capacity each cross under and through the Karoro Stream adjacent to the Sales Gate. The interconnection of these two pipes has significantly increased security of supply by eliminating the dependency on both pipelines such that one or other can operate in isolation, whilst additionally providing the ability to cut in the new pipes across the stream which were installed in 2015. (Discussed in greater detail in section 8.0).

The cutting in and commissioning of the new Intermediate Pressure pipeline crossings adjacent to the Whanganui Sales Gate was completed in the last quarter of 2018.



Interconnection of the medium pressure bridge crossings in Whanganui was largely completed in late 2018 with the final 'tie in' section of main on the Aramoho rail bridge due to be completed in 2020/21. Originally starting in 2009 this strategic link will provide a significant interconnection of the three medium pressure mains located on bridges crossing the Whanganui River.

Commencing in 2011 GasNet introduced a plan to install isolation valves on the inlet of all of its above ground District Regulator Stations to provide quicker and easier isolation of any station in the event that access to the above ground pipework was hindered or not possible. Although the current situation does not pose an immediate risk as there are alternative means of isolating supply to each station if required, installation of remote isolation

valves is considered prudent. The historic and forecast expenditure reflects replacement each year of a manageable number of valve installations acknowledging the various issues that each installation poses, with no two stations providing the same set of circumstances.

Safety related projects planned for 2020/21,estimated to total $109K include a District Regulator Station enclosure security upgrade, pipeline crossings safety improvements and a strategic main signage upgrade amongst others.

9.4.7 Non-network Assets Capex

Non-network assets are those assets that are not considered part of the network but that are related to the provision of network services such as vehicles, plant and equipment, office furniture and equipment, information technology and asset management systems.

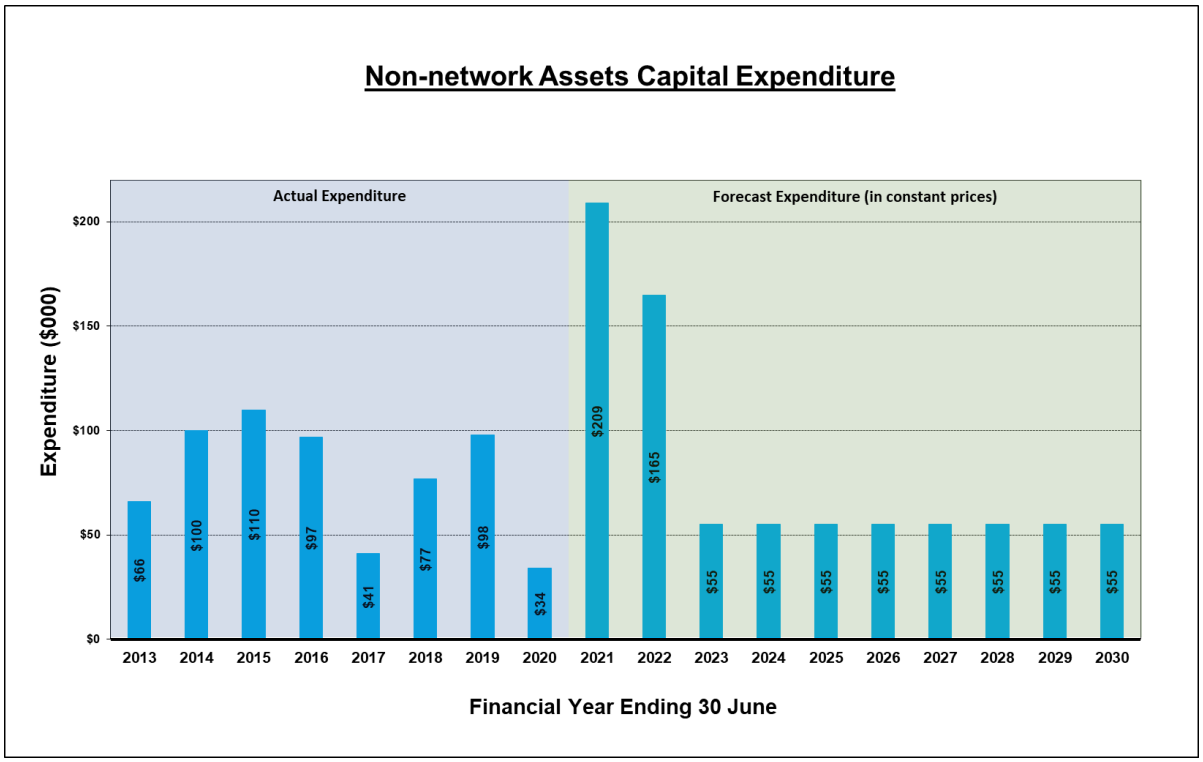
Vehicles, plant and equipment comprise slightly less than 50% of the value of GasNet's Non-network assets in its Regulatory Asset Base (RAB) which is not surprising when considering that GasNet employs almost all the resources required to construct, operate and maintain its network. GasNet does not operate a fixed period plant replacement program but instead replaces its vehicles or equipment when it is considered necessary. The average age of the fleet of vehicles is eleven years at the time this AMP was updated.

Similarly Information technology hardware and software makes up approximately one third of GasNet's Non-network assets in its RAB and its replacement policy dictates that hardware or software is only replaced when it reaches the end of its useful life.

Historic and forecast expenditure can therefore become quite "lumpy" and problematic to predict. It is planned in the 10 year forecast period to replace all vehicles that are currently ten years or older, but the timing of their replacement is not certain and they will only be replaced if it is considered necessary in each annual planning process.

Other non-network assets' acquisitions and replacements - including information technology hardware and software - are equally as problematic to predict so the forecast reflects this.

The 2021 year forecast includes the proposed purchase of a replacement Van vehicle, network operations tooling, and also asset management system software.



10.0 RISK MANAGEMENT

10.1 Overview

GasNet's risk management process aligns with ISO 31000 to manage risk across the organisation. The risk management process provides a systematic approach for elimination business risks and hazards or minimisation of business risks and hazards to a tolerable level by using a hierarchy of controls and developing appropriate control strategies and measures.

All remaining risks are considered tolerable, with for public safety (harm) and possible damage to their property, an additional test applied so that risks are managed as low as reasonably practicable (ALARP).

In regard to the AMP, the context is assets forming the regulatory asset base (RAB).

10.2 Risk Management Policy

GasNet recognises that effective risk management is a process which is core to its business activities and necessary to protect its employees, assets, liabilities and the public.

As stated in its Risk Management Policy GNX-016 GasNet is committed to ensuring that a strong risk management culture exists and will develop and maintain a system that satisfies the following risk management principles to:

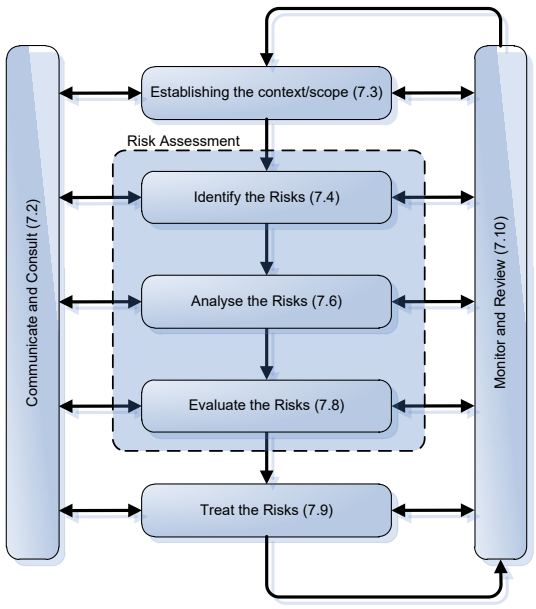
- achieve the strategic goals of the Company;
- manage risks in order to maximise opportunities and minimise adversity;
- balance the cost of managing risk with the anticipated benefits;
- take a proactive approach to the management of risk;
- ensure robust and effective business continuity management as the mechanism to restore and deliver continuity of key services in the event of a disruption or emergency.

10.3 Risk Management Process

The key elements of GasNet's risk management process are set out in the figure below which is based on AS/NZS ISO 31000:2018 and where the numbers in the brackets against each element represents the relevant clause within GasNet's Risk Management Policy.

The risk management process outlined in the Standard requires the following procedures to be undertaken:

- Communicate and consult
- Establish the context
- Identify risks
- Analyse risks
- Evaluate risks
- Treat risks, and
- Monitor and review



10.4 Risk Identification

All hazards associated with the RAB are systematically identified, described, and documented through risk identification processes. This covers not only those risks that have the potential to harm the public or damage public property but also those that affect GasNet personnel, contractors and the environment. For existing RAB assets this process is conducted on or before a predefined review date and whenever changes occur. For new RAB assets the process is initiated in the design phase prior to assets being constructed and going into service. The characteristics of each risk, its context, and the exposure of people and property to it, are recorded in Risk Manager.

10.5 Risk Assessment

A qualitative risk assessment is carried out on each risk and hazard in accordance with ISO 31000 to determine whether it presents a significant business risk. Risks determined to be low or negligible or demonstrated to be ALARP are deemed to be acceptable risks. For those risks that lie above the low or negligible level the costs and benefits are compared to establish the achievable reduction in risk magnitude to meet ALARP requirements.

10.6 Risk Treatment

Subsequent to the identification of significant risk and hazards, all practicable steps are taken to control them in the following order:

1. Elimination; or if not possible,
2. Minimisation.

The extent of the controls applied is decided by the:

- Level of risk (high, medium or low) that the risk or hazard represents;
- Costs and benefits of applying the control measures; and
- Current body of knowledge, for example good and accepted practices.

The controls applied to each risk or hazard are designed to lower the likelihood and/or consequence of the residual risk to that, that is tolerable to GasNet and for public safety and property is as low as reasonably practicable.

10.7 Coverage

The risk and hazard identification, risk assessment and risk treatment processes are carried out to address:

(a) Hazards or potential hazards identified during the design, construction, commissioning, operation, maintenance, failure mode, and decommissioning of RAB assets;
(b) The security of, and control access to, the RAB assets; and
(c) The implementation and management of contingency plans for emergency situations that may affect, or be affected by the RAB assets.

10.8 High Impact – Low probability Events

GasNet's Whanganui network incorporate both modern welded steel and polyethylene pipelines and older type low pressure mechanically jointed metallic cast and wrought iron pipes. The modern Whanganui network section and the entire Marton and Bulls networks are of construction types that remain resilient to high impact events such as earthquake and floods.

The network is designed in a grid mesh that allows for a segment of the network to be isolated without interrupting supplies to a larger number of customers. Network isolation plans form an integral part of GasNet's emergency response to deal with such events.

The development of detailed emergency response plans for each event scenario and specific network is a key area of emergency response development for coming publications.

These events include:

General

- Earthquake
- Loss of supply from Sales Gate
- Gas Leak in highly population area
- Low pressure across network
- High pressure across network
- Flooding across network
- Ingress of pressurized water
- Delivery of non-specification gas
- Delivery of under or over odorised gas

Specific

- Whanganui river flood.

GasNet has the following controls in place to reduce the impact of these events;

General

- Emergency Response Plans
- Network Isolation Plans
- Network Design Planning
- Business Continuity Planning
- Resilient equipment and material selection
- Emergency management and field staff in house

Specific

- Network Rehabilitation and upgrade in Whanganui

10.9 Information Availability

Hazard and risk information from the identification and control of risks and hazards is made available as appropriate to stakeholders at the worksite, parties working adjacent to, or in the vicinity of the risk or hazard, or responding to emergencies on the RAB assets in accordance with GasNet's Risk Management Policy supported by a suite of Safe Work Procedures (SWP's).

10.10 Monitoring and Review

In determining when hazard and risk reviews are conducted to test the continuing effectiveness of control measures taken, assessments are updated for the following reasons:

- Implementation of audit findings;
- Proposed changes to the assets that may change the nature or scale of hazards, the operating parameters or asset design;
- Changes to the environment in which the assets are operated;
- Incidents and other experience from elsewhere in the system, or from other supply systems, or from anywhere else that might be relevant;
- Following an emergency;
- Performing non-routine activities;
- Following changes in legislation; and
- The passage of time.

The following types of incidents and their consequences are considered in conducting the hazard review;

- Over-pressurisation of the assets
- Inadequate pressure in the system
- Inadequate gas supply to the system
- Overpressure of internal pipework/end user installation
- Inadequate pressure of internal pipework/end user installation
- Escape of gas from the system: i) controlled and ii) uncontrolled
- Corrosion/fracture/joint failure
- Failure of safety critical equipment
- Failure in system due to interference/3rd party damage
- Interruption of supply due to GMS shut off by network operator
- Introduction of out of specification gas into the system
- Lack of adequate odour level to be readily detectable
- Resources and Competencies
- Unnecessary visual and sound impact.

The results of the formal risk management processes are recorded in GasNet's Risk Register (Risk Manager). The effectiveness of the controls applied to each significant risk or hazard is assessed on a regular basis through the implementation of a monitoring and verification process.

10.11 Responsibilities

The following responsibilities are specific to GasNet's management of risk and as stated in its Risk Management Policy.

10.11.1 Board of Directors

The Board of Directors is responsible for determining the nature and extent of the significant risks it is willing to take in achieving its strategic objectives.

10.11.2 General Manager

The General Manager is responsible for ensuring that a risk management process is established, implemented and maintained in accordance with this Risk Management Policy.

10.11.3 Management Team

The Management Team is responsible for overseeing the risk management process, for determining an acceptable level of risk, and for monitoring the Company's overall risk profile and risk treatment strategies.

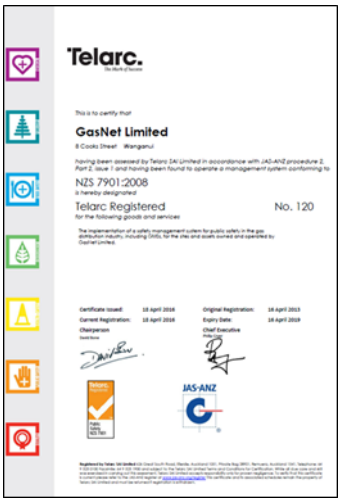
10.11.4 Managers

Managers are responsible for the implementation of the Risk Management Policy and Risk Management Framework within their respective areas of responsibility including the identification, assessment and recording of risks identified, and the acceptance or assignment of risk responsibility, ongoing assessment and registering of risk as part of business and project planning and management.

10.11.5 Employees

All employees are responsible for identifying potential risks and for the effective management of risk. As such they will have access to information regarding the Company's risk management process, and the risks identified in their work area from the Risk Register.

10.12 Public Safety Management System


Telarc.

