FITNESS FOR PURPOSE REPORT

Pipeline Licence No 1

MOOMBA TO ADELAIDE GAS PIPELINE SYSTEM

Document No S-1-101-FFP-G-001

February 2008

EXECUTIVE SUMMARY

The Moomba to Adelaide Gas Pipeline (MAP) is owned, operated and maintained by Epic Energy. The pipeline is licensed under Pipeline Licence 1 (PL 1) and was designed to the American Standard Code for Pressure Piping-Gas Transmission & Distribution Piping Systems ASA B31.8 – 1968.

The pipeline was constructed in 1967/68, commissioned in 1969 to supply natural gas from the Cooper Basin to South Australia. The Pipeline is 781 km long and 559 mm in diameter, constructed of welded steel, wrapped in a protective coating and is buried to depths in excess of 800mm. The pipeline is designed to operate at a Maximum Allowable Operating Pressure (MAOP) of 7.322MPa.

Epic Energy operates and controls the MAPS from the Transportation Services Centre (TSCC) in Melbourne, Victoria using the Epic Energy Telvent SCADA System. The pipeline can also be monitored and controlled by a back up system located at Epic Energy's emergency control centre at Dry Creek, South Australia.

In accordance with the South Australian Petroleum Act 2000 and the Petroleum Regulations Part 6 Division 4 this Fitness for Purpose Report assesses the risks imposed by the pipeline on:

- The environment
- Public health and safety
- Security of production of supply of natural gas

This report specifically addresses:

- The physical condition of the pipeline
- The effectiveness of management systems for the operation and maintenance of the facility
- The potential for the environment to effect the safe and effective operation of the pipeline
- The potential for serious incidents to occur along the pipeline including the potential for hazardous materials or substances stored at or near the pipeline to affect the safe or effective operation of the pipeline
- The adequacy of and reliability of the utilities in order to enable the effective operation of the pipeline

The Fitness for Purpose Report is completed every five years with the last report submitted in February 2003 for the period 1998 to 2002.

Based on the following assessments of the pipeline:

- Internal and external defect assessment using inline inspection tools
- Inspection processes of equipment
- Coating defect survey and dig up inspection programmes
- A risk review performed in accordance with the AS2885 in 2007
- Audits & improvements of the management systems governing the manner in which the pipeline is operated and maintained
- Corrosion and protection system surveys and other relevant information
- Maintenance records

The Moomba to Adelaide Pipeline is assessed, as at February 2008, as being in sound condition and is considered "Fit for Purpose" for the current and future use, for the next five years.

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LIST OF ABBREVIATIONS

ALARP - As Low As Reasonably Practicable
AS2885 - Australian Standard 2885 – Pipelines- Gas and Liquid Petroleum
ASME - American Society of Mechanical Engineers
CAR - Corrective Action Request
CFS - Country Fire Service
COP - Code of Environmental Practice
CMMS - Computerised Maintenance Management System
COPS - Closed Order Potential Survey
CP - Cathodic Protection
DCVG - Direct Current Voltage Gradient
EMS - Environmental Management System
ERC - Emergency Response Centre
ERF - Estimated Repair Factor
ERP – Emergency Response Plan
FBE - Fusion Bonded Epoxy
GPS - Geographical Positioning System
GIS - Graphical Information System
HAZOP - Hazard Operability
ILI - Inline Inspection
IMP - Integrity Management Plan
KP - Kilometre Point
KPI - Key Performance Indicator
LMS - Land Management System
LPG - Liquid Petroleum Gas
MAOP - Maximum Allowable Operating Pressure
MAP - Moomba to Adelaide Pipeline
MAPS - Moomba to Adelaide Pipeline System
MFS - Metropolitan Fire Service
MLV -Mainline Valve
MIC - Microbiologically Influenced Corrosion
NB - Nominal Bore
NDT - Non Destructive Testing
NGL - Natural Gas Liquid
P&ID - Piping and Instrumentation Drawing
PIRSA - Primary Industries and Resources of South Australia
PS - Pump Station
PSV - Pressure Safety Valve
RBI - Risked Based Inspection
ROC - Remote Operation Controller
ROW - Right of Way
SCADA - Supervisory Control and Data Acquisition
SCC - Stress Corrosion Cracking
SEO - Statement of Environmental Objectives
SES - State Emergency Service
SMS - Safety Management System
SRB - Sulphate Reducing Bacteria
SWER - Single Wire Earth Return
TRU - Transformer Rectifier Unit
TSCC - Transportation Services Control Centre
TI - Torrens Island
UHF - Ultra High Frequency
VHF - Very High Frequency

1 OVERVIEW OF FACILITIES

The design parameters and description of the facilities for the Moomba to Adelaide Pipeline are summarised in table 1 below. A detailed description of facilities is given in Appendix 1.

Table 1 – Moomba to Adelaide Gas Pipeline Technical Data

Date Constructed	1967/68
Date Commissioned	1969
Length, km	781
Diameter (OD), mm	559
Fluid	Natural Gas
Wall Thickness, mm: -Normal -Special Crossings (eg: rivers, roads, railways) - MLV	 7.92 9.50 9.50
Pipe Grade	API 5L X52
MAOP, kPa - North KP 731 - South KP 731 to TI	 7322 KPa Voluntary reduction of 6100 KPa
Coating	Plicoflex Tape
Depth of cover	Nominal 750 mm 1200 mm at road, rail and creek crossings
Main Line Valves	Cameron Ball Valves (30 in total)
Actuators (Remote activation)	Shafer gas over oil valve actuators (13 in total)
Actuators (Local activation)	17 Manual gear type operators
Mainline Compressor and scraper stations	Four operating compressor stations are installed on the mainline. Each site has two gas turbine powered centrifugal compressor packages. During 2006 three of the original compressor stations (CS2, 5 and 7) were isolated from the pipeline and mothballed.
Loop Line Compressor Stations	One reciprocating engine & compressor package installed at Wasleys
Lateral Compressor Stations	One reciprocating compressor units installed on the lateral pipelines located at Whyte Yarcowie
Meter Stations	31
Cathodic Protection	Impressed current cathodic protection system, 116 cathodic protection units installed.
SCADA system	Digital microwave link from Moomba to Adelaide with VHF radio coverage for voice communication

Table 2 summarises the technical aspects of laterals and looping systems on the mainline pipeline system:

Table 2 – Laterals and Looping on Mainline

(Refer to key below)

Item	A	B	C	D	E	F	G	H	I
Date Constructed	2000	1986	1972	1975-1976	1974	1984	1969	2000	2001
Date Commissioned	2000	1986	1972	1976	1974	1984	1969	2000	2002
Length (Kms)	CS1 5.2 km , CS2 10 km, CS3 13.3 km, CS 4 6 km (Total 34.4 km)	42	1.9	77.8	15	5.5	38.7	River – 0.855 Km , Land – 1.007 Km	114.3
External Diameter (mm)	600	508	88.9	168.3	88.9	219.1	219	356	219
Fluid	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Wall Thickness (mm)	Loops 1 to 3 – 7.14, Loop 4 – 8.74	9.0	4.78	4.37	4.78	4.77	4.78	7.1	4.00 & 4.78
Pipe Grade	API 5L X65	API 5L X60	ASTM A53 Gr B	ASTM A53 Gr B	ASTM A53 Gr B	API 5L X42	API 5L X42	API 5L X52	API 5L X42
MAOP (Kpa)	Loops 1 to 3 7322 , Loop 4 8740	7322	690	8240	7322	7322	7322	9600	9930
Coating	FBE	FBE	Armathene	Pilcoflex PVC	Yellow Jacket	FBE	Pilcoflex PVC	River – 400 micron, FBE plus powercrete, land – 400 micron	Yellow jacket
Main Line Valves		6		3			1		1
Actuators (Remote activation)		4							
Actuators (Local activation)		Two manual gear type actuators							
Compressor stations		1 (Wasley)		1 (Whyte Yarcowie)					
Meter Stations		5	1	1	1	1	3	1	1

Key:

A – Main pipeline loop sections
B – Wasleys to Adelaide Loop Line
C - Peterborough Lateral
D - Port Pirie Lateral
I – Amcor lateral
E- Burra Lateral
F – Mintaro Lateral
G - Angaston Lateral
H- Pelican Point Lateral

Item	J	K	L	M	N	O	P	Q	R	S
Date Constructed	1998	1970-71	1969	1988-1989	1988-1989	1972	1988-1989	2001	1972	2001
Date Commissioned	1998	1971	1969	1989	1989	1972	1989	2002	1972	2001
Length (Kms)	River – 0.852 , Land 1- 1.31, Land 2 – 0.188	1.3	1.2	5.5	87.8	1.6	11.5	0.14	0.35	0.74
External Diameter (mm)	River – 273.1 , Land 1- 273.1, Land 2 – 219.1	323.9	323.9	114.3	219.1	114.3	114.3	219	89	219
Fluid	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas
Wall Thickness (mm)	River – 6.4 , Land 1- 9.2, Land 2 – 4.0	9.53	9.53	4.1 to KP 5.43, 4.8 KP 5.43 to Port Bonython	4.3	4.78	4.3	8.2	4.78	8.2
Pipe Grade	API 5L X42	API 5L X42	API 5L X42	API 5L X42	API 5L X52	ASTM A53 Gr B	API 5L X52	API 5L X42	ASTM A53 Gr B	API 5L X42
MAOP (Kpa)	10000	2067	7322	7322	10130	1379	10130	7322	1379	7322
Coating	River FBE concrete coated, Land Yellow Jacket	Yellow Jacket	Double wrap coal tar epoxy concrete coated	Polyken 2 layer tape	Polyken 2 layer tape	Armathene	Polyken 2 layer tape 25 mm concrete coating at crossings	Yellow jacket	Armahene	Yellow jacket
Main Line Valves					4				1	1
Actuators (Remote activation)										
Actuators (Local activation)										
Compressor stations										
Meter Stations	1	2	1	1	3	1		1		1

Key:
J – Osborne Lateral
K- Dry Creek Lateral
L – Taperoo Lateral
M - Port Bonython Lateral
R - Tarac Lateral
N- Whyalla Lateral
O – Nurioopta Lateral
P- Whyalla Lateral Loop
Q- Quarantine Lateral
S – Hallett Lateral

2 MANAGEMENT SYSTEMS

2.1 SAFETY MANAGEMENT SYSTEMS

Epic Energy demonstrates effective management of health and safety risks through the development and implementation of Safe Operational Procedures and Work Instructions. Epic Energy's Health and Safety Policy is shown in Appendix 2.

The Safety Management System (SMS) developed and implemented at Epic Energy provides all Epic Energy personnel with a framework for the Management of health and safety related risks on facilities operated by Epic Energy, including the Moomba to Adelaide Pipeline (MAP) System.

The Safety Management System provides guidance to personnel at all levels of the organisation, to ensure that all activities on site are undertaken safely. It is an integral part of the overall management system at Epic Energy, designed to complement other systems in order to facilitate the management of safety and risk at each facility.

The Safety Management System also provides a means for review of individual performance and a mechanism for continuous improvement of operational performance. The Safety Management System is periodically reviewed and updated as a result of operational, personnel, legislative and/ or management changes. A revised Safety and Operating Plan was issued in March 2007. Epic Energy also audit and monitor compliance with the safety management system at regular intervals.

2.2 ENVIRONMENTAL MANAGEMENT SYSTEMS

The definition of environment is all encompassing and includes the air, water, land, natural resources, flora, fauna and social, heritage and economic aspects, so the area of expected responsibility, behavior and compliance with laws and regulations is quite diverse and is always changing as business and community knowledge and expectations develop.

Epic's Environmental Management System (EMS), underpins, facilitates and enhances the company's environmental programmes. Epic's EMS consists of a number of levels of documentation (including plans and procedures) that together form the framework that is the tool for the management of the environment Epic works in. The EMS is based on Australian Standard/New Zealand Standard ISO14001:1996.