GasNet Limited

NZS 7901:2008

Telarc Registered No. 120

JAS-ANZ

Under the Gas Act 1992, GasNet is defined as a "Gas Distributor" and as such, is required to implement and maintain an audited safety management system to ensure the safe operation of its "Distribution Systems".

In consideration of its regulatory obligations GasNet has chosen to comply with New Zealand Standard NZS 7901, Electricity and gas industries Safety management systems for public safety rather than the alternative option to comply with specific regulations stated in the Gas (Safety and Measurement) Regulations.

A Safety & Operating Plan along with the Asset, Health & Safety and Environment Management Plans and the Hazard Identification and Control Processes make up the GasNet's core safety management system as required under NZS 7901.

The Public Safety Management System is regularly audited by an accredited external auditor and an audit certificate together with a statutory declaration is sent to the Secretary (Energy Safety) at intervals not exceeding five years. GasNet's first declaration was made in April 2013, and after a revalidation audit a second declaration was made in April 2019.

10.13 Safety and Operating Plan

A Safety & Operating Plan has been developed for GasNet's gas distribution system to detail the controls in place to mitigate the risks that have been identified under the hazard and risk assessment processes for minimisation of harm to persons and property. The Plan covers the entire lifecycle of the assets and the associated systems and processes through to performance measurement and auditing. Its structure follows closely the recently introduced joint Standard AS/NZS 4645.1 which is now the cited Standard. The Plan aims to ensure that the relevant statutory provisions (in respect of matters related to gas distribution (network) systems are complied with in relation to the operations intended to be undertaken.

Most existing systems have been developed and operated in accordance with NZS 5258 and therefore compliance in some aspects may not be fully aligned with the new Standard as it does not apply retrospectively.

The Safety & Operating Plan has been prepared in accordance with the following primary legislation and standards;

- Gas Act 1992
- Health and Safety at Work Act 2015
- Gas (Safety and Measurement) Regulations 2010
- Civil Defence Emergency Management Act 2002
- NZS 7901 Electricity and Gas Industries – Safety Management Systems for Public Safety

11.0 EMERGENCY MANAGEMENT

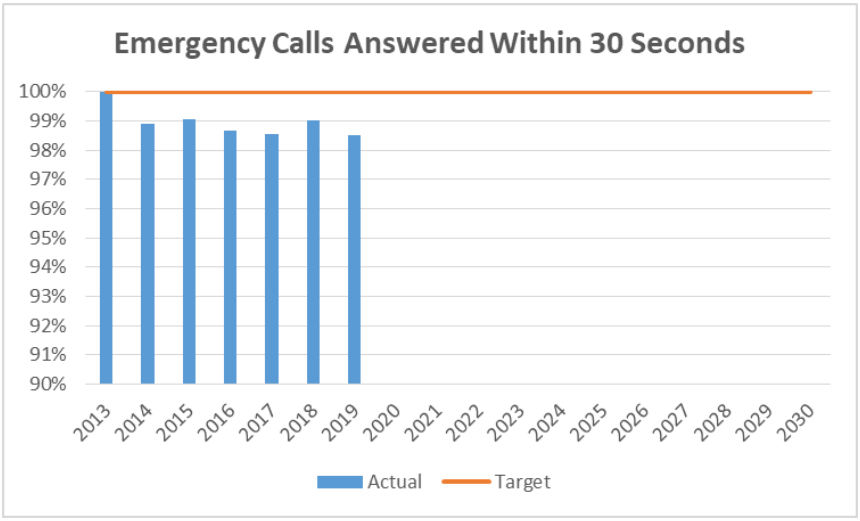
11.1 Emergency Response

With any gas network system there is the potential for an unplanned event either due to an incident, an asset failure or a supply interruption to create an emergency situation. GasNet has emergency response arrangements in place to mitigate the consequences of an emergency situation and to safely restore supplies to consumers as soon as possible.

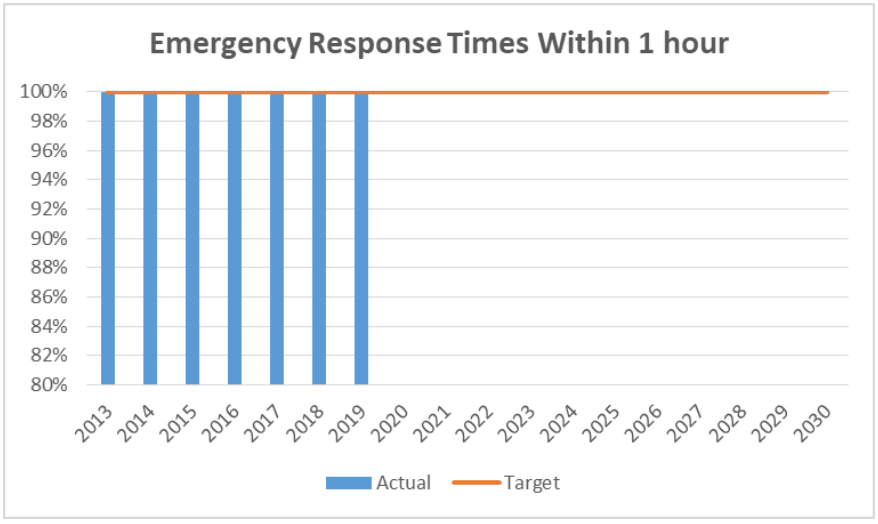
Facilities for the public and others to report gas related events are available 24 hours a day 7 days a week via GasNet's free calling telephone number, promoted across a variety of media. GasNet has a team of trained staff that answer calls during business hours from its Whanganui offices where its Engineering team is based. This arrangement provides for immediate technical information to be available to manage the event and for GasNet to initiate a prompt response. Frontline personnel answering telephone calls hold formal gas customer support and emergency response qualifications providing them with the skills to deal with the variety of situations that they might be presented with.

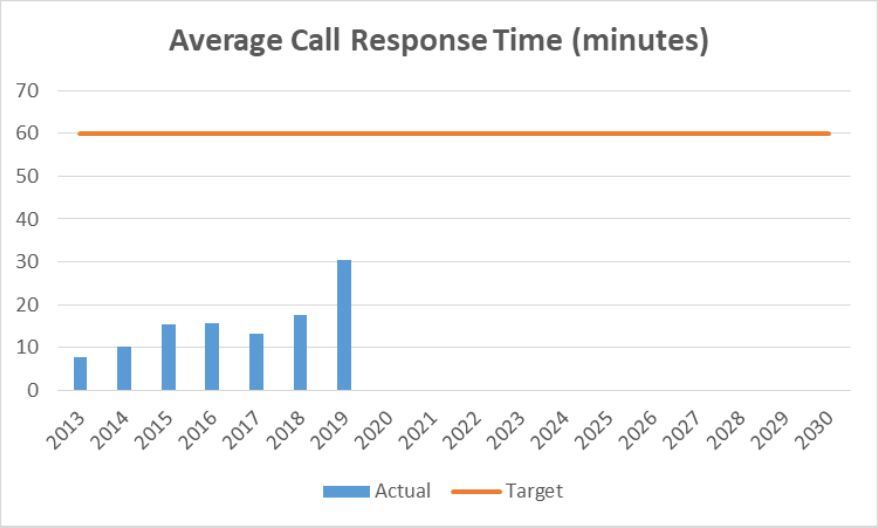
After normal business hours calls made to GasNet are redirected to an external provider, which answer the calls and have procedures in place to manage any type of call. The after-hours service provider relays information to on call personnel for advice or on site attendance as required.

GasNet's call answering times are recorded and reviewed every six months and then reported annually in its disclosures. The following graph shows GasNet's actual performance in answering calls within 30 seconds since 2013 as well as its target for the planning period.

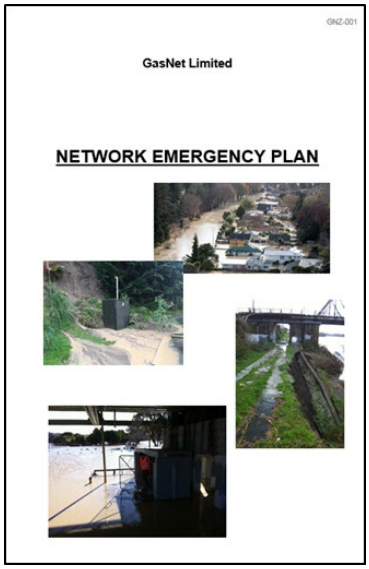


GasNet first response to a report of a gas leak is provided by its own Technicians who are trained in emergency responses in accordance with industry standards. Reports of events including leakage reports are acted on as quickly as possible and personnel despatched to make safe any unsafe situation and to locate and assess any detected leaks. The time taken to get to site is a key indicator of emergency management performance so these times are recorded and monitored. The response times since 2013 and the targets for the planning period are shown in the graphs as follow.





11.2 Network Emergency Plan



GasNet's Network Emergency Plan is the primary document for the management of emergencies. It identifies the various types of threats that can be foreseen and provides the structure and organisational requirements to respond and implement the 'make safe' arrangements as quickly as possible. Then, when causes have been identified or supplies are available again, it sets out the restorative actions to enable resupply to consumers.

The Plan requires the establishment of an emergency organisational structure to provide the appropriate resources for overall control of the situation and control at the site or areas affected by the emergency. It identifies the roles and responsibilities and the competency requirements.

The Plan requires that all emergency operational activities are carried in accordance with GasNet's Health and Safety Policy.

In addition the Plan includes the following provisions:

- Arrangements for liaising with members of the public and consumers in the event of an emergency situation;
- Arrangements for coordination with emergency services and other response agencies including CDEM authorities at regional and local level before during and after emergencies;
- Arrangements and lines of communication with the transmission system operator, retailers, statutory authorities and media.
- Procedures to regularly exercise and test arrangements for response under the Plan; and
- Arrangements to ensure that list of contacts are kept up updated.

The Network Emergency Plan is reviewed either on a biennial basis or following an actual event of such a scale that it provided a robust test of the plan. All events which fall within the criteria of an emergency as specified within the plan are subject to a review and debrief, with any corrective actions either procedural or relating to the Plan recorded and actioned.

Where additional resources are required for managing an emergency additional assistance and/or equipment and materials may be available through the Gas Industry - North Island Gas Distribution Network Mutual Aid Guide currently under final consultation.

11.3 Business Continuity Management

Business continuity management is an integral part of GasNet's overall risk management, corporate governance and quality management systems. GasNet's Business Continuity Management Policy supports and complements its Risk Management Policy and is aligned with AS/NZS 5050:2010 Business Continuity – Managing Disruption Related Risk.

Using a risk management approach, GasNet's key business interruption risks are identified and assessed so as to maximise the uninterrupted availability of all key business resources required to support essential or critical business activities.

All unacceptably high business interruption risks are subject to risk mitigation treatment in line with GasNet's overall risk management strategies. The effectiveness of the business continuity management system is constantly monitored and regularly reviewed.

The process that GasNet has adopted and which forms the core process within the Business Continuity Management Framework is as follows.

- Identify the Critical Business Functions and Processes
- Identify the Types of Disruptions
- Identify the Business Cycles
- Conduct a Business Impact Analysis
- Identify and Document Existing Continuity Arrangements
- Identify the Resources
- Consider Business Impact Analysis of Each Area
- Documenting the Business Continuity Plan
- Communications Strategy
- Testing and Training
- Review of the Business Continuity Plan

11.4 Supply Contingencies

For critical contingencies caused by restriction or cessation of gas supply due to transmission or supply failures GasNet follows the requirements of Gas Governance (Critical Contingency Management) Regulations 2008 when a critical contingency is declared.

Where load shedding is required GasNet monitors gas usage to ensure restrictions are complied with. As GasNet's principle priority in a supply contingency is to ensure the safety of the network systems additional load shedding over and above that required by the transmission system operator may be necessary.

Criteria that are used to invoke emergency procedures for managing supply contingencies on the system are set out in GasNet's Network Emergency Plan.

11.5 Emergency Incident Review

GasNet has developed an incident reporting & investigation procedure to provide a process for management of events and near misses. The aim of the procedure is to ensure all events are recorded, investigated and analysed so that corrective actions to minimise recurrences can be implemented. Reporting is encouraged under a 'no-blame' culture.

Where an event related to the gas network systems causes serious injury or death to a person or significant property damage it is reported to the relevant regulatory body as required under either Section 17 of the Gas Act or Section 56 of the Health and Safety at Work Act 2015.

12.0 IMPROVEMENT PLAN

As GasNet's third AMP produced under the full provisions of the Gas Industry Information Disclosure Requirements and acknowledging the significant effort and development to get it to this stage, it is GasNet's intention to review the structure and content prior to the next publication in 2021. This is primarily to identify aspects of the AMP which may need further work to ensure that the AMP meets the disclosure requirements, and has content produced in a format that is reasonable and legible to the reader.

In respect to Schedule 12b: Forecast Utilisation, GasNet undertook significant development of its network modelling analysis application Synergi Gas with base models of all five networks completed in 2020. Further work planned includes; development of DRS templates, verification of modelling assumptions and inclusion of TOU data.

The company's asset management strategy will be documented and incorporated into future versions of this AMP, including confirmation of the management of older LP metallic mains.

Whilst this AMP discusses the risks associated with the various construction materials of older low pressure metallic mains, further work is planned to confirm the risk profile of individual assets using material, size, operating conditions, location and history to review their asset life remaining.

A review of the enhanced information and system requirements is planned for 2020 which will provide for solutions to the company's ever increasing need for detailed asset information. This work will identify requirements for asset information collection and recording including the development of a condition rating standard.

GasNet through its shareholder the Whanganui District Council has an intrinsic link to end users and the community. Although this link is indirect through an intermediate party we have the same ideology as council in that we serve the community. Our new branding incorporates the slogan 'connecting communities' which displays our community focus and a desire to connect consumers within. We are proposing to develop a strategy for increasing communication with consumers and public.

Acknowledging that a cross referencing compliance table would assist readers to quickly access information that they are seeking, it is planned to introduce such a table in the 2021 AMP.

Appendix 1 – Glossary of Terms

AMP	Asset Management Plan
ALARP	As Low As Reasonably Practicable
API	American Petroleum Institute
Capex	Capital Expenditure
CNG	Compressed Natural Gas
CP	Cathodic Protection
CY	Current Year
DRS	District Regulator Station
DPP	Default Price-Quality Path
HDPE	High Density Polyethylene
ICP	Installation Control Point
IDD	Gas Distribution Information Disclosure Determination 2012 - consolidated 3 April 2018
IP	Intermediate Pressure
ISO	International Standards Organisation
GasNet	GasNet Limited
GDB	Gas Distribution Business
GIS	Geographic Information System
GJ	Gigajoule
GMS	Gas Measurement System
kPag	kiloPascal gauge
LP	Low Pressure
MDPE	Medium Density Polyethylene
MLV	Main Line Valve
MP	Medium Pressure
Opex	Operational Expenditure
ISO 55000	International Standard Asset Management series
PE	Polyethylene
s53ZD	Reference to clause 53ZD in Commerce Act (1986 and amendments)

Company Name	GasNet Limited
AMP Planning Period	1 July 2020 – 30 June 2030

SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions)
GDBs must provide explanatory comment on the difference between constant price and nominal dollar forecasts of expenditure on assets in Schedule 14a (Mandatory Explanatory Notes).
This information is not part of audited disclosure information.

sch ref		Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5	CY+6	CY+7	CY+8	CY+9	CY+10
	for year ended	30 Jun 20	30 Jun 21	30 Jun 22	30 Jun 23	30 Jun 24	30 Jun 25	30 Jun 26	30 Jun 27	30 Jun 28	30 Jun 29	30 Jun 30
	11a(i): Expenditure on Assets Forecast	$000 (nominal dollars)										
	Consumer connection	150	175	132	135	140	143	146	149	152	155	158
	System growth	75	247	161	171	176	180	184	188	191	195	199
	Asset replacement and renewal	198	310	531	563	582	594	607	619	631	644	657
	Asset relocations	-	20	215	-	-	-	-	-	-	-	-
	Reliability, safety and environment:											
	Quality of supply	66	30	21	23	23	24	25	25	26	26	27
	Legislative and regulatory	30	40	43	45	47	48	49	50	51	52	53
	Other reliability, safety and environment	10	80	21	23	23	24	25	25	26	26	27
	Total reliability, safety and environment	106	150	86	91	94	96	98	100	102	104	106
	Expenditure on network assets	529	902	1,125	960	992	1,013	1,035	1,055	1,077	1,098	1,120
	Expenditure on non-network assets	34	209	177	63	65	66	67	69	70	72	73
	Expenditure on assets	563	1,111	1,302	1,023	1,056	1,079	1,102	1,124	1,147	1,170	1,193
	plus Cost of financing											
	less Value of capital contributions											
	plus Value of vested assets											
	Capital expenditure forecast	563	1,111	1,302	1,023	1,056	1,079	1,102	1,124	1,147	1,170	1,193
	Assets commissioned	563	1,111	1,302	1,023	1,056	1,079	1,102	1,124	1,147	1,170	1,193

		Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5	CY+6	CY+7	CY+8	CY+9	CY+10
	for year ended	30 Jun 20	30 Jun 21	30 Jun 22	30 Jun 23	30 Jun 24	30 Jun 25	30 Jun 26	30 Jun 27	30 Jun 28	30 Jun 29	30 Jun 30
		$000 (in constant prices)										
	Consumer connection	150	175	123	119	119	119	119	119	119	119	119
	System growth	75	247	150	150	150	150	150	150	150	150	150
	Asset replacement and renewal	198	310	495	495	495	495	495	495	495	495	495
	Asset relocations	-	20	200	-	-	-	-	-	-	-	-
	Reliability, safety and environment:											
	Quality of supply	66	30	20	20	20	20	20	20	20	20	20
	Legislative and regulatory	30	40	40	40	40	40	40	40	40	40	40
	Other reliability, safety and environment	10	80	20	20	20	20	20	20	20	20	20
	Total reliability, safety and environment	106	150	80	80	80	80	80	80	80	80	80
	Expenditure on network assets	529	902	1,048	844	844	844	844	844	844	844	844
	Expenditure on non-network assets	34	209	165	55	55	55	55	55	55	55	55
	Expenditure on assets	563	1,111	1,213	899	899	899	899	899	899	899	899
	Subcomponents of expenditure on assets (where known)											
	Research and development											

	Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5	CY+6	CY+7	CY+8	CY+9	CY+10
for year ended	30 Jun 20	30 Jun 21	30 Jun 22	30 Jun 23	30 Jun 24	30 Jun 25	30 Jun 26	30 Jun 27	30 Jun 28	30 Jun 29	30 Jun 30
Difference between nominal and constant price forecasts	$000										
Consumer connection	-	-	9	16	21	24	27	30	33	36	39
System growth	-	-	11	21	26	30	34	38	41	45	49
Asset replacement and renewal	-	-	36	68	87	99	112	124	136	149	162
Asset relocations	-	-	15	-	-	-	-	-	-	-	-
Reliability, safety and environment:											
Quality of supply	-	-	1	3	3	4	5	5	6	6	7
Legislative and regulatory	-	-	3	5	7	8	9	10	11	12	13
Other reliability, safety and environment	-	-	1	3	3	4	5	5	6	6	7
Total reliability, safety and environment	-	-	6	11	14	16	18	20	22	24	26
Expenditure on network assets	-	-	77	116	148	169	191	211	233	254	276
Expenditure on non-network assets	-	-	12	8	10	11	12	14	15	17	18
Expenditure on assets	-	-	89	124	157	180	203	225	248	271	294

11a(ii): Consumer Connection

	Current Year CY	CY+1	CY+2	CY+3	CY+4	CY+5
for year ended	30 Jun 20	30 Jun 21	30 Jun 22	30 Jun 23	30 Jun 24	30 Jun 25
*Consumer types defined by GDB**	$000 (in constant prices)					
Domestic	130	155	103	103	103	103
Non-domestic	20	20	20	16	16	16
[GDB consumer type]						
[GDB consumer type]						
[GDB consumer type]						
Consumer connection expenditure	150	175	123	119	119	119
less Capital contributions funding consumer connection						
Consumer connection less capital contributions	150	175	123	119	119	119

** include additional rows if needed*

11a(iii): System Growth

Intermediate pressure						
Main pipe						
Service pipe						
Stations						
Line valve						
Special crossings						
Intermediate Pressure total	-	-	-	-	-	-
Medium pressure						
Main pipe	20	178	100	100	100	100
Service pipe						
Stations						
Line valve						
Special crossings						
Medium Pressure total	20	178	100	100	100	100

SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

Company Name **GasNet Limited**

AMP Planning Period **1 July 2020 – 30 June 2030**

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions)
GDBs must provide explanatory comment on the difference between constant price and nominal dollar forecasts of expenditure on assets in Schedule 14a (Mandatory Explanatory Notes).
This information is not part of audited disclosure information.

sch ref							
92	**Low Pressure**						
93	Main pipe	55	69	50	50	50	50
94	Service pipe						
95	Line valve						
96	Special crossings						
97	**Low Pressure total**	55	69	50	50	50	50
98	**Other network assets**						
99	Monitoring and control systems						
100	Cathodic protection systems						
101	Other assets (other than above)						
102	**Other network assets total**	-	-	-	-	-	-
103							
104	**System growth expenditure**	75	247	150	150	150	150
105	*less* Capital contributions funding system growth						
106	**System growth less capital contributions**	75	247	150	150	150	150
107							
108							
109		*Current Year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
	for year ended	**30 Jun 20**	**30 Jun 21**	**30 Jun 22**	**30 Jun 23**	**30 Jun 24**	**30 Jun 25**
110	**11a(iv): Asset Replacement and Renewal**						
111	**Intermediate pressure**	**$000 (in constant prices)**					
112	Main pipe						
113	Service pipe						
114	Stations	3	5	10	10	10	10
115	Line valve		7				
116	Special crossings						
117	**Intermediate Pressure total**	3	12	10	10	10	10
118	**Medium pressure**						
119	Main pipe		19				
120	Service pipe		31				
121	Station			10	10	10	10
122	Line valve						
123	Special crossings						
124	**Medium Pressure total**	-	50	10	10	10	10
125	**Low Pressure**						
126	Main pipe	165	209	425	425	425	425
127	Service pipe	30	39	50	50	50	50
128	Line valve						
129	Special crossings						
130	**Low Pressure total**	195	248	475	475	475	475

SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

Company Name **GasNet Limited**
AMP Planning Period **1 July 2020 – 30 June 2030**

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions)
GDBs must provide explanatory comment on the difference between constant price and nominal dollar forecasts of expenditure on assets in Schedule 14a (Mandatory Explanatory Notes).
This information is not part of audited disclosure information.

sch ref							
131		**Other network assets**					
132		Monitoring and control systems					
133		Cathodic protection systems					
134		Other assets (other than above)					
135		**Other network assets total**	-	-	-	-	-	-
136							
137		**Asset replacement and renewal expenditure**	198	310	495	495	495	495
138	*less*	Capital contributions funding asset replacement and renewal						
139		**Asset replacement and renewal less capital contributions**	198	310	495	495	495	495
140								

11a(v): Asset Relocations

142		*Project or programme**						
143		Somme Parade - Aramoho Rail Bridge underpass IP main relocation	-	20	200			
144		[Description of material project or programme]						
145		[Description of material project or programme]						
146		[Description of material project or programme]						
147		[Description of material project or programme]						
148		** include additional rows if needed*						
149		All other projects or programmes - asset relocations						
150		**Asset relocations expenditure**	-	20	200	-	-	-
151	*less*	Capital contributions funding asset relocations						
152		**Asset relocations less capital contributions**	-	20	200	-	-	-
153								

11a(vi): Quality of Supply

			Current Year CY	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*
		for year ended	**30 Jun 20**	**30 Jun 21**	**30 Jun 22**	**30 Jun 23**	**30 Jun 24**	**30 Jun 25**
157		*Project or programme**	**$000 (in constant prices)**					
158		Minor System reinforcement		10	20	20	20	20
159		Aramoho Rail Bridge Crossing upgrade		20				
160		Hakeke Street reinforcement	66					
161		[Description of material project or programme]						
162		[Description of material project or programme]						
163		** include additional rows if needed*						
164		All other projects or programmes - quality of supply						
165		**Quality of supply expenditure**	66	30	20	20	20	20
166	*less*	Capital contributions funding quality of supply						
167		**Quality of supply less capital contributions**	66	30	20	20	20	20
168								

Company Name: GasNet Limited
AMP Planning Period: 1 July 2020 – 30 June 2030

SCHEDULE 11a: REPORT ON FORECAST CAPITAL EXPENDITURE

This schedule requires a breakdown of forecast expenditure on assets for the current disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms. Also required is a forecast of the value of commissioned assets (i.e., the value of RAB additions)
GDBs must provide explanatory comment on the difference between constant price and nominal dollar forecasts of expenditure on assets in Schedule 14a (Mandatory Explanatory Notes).
This information is not part of audited disclosure information.

sch ref							
169	**11a(vii): Legislative and Regulatory**						
170	*Project or programme*						
171	upgrades	30	40	40	40	40	40
172	[Description of material project or programme]						
173	[Description of material project or programme]						
174	[Description of material project or programme]						
175	[Description of material project or programme]						
176	** include additional rows if needed*						
177	All other projects or programmes - legislative and regulatory						
178	**Legislative and regulatory expenditure**	30	40	40	40	40	40
179	*less* Capital contributions funding legislative and regulatory						
180	**Legislative and regulatory less capital contributions**	30	40	40	40	40	40
181	**11a(viii): Other Reliability, Safety and Environment**						
182	*Project or programme**						
183	Various	10	80	20	20	20	20
184	[Description of material project or programme]						
185	[Description of material project or programme]						
186	[Description of material project or programme]						
187	[Description of material project or programme]						
188	** include additional rows if needed*						
189	All other projects or programmes - other reliability, safety and environment						
190	**Other reliability, safety and environment expenditure**	10	80	20	20	20	20
191	*less* Capital contributions funding other reliability, safety and environment						
192	**Other Reliability, safety and environment less capital contributions**	10	80	20	20	20	20
193							
194	**11a(ix): Non-Network Assets**						
195	**Routine expenditure**						
196	*Project or programme**						
197	Office Equipment		-				
198	Furniture and fittings	11	3				
199	Plant and equipment	23	17	20	20	20	20
200	PC hardware and software		61				
201	Building/DRS Stations site security		16				
202	** include additional rows if needed*						
203	All other projects or programmes - routine expenditure						
204	**Routine expenditure**	34	97	20	20	20	20
205	**Atypical expenditure**						
206	*Project or programme**						
207	Office mods		40				
208	Van replacement		73	145	35	35	35
209	[Description of material project or programme]						
210	[Description of material project or programme]						
211	[Description of material project or programme]						
212	** include additional rows if needed*						
213	All other projects or programmes - atypical expenditure						
214	**Atypical expenditure**	-	113	145	35	35	35
215							
216	**Expenditure on non-network assets**	34	209	165	55	55	55

SCHEDULE 11b: REPORT ON FORECAST OPERATIONAL EXPENDITURE

Company Name **GasNet Limited**

AMP Planning Period **1 July 2020 – 30 June 2030**

This schedule requires a breakdown of forecast operational expenditure for the disclosure year and a 10 year planning period. The forecasts should be consistent with the supporting information set out in the AMP. The forecast is to be expressed in both constant price and nominal dollar terms.