In short, the EMS should be viewed as tool to manage environmental responsibilities, issues and the risks associated with Epic's operational activities such as:

- Pipeline construction (including route selection, design, land access and construction activities)
- Pipeline operations
- Operation of ancillary facilities

Currently Epic's EMS is being refreshed and the following key aspects are being reviewed:

- Planning for continuous improvement
- Implementation and operation
- Checking and corrective action
- Performance Review

Epic Energy has a corporate culture which stresses environmental, health and safety excellence and makes this the responsibility of every employee and contractor

The South Australian Petroleum Act 2000 and Regulations require that all regulated activities carried out under the Act must be covered by an approved Statement of Environmental Objectives (SEO) and an Environmental Impact Report (EIR).

In March 2003 an Environmental Impact Report (EIR) and a draft SEO were prepared to meet the regulatory requirements for the operation of the pipeline.
The EIR provided:

- A description of the pipeline and facilities
- Described the specific features of the environment that can reasonably be expected to be affected by pipeline operational activities
- Proposes measures to mitigate potential environmental impacts and consequences
- Summarises stakeholder consultation
- Identified potential environmental impacts and consequences

The SEO was developed in conjunction with the EIR to outline the environmental objectives that Epic Energy is required to achieve and the criteria upon which the objectives are assessed. The objectives stated in the SEO were:

- To minimise the environmental damage from the activities involved in the construction or operation of transmission pipelines in transporting hydrocarbon products.
- To establish appropriate consultative processes involving people directly affected by regulated activities and the public generally
- To promote adherence to AS2885 as a primary means of achieving public, environmental and safety objectives
- To protect the public from risks inherent in regulated activities.

Both the EIR and SEO have been approved. All operational activities on the MAPS are conducted in accordance with the SEO.

Epic Energy's Environmental Policy is provided in Appendix 3.

2.3 LANDOWNER LIAISON

An integral part of Epic Energy's Environmental Management System and to ensure compliance is landowner liaison.

There are a total of 643 landowners crossed by the Moomba to Adelaide Pipeline System. A property owner contact scheme is operated where each owner or occupier along the MAPS pipeline is visited annually and in addition contacted at least twice annually by mail. Other contacts, made by Field Maintenance Officers and Superintendents during the course of daily business, are recorded in the Land Management System (LMS).

Land Management is supported by dedicated LMS software which is linked to a GIS system. All property details and notes relating to discussions or issues with the property owners are recorded in the LMS.

All property owners are provided with pipeline safety awareness information brochures, which contain the "Dial before You Dig" contact phone number and strongly reinforce safe working practices near high pressure pipelines.

Public pipeline Safety Awareness Presentations for the MAPS are held throughout the year. These presentations are provided to local Councils, utilities, contractors and emergency service providers. The focus of these presentations are on the specific nature and characteristics of the products carried by the MAPS, the route of the pipeline, basic information about the pipeline and its monitoring, control and emergency procedures and what notifications are required to be adhered to when working in the vicinity of the pipeline easement.

2.4 EMERGENCY RESPONSE MANAGEMENT

Epic Energy maintains an emergency response capability designed to ensure that Epic Energy:

- minimises or eliminates any danger or risk to individuals,
- minimises or eliminate any risk to the business, and
- ensure that the pipeline system is returned efficiently to a safe, operational state, with minimum customer and environmental impact.

2.4.1 EMERGENCY RESPONSE

To ensure that the pipeline system is returned efficiently to a safe, operational state with minimum customer and environmental impact Epic Energy maintain a comprehensive team structure, equipment and services, that is available and tested regularly to fine tune it's responsiveness to emergency events.

To enable this, the Emergency Response Manual and the mapped business process of responding to breakdown and emergency are utilised. The Emergency response manual is reviewed and audited regularly with the last review and updated version released in November 2006

The Emergency Response Plans provide an Emergency Management Overview detailing the Epic Response Notification and the Emergency Management Team supplemented by the State response recovery plans.

Epic Energy's Emergency Response process is based on an Incident Command System that work towards the establishment and maintenance of a uniform, fully integrated, well coordinated, response effort. Its aim is to move the response from a reactive to a proactive mode of operation as quickly and efficiently as possible. By addressing the needs of an emergency as a project, the techniques and benefits of project management are utilised in achieving this aim.

Epic review and test its preparedness to respond to an emergency as follows:

- Two exercises will be conducted annually on pipelines including those other than PL1.
- A full emergency exercise will be conducted once every two years on PL1 exclusively.
- Routine inspection/testing of pipeline emergency response equipment

2.4.2 EMERGENCY RESPONSE DRILLS

Emergency response procedures, equipment and materials are maintained to allow a prompt and effective response to any emergency situation, which may develop on the MAPS. The procedures are regularly tested to provide training for involved personnel and as a check that the response plans and procedures ensure an effective response.

The following emergency response exercises have been conducted on the MAP over the past five years:

- In 2003 (EPIGAS) completed at Peterborough
- In 2005 (Operation Cadweld) conducted on the MAP
- In 2006 (Operation Flinders) was undertaken incorporating both the MAPS and PL2
- In 2007 (MAPS Local Response) was undertaken on the Dry Creek lateral on the MAP

A real emergency was declared in 2006 when a stem seal on MLV25 on the Moomba to Port Bonython Liquids Pipeline leaked discharging product to the atmosphere and prompting an emergency response. The root cause of the leak was failure/ degradation of the seal due to age. While this item was not on the MAPS it did test Epic's ER procedures in various common areas in terms of first response, management of situation and notification processes.

2.5 MAINTENANCE PLAN

Epic Energy's Maintenance Plan is designed to provide timely, quality and cost-effective maintenance and technical guidance in support of the pipeline operation. The programme outlines Epic Energy's maintenance organisation, detailing maintenance commitment, resource structure and work control philosophy.

The maintenance programme outlines the maintenance to be performed on varying types of asset, detailing the frequency, duration, plant condition, type of maintenance action, rationale behind the activity to be undertaken and technical expertise required for the task.

The resource structure details the types of resource available and the responsibilities in the maintenance organisation. The work control philosophy details the methodology on how the work is to be controlled.

MAXIMO is the Computerised Maintenance Management System (CMMS) utilised to implement the Maintenance Program. This is a work management tool for planning, scheduling, executing, controlling and recording the maintenance work.

2.6 TRAINING

Epic Energy's strategy is to ensure all operations and maintenance staffs are trained and competent in the tasks for which they are employed to perform. Annual individual training programs are developed for each employee from a skills/competency matrix to identify safety and technical training needs. Training and competencies programs are monitored in monthly reports and measured against corporate Key Performance Indicators (KPI's).

2.7 INTEGRITY MANAGEMENT PLAN

An Integrity Management Plan (IMP) has been prepared to identify integrity hazards and the appropriate monitoring, mitigation and inspection activities necessary to ensure safe, reliable and environmentally responsible operation of the pipeline and compliance with the requirements of AS2885. It considers the buried pipelines, main line valves, pig launchers and receivers but excludes above ground facilities such as compressor and meter stations.

The specific aims of the IMP are to:

- Identify the potential failure modes.
- Apply appropriate activities to monitor, mitigate and inspect degradation.
- Determine the appropriate frequency of application of monitoring, mitigation and inspection activities.

- Maintain pipeline risk to “As Low As Reasonably Practicable (ALARP)”

This IMP is currently in draft and being tested against the operations business activities. The IMP may be further optimised depending on business needs.

2.8 CONTRACTOR/VENDOR MANAGEMENT SYSTEM

Epic Energy demonstrates effective management of contractors/vendors and minimises risk through the development and implementation of a pre-qualification process.

Epic Energy is committed to achieving a fair, effective and efficient contractor/vendor management process that minimises risk whilst ensures compliance with Epic’s operational, safety and environmental objectives and obligations.

The contractor/vendor pre-qualification process requires that each party provides information to Epic Energy to enable the assessment of the ability to meet performance expectations.

The selection process at Epic Energy provides all personnel with risk assessment techniques consistent with Epic Energy’s risk management process, in order to determine the level of risk exposure and the evidence/documentation required from vendors.

The Contractor/Vendor Management System also provides a means for review of performance and a mechanism for continuous improvement of compliance. The system is periodically reviewed and updated as a result of operational, personnel, legislative and/ or management changes. Epic Energy also audit and monitor compliance with this system on regular intervals.

Further work is planned on this important system to improve its effectiveness moving forward.

3 RISK MANAGEMENT

Epic Energy has been identifying, assessing and addressing hazard’s and risks associated with the operation of the MAPS since it assumed ownership of the MAPS in 1996. These tasks have been performed using both in house and external resources.

A detailed Risk Assessment of the Pipeline System commenced in late 2006 and was completed in August 2007. This risk assessment was undertaken by qualified and experienced Epic Energy staff and contractor personnel for the whole of the pipeline in accordance with Australian Standard AS2885.1, additional requirements of the Draft AS 2885.1 DR 04561] ref 3 was taken into consideration.

The objectives of the risk assessment were to:

- Review the land use and activities in the areas adjacent to the pipeline.
- Systematically identify threats to the pipeline that result in loss of integrity.
- Review the external interference protection and other design/ procedural protection measures and assess their effectiveness.
- Propose additional design/procedural protection and/or mitigation measures if required.
- Assess the risks resulting from threats to the pipeline integrity classified as failure events.

The scope of the risk review included all buried sections of the pipeline plus, scraper stations and main line valves facilities. Each of these stations were subject to a HAZOP in 2002.

The risk review focused on the threats to pipeline integrity from location specific and non location specific activities and conditions during the pipeline’s operations. The review was conducted in

the following manner:

- The pipeline ROW were examined starting at Moomba and working southwards in sections. The sections were derived based on landownership or location class. In each case the pipeline's route for that section was traced from end to end using the Epic Energy GIS and the location class reviewed.
- Each threat identified during previous risk assessments and recorded in the GIS were reviewed to determine whether the threat is still applicable, if the protection measures are still applicable and whether the risk associated with the threat was reduced by the protection measures to an acceptable level.
- The noted threats, protection measures and risk evaluations were updated directly into the GIS where it was identified that the previous records were no longer considered appropriate.
- Any additional threats not previously noted in the GIS were added to the GIS, together with the applicable protection measures and risk evaluation.
- Where additional information or assessment was identified as being required applicable actions were recorded. These actions were recorded in the GIS database.
- Where the risk assessment could not be completed due to the need to obtain information then that action was tagged as "pending" in the GIS database.

The risk assessment found that in most cases the protection measures in place reduced the risk of the identified threats to as low as reasonably practicable (ALARP). The following threats were deemed hazardous events and were risk ranked using the AS2885 risk matrix:

- Railway accidents – at KP locations as detailed in the risk assessment including Angaston, Dry Creek, Nurioopta, Port Pirie, Tarac, Whyalla laterals, MAP and Wasleys Loop Line.
- Water and exploratory boring activities
- Anchor dragging – Whyalla Lateral crossing the Spencer Gulf
- Excavation activities – Port Bonython, Port Pirie and Whyalla Laterals
- Maintenance activities by third parties adjacent to pipelines
- Maintenance by third parties over the pipeline

The following conclusions were determined from the risk assessment:

- For the majority of threats to the pipelines the protection measures reduce the risks to as low as reasonably practicable (ALARP).
- The signage spacing generally complied with for R1 classifications. For other location classifications and for some R1 locations an action was raised where signage did not comply with standard signage requirements.

The risk assessment recommended:

- All previous AS2885 risk assessment actions require verification of being suitably completed and closed out.
- The GIS should be updated such that the threat analyses for typical designs are reflected for each occasion of the representative threat.
- The risk assessment should be completed for all pending threats.
- Where a secondary location classification was considered to be applicable to a particular pipeline sectional area then this should be confirmed and the impact clarified for future reference.
- The depth of cover recorded in the GIS is date stamped so that subsequent reviewers of the data can see its currency.

In relation to the station facilities the following Hazardous and Operability Studies (HAZOP's) have been performed during the last 5 year period:

- 2003 – CS4, Wasley Compressor Station, MLV 28, Beach Petroleum ROW, Balcoracana Creek Tie-in
- 2004 – Fire and Gas upgrade project commencing at CS5, actions arising from metropolitan meter stations, actions arising from compressor station 2002/03 HAZOP.

As part of the risk assessment process Epic Energy plans to carry out full HAZOP's for its above ground facilities during 2008 and 2009. Epic has reviewed informally the previous HAZOP information and found little change has occurred to these sites since then.

The Petroleum Regulations specifically refers to the risk the pipeline imposes on the following:

- Public Health and Safety
- Environment and
- Security of Natural Gas Supply

3.1 PUBLIC HEALTH AND SAFETY

The pipeline route varies between broad rural landscape and National Park where land is largely undeveloped and sparsely populated and traverses some metropolitan, regional and rural centres which are more densely populated.

Epic Energy implements a Community Awareness Programme, which involves holding community awareness meetings with communities along the pipeline route. To cover the pipeline infrastructure that Epic Energy operates in South Australia including the Adelaide to Moomba Gas Pipeline, Epic target 30 meetings annually with CFS, MFS, Police, Ambulance, SES, councils, earth moving contractors, irrigation and fencing installation contractors.

The presentations for the Moomba to Adelaide Gas pipeline system focus on the general properties of the natural gas, the location of the high pressure pipelines in the regions concerned, correct procedures when working within the pipeline easements, pipeline threats and dealing with emergency situations.

Previous incidents that have occurred on the pipeline have included:

- Minor loss of cover due to soil erosion activities
- Unauthorized activity on easement due to landowner activities
- Threats to pipeline integrity due to activities by third parties (e.g. fencing contractor and quarrying).

To date no incident has resulted in any significant or long term impact to the environment or members of the public. The safe design of the pipeline, routine inspections and maintenance coupled with sound management practices reduces the risk to as low as reasonably possible.

3.2 THE ENVIRONMENT

Potential environmental hazards and consequences associated with the operation of the pipeline were identified in the March 2003 Environmental Impact Report. The objectives for environmental management of the pipeline are:

- Avoid unnecessary disturbance to third party infrastructure, landholders or land use
- Soil erosion

- Maintenance of vegetation cover on the easement
- Prevent the spread of weed and disease
- Water and land contamination
- Minimise the risk to public health and safety
- Minimise noise due to operation of the pipeline
- Minimise discharge from the pipeline
- Protect cultural heritage sites and values
- Minimise the impact of the pipeline operations on surface water sources

The most significant contamination associated with the operation of the pipeline is the potential for land contamination from previous practices.

These included:

- the use of underground storage tanks (USTs)
- contaminated discharges from triple interceptor trap systems and soakage pits
- vents and bleedlines that discharge to ground

Between 1995 and 1999 Epic Energy instigated an improvement programme to minimise the risk of any further hydrocarbon contamination occurring and minimize the impact of any existing contamination. Activities included:

- removal of all underground storage tanks and testing the soil for residual contamination.
- Installation of leakage monitoring systems where it is not possible or feasible to remove the UST
- Establishment of landfarms to treat hydrocarbon contaminated soil
- Installation of ground water monitoring bores where there was potential for contamination
- Installation of groundwater remediation systems where required to remove hydrocarbon contamination
- Relining triple interceptor pits and decommissioning soakage pits
- Installation of oil containment systems including bunds in compressor buildings and mist eliminators on vents
- Implementation of a monitoring programme to establish the extent of any contamination and monitor effectiveness of the management programmes.

As a result of the work described above it was identified that hydrocarbon contamination of the land and groundwater had occurred as a result of leakages from the UST's or soakage pits. Groundwater contamination was identified at the Torrens Island Meter Station and at Compressor Stations 2 and 7. Land farms were established at Compressor Stations 1 to 5 and the Peterborough Depot to treat the hydrocarbon contaminated soil excavated during the removal of the UST's and other remedial excavations.

A number of known pre-existing potential contaminated soil sites are also present on the pipeline easement within the Adelaide metropolitan region in the industrial areas of Dry Creek and Torrens Island. To address these issues environmental monitoring works has been completed at several sites along the MAP including Compressor Stations 1-7, the Mintaro Meter Station, Peterborough Depot and Torrens Island Meter Station. This monitoring has identified:

- The extent of contamination and determined that any existing contamination is not increasing or becoming mobile
- That no leaks or discharges are apparent from the underground storage tanks still in use
- That land farming of hydrocarbon contaminated soils is slowly decreasing hydrocarbon concentrations.

Through the maintenance of the monitoring programme outlined below, it is believed that the contamination can be managed to ensure that the contamination does not spread from its existing boundaries and will slowly degrade over time.

The potential for the movement of water and contaminants within the trench of the MAP and associated lateral pipelines has been considered. However due to the nature of the soils and the landforms through which the pipeline pass and the installation of trench breakers during construction of the pipelines it is unlikely that sufficient water movement would occur along the trench to create these issues.

The potential for the spread of existing areas of known contamination along the pipeline easement has also been considered. The nature of pipeline operations is such that the only incident in which this has potential to occur is during the excavation of the pipeline. In the event that an excavation is required on the easement, in an area of known potential contamination, consideration would be given to the management of handling the contaminated material in relation to preventing its spread into the environment and reducing the potential impact on the health of personnel and the general public.

Measures that have been put in place to minimize the impact of the existing contamination and prevent any further contamination include:

- Monitoring of the existing contamination and land farms on at least an annual basis
- Implementing additional investigations and monitoring if it becomes apparent that hydrocarbon contamination levels are increasing or spreading outside existing boundaries
- Operation of a passive skimming unit at Compressor Station 7 to remove phased separated hydrocarbon
- Regular monitoring of underground storage tanks to ensure that integrity is maintained
- Ensuring that the use and storage of hazardous substances is undertaken within contained areas and appropriate spill containment measures are implemented
- Implementation of a spill response system to promptly manage any spill of hazardous material
- Discussions of management of soil and water with appropriate regulatory authorities prior to the commencement of excavations in areas of know potential contamination.

These issues are subject to an annual assessment or audit according to the guidelines given in the SEO to determine if satisfactory environmental management is achieved.

Associated with the annual dig up program that has been undertaken since 2005 on the MAPS, cultural & archeological significance surveys are undertaken in the areas where digging is planned.

3.3 SECURITY OF NATURAL GAS SUPPLY

Reliability of sales gas supply to consumers depends on the Moomba Processing Plant and the MAP continuing to deliver sales gas. An incident which results in the shutdown or significant restriction in throughput due to failure of either of these facilities has the potential to adversely impact the security of supply of natural gas to South Australia.

The construction of the QSN Link pipeline linking Epic Energy's South West Queensland Pipeline (SWQP) from Wallumbilla to Ballera to the Moomba to Adelaide Pipeline will improve the security of gas supply to the MAP and South Australia. The QSN Link will be a 180km 400 mm diameter extension of the SWQP designed to transport over 250 TJ/ day.

Epic Energy operates a 24 hour /365 day a year TSCC in Melbourne which monitor all of Epic Energy's pipelines including the MAP. All aspects of operation are monitored from the Control Centre including field travel movement and maintenance work on operational equipment. Outages on rotating equipment are planned to ensure availability of critical equipment.

The systems and procedures used to manage maintenance work and third party activities, monitor pipeline condition, emergency systems and procedures are directed at eliminating or minimising the risk of a serious incident which may result in a shutdown of the pipeline.

4 PHYSICAL ASSESSMENT OF FACILITIES

The Moomba to Adelaide Gas Pipeline is 39 years old and was designed and constructed to the standards and best practice principles at the time. To ensure integrity new pipelines and the existing MAPS are constructed and maintained in accordance with Australian Standard AS2885: Pipelines Gas and Liquid Petroleum.

Pressure vessel integrity is maintained through the application of appropriate Australian Standards for design, maintenance and inspection. AS/NZS 3788 2006 Pressure Equipment – In - Service Inspection forms the basis of the Inspection Programme. Specialist inspection contractors are engaged to conduct inspections to this standard.

Routine maintenance of mainline valves, compressor stations and meter stations is performed six monthly, all pipeline pressure regulator and over pressure protection devices are tested in accordance with relevant Australian Standards and the maintenance schedule. Ancillary equipment such as pipe supports and pigging facilities are also routinely inspected.

During the time frame since the last fitness for purpose report was issued in 2003 the following physical assessment activities have been performed:

4.1 PIPELINES

In addition to routine maintenance activities the following inspections were also performed:

4.1.1 INLINE INSPECTION SURVEYS AND REFURBISHMENT

4.1.1.1 MAP

An In Line Inspection Survey of the MAP and the 20 inch Wasleys Loop Line commenced in May 2002 and was completed in November 2003. As expected for a pipeline of the age of the MAP the ILI tool detected a large number of anomalies and defects along the pipeline. Interpretation of this data and prioritisation of the information is crucial to ensure that high priority features are identified and targeted for physical inspection and repair. In particular the ILI tool detected a number of external corrosion features between Moomba and Compressor Stations 1 to 4.

Epic Energy uses a "3 Tier "approach to assess defects as follows:

- Tier 1 – This method approximates the corrosion defect as a rectangle shape based on the length and depth of the corrosion defect as recorded by the ILI. This is the most conservative assessment method.
- Tier 2 – This method approximates the corrosion defect as a parabolic shape based on the length and maximum depth of the corrosion defect.
- Tier 3 – This method measures the effective area of the corrosion defect by recording the actual maximum depths along the entire length of the corrosion defect. Tier 3

assessments are the least conservative approach but are an industry accepted method for defect assessment.

Epic Energy applies the three tier assessment progressively from the most conservative (tier 1) to least conservative (tier 3). Any defects which fail all three tiers are targeted for inspection and repair. The most common form of corrosion on the MAP is typically pitting corrosion with numerous shallow pits covering a large surface area.

The 2003 ILI inspection survey reported defects using the Tier 3 method in terms of the Estimated Repair Factor (ERF). Defects with an ERF > 1 are not acceptable to ASME B31.G/ AS 2885 and require repair. The "field verified "depth and length characteristics of each of these defects was analysed using commercial software called RSTRENG ™.

Eleven of the most severe defects with ERF > 1 were excavated for further assessment and verification in 2004. Seven of these defects were located between Compressor Stations 1 and 2, two defects between Compressor Stations 2 and 3, one defect between Compressor Station 3 and 4 and one defect between Compressor Station 5 and 6.

Between 2005 and 2007 further defect repair and pipeline refurbishment work was conducted. In 2005 an additional twenty five defects were excavated and repaired between Compressor Stations 1 and 2 with an ERF > 1.

In 2006 a total of 48 defects were excavated and repaired. Twenty of these defects (seventeen between Compressor Station 1 and Compressor Station 2 and three defects between Compressor Station 2 and Compressor Station 3) had an ERF > 1.

In 2007 a total of 45 defects were excavated and repaired, five of these defects, between Compressor Station 2 and Compressor Station 3 had an ERF>1.

All defects with an ERF > 1 were repaired using clock springs.

In conjunction with the defect repair programme pipeline coating refurbishment was completed at the following locations:

- 2005 : 685 metres of pipeline coating was refurbished between Compressor Station 1 and 2
- 2006 : a total of 560 metres of pipeline coating was refurbished; 39 metres between Moomba and Compressor Station 1, 370 metres between Compressor Station 1 and Compressor Station 2, 34 meters between Compressor Station 2 and Compressor Station 3, 111 metres between Compressor Station 3 and Compressor Station 4 and 6 metres between Compressor Station 4 and Compressor Station 5.
- 2007 : a total of 450 metres of pipeline coating was refurbished, 237 metres between Compressor Station 1 and Compressor Station 2, 99 metres between Compressor Station 2 and Compressor Station 3 and 114 metres between Compressor Station 3 and Compressor Station 4.