GDBs must provide explanatory comment on the difference between constant price and nominal dollar operational expenditure forecasts in Schedule 14a (Mandatory Explanatory Notes).

sch ref												
7		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
8	for year ended	**30 Jun 20**	**30 Jun 21**	**30 Jun 22**	**30 Jun 23**	**30 Jun 24**	**30 Jun 25**	**30 Jun 26**	**30 Jun 27**	**30 Jun 28**	**30 Jun 29**	**30 Jun 30**
9	**Operational Expenditure Forecast**	**$000 (in nominal dollars)**										
10	Service interruptions, incidents and emergencies	425	45	48	51	53	54	55	56	57	59	60
11	Routine and corrective maintenance and inspection	89	135	156	176	194	210	227	244	261	280	299
12	Asset replacement and renewal	14	25	27	28	29	30	31	31	32	33	33
13	**Network opex**	528	205	231	256	276	294	313	331	351	371	391
14	System operations and network support	803	870	934	990	1,022	1,045	1,067	1,088	1,110	1,132	1,155
15	Business support	985	1,255	1,347	1,427	1,475	1,507	1,539	1,569	1,601	1,633	1,665
16	**Non-network opex**	1,788	2,125	2,280	2,417	2,497	2,552	2,605	2,657	2,710	2,765	2,820
17	**Operational expenditure**	2,316	2,330	2,511	2,673	2,773	2,846	2,918	2,989	3,061	3,135	3,211
18		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
19	for year ended	**30 Jun 20**	**30 Jun 21**	**30 Jun 22**	**30 Jun 23**	**30 Jun 24**	**30 Jun 25**	**30 Jun 26**	**30 Jun 27**	**30 Jun 28**	**30 Jun 29**	**30 Jun 30**
20		**$000 (in constant prices)**										
21	Service interruptions, incidents and emergencies	425	45	45	45	45	45	45	45	45	45	45
22	Routine and corrective maintenance and inspection	89	135	145	155	165	175	185	195	205	215	225
23	Asset replacement and renewal	14	25	25	25	25	25	25	25	25	25	25
24	**Network opex**	528	205	215	225	235	245	255	265	275	285	295
25	System operations and network support	803	870	870	870	870	870	870	870	870	870	870
26	Business support	985	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255
27	**Non-network opex**	1,788	2,125	2,125	2,125	2,125	2,125	2,125	2,125	2,125	2,125	2,125
28	**Operational expenditure**	2,316	2,330	2,340	2,350	2,360	2,370	2,380	2,390	2,400	2,410	2,420
29	**Subcomponents of operational expenditure (where known)**											
30	Research and development											
	Insurance	217	285	285	285	285	285	285	285	285	285	285
32												
33		*Current year CY*	*CY+1*	*CY+2*	*CY+3*	*CY+4*	*CY+5*	*CY+6*	*CY+7*	*CY+8*	*CY+9*	*CY+10*
34	for year ended	**30 Jun 20**	**30 Jun 21**	**30 Jun 22**	**30 Jun 23**	**30 Jun 24**	**30 Jun 25**	**30 Jun 26**	**30 Jun 27**	**30 Jun 28**	**30 Jun 29**	**30 Jun 30**
35	**Difference between nominal and real forecasts**	**$000**										
36	Service interruptions, incidents and emergencies	-	-	3	6	8	9	10	11	12	14	15
37	Routine and corrective maintenance and inspection	-	-	11	21	29	35	42	49	56	65	74
38	Asset replacement and renewal	-	-	2	3	4	5	6	6	7	8	8
39	**Network opex**	-	-	16	31	41	49	58	66	76	86	96
40	System operations and network support	-	-	64	120	152	175	197	218	240	262	285
41	Business support	-	-	92	172	220	252	284	314	346	378	410
42	**Non-network opex**	-	-	155	292	372	427	480	532	585	640	695
43	**Operational expenditure**	-	-	171	323	413	476	538	599	661	725	791

SCHEDULE 12a: REPORT ON ASSET CONDITION

Company Name **GasNet Limited**

AMP Planning Period **1 July 2020 – 30 June 2030**

This schedule requires a breakdown of asset condition by asset class as at the start of the forecast year. The data accuracy assessment relates to the percentage values disclosed in the asset condition columns. Also required is a forecast of the percentage of units to be replaced in the next 5 years. All information should be consistent with the information provided in the AMP and the expenditure on assets forecast in Schedule 11a.

sch ref

					Asset condition at start of planning period (percentage of units by grade)						
8	Operating Pressure	Asset category	Asset class	Units	Grade 1	Grade 2	Grade 3	Grade 4	Grade unknown	Data accuracy (1–4)	% of asset forecast to be replaced in next 5 years
9	Intermediate Pressure	Main pipe	IP PE main pipe	km						4	-
10	Intermediate Pressure	Main pipe	IP steel main pipe	km				100.00%		2	-
11	Intermediate Pressure	Main pipe	IP other main pipe	km						4	-
12	Intermediate Pressure	Service pipe	IP PE service pipe	km						4	-
13	Intermediate Pressure	Service pipe	IP steel service pipe	km				100.00%		2	-
14	Intermediate Pressure	Service pipe	IP other service pipe	km						4	-
15	Intermediate Pressure	Stations	Intermediate pressure DRS	No.		7.00%	93.00%			4	7.00
16	Intermediate Pressure	Line valve	IP line valves	No.			10.00%	90.00%		3	7.00
17	Intermediate Pressure	Special crossings	IP crossings	No.				100.00%		2	-
18	Medium Pressure	Main pipe	MP PE main pipe	km				100.00%		2	-
19	Medium Pressure	Main pipe	MP steel main pipe	km		10.00%		90.00%		2	-
20	Medium Pressure	Main pipe	MP other main pipe	km						4	-
21	Medium Pressure	Service pipe	MP PE service pipe	km				100.00%		2	-
22	Medium Pressure	Service pipe	MP steel service pipe	km				100.00%		2	-
23	Medium Pressure	Service pipe	MP other service pipe	km						4	-
24	Medium Pressure	Stations	Medium pressure DRS	No.			100.00%			4	-
25	Medium Pressure	Line valve	MP line valves	No.				100.00%		3	-
26	Medium Pressure	Special crossings	MP special crossings	No.		3.00%	7.00%	90.00%		2	3.00
27	Low Pressure	Main pipe	LP PE main pipe	km				100.00%		2	-
28	Low Pressure	Main pipe	LP steel main pipe	km		8.00%	92.00%			2	10.00
29	Low Pressure	Main pipe	LP other main pipe	km		8.00%	92.00%			2	10.00
30	Low Pressure	Service pipe	LP PE service pipe	km				100.00%		2	-
31	Low Pressure	Service pipe	LP steel service pipe	km		30.00%	70.00%			2	50.00
32	Low Pressure	Service pipe	LP other service pipe	km		30.00%	70.00%			2	50.00
33	Low Pressure	Line valve	LP line valves	No.				100.00%		3	-
34	Low Pressure	Special crossings	LP special crossings	No.			40.00%	60.00%		2	27.00
35	All	Monitoring and control systems	Remote terminal units	No.			30.00%	70.00%		4	50.00
36	All	Cathodic protection systems	Cathodic protection	No.				100.00%		4	-

SCHEDULE 12b: REPORT ON FORECAST UTILISATION

Company Name **GasNet Limited**

AMP Planning Period **1 July 2020 – 30 June 2030**

This Schedule requires a breakdown of current and forecast utilisation (for heavily utilised pipelines) consistent with the information provided in the AMP and the demand forecast in schedule S12c.

sch ref

Forecast Utilisation of Heavily Utilised Pipelines

Utilisation

Region	Network	Pressure	Nominal operating pressure (NOP) (kPa)	Minimum operating pressure (MinOP) (kPa)	Total capacity at MinOP (scmh)	Remaining capacity at MinOP (scmh)	Unit	*Current Year CY* y/e 30 Jun 20	*CY+1* y/e 30 Jun 21	*CY+2* y/e 30 Jun 22	*CY+3* y/e 30 Jun 23	*CY+4* y/e 30 Jun 24	*CY+5* y/e 30 Jun 25	Comment
Rangitikei	Bulls	MP16	300	180	1,062	664	scmh	398	404	410	416	422	428	Bulls network has two large commercial consumers connected and domestic/small commercial load. A small annual increase in the domestic load is expected.
							kPa	272	271	271	270	270	269	
Rangitikei	Flockhouse	MP4	150	90	348	328	scmh	20	20	20	20	20	20	The Flockhouse network has small commercial and domestic load which is not expected to increase. The network was originally constructed for a agricultural training facility that no longer exists.
							kPa	150	150	150	150	150	150	
South Taranaki	Waitotara	MP5	300	180	288	23	scmh	265	265	265	265	265	265	This pressure system has one consumer, a meat processing plant. We are not aware of any change to load but will continue to liaise with Retailer.
							kPa	200	200	200	200	200	200	
Rangitikei	Marton	MP3	210	126	1,005	150	scmh	855	873	891	909	927	945	MinOP occurs at an extremity of the network where a small diameter main supplies two commercial consumers. A reinforcement project is proposed for 2020/21 to link the main to a high capacity arterial main.
							kPa	184	197	197	196	194	193	
Rangitikei	Marton	IP2	1,500	900	7,350	4,846	scmh	2504	2522	2540	2558	2576	2594	This network is a single arterial main ending at a DRS. The DRS load was increased to calculate MinOp.
							kPa	1480	1480	1479	1478	1478	1477	
Whanganui	West	LP1	2	2	2,290	100	scmh	2190	2220	2235	2258	2265	2280	The Whanganui West LP network is predominently residential connections. There is limited growth with a number of small residential housing developments. The extension of the MP network will limit future connections onto this network
							kPa	1.84	1.8	1.77	1.71	1.68	1.63	
Whanganui	East	LP2	2	2	853	52	scmh	801	807	813	819	825	831	Whanganui East LP network is substantially residential load with little load growth predicted
							kPa	1.84	1.83	1.81	1.79	1.77	1.74	
Whanganui	Main	MP1	210	126	3,968	740	scmh	3228	3258	3278	3298	3318	3338	Extension of this network into residential development area, future connnections will increase load. Reinforcement is planned in 2020/21
							kPa	203	202	201	200	198	197	
Whanganui	Aramoho	MP2	210	126	490	390	scmh	100	100	100	100	100	100	The Whanganui Aramoho MP network supplies a DRS,a single commerical load and few residential connections, little load growth predicted
							kPa	209	209	209	209	209	209	
Whanganui		IP1	1,050	630	12,170	1,215	scmh	10955	11003	11038	11073	11108	11143	The Whanganui IP network supplies all gas to the city, load is predicted to remain steady.
							kPa	1021	1016	1012	1007	1002	997	

** Current year utilisation figures may be estimates. Year 1–5 figures show the utilisation forecast to occur given the expected system configuration for each year, including the effect of any new investment in the pressure system.*

Disclaimer for supply enquiries

The information contained in this Table has been provided from models using estimates of utilisation and capacity. Parties interested in connection to the network should contact GasNet directly.

Notes and assumptions

1. Development of GasNet's network models using the Synergi application is on going with all networks base models completed. The information contained in this Report only contains data from these models.
2. The minimum operating pressure (MinOP) for IP and MP networks has been determined to be 60% of the Nominal Operating Pressure (NOP).
3. The minimum operating pressure (MinOP) for LP networks has been determined to be 80% of the Nominal Operating Pressure (NOP). Whanganui LP networks MinOP is 1.6kPa
4. Total capacity at MinOP has been determined by applying additional load at either; the extremity of the network presenting the lowest pressure under current operation or; by application of additional load in areas where development plans indicate future demand is most likely, to the point that MinOP is reached at that point in the pressure network.

Company Name	**GasNet Limited**
AMP Planning Period	**1 July 2020 – 30 June 2030**

SCHEDULE 12c: REPORT ON FORECAST DEMAND

This schedule requires a forecast of new connections (by consumer type), peak demand and energy volumes for the disclosure year and a 5 year planning period. The forecasts should be consistent with the supporting information set out in the AMP as well as the assumptions used in developing the expenditure forecasts in Schedule 11a and Schedule 11b and the capacity and utilisation forecasts in Schedule 12b.

sch ref

12c(i) Consumer Connections

Number of ICPs connected in year by consumer type

Consumer types defined by GDB	*Current year CY* **30 Jun 20**	*CY+1* **30 Jun 21**	*CY+2* **30 Jun 22**	*CY+3* **30 Jun 23**	*CY+4* **30 Jun 24**	*CY+5* **30 Jun 25**
Domestic	80	120	80	80	80	80
Non-domestic	5	5	4	4	4	4
Total	85	125	84	84	84	84

12c(ii): Gas Delivered

	Current year CY **30 Jun 20**	*CY+1* **30 Jun 21**	*CY+2* **30 Jun 22**	*CY+3* **30 Jun 23**	*CY+4* **30 Jun 24**	*CY+5* **30 Jun 25**
Number of ICPs at year end (at year end)	10,063	10,145	10,200	10,255	10,310	10,365
Maximum daily load (GJ per day)	5,267	5,265	5,265	5,265	5,265	5,265
Maximum monthly load (GJ per month)	131,090	130,000	130,000	130,000	130,000	130,000
Number of directly billed ICPs (at year end)						
Total gas conveyed (GJ per annum)	1,320,037	1,320,000	1,320,000	1,320,000	1,320,000	1,320,000
Average daily delivery (GJ per day)	3,607	3,616	3,616	3,616	3,607	3,616
Load factor	83.91%	84.62%	84.62%	84.62%	84.62%	84.62%

Company Name	GasNet Limited
AMP Planning Period	1 July 2020 – 30 June 2030
Asset Management Standard Applied	ISO 55000 series

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY

This schedule requires information on the GDB'S self-assessment of the maturity of its asset management practices.

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
3	Asset management policy	To what extent has an asset management policy been documented, authorised and communicated?	2	The Asset Management Policy first approved on 23 June 2014 was most recently reviewed and subsequently approved by GasNet's Board of Directors on 17 June 2019. As with all company policies the Asset Management Policy is accessible to all personnel via the companies Intranet. The policies significance is well understood and supported by GasNet's management team.		Widely used AM practice standards require an organisation to document, authorise and communicate its asset management policy (eg, as required in PAS 55 para 4.2 i). A key pre-requisite of any robust policy is that the organisation's top management must be seen to endorse and fully support it. Also vital to the effective implementation of the policy, is to tell the appropriate people of its content and their obligations under it. Where an organisation outsources some of its asset-related activities, then these people and their organisations must equally be made aware of the policy's content. Also, there may be other stakeholders, such as regulatory authorities and shareholders who should be made aware of it.	Top management. The management team that has overall responsibility for asset management.	The organisation's asset management policy, its organisational strategic plan, documents indicating how the asset management policy was based upon the needs of the organisation and evidence of communication.
10	Asset management strategy	What has the organisation done to ensure that its asset management strategy is consistent with other appropriate organisational policies and strategies, and the needs of stakeholders?	1	Noting that GasNet has not yet documented its AMP Strategy, strategic planning is integral to its asset management operations and planning. The annual planning process which is approved by the Board provides activities planned for the coming year of which a number of items will refer to an overall strategy. GasNet's Management Team meet regularly to discuss operational and strategic matters, and are actively involved in the development and review of all policies and procedures.		In setting an organisation's asset management strategy, it is important that it is consistent with any other policies and strategies that the organisation has and has taken into account the requirements of relevant stakeholders. This question examines to what extent the asset management strategy is consistent with other organisational policies and strategies (eg, as required by PAS 55 para 4.3.1 b) and has taken account of stakeholder requirements as required by PAS 55 para 4.3.1 c). Generally, this will take into account the same polices, strategies and stakeholder requirements as covered in drafting the asset management policy but at a greater level of detail.	Top management. The organisation's strategic planning team. The management team that has overall responsibility for asset management.	The organisation's asset management strategy document and other related organisational policies and strategies. Other than the organisation's strategic plan, these could include those relating to health and safety, environmental, etc. Results of stakeholder consultation.
11	Asset management strategy	In what way does the organisation's asset management strategy take account of the lifecycle of the assets, asset types and asset systems over which the organisation has stewardship?	1	GasNet's personnel and in particular the Engineering personnel have a wealth of asset knowledge, the majority of whom have significant experience with the company, hands on knowledge of assets and are very much focussed on ensuring they are managed effectively, efficiently and safely throughout their lifecycle.		Good asset stewardship is the hallmark of an organisation compliant with widely used AM standards. A key component of this is the need to take account of the lifecycle of the assets, asset types and asset systems. (For example, this requirement is recognised in 4.3.1 d) of PAS 55). This question explores what an organisation has done to take lifecycle into account in its asset management strategy.	Top management. People in the organisation with expert knowledge of the assets, asset types, asset systems and their associated life-cycles. The management team that has overall responsibility for asset management. Those responsible for developing and adopting methods and processes used in asset management	The organisation's documented asset management strategy and supporting working documents.
26	Asset management plan(s)	How does the organisation establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems?	2	GasNet's Asset Management Plan has evolved from the first transitional AMP in 2013 to the third full AMP in 2020. The AMP is progressively becoming the key planning document for GasNet's management of its assets. Future AMP publications will inevitably become more comprehensive and with it increased significance and dependency as GasNet's key asset management planning document. Principally those responsible for establishing and documenting the asset management plans are currently or have been involved in the day to day management of the assets.		The asset management strategy need to be translated into practical plan(s) so that all parties know how the objectives will be achieved. The development of plan(s) will need to identify the specific tasks and activities required to optimize costs, risks and performance of the assets and/or asset system(s), when they are to be carried out and the resources required.	The management team with overall responsibility for the asset management system. Operations, maintenance and engineering managers.	The organisation's asset management plan(s).