All excavated pipeline is tested for SCC using magnetic particle inspection.

In 2008 it is planned to refurbish a total of 500 metres of pipeline coating between Compressor Station 1 and Compressor Station 2, Compressor Station 3 and Compressor Station 4 and Compressor Station 4 and Compressor Station 5.

During the field verification programme discrepancies between the data obtained in the field compared to the data provided by the ILI tool were noted. Typically the tool underestimated the

length and depth of each defect. It was concluded that this discrepancy is due to the reporting threshold of the ILI tool being set to satisfy tier 1 and tier 2 methods but not tier 3.

A large amount of work has been completed in conjunction with the ILI contractor to correct the misalignment between the ILI and field verification data and include the lessons learnt into the 2008 ILI programme.

Field verification work has also shown that one defect between Compressor Station 1 and 2 at log distance 69803.22 meters, one defect between Compressor Stations 3 and 4 at log distance 90914.12 metres and one defect between Compressor Stations 5 and 6 at log distance 15409.24 require re assessment and will be prioritised for repair in 2008.

Details of the features identified by the ILI survey with an ERF > 1 and the repair work conducted is summarised in Appendix 4.

4.1.1.2 ANGASTON LATERAL

During August 2004 an Inline Inspection Survey was completed on the Angaston Lateral from the Wasleys Off-take to the Angaston Meter Station. A total of twenty two defects were noted, six of the most significant defects were excavated, inspected and refurbished in 2005 (results). The ILI survey detected one defect at KP 35.04 which exceeded an ERF of 1 when assessed according to modified ASME B31.G criteria using RSTRENG ^{TM} analysis. Work order 60169 states that the defect was inspected, FFP calculation performed and pipe recoated.

The defects detected by the ILI and those excavated recoated and backfilled are summarised in Appendix 5.

4.1.1.3 WHYALLA AND PORT PIRIE LATERAL

During August and September 2006 the lateral pipelines from Whyte Yarcowie (Port Pirie Lateral) to Bungama and Bungama to Whyalla (Whyalla Lateral) were inspected using the ILI tool. No defects on either pipeline were detected with and ERF greater than 1. Further work is planned to investigate the external corrosion defect on the Whyte Yarcowie to Bungama Lateral at log distance 18228.88 metres due to it's length and the two internal corrosion defects at log distances 53919.77 and 41600.06 metres.

One significant defect was detected on the Bungama to Whyalla Lateral. This is an internal metal loss milling feature at log distance 11979.48. Four defects were found under the Spencer Gulf, two were metal loss milling features, one a milling feature and one defect an ID anomaly. These defects and twenty minor defects will be considered for further investigation in conjunction with coating defect verification digs and inspections planned during 2008/09.

Details of eleven of the most significant features detected by the ILI survey are summarised in Appendix 6.

4.1.2 CLEANING PIG OPERATIONS

The gas received for the MAPS is low in water content and corrosive gases. Pipeline pigging to remove accumulated water and sludge is typically carried out prior to ILI surveys being performed.

4.1.3 DCVG COATING SURVEYS AND DIG UPS

From 2003 to 2007 the following above ground coating defect (DCVG surveys), inspection and refurbishment was conducted on the following pipelines:

- Wasleys to Torrens Island Loop Line
- Taperoo Lateral
- Dry Creek Lateral
- Downstream Moomba to KP30
- Downstream Compressor Station 1 to KP 97.9
- Downstream Compressor Station 2 to KP191.30
- Downstream of Compressor Station 3 survey distance 22.4 km
- Downstream of Compressor Station 4 to KP 382.8
- Downstream of Compressor Station 5 survey distance 26.8 km
- Downstream of Compressor Station 6 survey distance 22.5 km
- Downstream of Compressor Station 7 survey distance 20.2 km
- Pelican Point Lateral
- Osborne Lateral
- Whyte Yarcowie to Whyalla
- Angaston Lateral
- Burra Lateral
- CS3 Loop
- Peterborough Lateral

The purpose of this work is to determine the condition of the coating, assist in assessing whether SCC could be a factor and to validate the performance of the cathodic protection systems. No significant corrosion or expected impacts for SCC was noted. In a number of instances the coating was found to have deteriorated in condition.

Verification digs will be conducted on a further number of these pipelines during 2008 to assess the effectiveness of the cathodic protection systems, enable a comparison between ILI surveys and field results and inspect for stress corrosion.

A summary of the defects identified by the DCVG surveys, refurbishment work conducted and taken is given in Appendix 7.

4.1.4 CATHODIC PROTECTION

The cathodic protection systems are maintained by field based technicians who monitor the operation and performance of the cathodic protection systems and Adelaide based engineers who provide long term direction and specialist engineering support.

Performance of the pipeline cathodic protection systems are monitored by:

- Two monthly, by function testing the cathodic protection units for correct operation and adjustment of output.
- Six-monthly by conducting ON/OFF potential surveys at all test points, to determine the level of protection achieved. Adjustments are made to the cathodic protection systems to achieved the protection criteria of -0.850 V to -1.200 V instantaneous OFF potential versus copper/copper sulphate half cell as required by Australian Standard AS2832.

A review of the cathodic protection data shows that the majority of the pipeline is satisfactorily protected however improvement is required in a number of areas to restore protection levels. These areas exist predominately at locations where ground beds have failed or output is reduced, compressor station inlets and outlets possibly due to interference with earthing systems and locations where the pipeline coating has deteriorated.

These locations include:

- Compressor Stations 1 (KP 67.7), 4 (KP 352.7), 7 (KP 638.2) and Wasleys (KP 731.8).
- Low protection levels between Compressor Station 3 (KP 256.1) and Compressor Station 4 (KP 352.7)
- Compressor Station 1 Loop Line (KP 69.1)
- Low protection levels Angaston Lateral.

Interference testing conducted in the Moomba Area between the MAP and Santos flow lines in 2007 concluded that the level of interference measured on the various pipelines is due to electrolytic interference from negative soil voltage gradients associated with poorly coated pipelines at adjacent pipe crossings. The level of anodic interference in many cases exceeds the +20mv shift as specified in Australian Standard 2832.1. The majority of pipelines are sufficiently negative to offset this minor anodic shift without compromising the level of protection of the pipeline to any significant degree. If protection levels are compromised then this will be addressed via resistive bonds between the pipelines and or coating refurbishment at pipe crossings.

The programmes planned during 2008/9 to rectify protection levels which are not satisfactory include:

- Continuation of the ground bed replacement programme.
- A current attenuation survey was performed in 2007 between Compressor Stations 3 and 4. The most likely locations being at KP266 and KP316 between the existing cathodic protection units at Dingo Lake, Munyallina, Wertaloona and Moorowie Bore.
- An audit against AS2832 is planned during 2008 to identify priority issues. The audit will include an assessment of cathodic protection system effectiveness and hardware function, ground bed remaining life assessments, pipeline electrical isolation, an on /off pipe to soil potential survey and further interference testing.
- A review or earthing and surge protection systems for compatibility with cathodic protection systems and personnel protection from high transient voltages and low frequency induced AC.
- The installation of cathodic protection system interrupter's to enable the synchronisation of cathodic protection units for instantaneous off potential measurement.
- Cathodic protection shielding occurs when dis-bonded coating prevents cathodic protection current from reaching deep inside a corrosion defect. External corrosion due to CP shielding has been identified as a risk to the integrity of the MAPS. It is planned to investigate CP shielding in conjunction with coating refurbishment programmes.

It is worth noting that due to the deterioration of the pipeline coating the current required to protect the MAP has increased by approximately fifteen times from an average of approximately 70 μ A / m^2 to 1100 μ A / m^2 since the pipeline was commissioned in 1970. The number of cathodic protection units has increased from thirteen to one hundred and sixteen.

The MAP off potential survey results for 2003 to 2007 is given in Appendix 8 and a summary of ground beds replaced (including laterals) is given in Appendix 9.

4.1.5 STRESS CORROSION CRACKING (SCC)

A programme to investigate higher risk areas for possible SCC locations downstream of compressor stations was carried out in 2004. Discharge pressure and temperature data from each compressor station was used to establish the most likely location of SCC. A DCVG survey programme was conducted on areas up to 30km downstream of each compressor station and dig ups performed to inspect for SCC in conjunction with the ILI defect repair programme. No

evidence of SCC has been detected.

Inspection for SCC was also conducted on other sections of the MAP in conjunction with refurbishment work following DCVG surveys in 2003 and 2004 and the defect repair and refurbishment programmes in 2005, 2006 and 2007. No evidence of SCC has been detected.

4.1.6 PIPELINE SUBSIDENCE PROJECT

This project investigated the subsidence of underground pipe work at MAP Compressor Stations and in particular the pipe work connecting the mainline, the station anchor blocks, pig launchers and receivers, the inlet and outlet valves and the MLV.

During 2004/05 an action plan was developed which included:

- Data gathering, site inspection, crack testing NDT, FEA stress analysis and hydotesting similar pipe to station pipe work to destruction for FEA model verification. Pipe work at CS6 and CS7 was excavated and inspected as these two sites were identified to be the only two requiring remedial work due to the extent of the subsidence.
- Pipe subsidence was concluded to be a combination of anchor block sinkage and no soil support under by pass pipe work coupled with soil load on top of the pipe. The mainline tees are additionally stressed due to these bending loads. The tees are non standard, short radius fittings, but comply with ASME B31.8 Analysis showed that the tees are fit for purpose under the combined bending and pressure loads.
- Corrective action was taken by the installation of supports under pipe work to lock pipe work in place to prevent further settlement and loading of the pipe work. All affected pipe work was blasted and 100% NDT inspected. Concrete supports were constructed and permanent survey monitoring points installed to ensure the earliest possible identification of future problem areas.

In 2006 a final FEA analysis report was prepared which concluded that subsidence should be checked annually at CS1, 2, 3, 4, 5, 6 and 7 and an engineering assessment completed. This now forms part of the annual maintenance plan.

4.1.7 UNDERWATER AND CASED CROSSINGS

Underwater crossing inspections are carried out annually on the Whyalla Lateral crossing of Spencer Gulf, the Wasleys to Adelaide Loop line crossing of the Barker Inlet and the Taperoo, Pelican Point, Osborne Lateral crossings of the Port River.

There have been no significant issues raised from these reports.

4.1.8 PIG LAUNCHERS AND RECEIVERS

Programmes to inspect pig launchers and receivers were completed in 2002/03 and 2005. Vessels were externally inspected; internal inspections were carried out where access was possible or by ultrasonic inspection. A number of vessels were found to have minor external corrosion and surface rust.

Pig Launchers and receivers, although not registered pressure vessels are included in the registered pressure vessel inspection programme. Pig launchers and receivers are also externally inspected and function tested at six monthly intervals as part of the routine maintenance programme. Internal and external Inspections due in 2007 have been deferred until 2008 pending a review of inspection practices and a move to risk based inspection.

4.2 PRESSURE VESSELS AND FACILITIES

4.2.1 PRESSURE VESSELS

Epic Energy operates approximately 200 registered pressure vessels and associated piping on the MAPS. Equipment integrity is maintained through the use of Australian Standard for design, maintenance and inspection AS/NZS 3788 “Pressure Equipment In Service Inspection“. This standard forms the basis of the inspection programmes which are carried out by specialist NDT contractor’s who typically inspect pressure vessels on a set frequency of 2 years for external inspections and 4 years for internal inspections. As stated above the practice of inspecting pressure vessels at a set frequency are currently being reviewed and a move to risk based inspections likely in line with industry practice.

A programme of inspecting MAPS registered pressure vessels was completed in 2002/03 and 2005. Vessels were externally inspected; internal inspection was carried out where access was possible or by ultrasonic inspection. A number of vessels were found to have minor external corrosion and surface rust.

4.2.2 METER STATIONS

A programme was completed at all major meter stations during 2003 to replace antiquated process instrumentation equipment.