Company Name	GasNet Limited
AMP Planning Period	1 July 2020 – 30 June 2030
Asset Management Standard Applied	ISO 55000 series

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
3	Asset management policy	To what extent has an asset management policy been documented, authorised and communicated?	The organisation does not have a documented asset management policy.	The organisation has an asset management policy, but it has not been authorised by top management, or it is not influencing the management of the assets.	The organisation has an asset management policy, which has been authorised by top management, but it has had limited circulation. It may be in use to influence development of strategy and planning but its effect is limited.	The asset management policy is authorised by top management, is widely and effectively communicated to all relevant employees and stakeholders, and used to make these persons aware of their asset related obligations.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
10	Asset management strategy	What has the organisation done to ensure that its asset management strategy is consistent with other appropriate organisational policies and strategies, and the needs of stakeholders?	The organisation has not considered the need to ensure that its asset management strategy is appropriately aligned with the organisation's other organisational policies and strategies or with stakeholder requirements. OR The organisation does not have an asset management strategy.	The need to align the asset management strategy with other organisational policies and strategies as well as stakeholder requirements is understood and work has started to identify the linkages or to incorporate them in the drafting of asset management strategy.	Some of the linkages between the long-term asset management strategy and other organisational policies, strategies and stakeholder requirements are defined but the work is fairly well advanced but still incomplete.	All linkages are in place and evidence is available to demonstrate that, where appropriate, the organisation's asset management strategy is consistent with its other organisational policies and strategies. The organisation has also identified and considered the requirements of relevant stakeholders.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
11	Asset management strategy	In what way does the organisation's asset management strategy take account of the lifecycle of the assets, asset types and asset systems over which the organisation has stewardship?	The organisation has not considered the need to ensure that its asset management strategy is produced with due regard to the lifecycle of the assets, asset types or asset systems that it manages. OR The organisation does not have an asset management strategy.	The need is understood, and the organisation is drafting its asset management strategy to address the lifecycle of its assets, asset types and asset systems.	The long-term asset management strategy takes account of the lifecycle of some, but not all, of its assets, asset types and asset systems.	The asset management strategy takes account of the lifecycle of all of its assets, asset types and asset systems.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
26	Asset management plan(s)	How does the organisation establish and document its asset management plan(s) across the life cycle activities of its assets and asset systems?	The organisation does not have an identifiable asset management plan(s) covering asset systems and critical assets.	The organisation has asset management plan(s) but they are not aligned with the asset management strategy and objectives and do not take into consideration the full asset life cycle (including asset creation, acquisition, enhancement, utilisation, maintenance decommissioning and disposal).	The organisation is in the process of putting in place comprehensive, documented asset management plan(s) that cover all life cycle activities, clearly aligned to asset management objectives and the asset management strategy.	Asset management plan(s) are established, documented, implemented and maintained for asset systems and critical assets to achieve the asset management strategy and asset management objectives across all life cycle phases.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Company Name	**GasNet Limited**
AMP Planning Period	**1 July 2020 – 30 June 2030**
Asset Management Standard Applied	**ISO 55000 series**

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
27	Asset management plan(s)	How has the organisation communicated its plan(s) to all relevant parties to a level of detail appropriate to the receiver's role in their delivery?	2	As GasNet's AMP has evolved from the first transitional AMP in 2013, so has the awareness of it amongst those within GasNet that need to know. By the nature of the content the information contained within the AMP will be well known to those whose role is dependent upon it. Due to the small centralised operation there is very good awareness of what other personnel are doing within the company and with a close and effective Management Team, information is effectively communicated to others as required. The General Manager provides appropriately detailed monthly reports to the Board of Directors who in turn take an active interest at Board of Directors meetings attended by the General Manager. There is good representation within GasNet's shareholder with a GasNet Director also a Director on the Board of Whanganui District Council Holdings Limited, and good information sharing through to GasNet's ultimate shareholder the Whanganui District Council.		Plans will be ineffective unless they are communicated to all those, including contracted suppliers and those who undertake enabling function(s). The plan(s) need to be communicated in a way that is relevant to those who need to use them.	The management team with overall responsibility for the asset management system. Delivery functions and suppliers.	Distribution lists for plan(s). Documents derived from plan(s) which detail the receivers role in plan delivery. Evidence of communication.
29	Asset management plan(s)	How are designated responsibilities for delivery of asset plan actions documented?	2	Responsibilities are clearly defined in Position Descriptions for all GasNet employees and reviewed on an annual basis in conjunction with the Personal Performance & Development Review (PPDR). Documented Policies and Procedures provide more detailed specific responsibilities and a thorough consultation process ensures maximum knowledge and understanding. Due to the small size of the company and the fact that almost every role is unique, the responsibilities are in most instances apparent to the position holder and others. No one else would logically share or take the responsibility.		The implementation of asset management plan(s) relies on (1) actions being clearly identified, (2) an owner allocated and (3) that owner having sufficient delegated responsibility and authority to carry out the work required. It also requires alignment of actions across the organisation. This question explores how well the plan(s) set out responsibility for delivery of asset plan actions.	The management team with overall responsibility for the asset management system. Operations, maintenance and engineering managers. If appropriate, the performance management team.	The organisation's asset management plan(s). Documentation defining roles and responsibilities of individuals and organisational departments.
31	Asset management plan(s)	What has the organisation done to ensure that appropriate arrangements are made available for the efficient and cost effective implementation of the plan(s)? (Note this is about resources and enabling support)	2	All Managers have clear responsibilities within their Position Descriptions for the management of resources under their control, both direct labour and external, and for meeting the company needs and legislative obligations relevant to the role. The Management Team meet regularly and have a good understanding of the issues at hand and their management. Additional financial resources have been made available when necessary to obtain specialist external support where it would be otherwise uneconomic to employ someone for that task. GasNet considers it is well placed to manage any resource issues that might arise through formalisation and further development of its AMP.		It is essential that the plan(s) are realistic and can be implemented, which requires appropriate resources to be available and enabling mechanisms in place. This question explores how well this is achieved. The plan(s) not only need to consider the resources directly required and timescales, but also the enabling activities, including for example, training requirements, supply chain capability and procurement timescales.	The management team with overall responsibility for the asset management system. Operations, maintenance and engineering managers. If appropriate, the performance management team. If appropriate, the performance management team. Where appropriate the procurement team and service providers working on the organisation's asset-related activities.	The organisation's asset management plan(s). Documented processes and procedures for the delivery of the asset management plan.