In 2005 an earthing and lightening project was completed on all metropolitan meter stations to establish an external earth grid and achieve equipotential bonding between instrument and site structures and the earth grid.

The Whyalla, Burra, Torrens Island, Taperoo, Virginia meter stations underwent recoating (painting) in 2003.

Meter station facilities at Douglas Point, Mambray Creek, Port Pirie, Bungama, Elizabeth, Nuriootpa, Pelican Point and Port Bonython underwent a recoat of all above ground pipe work and equipment in 2004.

4.2.3 COMPRESSOR STATIONS

During 2003 an extensive boroscope inspection programme was undertaken to identify gas turbine related problems at CS1, 2, 3 4, 5 and 6. The programme identified some problems with the Allison engines at CS3, 4 and 6 requiring combustion liner replacements.

In 2007 further boroscoping and thermal imaging was completed on the MAPS units at CS 1, 3, 4, 6 and Whyte Yarcowie. Information from this program is being assessed and remedial action being undertaken as necessary.

In 2005 an earthing and lightening project was completed on Compressor Station 7, Angaston and Wasleys Compressor Stations to establish an external earth grid and achieve equipotential bonding between instrument and site structures and the earth grid. Sites upstream of CS7 were completed in 2002. Painting of above ground pipe work at Compressor Stations 3 was completed in 2005.

Compressor stations control room facilities were upgrade in 2004.

During 2006 Epic Energy commenced a programme of mothballing CS 2, 5 and 7 due to predicted lower output. These sites were isolated from the main pipeline, compressor units placed in preserved condition and all ancillary gas supplies isolated from the turbine units and the

sites powered valves.

4.2.4 MAINLINE VALVES

Routine main valve maintenance including valve sealing integrity checks, stem and ball seal greasing, valve operational checks and valve serviceability checks are completed at six monthly intervals.

4.3 PIPELINE MONITORING SYSTEM (COMMUNICATIONS SCADA)

Routine maintenance tasks that occur at the communications facilities consist of:

- Annual micro wave, VHF & UHF radio system performance checks
- Electrical checks at the site radio hut facilities
- Three and six monthly uninterruptible power supply system inspections and checks including battery maintenance.
- Guy rope tensioning and replacement as required to ensure the tower ropes are tensioned as per the original design specification and to correct any misalignment that may have occurred over time.
- Radio tower three yearly routine maintenance inspections. This work involves a physical inspection of the radio tower structure and replacement as required including all ancillary equipment such as antennas, tower cabling, cable trays, mast lighting and corrosion issues.
- Painting of towers

4.4 RIGHT OF WAY

4.4.1 SIGNAGE

An ongoing program has been developed to upgrade the signage along the entire length of the Pipeline to 500 metre spacing to comply with AS 2885. Routine maintenance will ensure the signs are maintained to the required standard.

All compounds are clearly identified with signage indicating what the facility is and who to contact in the event of an emergency.

4.4.2 MAINLINE VALVE COMPOUNDS

Routine maintenance is carried out on MLV compound fences and gates as part of the ROW patrols with corrective actions followed up as required.

4.4.3 WEED CONTROL

Weed identification and control is performed as part of ROW patrols, additional contract resources are engaged to monitor and control the African Rue in the vicinity of compressor station 5.

4.4.4 AERIAL SURVEILLANCE

High risk areas (metropolitan) aerial surveys are completed monthly and a quarterly patrol up to CS4 completed every 3 months.

4.4.5 ROAD PATROLS

Road patrols are daily in high risk metropolitan areas and two weekly, monthly or three monthly as determined by the AS 2885 risk assessments and after heavy rains in other areas as determined by the risk assessment process.

Road maintenance is performed as required in areas where the ROW is used as the pipeline access track.

4.4.6 PIPELINE LOCATION SERVICE

Epic Energy subscribes to the Dial-Before-You-Dig programme and offers a free pipeline location service. The remoteness of this pipeline results in a limited number of applications for this service in the northern remote areas, and between 450 & 500 requests annually for services in the built areas south of Peterborough. Cooperation with the community has been excellent in this matter.

4.4.7 LANDHOLDER CONTACT PROGRAM

Every twelve months all property owners and local councils along the pipeline are visited and sent pipeline awareness correspondence and brochures as part of a contact scheme. The scheme is intended to remind and keep property owners abreast of the potential hazards associated with high pressure pipelines and the rules and obligations associated with landowner activity in the vicinity of the pipeline.

Epic Energy implements a Community Awareness Program, which entails holding awareness meetings with communities along the pipeline route. To cover the various pipeline infrastructure that Epic Energy operates and maintains in South Australia Epic Energy had set an annual national target of a minimum 30 meetings annually with CFS, MFS, Police, Ambulance, SES, councils, earth moving contractors, irrigation and fencing installation contractors.

4.4.8 WASH OUTS

Washouts are identified through routine patrols and site visits for maintenance. During this reporting period several sections of the pipeline have been subject to erosion resulting from heavy rains and flooding reducing the pipeline depth of cover. Repairs were carried out at the first opportunity as a priority after the wash outs are identified.

4.8 SINGLE WIRE EARTH RETURN SYSTEMS

Annual maintenance performed by a specialist contractor is completed on sections of the SWER line each year. Any corrective action is undertaken and a SWER line technical audit report is required to be provided to the Office of Technical Regulator (OTR) every two years on this system for compliance related matters.

5 EFFECTIVENESS OF MANAGEMENT SYSTEMS

The Epic Energy Environmental Health and Management System are compliant with Australian Standard AS4801:2000 Occupational Health and Safety System. The EHSMS comprises of core management standards which apply to matters of the environment, health, safety and security of production and to all business aspects of its operation.

The EHSMS comprises detailed hazard standards for environment and health and safety. These standards address the key hazards presented within the Epic Energy operation and document the

control required to adequately manage these hazards. EHSMS assessments are conducted by independent external auditors when required.

5.1 AUDITS AND REPORTS

5.1.1 OPERATIONS AND MAINTENACE AUDIT

During September 2007 an internal Operations and Maintenance Audit was conducted. The audit was conducted to review Epic Energy's systems and procedures for compliance with the requirements of AS2885.3. The following audit methodology was undertaken:

- A desktop audit was conducted at the Epic Energy Dry Creek office to review and assess existing procedures and records
- A field assessment was conducted of the pipeline facility and a small section on the right of way.
- A formal assessment report was prepared.

Key finding from this audit included:

- The audit determined that Epic Energy has a set of operating procedures for the conduct of operations, maintenance, monitoring and provision for engineering services for the pipeline. Epic Energy aims to operate in accordance with AS2885.3 guidelines and has in general met the intent of the standard.
- Certain procedures and work instructions were not available and some procedures were incomplete.
- Personnel are adequately trained and qualified to carry out their duties with the aid of the Competency Based Training System.
- Some job plans had insufficient information to accurately identify the work required and some work instructions lacked detail.
- The absence of some approved procedures and work instructions prevented full compliance with the requirements of AS2885.3

The findings from this audit are being addressed.

5.1.2 OTHER GENERAL AUDITS

In addition to the specific operations and maintenance audit, a number of other system control audits are conducted by Epic Energy as part of the normal annual business audit program. Some of these included auditing off:

- Integrity of Compressor Station Audit – Thermal Imaging & Boroscoping
- Effectiveness of ERP manual
- Review and effectiveness of compliance of metering equipment via AVT process
- Safety related audits in Trenching & Excavation, Working at Height, Personnel Tracking Movements etc.
- Status of work program against annual maintenance plan

Corrective actions from these audits are addressed as required.

5.1.3 SAFETY MANAGEMENT SYSTEM AUDIT

An internal audit of Epic Energy's safety management system is conducted on an annual basis. Results of the audit are circulated to senior management for delegation of the close out actions.

The status of action items is checked for completion on a regular basis prior to the commencement of the following year's audit. There are no outstanding issues related to the MAPS requiring follow up.

5.1.4 ENVIRONMENTAL AUDIT

An internal audit of Epic Energy's compliance against its environmental objectives (SEO) is completed annually.

An external environmental audit was conducted on all compressor station facilities in 2005. The audit determined that Epic Energy complied with its environmental objectives and recommended that future external audits be performed biannually.

In May 2007 an Environmental Audit was conducted of the MAP between Moomba and Compressor Station 4 in conjunction with an Environmental Audit of the Moomba to Port Bonython Liquids Pipeline. No major non-compliances with the SEO were noted. Findings relating to the MAP included:

- Epic Work Instruction WM 02-134 Excavation of Liquid and Gas Pipeline Systems be revised to reflect revisions to the Environmental Management System and include a requirement to complete a disturbance checklist.
- Regular training sessions be provided to Epic personnel and contractors on the requirements of the EHS
- A weed control program be initiated at Compressor Station 1 to prevent further outbreaks of Caltrop.
- Records relating to the management of soil farms at Peterborough and Compressor Stations need to be updated to reflect current practice.
- Expired batteries should be removed to an appropriate waste depot for disposal to reduce the risk of spills or injury.
- Procedures should be updated as required to include requirements for undertaking heritage investigations of pipeline easements and for the accidental discovery of heritage sites.

6 ASSUMPTIONS AND SENSITIVITIES

This report specifically addresses the Fitness for Purpose of the MAP. Certain assumptions have been made:

The risk assessments conducted by Epic Energy personnel or consultants relate to the consequence and likelihood applied to the various risk scenarios assessed. Risk assessments are conducted based on the two dimensional matrix given in AS4360. Where it is possible historical data is used to determine the possible extent of disruption to the pipeline and the level of consequence. The likelihood of an event occurring is supported by Epic Energy's records. In the absence of historical data best judgement has been used based upon the experience of Epic Energy personnel.

As prudent pipeline operators Epic Energy personnel represent the organization in the best possible way based on their knowledge and experience. This is not to say that certain assumptions can in fact be incorrect and this should be noted.

7 IMPACT OF THE ENVIRONMENT ON THE PIPELINE

The pipeline crosses a range of different landforms and land uses and is divided into the following

environmental regions as described in table 4 below.

Table 4 – MAPS Environmental Landforms

Region	Mainline KP	Laterals Contained within Region	Impact on Pipeline
Channel Country	KP 0.0 – 26.7		Periodic flooding, Pastoral land for organic beef-chemical free
Dunefields	KP 26.7 – 162.0		Periodic flooding and wind erosion, Pastoral land for organic beef-chemical free
Stony Plains	KP 162.0 – 215.0 KP 234.0 –314.1	Beverley Lateral	Periodic flooding, Pastoral land for organic beef-chemical free
Flinders Lofty	KP 215.0 -234.0 KP 314.1- 359.5 KP 367.6- 376.5 KP 400.0 –695.2	Peterborough Lateral Hallett Lateral Nuriootpa Lateral Port Pirie Lateral Whyalla Lateral Port Bonython Lateral Point Douglas Lateral Burra Latera Mintaro Lateral	Livestock grazing and cereal crops
Broken Hill	KP 359.5 – 367.6 KP 376.0 – 400.0		Livestock grazing
Eyre Yorke	KP 695.2 – 751.8	Port Pirie Lateral Whyalla Lateral Port Bonython Lateral Amcor Lateral Angaston Lateral Nuriootpa Lateral Dry Creek Lateral Taperoo Lateral Wasleys Loop Pelican Point Lateral Osborne Lateral Quarantine Power Station Lateral	Intensive agriculture, cereal crops, livestock grazing, grape cultivation, forestry industry, urbanisation.
Western Pastoral		Whyalla Lateral Port Bonython Lateral Point Douglas Lateral??	Livestock grazing, recreational land use, regional centres
Spencer Gulf		Point Douglas Lateral	Commercial fishing and shipping

Flooding, soil erosion and third party impact present the greatest risk from the environment to the integrity and operation of the pipeline. For the number of watercourse crossings along the pipeline route, issues relating to erosion and pipeline exposure have been minimal and are managed in accordance with the SEO requirements. Remedial action has been implemented at

these locations to minimise the potential for further exposure and minimise the risk to the integrity of the pipeline.