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
27	Asset management plan(s)	How has the organisation communicated its plan(s) to all relevant parties to a level of detail appropriate to the receiver's role in their delivery?	The organisation does not have plan(s) or their distribution is limited to the authors.	The plan(s) are communicated to some of those responsible for delivery of the plan(s). OR Communicated to those responsible for delivery is either irregular or ad-hoc.	The plan(s) are communicated to most of those responsible for delivery but there are weaknesses in identifying relevant parties resulting in incomplete or inappropriate communication. The organisation recognises improvement is needed as is working towards resolution.	The plan(s) are communicated to all relevant employees, stakeholders and contracted service providers to a level of detail appropriate to their participation or business interests in the delivery of the plan(s) and there is confirmation that they are being used effectively.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
29	Asset management plan(s)	How are designated responsibilities for delivery of asset plan actions documented?	The organisation has not documented responsibilities for delivery of asset plan actions.	Asset management plan(s) inconsistently document responsibilities for delivery of plan actions and activities and/or responsibilities and authorities for implementation inadequate and/or delegation level inadequate to ensure effective delivery and/or contain misalignments with organisational accountability.	Asset management plan(s) consistently document responsibilities for the delivery of actions but responsibility/authority levels are inappropriate/ inadequate, and/or there are misalignments within the organisation.	Asset management plan(s) consistently document responsibilities for the delivery actions and there is adequate detail to enable delivery of actions. Designated responsibility and authority for achievement of asset plan actions is appropriate.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
31	Asset management plan(s)	What has the organisation done to ensure that appropriate arrangements are made available for the efficient and cost effective implementation of the plan(s)? (Note this is about resources and enabling support)	The organisation has not considered the arrangements needed for the effective implementation of plan(s).	The organisation recognises the need to ensure appropriate arrangements are in place for implementation of asset management plan(s) and is in the process of determining an appropriate approach for achieving this.	The organisation has arrangements in place for the implementation of asset management plan(s) but the arrangements are not yet adequately efficient and/or effective. The organisation is working to resolve existing weaknesses.	The organisation's arrangements fully cover all the requirements for the efficient and cost effective implementation of asset management plan(s) and realistically address the resources and timescales required, and any changes needed to functional policies, standards, processes and the asset management information system.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
37	Structure, authority and responsibilities	What has the organisation done to appoint member(s) of its management team to be responsible for ensuring that the organisation's assets deliver the requirements of the asset management strategy, objectives and plan(s)?	2	The three Section Managers are each directly responsible to the General Manager and collectively responsible for delivery of the company's business requirements. Each Section is functionally based with little scope for confusion. Roles and responsibilities are clearly defined in Position Descriptions and delegated authorities are clearly understood and reflected in the managers performance and behaviour.		In order to ensure that the organisation's assets and asset systems deliver the requirements of the asset management policy, strategy and objectives responsibilities need to be allocated to appropriate people who have the necessary authority to fulfil their responsibilities. (This question, relates to the organisation's assets eg, para b), s 4.4.1 of PAS 55, making it therefore distinct from the requirement contained in para a), s 4.4.1 of PAS 55).	Top management. People with management responsibility for the delivery of asset management policy, strategy, objectives and plan(s). People working on asset-related activities.	Evidence that managers with responsibility for the delivery of asset management policy, strategy, objectives and plan(s) have been appointed and have assumed their responsibilities. Evidence may include the organisation's documents relating to its asset management system, organisational charts, job descriptions of post-holders, annual targets/objectives and personal development plan(s) of post-holders as appropriate.
40	Structure, authority and responsibilities	What evidence can the organisation's top management provide to demonstrate that sufficient resources are available for asset management?	2	GasNet's Management Team is highly effective at identifying and managing resourcing issues and needs as they are identified or become apparent. In addition to their management responsibilities the managers are operational and work closely with their direct reports within the same small office environment. The Management Team is efficient because of its active participation and size in making changes when necessary to ensure business requirements are met. Where the change requires additional resources and/or guidance from the Board, the General Manager has access to a designated Director outside of official Board meetings, and has a good working relationship with the Board during meetings. The Management Team is constantly aware of the increasing and changing resourcing needs, particularly given the recent changes in safety and commercial legislation and has made a number of significant resourcing changes. The asset management resourcing needs will continue to be monitored and addressed as necessary.		Optimal asset management requires top management to ensure sufficient resources are available. In this context the term 'resources' includes manpower, materials, funding and service provider support.	Top management. The management team that has overall responsibility for asset management. Risk management team. The organisation's managers involved in day-to-day supervision of asset-related activities, such as frontline managers, engineers, foremen and chargehands as appropriate.	Evidence demonstrating that asset management plan(s) and/or the process(es) for asset management plan implementation consider the provision of adequate resources in both the short and long term. Resources include funding, materials, equipment, services provided by third parties and personnel (internal and service providers) with appropriate skills competencies and knowledge.
42	Structure, authority and responsibilities	To what degree does the organisation's top management communicate the importance of meeting its asset management requirements?	2	Each of the three Section Managers that along with the General Manager make up the Management Team manage a small number of direct reports with whom regular operational meetings are held. With the relatively small number of employees GasNet could not operate effectively if individuals did not have a good understanding of what they are required to do and what is expected of others. In addition to the formal and informal communication from their managers, all office based employees operate out of a single open plan office effectively exposing them to all aspects of GasNet's business activities both strategic and operational, with a consequence that there is a good understanding of business systems and processes.		Widely used AM practice standards require an organisation to communicate the importance of meeting its asset management requirements such that personnel fully understand, take ownership of, and are fully engaged in the delivery of the asset management requirements (eg, PAS 55 s 4.4.1 g).	Top management. The management team that has overall responsibility for asset management. People involved in the delivery of the asset management requirements.	Evidence of such activities as road shows, written bulletins, workshops, team talks and management walk-abouts would assist an organisation to demonstrate it is meeting this requirement of PAS 55.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
37	Structure, authority and responsibilities	What has the organisation done to appoint member(s) of its management team to be responsible for ensuring that the organisation's assets deliver the requirements of the asset management strategy, objectives and plan(s)?	Top management has not considered the need to appoint a person or persons to ensure that the organisation's assets deliver the requirements of the asset management strategy, objectives and plan(s).	Top management understands the need to appoint a person or persons to ensure that the organisation's assets deliver the requirements of the asset management strategy, objectives and plan(s).	Top management has appointed an appropriate people to ensure the assets deliver the requirements of the asset management strategy, objectives and plan(s) but their areas of responsibility are not fully defined and/or they have insufficient delegated authority to fully execute their responsibilities.	The appointed person or persons have full responsibility for ensuring that the organisation's assets deliver the requirements of the asset management strategy, objectives and plan(s). They have been given the necessary authority to achieve this.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
40	Structure, authority and responsibilities	What evidence can the organisation's top management provide to demonstrate that sufficient resources are available for asset management?	The organisation's top management has not considered the resources required to deliver asset management.	The organisations top management understands the need for sufficient resources but there are no effective mechanisms in place to ensure this is the case.	A process exists for determining what resources are required for its asset management activities and in most cases these are available but in some instances resources remain insufficient.	An effective process exists for determining the resources needed for asset management and sufficient resources are available. It can be demonstrated that resources are matched to asset management requirements.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
42	Structure, authority and responsibilities	To what degree does the organisation's top management communicate the importance of meeting its asset management requirements?	The organisation's top management has not considered the need to communicate the importance of meeting asset management requirements.	The organisations top management understands the need to communicate the importance of meeting its asset management requirements but does not do so.	Top management communicates the importance of meeting its asset management requirements but only to parts of the organisation.	Top management communicates the importance of meeting its asset management requirements to all relevant parts of the organisation.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
45	Outsourcing of asset management activities	Where the organisation has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organisational strategic plan, and its asset management policy and strategy?	N/A	GasNet does outsource physical contract works but does not outsource asset management activities. GasNet has, and will continue to seek occasional ad hoc specialist support from external parties, but whenever it does the responsibility for the activity remains clearly with the relevant Manager.		Where an organisation chooses to outsource some of its asset management activities, the organisation must ensure that these outsourced process(es) are under appropriate control to ensure that all the requirements of widely used AM standards (eg, PAS 55) are in place, and the asset management policy, strategy objectives and plan(s) are delivered. This includes ensuring capabilities and resources across a time span aligned to life cycle management. The organisation must put arrangements in place to control the outsourced activities, whether it be to external providers or to other in-house departments. This question explores what the organisation does in this regard.	Top management. The management team that has overall responsibility for asset management. The manager(s) responsible for the monitoring and management of the outsourced activities. People involved with the procurement of outsourced activities. The people within the organisations that are performing the outsourced activities. The people impacted by the outsourced activity.	The organisation's arrangements that detail the compliance required of the outsourced activities. For example, this this could form part of a contract or service level agreement between the organisation and the suppliers of its outsourced activities. Evidence that the organisation has demonstrated to itself that it has assurance of compliance of outsourced activities.
48	Training, awareness and competence	How does the organisation develop plan(s) for the human resources required to undertake asset management activities - including the development and delivery of asset management strategy, process(es), objectives and plan(s)?	1.5	With clearly defined Position Descriptions within a functionally based organisational structure, the responsibilities and expectations from each employee are well documented and understood by all. All employees are subject to an annual Personal Performance and Development Review (PPDR) attended by their supervisor/manager and manager/General Manager, where their performance over the past 12 months is reviewed, performance targets for the next 12 months are set and agreed, and any training needs resulting from personal development of changing business needs are discussed and agreed.		There is a need for an organisation to demonstrate that it has considered what resources are required to develop and implement its asset management system. There is also a need for the organisation to demonstrate that it has assessed what development plan(s) are required to provide its human resources with the skills and competencies to develop and implement its asset management systems. The timescales over which the plan(s) are relevant should be commensurate with the planning horizons within the asset management strategy considers e.g. if the asset management strategy considers 5, 10 and 15 year time scales then the human resources development plan(s) should align with these. Resources include both 'in house' and external resources who undertake asset management activities.	Senior management responsible for agreement of plan(s). Managers responsible for developing asset management strategy and plan(s). Managers with responsibility for development and recruitment of staff (including HR functions). Staff responsible for training. Procurement officers. Contracted service providers.	Evidence of analysis of future work load plan(s) in terms of human resources. Document(s) containing analysis of the organisation's own direct resources and contractors resource capability over suitable timescales. Evidence, such as minutes of meetings, that suitable management forums are monitoring human resource development plan(s). Training plan(s), personal development plan(s), contract and service level agreements.
49	Training, awareness and competence	How does the organisation identify competency requirements and then plan, provide and record the training necessary to achieve the competencies?	2	Requirements for change are guided by GasNet's Change Management Policy, as a result of an identified need or deficiency occurring following an incident or non-conformance of a system or process, or during the annual Personal Performance and Development Review (PPDR). The annual training budget is based on a training plan developed at the time the budget is prepared and is based on the plan rather than a nominal percentage of salary target. Competencies achieved are recorded in the employees Personnel File and in the Risk Manager application.		Widely used AM standards require that organisations to undertake a systematic identification of the asset management awareness and competencies required at each level and function within the organisation. Once identified the training required to provide the necessary competencies should be planned for delivery in a timely and systematic way. Any training provided must be recorded and maintained in a suitable format. Where an organisation has contracted service providers in place then it should have a means to demonstrate that this requirement is being met for their employees. (eg, PAS 55 refers to frameworks suitable for identifying competency requirements).	Senior management responsible for agreement of plan(s). Managers responsible for developing asset management strategy and plan(s). Managers with responsibility for development and recruitment of staff (including HR functions). Staff responsible for training. Procurement officers. Contracted service providers.	Evidence of an established and applied competency requirements assessment process and plan(s) in place to deliver the required training. Evidence that the training programme is part of a wider, co-ordinated asset management activities training and competency programme. Evidence that training activities are recorded and that records are readily available (for both direct and contracted service provider staff) e.g. via organisation wide information system or local records database.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
45	Outsourcing of asset management activities	Where the organisation has outsourced some of its asset management activities, how has it ensured that appropriate controls are in place to ensure the compliant delivery of its organisational strategic plan, and its asset management policy and strategy?	The organisation has not considered the need to put controls in place.	The organisation controls its outsourced activities on an ad-hoc basis, with little regard for ensuring for the compliant delivery of the organisational strategic plan and/or its asset management policy and strategy.	Controls systematically considered but currently only provide for the compliant delivery of some, but not all, aspects of the organisational strategic plan and/or its asset management policy and strategy. Gaps exist.	Evidence exists to demonstrate that outsourced activities are appropriately controlled to provide for the compliant delivery of the organisational strategic plan, asset management policy and strategy, and that these controls are integrated into the asset management system	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
48	Training, awareness and competence	How does the organisation develop plan(s) for the human resources required to undertake asset management activities - including the development and delivery of asset management strategy, process(es), objectives and plan(s)?	The organisation has not recognised the need for assessing human resources requirements to develop and implement its asset management system.	The organisation has recognised the need to assess its human resources requirements and to develop a plan(s). There is limited recognition of the need to align these with the development and implementation of its asset management system.	The organisation has developed a strategic approach to aligning competencies and human resources to the asset management system including the asset management plan but the work is incomplete or has not been consistently implemented.	The organisation can demonstrate that plan(s) are in place and effective in matching competencies and capabilities to the asset management system including the plan for both internal and contracted activities. Plans are reviewed integral to asset management system process(es).	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
49	Training, awareness and competence	How does the organisation identify competency requirements and then plan, provide and record the training necessary to achieve the competencies?	The organisation does not have any means in place to identify competency requirements.	The organisation has recognised the need to identify competency requirements and then plan, provide and record the training necessary to achieve the competencies.	The organisation is the process of identifying competency requirements aligned to the asset management plan(s) and then plan, provide and record appropriate training. It is incomplete or inconsistently applied.	Competency requirements are in place and aligned with asset management plan(s). Plans are in place and effective in providing the training necessary to achieve the competencies. A structured means of recording the competencies achieved is in place.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
50	Training, awareness and competence	How does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	2	Each of the three Section Managers have an appropriate and relevant combination of qualifications and experience required for the position they hold. The Engineering Manager, a key asset management role, has two NZCE's the first in Mechanical Engineering and the second in Gas, combined with 30 years experience covering all aspects of natural gas distribution engineering. The General Manager has undertsanding of the ISO 55000 series of Standards and is a certified asset management assessor CAMA . The 4 Technicians have all been trained under the NZ qualifications framework to National Certificate Levels 3 and 4 in accordance with NZ Gas Industry minimum competency requirements as specified in the GANZ Certificate of Competency Framework. In addition to this platform of qualifications, experience and competencies it is relatively easy to identify non-performance and deficiencies in competence within a company the size of GasNet and where employees work within the same open plan office environment.		A critical success factor for the effective development and implementation of an asset management system is the competence of persons undertaking these activities. organisations should have effective means in place for ensuring the competence of employees to carry out their designated asset management function(s). Where an organisation has contracted service providers undertaking elements of its asset management system then the organisation shall assure itself that the outsourced service provider also has suitable arrangements in place to manage the competencies of its employees. The organisation should ensure that the individual and corporate competencies it requires are in place and actively monitor, develop and maintain an appropriate balance of these competencies.	Managers, supervisors, persons responsible for developing training programmes. Staff responsible for procurement and service agreements. HR staff and those responsible for recruitment.	Evidence of a competency assessment framework that aligns with established frameworks such as the asset management Competencies Requirements Framework (Version 2.0); National Occupational Standards for Management and Leadership; UK Standard for Professional Engineering Competence, Engineering Council, 2005.
53	Communication, participation and consultation	How does the organisation ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	2	GasNet provides its employees open access to required documentation through the Company Intranet, with the exception of commercially sensitive and confidential documents and information. Where there is an identified need for a specific group or individual in respect of information whether it be asset management or any other information, the relevant manager will ensure those needs are met. There is a good communication link between the Management Team and the Board of Directors via the General Manager and regularly reporting to the Board on a monthly basis. In view of the low level of activity and the advisory nature of the engagement, contracted service providers are not typically exposed to, nor require access to asset management information, but clearly would be provided with such if it were required in order to complete the task.		Widely used AM practice standards require that pertinent asset management information is effectively communicated to and from employees and other stakeholders including contracted service providers. Pertinent information refers to information required in order to effectively and efficiently comply with and deliver asset management strategy, plan(s) and objectives. This will include for example the communication of the asset management policy, asset performance information, and planning information as appropriate to contractors.	Top management and senior management representative(s), employee's representative(s), employee's trade union representative(s); contracted service provider management and employee representative(s); representative(s) from the organisation's Health, Safety and Environmental team. Key stakeholder representative(s).	Asset management policy statement prominently displayed on notice boards, intranet and internet; use of organisation's website for displaying asset performance data; evidence of formal briefings to employees, stakeholders and contracted service providers; evidence of inclusion of asset management issues in team meetings and contracted service provider contract meetings; newsletters, etc.
59	Asset Management System documentation	What documentation has the organisation established to describe the main elements of its asset management system and interactions between them?	2.5	GasNet has an extensive range of documentation to support its asset management, such as policies, procedures and plans integrated with its risk management, public and workplace safety management systems. The review processes referred to in the AMP and its alignment with the regulatory requirements under the IDD will provide the catalyst for the identification of any gaps in the existing systems and documentation and formalisation of the asset management system.		Widely used AM practice standards require an organisation maintain up to date documentation that ensures that its asset management systems (ie, the systems the organisation has in place to meet the standards) can be understood, communicated and operated. (eg, s 4.5 of PAS 55 requires the maintenance of up to date documentation of the asset management system requirements specified throughout s 4 of PAS 55).	The management team that has overall responsibility for asset management. Managers engaged in asset management activities.	The documented information describing the main elements of the asset management system (process(es)) and their interaction.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
50	Training, awareness and competence	How does the organization ensure that persons under its direct control undertaking asset management related activities have an appropriate level of competence in terms of education, training or experience?	The organization has not recognised the need to assess the competence of person(s) undertaking asset management related activities.	Competency of staff undertaking asset management related activities is not managed or assessed in a structured way, other than formal requirements for legal compliance and safety management.	The organization is in the process of putting in place a means for assessing the competence of person(s) involved in asset management activities including contractors. There are gaps and inconsistencies.	Competency requirements are identified and assessed for all persons carrying out asset management related activities - internal and contracted. Requirements are reviewed and staff reassessed at appropriate intervals aligned to asset management requirements.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
53	Communication, participation and consultation	How does the organisation ensure that pertinent asset management information is effectively communicated to and from employees and other stakeholders, including contracted service providers?	The organisation has not recognised the need to formally communicate any asset management information.	There is evidence that the pertinent asset management information to be shared along with those to share it with is being determined.	The organisation has determined pertinent information and relevant parties. Some effective two way communication is in place but as yet not all relevant parties are clear on their roles and responsibilities with respect to asset management information.	Two way communication is in place between all relevant parties, ensuring that information is effectively communicated to match the requirements of asset management strategy, plan(s) and process(es). Pertinent asset information requirements are regularly reviewed.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
59	Asset Management System documentation	What documentation has the organisation established to describe the main elements of its asset management system and interactions between them?	The organisation has not established documentation that describes the main elements of the asset management system.	The organisation is aware of the need to put documentation in place and is in the process of determining how to document the main elements of its asset management system.	The organisation in the process of documenting its asset management system and has documentation in place that describes some, but not all, of the main elements of its asset management system and their interaction.	The organisation has established documentation that comprehensively describes all the main elements of its asset management system and the interactions between them. The documentation is kept up to date.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
62	Information management	What has the organisation done to determine what its asset management information system(s) should contain in order to support its asset management system?	1	As GasNet's AMP has evolved so has GasNet's need for information and systems to support it. The first full AMP published in 2017 demanded significant additional information that whilst the majority was readily available and accessible, it was acknowledged that repeatability and reliability of the information source was critical to GasNet's management of its assets and production of a credible and defendable AMP's in the future. Is it planned to undertake further review of the enhanced information and system requirements as well as the additional requirements necessary to GasNet's management of assets.		Effective asset management requires appropriate information to be available. Widely used AM standards therefore require the organisation to identify the asset management information it requires in order to support its asset management system. Some of the information required may be held by suppliers. The maintenance and development of asset management information systems is a poorly understood specialist activity that is akin to IT management but different from IT management. This group of questions provides some indications as to whether the capability is available and applied. Note: To be effective, an asset information management system requires the mobilisation of technology, people and process(es) that create, secure, make available and destroy the information required to support the asset management system.	The organisation's strategic planning team. The management team that has overall responsibility for asset management. Information management team. Operations, maintenance and engineering managers	Details of the process the organisation has employed to determine what its asset information system should contain in order to support its asset management system. Evidence that this has been effectively implemented.
63	Information management	How does the organisation maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	2	GasNet has developed a robust document management system combined with registers providing a record of documents held and their status. GasNet has identified its GIS, MIDaS and KernMobile applications as its core asset information systems and with access limited to only a few personnel with the authority to change and update data, the reliance is on the competency of the persons making those changes to maintain quality. With its increasing use and dependency on electronic based data GasNet has recognised the need to set and maintain standards in data management and quality, and in conjunction with a business system process review being undertaken at the time of preparing this document, plans to introduce systems to check data accuracy.		The response to the questions is progressive. A higher scale cannot be awarded without achieving the requirements of the lower scale. This question explores how the organisation ensures that information management meets widely used AM practice requirements (eg, s 4.4.6 (a), (c) and (d) of PAS 55).	The management team that has overall responsibility for asset management. Users of the organisational information systems.	The asset management information system, together with the policies, procedure(s), improvement initiatives and audits regarding information controls.
64	Information management	How has the organisation's ensured its asset management information system is relevant to its needs?	1.5	GasNet's asset management information system is based predominantly around its key software applications with data held in electronic format. As GasNet's needs for information have increased over recent years so to has the availability of data from the information system. Driven largely from the regulatory changes in 2013 GasNet is now able to produce extensive information from its system which is both reliable and repeatable. GasNet is confident that as its needs change in coming years for more or different asset related information it will be able to be accommodated within its existing information system. The ease at which GasNet was able to provide the additional information for its 2017 AMP is evidence of its ability to meet its needs.		Widely used AM standards need not be prescriptive about the form of the asset management information system, but simply require that the asset management information system is appropriate to the organisations needs, can be effectively used and can supply information which is consistent and of the requisite quality and accuracy.	The organisation's strategic planning team. The management team that has overall responsibility for asset management. Information management team. Users of the organisational information systems.	The documented process the organisation employs to ensure its asset management information system aligns with its asset management requirements. Minutes of information systems review meetings involving users.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
62	Information management	What has the organisation done to determine what its asset management information system(s) should contain in order to support its asset management system?	The organisation has not considered what asset management information is required.	The organisation is aware of the need to determine in a structured manner what its asset information system should contain in order to support its asset management system and is in the process of deciding how to do this.	The organisation has developed a structured process to determine what its asset information system should contain in order to support its asset management system and has commenced implementation of the process.	The organisation has determined what its asset information system should contain in order to support its asset management system. The requirements relate to the whole life cycle and cover information originating from both internal and external sources.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
63	Information management	How does the organisation maintain its asset management information system(s) and ensure that the data held within it (them) is of the requisite quality and accuracy and is consistent?	There are no formal controls in place or controls are extremely limited in scope and/or effectiveness.	The organisation is aware of the need for effective controls and is in the process of developing an appropriate control process(es).	The organisation has developed a controls that will ensure the data held is of the requisite quality and accuracy and is consistent and is in the process of implementing them.	The organisation has effective controls in place that ensure the data held is of the requisite quality and accuracy and is consistent. The controls are regularly reviewed and improved where necessary.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
64	Information management	How has the organisation's ensured its asset management information system is relevant to its needs?	The organisation has not considered the need to determine the relevance of its management information system. At present there are major gaps between what the information system provides and the organisations needs.	The organisation understands the need to ensure its asset management information system is relevant to its needs and is determining an appropriate means by which it will achieve this. At present there are significant gaps between what the information system provides and the organisations needs.	The organisation has developed and is implementing a process to ensure its asset management information system is relevant to its needs. Gaps between what the information system provides and the organisations needs have been identified and action is being taken to close them.	The organisation's asset management information system aligns with its asset management requirements. Users can confirm that it is relevant to their needs.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
69	Risk management process(es)	How has the organisation documented process(es) and/or procedure(s) for the identification and assessment of asset and asset management related risks throughout the asset life cycle?	2	GasNet risk management system is governed by its Risk Management Policy which addresses all forms of risk to which the company is or may be exposed. Implementation of GasNet's Public Safety Management System in 2013 formalised the management risk with a particular focus on safety and asset related risks.		Risk management is an important foundation for proactive asset management. Its overall purpose is to understand the cause, effect and likelihood of adverse events occurring, to optimally manage such risks to an acceptable level, and to provide an audit trail for the management of risks. Widely used standards require the organisation to have process(es) and/or procedure(s) in place that set out how the organisation identifies and assesses asset and asset management related risks. The risks have to be considered across the four phases of the asset lifecycle (eg, para 4.3.3 of PAS 55).	The top management team in conjunction with the organisation's senior risk management representatives. There may also be input from the organisation's Safety, Health and Environment team. Staff who carry out risk identification and assessment.	The organisation's risk management framework and/or evidence of specific process(es) and/ or procedure(s) that deal with risk control mechanisms. Evidence that the process(es) and/or procedure(s) are implemented across the business and maintained. Evidence of agendas and minutes from risk management meetings. Evidence of feedback in to process(es) and/or procedure(s) as a result of incident investigation(s). Risk registers and assessments.
79	Use and maintenance of asset risk information	How does the organisation ensure that the results of risk assessments provide input into the identification of adequate resources and training and competency needs?	1	With the safety considerations inherent in a natural gas infrastructure business, the management of risk has become naturally embedded within GasNet's business processes and activities. With close alignment to the hazard and risk management processes required under the workplace health and safety legislation and as asset related risk is often identified in conjunction with health and safety related risks, the focus on managing asset risk information is not new to GasNet or its employees. It is acknowledged however that by formalising its asset management system and practices and with specific consideration to asset related risks that gaps will be identified.		Widely used AM standards require that the output from risk assessments are considered and that adequate resource (including staff) and training is identified to match the requirements. It is a further requirement that the effects of the control measures are considered, as there may be implications in resources and training required to achieve other objectives.	Staff responsible for risk assessment and those responsible for developing and approving resource and training plan(s). There may also be input from the organisation's Safety, Health and Environment team.	The organisations risk management framework. The organisation's resourcing plan(s) and training and competency plan(s). The organisation should be able to demonstrate appropriate linkages between the content of resource plan(s) and training and competency plan(s) to the risk assessments and risk control measures that have been developed.
82	Legal and other requirements	What procedure does the organisation have to identify and provide access to its legal, regulatory, statutory and other asset management requirements, and how is requirements incorporated into the asset management system?	2	In accordance with its Compliance Policy, GasNet has published a comprehensive legislation register applying across all business interests of the company, accessible to all employees via its intranet. The register provides the specific items of legislation and covers acts, regulations, standards, codes of practice and guidelines, with active links to documents where they are available on the web. In addition GasNet is a member of the Gas Association of New Zealand, LPG Association, subscribes to email notifications from the Gas Industry Company and is either a member itself, or individual employees are members of, a range of various organisations with interests in asset related matters.		In order for an organisation to comply with its legal, regulatory, statutory and other asset management requirements, the organisation first needs to ensure that it knows what they are (eg, PAS 55 specifies this in s 4.4.8). It is necessary to have systematic and auditable mechanisms in place to identify new and changing requirements. Widely used AM standards also require that requirements are incorporated into the asset management system (e.g. procedure(s) and process(es))	Top management. The organisations regulatory team. The organisation's legal team or advisors. The management team with overall responsibility for the asset management system. The organisation's health and safety team or advisors. The organisation's policy making team.	The organisational processes and procedures for ensuring information of this type is identified, made accessible to those requiring the information and is incorporated into asset management strategy and objectives