Depending on the severity of the incident the emergency response and maintenance systems provide effective response to these situations.

As mentioned previously at Balcooracanna creek crossing a new pipe section was installed to prevent flowing water from exposing the pipeline (2003).

Depth of cover investigations in high risk areas including fences, road and rail crossings, creeks and rivers are carried out routinely. Depth of cover rectification programmes are completed as necessary with the current program instigated as a result of the 2007 risk assessment process.

The pipeline easements traverse a number of Native Title claimant and cultural heritage areas. It also passes a number of European heritage sites which are logged in Epic's GIS system.

Trees are not permitted to grow on the ROW within 2 metres of the pipeline. Other vegetation on the ROW is controlled to ensure that the line of sight for pipeline markers is maintained.

8 POTENTIAL FOR SERIOUS INCIDENTS

A leak in the pipeline would result in the release of natural gas. The rate of release would be dependent on the size of the rupture. Fire could result if a source of ignition was present. The quantity of natural gas lost and the risk to safety and the environment would depend on the time taken to detect, isolate and repair the pipeline. The risk to public safety would depend on the location of the rupture and proximity to the public.

Epic Energy have conducted a pipeline integrity risk assessment in accordance with AS2885; while it is recognized that there are risks associated with the operations and maintenance of a high pressure natural gas pipeline Epic Energy believes all of these risks have been identified and steps taken to ensure that in all cases these risks have been reduced such that they can be considered to be "As Low As is Reasonably Practicable" (ALARP"). Given this approach the potential for a serious incident to occur has been minimized.

9 PIPELINE UTILITIES

The mainline pipeline utilities consists of 7 turbine driven Compressor Stations, 3 of which were decommissioned in 2007, 2 reciprocating units exists on lateral pipeline and thirty regulator/meter stations.

Of the 4 active CS, these are primarily operated in a duty standby arrangement effectively providing 100% reliability. Further to this the meter stations are designed with the majority having an active and standby run with a further level of redundancy built into each run also again providing a very high level of reliability.

10 FITNESS FOR PURPOSE

10.1 GROUNDS FOR FITNESS FOR PURPOSE

This pipeline is being operated and maintained by Epic Energy, an experienced Australian pipeline owner and operator. The management systems employed by Epic Energy in the operation and maintenance of the MAPS are robust and regularly audited. If the pipelines and facilities are found to be in an unacceptable condition, corrective actions plans are implemented

to address these issues.

The Internal Operations and Maintenance audit conducted in September 2007 determined that Epic Energy operates the MAPS in accordance with AS2885 but noted several recommendations for improvement. Risk Assessment's in accordance with AS2885 have confirmed that there are no threats to the pipeline, which are not being managed appropriately, and the asset poses an acceptable risk to public health, safety and the environment.

Epic Energy has a structured process in place for recruitment and training of employees, which ensures personnel involved in the operation and maintenance of the Pipeline are competent and have appropriate levels of experience. Emergency response exercises are conducted to test the emergency response capability; identified improvements are subsequently incorporated.

The entire length of the main pipeline from Moomba to Torrens Island was internally inspected by an In Line Inspection Survey during 2002 and 2003. The ILI showed a significant number of external defects, in particular in the northern sections of the pipeline between the Moomba Plant and Compressor Station 4. These defects are consistent with an old deteriorated coated pipeline. Epic Energy manages these defects and external corrosion to the MAP through the application of cathodic protection and the pipeline refurbishment programmes. Inline Inspection Survey's are carried out at 5 yearly intervals with the next survey planned for 2008. In Line Inspection Surveys were also performed on the Angaston Lateral in 2004 and the Whyalla and Pirie Lateral in 2006.

Improvements to the microwave communications and SCADA systems have improved the reliability of the systems and hence the ability to accurately monitor and control the MAPS.

Epic Energy recognises that its maintenance programmes must be proactive if the integrity of the MAPS is to be maintained. Based on the following assessments of the Pipeline:

- Internal and external defect assessment using Inline Inspection tools.
- Pipeline refurbishment programmes as a follow up to ILI
- Coating defect surveys and dig up inspection programmes
- Risk reviews and follow up actions carried out in accordance with the requirements of AS 2885.
- Audits and improvements of the management systems governing the manner in which the Pipeline is operated and maintained,
- Cathodic Protection ground bed replacement programme
- Integrity Management Plan implementation
- Compressor Station pipeline subsidence monitoring and restoration.
- The pressure vessel inspection programme

The Moomba to Adelaide Gas Pipeline System is assessed, as at February 2008, as being "fit-for-purpose" for the current and future use, for the next five years.

Epic Energy is satisfied that the condition of the Moomba to Adelaide Pipeline System and facilities including the utilities, management system and procedures are fit for purpose and satisfy the terms of PL1 with respect to public health, the environment and reliability of production and supply of natural gas.

10.2 FITNESS FOR PURPOSE FOLLOW UP

The following issues have been identified and are currently being followed up:

- Continued Operations and Maintenance compliance audit of the MAPS against AS2885.3 will be performed at regular intervals

- DRAFT Integrity Management Plans are to be reviewed and implemented
- A risk based inspection programme for pressure vessels is to be initiated
- An Inline Intelligent Pig survey of the MAP and Loop Line to Torrens Island is to be completed in 2008.
- Ongoing monitoring and replacement of CP system is to continue
- An audit of the Cathodic Protection System will be conducted over the coming period

11 CONCLUSIONS

Epic Energy concludes that the Fitness for Purpose of MAPS is appropriate to manage the risks imposed by the pipeline on:

- The Environment
- Public Health and Safety
- The Security of Production or Supply of Natural Gas

This report identifies a number of actions that should be followed up to ensure that the pipeline remains fit for purpose. Should the operational circumstances surrounding the pipeline change within the five year period, the Fitness for Purpose Report will be reviewed to determine whether any operational adjustment is required.

The MAPS is assessed as being fit-for-purpose for current and future use. Over the period of the next five years a subsequent Fitness for Purpose Report is required under the Petroleum Act 2000 and Regulations.

12 APPENDICES

APPENDIX 1
FACILITY DESCRIPTION

A.1 METER AND REGULATOR STATIONS

Epic Energy has 31 delivery points on the Moomba to Adelaide Pipeline and laterals associated with Pipeline Licence 1. The sale of gas from these outlets are to major customers, Origin Energy, International Power, AGL, One Steel, Amcor and Heathgate Resources, for use in domestic gas supplies and power generation.

Epic Energy carries out pressure regulation prior to transfer to its customers at each delivery point. The regulator/meter stations were designed constructed and is operated in accordance with the requirements of AS2885 to meet the customer requirements and maximum allowable operating pressure of the customer's pipe work.

All the stations listed in the meter station tables in subsequent pages are custody delivery points, except for the Wasleys regulator, meter and compressor station and the Bungama regulator station.

At Freeling, Penfield Roses, Laukies and Metro Piggery stations, the meter is separate from the regulation station and the meters are owned by the customer, Origin Energy.

At Whyalla OneSteel, Port Bonython, Pacific Salt and Freeling, the meters are installed within the Epic owned station pipe work and owned by Origin Energy.

An additional regulator meter station, supplying a power generation plant with gas from the Moomba to Adelaide Pipeline system, is owned by the customer and Epic Energy has an O&M contract to operate the facility in accordance with AS2885.3, on behalf of the owner.

All odorisation facilities located within the Epic Energy delivery points are owned and operated by the customer Origin Energy.

Table A1 – MAP Meter Stations

Meter Station Name	Location	Metering	Sales Pressure	Filtration Yes/No	Over Pressure Protection System
Moomba Meter Station	Moomba Gas Plant	3 orifice meters	N/A	Nil	N/A
Taperoo Meter Station	Mercey Road Taperoo, Section 633, Hundred of Port Adelaide.	2 runs of 200mm Daniel Orifice Plates 1750kPa, 44000 SCMH	1700kPa	- 2xT'Oconnor Gas dust filters (7.322MPa, 75°C) - V2802: Size (620mm ID by 2430mmLong) Capacity 766L - V2801: Size (620mm ID by 2438mm Long) Capacity 766L -	100mm Fisher 399 Run #1 1750kPa Run#2 1725kPa Small Relief (Valve 1) set @ 1875kPa AGCO, Blowdown Modulating Medium Relief (Valve 2) set @1925kPa Axelson, Blowdown @ 1850kPa
Elizabeth Meter Station	Corner of Greyhound & Mills Road, Section 4247, Hundred of Munno Para.	3 runs of 150mm Daniel Orifice Plates 1750kPa, 17000 SCMH	1750kPa	2x Peco Gas dust filter/coalescers V27A01: Design (8274kPa, 93°C) Size (324mm DIA by 1540mm Long) V27A02: Design (7336kPa, 38°C) Size (457mm DIA by 1400mm Long)	Three runs with 50mm Fisher 399A regulators. Run #1 1750kPa Run #2 1725kPa Run #3 1700kPa Small relief set @ 1875kPa Anderson Greenwood blowdown modulating AGCO – Model 46310-24/s1 [s/n 99-06525] Medium relief set @ 1925kPa Axelson snap action type valve AXELSON – 4", type D3 – s/n 12702
Dry Creek Meter Station	Magazine Road, Dry Creek, Section 428, Hundred of Port Adelaide	2 runs of 200mm Daniel Orifice Plates 1500kPa, 40000SCMH	Between 1350 and 2000kPa	2 x Peco horizontal gas filter (7.336MPa, 38°C) V27B01 and V27B02 635mm OD x 2540mm Long, 809 Litres V27B03 Natco Liquids Scrubber	150mmJetstream Run #1 1500kPa Run #2 1400kPa Small Relief (Valve 1) set @ 1625kPa AGCO Blowdown Modulating Medium Relief (Valve 2) set @ 1675kPa AGCO Blowdown Modulating
Gepps Cross Meter Station	South west corner of Magazine road and Henschke Street, Dry Creek, Section 428, Hundred of Port Adelaide	3 runs of 200mm Daniel orifice plates 1750kPa, 44000SCMH	Between 1350 and 2000kPa	2 x Coalescer Filters Design (8.322MPa, 55 oC) V27C01: Size (762mm OD by 2202mm Long) Capacity 1196L V27C02: Size (762mm OD by 2202mm Long) Capacity 1196L	150mm Jetstream Run #1 1750kPa Run #2 1725kPa Small Relief (Valve 1) set @ 1875kPa Axelson, Blowdown Modulating Medium Relief (Valve 2) set @ 1925kPa Axelson, Blowdown @ 1850kPa
Angaston Meter Station	Corner of Stockwell Road and Angaston Railway line, Angaston. Section 67, Hundred of Moorooroo.	250mm turbine flow meter measuring how much gas goes to Origin Compressor into Berri Lateral. 2 runs of 100mm Daniel orifice plates measuring how much gas goes to ABC.	700kPa (ABC)	T O'connor dust filter (8.274MPa, 93 °C)	50mmJetstream, Fisher Cont. Valve Run#1 700kPa (ABC) Run #2 650kPa 100mm Run #1 350kPa (Township)

		American Meter Co. AL5000 displacement meter measuring how much gas goes to the township			Run #2 330kPa (Township) Run #2 330kPa No Regulation on Berri Lateral
Pt Pirie Meter Station	Port Pirie Township Road, Port Pirie, Section 7017, Hundred of Port Pirie.	1 run with a 75mm Barton turbine meter 700kPa, 8000SCMH	Between 600-900kPa	Swinney Gas Filter Type A Peco Horizontal Dust Filter V19PP01 V19PP02	50mm Jetstream/Fisher Run#1 700kPa Run #2 650kPa (USI/D3 75x100mm)
Bungama Scraper Station	Junction of Whyalla and Port Pirie Laterals	Nil	To Port Pirie 3500kPa To Whyalla 6800kPa	Nil	Approximately 3500kPa
Whyalla Township Meter Station	Inside BHP facility, near main entrance. Allotment 9, DP38820, Hundred of Cultana	1 run, 100mm Email diaphragm American Meter Co. AL5000 Meter, 650kPa, 1550SCMH	Between 80 and 150kPa	Peco dust filter / Coalescer (7.336MPa, 38 °C) V19W03: Size (508mm OD by 2450mm Long) Capacity 400L	25mm Tartarini Town Sales Monitor 175kPa Active 150kPa Town Supply Monitor 680kPa Active 640kPa
Whyalla OneSteel Meter Station	Inside **OneSteel** facility, near main entrance. Allotment 9, DP38820, Hundred of Cultana	1 run with a 300mm Rockwell Turbine Meter 650kPa, 30,000 SCMH	Between 650 and 850kPa	Peco dust filter / Coalescer (7.336MPa, 38 °C) V19W03: Size (508mm OD by 2450mm Long) Capacity 400L	75mm Tartarini Run #1 Active 700kPa Monitor 750kPa Run #2 Active 690kPa Monitor 760kPa Run #1 set @ 850kPa Run # 2 set @ 900kPa
Whyalla Cogen Meter Station	Inside OneSteel facility, near main entrance. Allotment 9, DP38820, Hundred of Cultana	1 run with an 80mm Turbine Meter	1870kPa	2 x Dust filter / Coalescer (10.130MPa, 60 °C) V19W03: Size (356mm OD by 2550mm Long) Capacity 220L	Run #1 Active 1880kPa Run #2 Active 1880kPa Monitor 2000kPa Set @ 2350kPa modulating
Pacific Salt Meter Station	On the Whyalla lateral, adjacent to the Pacific Salt facility, Section 2, Hundred of Cultana.	1 run with 100mm Email AL2300 Diaphragm Meter 350kPa, 156 SCMH	140kPa	Gas Dust Filter (8.274MPa and 93 °C) V19P01: Size (220mm OD by 1650mm Long) Capacity 52L	25mm Tartarini Active: 490kPa Monitor: 520kPa Small Relief Valve set @ 600kPa
Port Bonython Meter Station	Near the main entrance of the Port Bonython facility, Section 239, Hundred of Cultana.	150mm Rockwell Turbine Meter 1200kPa, 850 SCMH	637kPa	Peerless Filter (8.224MPa, 93 °C) V19B01: Size (406mm OD by 1500mm Long) Capacity 140L	40mm Tartarini Active: 1080kPa Monitor: 1160kPa Small Relief Valve set @ 1400kPa
Nuriootpa Meter Station	35km along the Angaston lateral	100mm Rockwell Turbine Meter (NB. Class #300) 1050kPa, 6500SCMH	Between 950 and 1150kPa	Natco Gas Filter (7.336MPa, 60 °C) Size (273mm OD by 1220mm Long) Capacity 75L Natco Scrubber (1.379MPa, 38 °C Size (618mm OD by 2286mm Long) Capacity 705L	50mmJetstream set @ 1050kPa Small Relief Farris valve set @ 1200kPa (mod)
Freeling Meter Station	Two kilometres south of Freeling on the Main Road, Section 395, Hundred of Nuriootpa.	100mm diaphragm A.L. 5000 meter 320kPa, 1000SCMH	Between 250-420kPa	Nil	25mm Fisher 627 Active: 300kPa Monitor: 350kPa Relief Valve set @ 400kpa

					Modulating Fisher FS 1808-26, 1.5-2" N.P.T. steel body type 3653 pilot.
Burra Meter Station	Samin Copper Works on the west side of Burra, Linkson Street Burra	75mm Roots positive displacement meter 800kPa / 300kPa (2 stage regulation), 1300SCMH	Between 70 and 300kPa	Gas Filter (7.336MPa, 60 °C) V23A01: Size (273mm OD by 1230mm Long) Capacity 70L V23A02: Natco Scrubber (1.379MPa, 38 °C) Size (324mm OD by 1626mm long) Capacity 125L	25mm Fisher Burra #1 set @700kPa Burra #2 set @ 250kPa Burra #1 set @ 850kPa Burra #2 set @ 300 kPa
Hallett Meter Station	Hallett Hill	1 Run with a G1000 Turbine Meter 4000kPa, 99376SCMH	1700kPa @ 28 °C	Coalescing Filter (9.8MPa, 60 °C, 5 micron) Size (610mm OD by 2170mm Long) Capacity 570L	Gorter R100s-100-600 Monitor: 1650kPa Active: 1550kPa Farris 27DA23M-20 set @ 10850kPa Farris 26JA12-120 set @ 1950kPa (10% of Max Flow)
Peterborough Meter Station	Peterborough, Sales tap at KP 559.88 on MAP	75mm Roots Positive displacement meter 700kPa, 350SCMH	600kPa	Natco Gas Filter and Natco Liquids Scrubber V2001: Filter Size (273mm OD by 1220mm long) Capacity 67L V2002: Scrubber, Size (273mm OD by 1220mm long) Capacity 100L	25mm Fisher Run #1 set @ 700kPa Small Relief set @ 800kPa AGCO, Blowdown Modulating
Cotton Road Meter Station	2km further down the Peterborough Lateral	Nil	Between 300-400kPa	Nil	50mm Rockwell Run set @ 350kPa Rockwell Valve #2 set @ 450kPa
Penfield Roses Meter Station	Short Road, Penfield, Allotment 9, DP 31457, hundred of Munno Para.	American Meter Co. AL5000 Displacement meter	Between 250-420kPa	Nil	Active regulator set @ 300kPa Monitor set regulator set @ 350kPa Relief Valve set @ 420kPa Fisher FS98H-29 1" N.P.T. screwed, cast iron body S.S. trim, nitrile diaphragm
Virginia Meter Station	Corner of Park & Supple Roads, Virginia, Allotment 1, Section 7558, Hundred of Port Adelaide.	25mm diaphragm meter American Meter Co. AL5000 300kPa, 1000SCMH	Between 250 and 420kPa	Refer to P&ID 328-L-003 PASA built filter, 168mm OD x 1400mm long Capacity 36 litres, Design Pressure 7322kPa	Active set @ 300kPa Monitor set @ 350kPa A fisher 399A-6365 relief valve is fitted in the meter run set @ 400kPa
Wasleys Metro Farm Meter Station	Within Metro Farm's facility 5 kilometres North West of Wasleys, Section 89, Hundred of Grace.	America Meter Co. AL2300, is located in the second regulator diaphragm 100mm 1¼ ft^3 per rev	Between 250-420kPa	Nil	Fisher 627M Upstream Active set @ 360kPa Downstream Monitor set @ 340kPa Farris 26FC10-120 1.5" Downstream of the regulators set @ 400kPa
Wasleys Compressor and Meter Station	The beginning of the Wasleys Loopline where KP 731.9	2 Orifice Meters	5100kPa	Nil	Active set @ 6100kPa Monitor set @ 6400kPa
She-Oak Log Regulator Station	The Meter station Lauke's Feed mill facility, Daveyston. Section 100, Hundred of Nuriootpa	Nil	between 250 and 420kPa	Nil	Fisher 627 14,000kPa390 SCMH U/S active set @ 360kPa D/S monitor set @ 340kPa

Symes Road Meter Station	Corner of Syme's and Coleman Roads, St Kilda.	Roots Turbine Flow Meter	350kPa	Nil	Active: 300kPa Monitor: 350kPa Vent set @ 400kPa
Mintaro Meter Station	The Mintaro Lateral is a 200mm off take from the MAP at a KP of 665.19 the Mintaro lateral travels for some 330m to the Mintaro Meter Station.	Nil	1800kPa	2 x Gas Filters (7870kPa, 10 to 40 ^{o}C) V2401 and V2402 Size (400mm OD by 2200mm) Capacity 277L	Run #1 set @ 1900kPa Run #2 set @ 1850kPa Run #1 set @ 2090kPa Run #2 set @ 2090kPa
Amcor Meter Station	Argent Road, Concordia.	Nil	250kPa	F-001 Coalescing Filter (9930kPa, 60 ^{o}C, 10 micron)	set @ 1100kPa set @ 850kPa set @ 1400kPa set @ 1100kPa
Pelican Point Meter & Regulator Station	On Pelican Point Lateral inside Power Station compound.	3 Turbine Meters	2765kPa	2X Filter Coalescers (10204kPa, 0-37 ^{o}C) V2004, V2010: Size (749mm ID by 2363mm Long) TK 2020 1000L above ground liquids tank.	Active set @ 2700kPa Run#1 Monitor set @ 2850kPa Run#2 Monitor set @ 2925kPa Run#3 Monitor set @3000kPa
Origin / Quarantine Meter Station	The Origin lateral is an off-take from Wasley's loop, the meter station is located inside the power station compound on Torrens Island.	1 Turbine Meter, Model No. G650 2900kPa, 30,337SCMH	2375kPa @ 27 ^{o}C	Coalescing Filter (9800kPa, 60 ^{o}C) F101: 2800kPa, 301 24SCMH	Active set @ 2390kPa Monitor set @ 2440kPa set @ 3000kPa
Torrens Island Meter Station	Behind the Torrens Island Power Station which is located at the end of the Moomba to Adelaide pipeline and end of Wasleys loop.	3 Runs of 300mm Daniel Orifice	1800kPa	3x Filter/Coalescers (8322kPa, 55 ^{o}C) V 3001, V 3002: Size (762mm OD by 2253mm Long) 1196L V 3003: Size (1372mm OD by 3176mm Long) 4922L	150mm Jetstreams, also 1 regulator by-pass run. Run#1 1825kPa Run#2 1800kPa Run#3 1775kPa Run#4 1750kPa Run#1 Small 3"x4" Axelson set @ 1950kPa Run#2 Large 8"x10" Anderson Greenwood set @2100
Osborne Meter Station & Regulator Station	Mercey Rd. Osborne.	2 x Turbine Meters	2490kPa	Filter/Coalescer (7322kPa, 50 ^{o}C) V 2901: (Size 750mm OD by 2551mm Long) V 2902: (Size 350mm OD by 1800mm Long)	MS: set @ 2400kPa RS: set @ 2700kPa (Active) set @ 2900kPa (Monitor) set @ 2700kPa (By-pass)
Frost Road	Frost Road Hundred of Port Gawler Two Wells	Coriolis Mass Flow Meter FE-101	450kpa	Y Strainer SP-100	Active regulator set @ 450kpa Monitor regulator set @ 475kpa Relief valve set point @ 550kpa ESD valve set to close @ 550koa

A.2 COMPRESSOR STATIONS

Epic Energy operates four compressor stations on the Moomba to Adelaide pipeline being stations 1, 3, 4 and 6 with Stations 2, 5 and 7 decommissioned in 2006.

The pipe work at the decommissioned compressor stations has been disconnected from the main line, blinded and vented of all gas. A new cathodic protection unit has been installed to allow individual CP outputs to be applied to each decommissioned sites underground pipe work and the pipeline in the immediate area. The turbine packages have been isolated and chemically preserved on site, Fire and gas systems have been isolated and the fire suppressant material (NAF-S-III gas) removed. All stores, bulk oils and fuel has been removed, service buildings have been locked and no longer available for use. The station inlet suction and outlet discharge valve power operators have been completely disabled and the station pressurizing skid has been isolated by removing pipe spools which removes all turbine and GEA fuel and associated control gases from the sites. The 24 volt DC batteries have been isolated and removed from sites.
The GEA's remain operational at CS2 to supply the Moomba – Adelaide pipeline cathodic protection system. The GEA's at CS5 & 7 have been decommissioned and isolated from the electrical distribution system as well as their fuel gas supplies.