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Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
69	Risk management process(es)	How has the organisation documented process(es) and/or procedure(s) for the identification and assessment of asset and asset management related risks throughout the asset life cycle?	The organisation has not considered the need to document process(es) and/or procedure(s) for the identification and assessment of asset and asset management related risks throughout the asset life cycle.	The organisation is aware of the need to document the management of asset related risk across the asset lifecycle. The organisation has plan(s) to formally document all relevant process(es) and procedure(s) or has already commenced this activity.	The organisation is in the process of documenting the identification and assessment of asset related risk across the asset lifecycle but it is incomplete or there are inconsistencies between approaches and a lack of integration.	Identification and assessment of asset related risk across the asset lifecycle is fully documented. The organisation can demonstrate that appropriate documented mechanisms are integrated across life cycle phases and are being consistently applied.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
79	Use and maintenance of asset risk information	How does the organisation ensure that the results of risk assessments provide input into the identification of adequate resources and training and competency needs?	The organisation has not considered the need to conduct risk assessments.	The organisation is aware of the need to consider the results of risk assessments and effects of risk control measures to provide input into reviews of resources, training and competency needs. Current input is typically ad-hoc and reactive.	The organisation is in the process ensuring that outputs of risk assessment are included in developing requirements for resources and training. The implementation is incomplete and there are gaps and inconsistencies.	Outputs from risk assessments are consistently and systematically used as inputs to develop resources, training and competency requirements. Examples and evidence is available.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
82	Legal and other requirements	What procedure does the organisation have to identify and provide access to its legal, regulatory, statutory and other asset management requirements, and how is requirements incorporated into the asset management system?	The organisation has not considered the need to identify its legal, regulatory, statutory and other asset management requirements.	The organisation identifies some its legal, regulatory, statutory and other asset management requirements, but this is done in an ad-hoc manner in the absence of a procedure.	The organisation has procedure(s) to identify its legal, regulatory, statutory and other asset management requirements, but the information is not kept up to date, inadequate or inconsistently managed.	Evidence exists to demonstrate that the organisation's legal, regulatory, statutory and other asset management requirements are identified and kept up to date. Systematic mechanisms for identifying relevant legal and statutory requirements.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
88	Life Cycle Activities	How does the organisation establish implement and maintain process(es) for the implementation of its asset management plan(s) and control of activities across the creation, acquisition or enhancement of assets. This includes design, modification, procurement, construction and commissioning activities?	2	GasNet has an extensive documentation framework comprising policies, procedures and plans. Whilst acknowledging that there are identified gaps in documentation and systems, they are diminishing and will be completed as a matter of course and with the appropriate priority. Development of new or changes to an existing process or document are undertaken with the oversight of the relevant section manager, management team, General Manager or Board of Directors as appropriate.		Life cycle activities are about the implementation of asset management plan(s) i.e. they are the "doing" phase. They need to be done effectively and well in order for asset management to have any practical meaning. As a consequence, widely used standards (eg, PAS 55 s 4.5.1) require organisations to have in place appropriate process(es) and procedure(s) for the implementation of asset management plan(s) and control of lifecycle activities. This question explores those aspects relevant to asset creation.	Asset managers, design staff, construction staff and project managers from other impacted areas of the business, e.g. Procurement	Documented process(es) and procedure(s) which are relevant to demonstrating the effective management and control of life cycle activities during asset creation, acquisition, enhancement including design, modification, procurement, construction and commissioning.
91	Life Cycle Activities	How does the organisation ensure that process(es) and/or procedure(s) for the implementation of asset management plan(s) and control of activities during maintenance (and inspection) of assets are sufficient to ensure activities are carried out under specified conditions, are consistent with asset management strategy and control cost, risk and performance?	2	GasNet has operated comprehensive asset maintenance regimes for a number of years, typically based on fixed interval preventative maintenance. Over time and with the recent introduction of risk based management under the gas safety and measurement regulations, GasNet has modified its practises to reflect the risk profile of the assets or their operation. With its small number of employees and the close working environment within which its employees operate, GasNet is well placed to implement change and take appropriate corrective action if an adverse event or incident should occur. There is little growth opportunities for GasNet within its existing footprint so the creation of new assets are typically associated with asset renewals, with a focus on the pre-natural gas era Low Pressure assets.		Having documented process(es) which ensure the asset management plan(s) are implemented in accordance with any specified conditions, in a manner consistent with the asset management policy, strategy and objectives and in such a way that cost, risk and asset system performance are appropriately controlled is critical. They are an essential part of turning intention into action (eg, as required by PAS 55 s 4.5.1).	Asset managers, operations managers, maintenance managers and project managers from other impacted areas of the business	Documented procedure for review. Documented procedure for audit of process delivery. Records of previous audits, improvement actions and documented confirmation that actions have been carried out.
95	Performance and condition monitoring	How does the organisation measure the performance and condition of its assets?	2	GasNet has a good understanding of its assets and their condition due to the relatively small size of its network, the knowledge shared and gained within the small number of employees, and the longevity of operational personnel working on the assets. GasNet recognises the importance of capturing asset condition information within its assets management system and the benefits of measuring performance through the reporting of key performance indicators. In addition to performance measures reported in GasNet's disclosures and AMP a number of lagging performance measures are collected for management purposes and reported internally on a monthly basis to the Board of Directors. GasNet would welcome the introduction of further gas industry standard measures providing the opportunity for comparison with other operators.		Widely used AM standards require that organisations establish implement and maintain procedure(s) to monitor and measure the performance and/or condition of assets and asset systems. They further set out requirements in some detail for reactive and proactive monitoring, and leading/lagging performance indicators together with the monitoring or results to provide input to corrective actions and continual improvement. There is an expectation that performance and condition monitoring will provide input to improving asset management strategy, objectives and plan(s).	A broad cross-section of the people involved in the organisation's asset-related activities from data input to decision-makers, i.e. an end-to end assessment. This should include contactors and other relevant third parties as appropriate.	Functional policy and/or strategy documents for performance or condition monitoring and measurement. The organisation's performance monitoring frameworks, balanced scorecards etc. Evidence of the reviews of any appropriate performance indicators and the action lists resulting from these reviews. Reports and trend analysis using performance and condition information. Evidence of the use of performance and condition information shaping improvements and supporting asset management strategy, objectives and plan(s).

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Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
88	Life Cycle Activities	How does the organisation establish implement and maintain process(es) for the implementation of its asset management plan(s) and control of activities across the creation, acquisition or enhancement of assets. This includes design, modification, procurement, construction and commissioning activities?	The organisation does not have process(es) in place to manage and control the implementation of asset management plan(s) during activities related to asset creation including design, modification, procurement, construction and commissioning.	The organisation is aware of the need to have process(es) and procedure(s) in place to manage and control the implementation of asset management plan(s) during activities related to asset creation including design, modification, procurement, construction and commissioning but currently do not have these in place (note: procedure(s) may exist but they are inconsistent/incomplete).	The organisation is in the process of putting in place process(es) and procedure(s) to manage and control the implementation of asset management plan(s) during activities related to asset creation including design, modification, procurement, construction and commissioning. Gaps and inconsistencies are being addressed.	Effective process(es) and procedure(s) are in place to manage and control the implementation of asset management plan(s) during activities related to asset creation including design, modification, procurement, construction and commissioning.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
91	Life Cycle Activities	How does the organisation ensure that process(es) and/or procedure(s) for the implementation of asset management plan(s) and control of activities during maintenance (and inspection) of assets are sufficient to ensure activities are carried out under specified conditions, are consistent with asset management strategy and control cost, risk and performance?	The organisation does not have process(es)/procedure(s) in place to control or manage the implementation of asset management plan(s) during this life cycle phase.	The organisation is aware of the need to have process(es) and procedure(s) in place to manage and control the implementation of asset management plan(s) during this life cycle phase but currently do not have these in place and/or there is no mechanism for confirming they are effective and where needed modifying them.	The organisation is in the process of putting in place process(es) and procedure(s) to manage and control the implementation of asset management plan(s) during this life cycle phase. They include a process for confirming the process(es)/procedure(s) are effective and if necessary carrying out modifications.	The organisation has in place process(es) and procedure(s) to manage and control the implementation of asset management plan(s) during this life cycle phase. They include a process, which is itself regularly reviewed to ensure it is effective, for confirming the process(es)/ procedure(s) are effective and if necessary carrying out modifications.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
95	Performance and condition monitoring	How does the organisation measure the performance and condition of its assets?	The organisation has not considered how to monitor the performance and condition of its assets.	The organisation recognises the need for monitoring asset performance but has not developed a coherent approach. Measures are incomplete, predominantly reactive and lagging. There is no linkage to asset management objectives.	The organisation is developing coherent asset performance monitoring linked to asset management objectives. Reactive and proactive measures are in place. Use is being made of leading indicators and analysis. Gaps and inconsistencies remain.	Consistent asset performance monitoring linked to asset management objectives is in place and universally used including reactive and proactive measures. Data quality management and review process are appropriate. Evidence of leading indicators and analysis.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
99	Investigation of asset-related failures, incidents and nonconformities	How does the organisation ensure responsibility and the authority for the handling, investigation and mitigation of asset-related failures, incidents and emergency situations and non conformances is clear, unambiguous, understood and communicated?	3	All incidents that occur on the gas network are investigated, with the details and findings recorded in GasNet's Risk Manager software application. The effort and extent to which an incident is investigated depends entirely on the type and nature of the event. Two managers have received formal training in incident investigation including the Engineering Manager who undertakes most investigations. There have been a few occasions where an external investigator has been engaged to undertake the investigation due typically to the complex nature of the incident and/or the need to ensure the interview process is robust and captures information which as closely as possible reflects the events that had occurred prior to and/or during the incident.GasNet's Corrective and Preventative Actions Policy addresses issues on non-conformance and promotes the practice of continual improvement.		Widely used AM standards require that the organisation establishes implements and maintains process(es) for the handling and investigation of failures incidents and non-conformities for assets and sets down a number of expectations. Specifically this question examines the requirement to define clearly responsibilities and authorities for these activities, and communicate these unambiguously to relevant people including external stakeholders if appropriate.	The organisation's safety and environment management team. The team with overall responsibility for the management of the assets. People who have appointed roles within the asset-related investigation procedure, from those who carry out the investigations to senior management who review the recommendations. Operational controllers responsible for managing the asset base under fault conditions and maintaining services to consumers. Contractors and other third parties as appropriate.	Process(es) and procedure(s) for the handling, investigation and mitigation of asset-related failures, incidents and emergency situations and non conformances. Documentation of assigned responsibilities and authority to employees. Job Descriptions, Audit reports. Common communication systems i.e. all Job Descriptions on Internet etc.
105	Audit	What has the organisation done to establish procedure(s) for the audit of its asset management system (process(es))?	1	GasNet is aware of the benefits of subjecting its systems and processes to an audit regime, whether it be internal or external or a combination of both. However it is also very aware that in an environment where there is increasing expectations from multiple stakeholders the audit must be well managed to ensure it achieves the desired outcomes both in terms of integrity and cost. A review of GasNets risk management practices within the context of asset management planning was conducted by Commerce Commission in 2019. The findings of the review will assist to establish the the audit requirements which are expected to be formalised in the 2020/21 Annual Planning period.		This question seeks to explore what the organisation has done to comply with the standard practice AM audit requirements (eg, the associated requirements of PAS 55 s 4.6.4 and its linkages to s 4.7).	The management team responsible for its asset management procedure(s). The team with overall responsibility for the management of the assets. Audit teams, together with key staff responsible for asset management. For example, Asset Management Director, Engineering Director. People with responsibility for carrying out risk assessments	The organisation's asset-related audit procedure(s). The organisation's methodology(s) by which it determined the scope and frequency of the audits and the criteria by which it identified the appropriate audit personnel. Audit schedules, reports etc. Evidence of the procedure(s) by which the audit results are presented, together with any subsequent communications. The risk assessment schedule or risk registers.
109	Corrective & Preventative action	How does the organisation instigate appropriate corrective and/or preventive actions to eliminate or prevent the causes of identified poor performance and non conformance?	3	GasNet's Corrective and Preventative Actions Policy addresses issues of non-conformance and promotes the practice of continual improvement. With the investigation of every incident, event and near-miss occurrence, corrective actions are identified in almost every instance with few exceptions, and whilst in the majority of instances the improvements are minor in nature, they nevertheless contribute and confirm GasNet's commitment to continual improvement. With the ease of access to senior management, employees are encouraged to make their managers aware of any improvement opportunities, which in the case of the operational field Technicians are often discussed in the daily meeting with their supervisor.		Having investigated asset related failures, incidents and non-conformances, and taken action to mitigate their consequences, an organisation is required to implement preventative and corrective actions to address root causes. Incident and failure investigations are only useful if appropriate actions are taken as a result to assess changes to a businesses risk profile and ensure that appropriate arrangements are in place should a recurrence of the incident happen. Widely used AM standards also require that necessary changes arising from preventive or corrective action are made to the asset management system.	The management team responsible for its asset management procedure(s). The team with overall responsibility for the management of the assets. Audit and incident investigation teams. Staff responsible for planning and managing corrective and preventive actions.	Analysis records, meeting notes and minutes, modification records. Asset management plan(s), investigation reports, audit reports, improvement programmes and projects. Recorded changes to asset management procedure(s) and process(es). Condition and performance reviews. Maintenance reviews

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Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
99	Investigation of asset-related failures, incidents and nonconformities	How does the organisation ensure responsibility and the authority for the handling, investigation and mitigation of asset-related failures, incidents and emergency situations and non conformances is clear, unambiguous, understood and communicated?	The organisation has not considered the need to define the appropriate responsibilities and the authorities.	The organisation understands the requirements and is in the process of determining how to define them.	The organisation are in the process of defining the responsibilities and authorities with evidence. Alternatively there are some gaps or inconsistencies in the identified responsibilities/authorities.	The organisation have defined the appropriate responsibilities and authorities and evidence is available to show that these are applied across the business and kept up to date.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
105	Audit	What has the organisation done to establish procedure(s) for the audit of its asset management system (process(es))?	The organisation has not recognised the need to establish procedure(s) for the audit of its asset management system.	The organisation understands the need for audit procedure(s) and is determining the appropriate scope, frequency and methodology(s).	The organisation is establishing its audit procedure(s) but they do not yet cover all the appropriate asset-related activities.	The organisation can demonstrate that its audit procedure(s) cover all the appropriate asset-related activities and the associated reporting of audit results. Audits are to an appropriate level of detail and consistently managed.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
109	Corrective & Preventative action	How does the organisation instigate appropriate corrective and/or preventive actions to eliminate or prevent the causes of identified poor performance and non conformance?	The organisation does not recognise the need to have systematic approaches to instigating corrective or preventive actions.	The organisation recognises the need to have systematic approaches to instigating corrective or preventive actions. There is ad-hoc implementation for corrective actions to address failures of assets but not the asset management system.	The need is recognized for systematic instigation of preventive and corrective actions to address root causes of non compliance or incidents identified by investigations, compliance evaluation or audit. It is only partially or inconsistently in place.	Mechanisms are consistently in place and effective for the systematic instigation of preventive and corrective actions to address root causes of non compliance or incidents identified by investigations, compliance evaluation or audit.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

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SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Score	Evidence—Summary	User Guidance	Why	Who	Record/documented Information
113	Continual Improvement	How does the organisation achieve continual improvement in the optimal combination of costs, asset related risks and the performance and condition of assets and asset systems across the whole life cycle?	1	The approval and implementation of the Corrective and Preventative Actions Policy provided the catalyst for formalising the existing practices embedded within GasNet's system and processes. Whilst GasNet had historically promoted and supported the identification of improvement opportunities (made easier by ease of access for all employees to their Section Manager and the General Manager) it is likely that there would have been opportunities missed through the absence of formal systems in place.		Widely used AM standards have requirements to establish, implement and maintain process(es)/procedure(s) for identifying, assessing, prioritising and implementing actions to achieve continual improvement. Specifically there is a requirement to demonstrate continual improvement in optimisation of cost risk and performance/condition of assets across the life cycle. This question explores an organisation's capabilities in this area—looking for systematic improvement mechanisms rather that reviews and audit (which are separately examined).	The top management of the organisation. The manager/team responsible for managing the organisation's asset management system, including its continual improvement. Managers responsible for policy development and implementation.	Records showing systematic exploration of improvement. Evidence of new techniques being explored and implemented. Changes in procedure(s) and process(es) reflecting improved use of optimisation tools/techniques and available information. Evidence of working parties and research.
115	Continual Improvement	How does the organisation seek and acquire knowledge about new asset management related technology and practices, and evaluate their potential benefit to the organisation?	2	GasNet has a history of active participation with persons and organisations external to its own operation and if it identifies a gap in knowledge or capabilities will seek assistance or advice. Whilst GasNet had previously adopted the International Infrastructure Management Manual (IIMM) followed by the Publicly Available Specification on Asset Management (PAS 55:2008) in 2014, GasNet's latest Asset Management Policy approved and implemented on 17 June 2019 acknowledges the ISO 55000 suite of standards.		One important aspect of continual improvement is where an organisation looks beyond its existing boundaries and knowledge base to look at what 'new things are on the market'. These new things can include equipment, process(es), tools, etc. An organisation which does this (eg, by the PAS 55 s 4.6 standards) will be able to demonstrate that it continually seeks to expand its knowledge of all things affecting its asset management approach and capabilities. The organisation will be able to demonstrate that it identifies any such opportunities to improve, evaluates them for suitability to its own organisation and implements them as appropriate. This question explores an organisation's approach to this activity.	The top management of the organisation. The manager/team responsible for managing the organisation's asset management system, including its continual improvement. People who monitor the various items that require monitoring for 'change'. People that implement changes to the organisation's policy, strategy, etc. People within an organisation with responsibility for investigating, evaluating, recommending and implementing new tools and techniques, etc.	Research and development projects and records, benchmarking and participation knowledge exchange professional forums. Evidence of correspondence relating to knowledge acquisition. Examples of change implementation and evaluation of new tools, and techniques linked to asset management strategy and objectives.

Company Name	GasNet Limited
AMP Planning Period	1 July 2020 – 30 June 2030
Asset Management Standard Applied	ISO 55000 series

SCHEDULE 13: REPORT ON ASSET MANAGEMENT MATURITY (cont)

Question No.	Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2	Maturity Level 3	Maturity Level 4
113	Continual Improvement	How does the organisation achieve continual improvement in the optimal combination of costs, asset related risks and the performance and condition of assets and asset systems across the whole life cycle?	The organisation does not consider continual improvement of these factors to be a requirement, or has not considered the issue.	A Continual Improvement ethos is recognised as beneficial, however it has just been started, and or covers partially the asset drivers.	Continuous improvement process(es) are set out and include consideration of cost risk, performance and condition for assets managed across the whole life cycle but it is not yet being systematically applied.	There is evidence to show that continuous improvement process(es) which include consideration of cost risk, performance and condition for assets managed across the whole life cycle are being systematically applied.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.
115	Continual Improvement	How does the organisation seek and acquire knowledge about new asset management related technology and practices, and evaluate their potential benefit to the organisation?	The organisation makes no attempt to seek knowledge about new asset management related technology or practices.	The organisation is inward looking, however it recognises that asset management is not sector specific and other sectors have developed good practice and new ideas that could apply. Ad-hoc approach.	The organisation has initiated asset management communication within sector to share and, or identify 'new' to sector asset management practices and seeks to evaluate them.	The organisation actively engages internally and externally with other asset management practitioners, professional bodies and relevant conferences. Actively investigates and evaluates new practices and evolves its asset management activities using appropriate developments.	The organisation's process(es) surpass the standard required to comply with requirements set out in a recognised standard. The assessor is advised to note in the Evidence section why this is the case and the evidence seen.

Appendix 2.2 – Schedule 14a: Mandatory Explanatory Notes on Forecast Information

(In this Schedule, clause references are to the Gas Distribution Information Disclosure Determination 2012 – as amended and consolidated 3 April 2018.)

1. This schedule requires GDBs to provide explanatory notes to reports prepared in accordance with clause 2.6.6.

2. This schedule is mandatory—GDBs must provide the explanatory comment specified below, in accordance with clause 2.7.2. This information is not part of the audited disclosure information, and so is not subject to the assurance requirements specified in section 2.8.

Commentary on difference between nominal and constant price capital expenditure forecasts (Schedule 11a)

3. In the box below, comment on the difference between nominal and constant price capital expenditure for the current disclosure year and the 10 year planning period, as disclosed in Schedule 11a.

Box 1: Commentary on difference between nominal and constant price capital expenditure forecasts

The difference between nominal and constant price capital expenditure forecasts is due to forecast indexation being applied, based on a long term forecast annual change in CPI of 2%.

For Year Ended	Change in CPI
Jun-20	0.00%
Jun-21	0.00%
Jun-22	7.30%
Jun-23	6.00%
Jun-24	3.30%
Jun-25	2.20%
Jun-26	2.10%
Jun-27	2.00%
Jun-28	2.00%
Jun-29	2.00%
Jun-30	2.00%

Commentary on difference between nominal and constant price operational expenditure forecasts (Schedule 11b)

4. In the box below, comment on the difference between nominal and constant price operational expenditure for the current disclosure year and the 10 year planning period, as disclosed in Schedule 11b.

Box 2: Commentary on difference between nominal and constant price operational expenditure forecasts

The difference between nominal and constant price capital expenditure forecasts is due to forecast indexation being applied, based on a long term forecast annual change in CPI of 2%.

For Year Ended	Change in CPI
Jun-20	0.00%
Jun-21	0.00%
Jun-22	7.30%
Jun-23	6.00%
Jun-24	3.30%
Jun-25	2.20%
Jun-26	2.10%
Jun-27	2.00%
Jun-28	2.00%
Jun-29	2.00%
Jun-30	2.00%

Appendix 3 – Schedule 17: Certification for Year-beginning Disclosures

Clause 2.9.1

We, Charles Peter Hazledine, and Matthew James Doyle, being directors of GasNet Limited certify that, having made all reasonable enquiry, to the best of our knowledge:

(a) the following attached information of GasNet Limited prepared for the purposes of clause 2.6.1, 2.6.3, 2.6.6 and 2.7.2 of the Gas Distribution Information Disclosure Determination 2012 in all material respects complies with that determination.

(b) The prospective financial or non-financial information included in the attached information has been measured on a basis consistent with regulatory requirements or recognised industry standards.

(c) The forecasts in Schedules 11a, 11b, 12a, 12b and 12c are based on objective and reasonable assumptions which both align with GasNet Limited's corporate vision and strategy and are documented in retained records.

Director and Chair Peter Hazledine

Director Matthew Doyle

18 December 2025

Date