In 1998, the MAP Compressor Stations underwent a major upgrade of their compression equipment. This included the replacement of the Solar Centaur T4002 3850HP packages at stations 1, 2, 3, 5 & 6 with Solar Taurus T60 6500HP packages and the upgrade of the Ingersoll Rand GT-22 packages at CS2 and 4 from a horsepower capacity of 4,250 to 5,400. At the same time the station control system was upgraded from an antiquated electro–mechanical system to an Allen Bradley PLC5 system.

The pipeline was further enhanced in 2000 by the construction of 34kms of 24" loops south of stations 1, 2, 3 & 4 and the remaining 4 Ingersol Rand packages being upgraded to the Allison 501-KC5 specification with a power rating of 5250 horsepower. A further major undertaking in 2000 was the installation of a reciprocating compressor at Wasleys with an installed power rating of 2200HP.

Compressor Stations 1-7 consist of typically a MLV and Scraper Station facility, Station Suction and Discharge valve assemblies with the components downstream of these valves arranged as follows:

- Main Station pipe work consisting of 550mm NB.
- A Centrifugal Gas Scrubber Assembly.
- A Suction Header incorporating two John's 550mm Check Valves.
- Valving from this Suction Header routes gas through two centrifugal process gas compressors powered by a gas turbine driver with the compressors configured in series.
- The process compressors discharge is connected to the discharge header which passes the gas through an after cooler assembly to remove excess heat from the compressed gas.
- A metering run consisting of an orifice plate, pressure and temperature measurement and a ΔP transmitter to measure the gas flow through the station.
- A Station Vent Valve Assembly for over pressure protection and to provide an ESD facility.
- Pressure reduction equipment is connected to the main station pipe work to produce turbine and gas engine alternator (GEA) fuel and control gas supplies at the pressures required for each of these functions.
- Incorporated within the Station compound are a services building housing the Control Room, Battery Room, Workshop and Store facility and a power house typically consisting of three GEA's.

Details of each compressor station are given below:

A.2.1 COMPRESSOR STATIONS 1 TO 3

Unit A: Solar Taurus T60 package comprising Solar Taurus 60.gas turbine engine and a Solar C402.centrifugal compressor. Upgrade commissioned in 1998.

Unit B: Ingersoll Rand GT-22 package comprising an Allison 501-KC5 gas turbine and a Dresser Rand CDP 416 centrifugal compressor. Upgrade commissioned in 2000

Compressor station controls are provided by an Allen–Bradley PLC housed in the Station Control Room. This PLC interfaces between TSCC via SCADA and the on-site HMI and processes all station and unit controls including set point changes for process control.

The power generation capability at these sites consists of three gas driven engine alternator sets of a nominal capacity of 90 kW. GEA's 1 & 2 are Caterpillar 68D driven machines direct coupled to a Stamford 415V 3 phase alternator. GEA 3 is a Caterpillar 7Y machine direct coupled to a Caterpillar 415V 3 phase alternator. All of these machines are capable of stand-alone operation or can be parallelled to each other to give a total nominal capacity of 270 kW. These machines are controlled by an intelligent engine management control system.

A.2.2 COMPRESSOR STATION 4

Unit A: Ingersoll Rand GT-22 package comprising an Allison 501-KC5 gas turbine and a Dresser Rand CDP 416 centrifugal compressor. Upgrade commissioned in 1998

Unit B: Ingersoll Rand GT-22 package comprising an Allison 501-KC5 gas turbine and a Dresser Rand CDP 416 centrifugal compressor. Upgrade commissioned in 1998

Compressor station controls are provided by an Allen–Bradley PLC housed in the Station Control Room. This PLC interfaces between TSCC via SCADA and the on-site HMI and processes all station and unit controls including set point changes for process control.

The power generation capability at this site consists of three gas driven engine alternator sets. GEA 1 & 2 each has a nominal capacity of 90 kW while GEA 3 is nominally rated at180 kW. GEA's 1 & 2 are Waukesha F817 gas engines direct coupled to a Dunlite alternator. GEA 3 is a Waukesha H2475 gas engine direct coupled to a Stamford alternator. All of these machines are capable of stand-alone operation or can be parallelled to each other to give a total capacity of a nominal 360 kW. These machines are controlled by an intelligent engine management control system.

A2.3 COMPRESSOR STATION 6

Unit A: Solar Taurus T60 package comprising Solar Taurus 60.gas turbine engine and a Solar C402.centrifugal compressor. Upgrade commissioned in 1998.

Unit B: Ingersoll Rand GT-22 package comprising an Allison 501-KC5 gas turbine and a Dresser Rand CDP 416 centrifugal compressor. Upgrade commissioned in 2000.

Compressor station controls are provided by an Allen–Bradley PLC housed in the Station Control Room. This PLC interfaces between TSCC via SCADA and the on-site HMI and processes all station and unit controls including set point changes for process control.

Power generation at this site consists of two GEA's with nominal capacities of 9- & 125kW: GEA 1 is a Caterpillar 68D driven machine direct coupled to a Caterpillar 415V 3 phase alternator. The

controls for this machine are handled by an electro-mechanical control system. GEA 2 is a Caterpillar G3406 engine alternator set in an acoustic canopy and is a stand-alone unit. These sets cannot be run in parallel. These machines act in a duty stand-by arrangement when the turbine units are operating and can back up the mains SWER line from the S.A power grid.

A.2.4 WHYTE YARCOWIE COMPRESSOR STATION

This station consists of a MLV and Scraper Station facility, inlet suction and outlet discharge valves feeding suction and discharge headers.

Components downstream of these valves are arranged as follows:

- Main Station pipe work consisting of 150mm NB line pipe.
- Valving from the Suction Header routes gas through a reciprocating compressor package with the discharge gas passing through an after cooler assembly, to remove excess heat from the compressed gas before passing back into the discharge header.
- There is a hydrocarbon waste collector tank which collects hydrocarbons from the package suction and discharge line automatically drained scrubber vessels.
- A metering run measures the gas flow through the station.
- A Station Vent Valve Assembly for the over pressure protection and to provide an ESD facility.
- Pressure reduction equipment is connected to the main station pipework to provide fuel and control gas supplies at the pressures required for the reciprocating compressor unit station powered valves.

Incorporated within the Station compound are a services building housing the Control Room, Battery Room, Workshop and Store facility.

A.2.5 WASLEYS COMPRESSOR STATION

The Wasleys Compressor Station consists of a MLV, Scraper Station facility and boost compressor for the Wasleys to Torrens Island 500mm NB loop-line, primarily supplying the Pelican Point Power Station. Compressor capacity control is accomplished by varying engine speed, compressor cylinder loaders and the unit recycle valve position. A station fire and gas detection system is installed. The compressor unit discharge flows through the station after-cooler assembly, to remove heat from the compressed gas. The discharge gas flow is metered using an orifice metering run. Unit fuel gas is metered using a coriolis meter. A hydrocarbon waste collection tank is installed to collect hydrocarbons from the coalescer assemblies installed on the unit suction and discharge headers. A unit vent valve assembly is installed for the provision of purging and ESD facility. Ancillary equipment such as fuel/start gas and lube oil makeup systems are also installed. Incorporated within the station compound is a services building that houses the control room, battery room and lunchroom facilities. A separate workshop and store facility is also provided. The station consists of Caterpillar G3680TAW turbo charged gas engine and a Aerial JGC/4 reciprocating compressor.

A.3 PIG LAUNCHERS AND RECEIVERS

Pig launcher/receiver assemblies are located at all Compressor Station sites, spaced approx 100 kilometres on the mainline.

Starting at CS1, 2, 3 & 4 the pipeline has been looped for several kilometres downstream and these 24” looping section can be pigged using portable pig launcher and receiver assemblies that need to be shifted from site to site.

Laterals with pigging facilities include, Whyalla lateral, Port Pirie lateral, Wasleys loop line,

Angaston lateral and the Pelican Point lateral.

In general both the Launcher and Receiver are equipped with a quick opening, horizontally hinged, Unibolt Closure equipped with safety interlock.

All Launcher/Receiver assemblies are equipped with kicker lines complete with associated valving to enable cleaning and intelligent tool pigging operations and to ensure pipeline flow can be accommodated through these lines without significantly causing any throttling effect on pipeline operations.

Launchers and Receivers are isolated from the Mainline via W.K.M. “Saf-T-Seal” round body, through conduit, gate valves.

A.4 SCRUBBERS

Centrifugal gas scrubbers are installed at Compressor Stations 1, 3, 4 and 6. Gas enters the tube bundle tangentially, creating a high centrifugal force that projects solids and liquids to the walls of the tubes, allowing clean gas to pass through the scrubber and waste impurities to be collected in the Dust Collector vessel, located below the scrubber.

The Station PLC cycles the Scrubber valves automatically twice every 24 hours, to eject the contents of the dust collector into the below ground scrubber tank.

A.5 AFTER COOLERS

Process gas cooling facilities are operational at Compressor Stations 1, 3, 4 and 6 on the Moomba – Adelaide Pipeline. Cooling of the gas after compression is achieved by a fin fan cooler system which utilizes two tube bundles and two electrically driven 4.88 metre diameter fans.

Process gas cooling facilities are also installed at Angaston, Whyte Yarcowie and the Wasleys reciprocating compressor stations with the fan drivers being provided by the reciprocating engine or compressor to ensure the process gas temperature remains within the pipeline design.

A.6 MAIN LINE VALVES

There are 30 Main Line valves on the MAP installed approximately 32km apart. Of these, 14 are actuated valves and are capable of remote operation. There are a further 16 non-actuated valves equipped with manual operators. Additional mainline valves are located on other laterals and piping associated with Pipeline Licence 1 includes:

- Wasleys to Torrens Island Loop Line 7
- Port Pirie Lateral 4
- Burra Lateral 2
- Peterborough Lateral 2
- Whyalla Lateral 4
- Angaston Lateral 3
- Pelican Point Lateral 2
- Osborne Lateral 2
- Dry Creek Lateral 2
- Taperoo Lateral 2
- Port Bonython Lateral 2
- Nuriootpa Lateral 2

A.6.1 VALVES GENERAL

All mainline valves are 550mm Cameron Full Bore Ball Valves and are installed below ground, with the exception of MLV4, located at Compressor Station 1, which is a 400mm Grove Full Bore Ball Valve. Each MLV has s a 150mm NB by-pass line equipped with two 150mm NB Ball Valves.

The Wasleys loop line valves are 500mm Cameron full bore ball valves and are installed below ground. The valves connecting the loop line to the mainline are 500mm Cameron reduced bore ball valves.

A.6.2 ACTUATED VALVES

On the mainline there are 14 of these valves between Moomba and Torrens Island. These valves are equipped with pneumatic–hydraulic rotary, vane type Shafer operators. These actuators are powered by natural gas, extracted from the mainline and regulated to a pressure suitable for this purpose. These valves are required to be remotely operated from Epic Energy's TSCC as they have no automatically line break facilities. Six of the loop line valves are also power actuated using pneumatic rotary type Rotork actuators and are controlled via SCADA.

A.6.3 NON ACTUATED VALVES

All valves are 550mm Cameron Full Bore Ball Valves and are installed below ground, with the exception of MLV4, located at Compressor Station 1, which is a 400mm Grove Full Bore Ball valve. These valves are equipped with an operator and gearbox assembly, to allow the valves to be operated manually. Incorporated into the MLV pipe work, is a 150mm NB by-pass line equipped with two 150mm NB Ball Valves.

At compressor stations 1, 2, 3 & 4 the pipeline has been looped and these loops have 600mm manually operated Perar valves installed to allow the section. The connections between the 550mm mainline and the 600mm loop are via 500mm Perar manually operated ball valves

A.7 FILTRATION

All major gas delivery points have upstream dry dust filters and downstream coalescing filtration. The dust filters have onsite differential pressure gauges and contain a mixture of Pall and Pearless type filter elements. The separator units have high level alarms to TSCC via the Valmet system and all units contain Pall coalescer type elements.

A.8 ROW

For the Moomba to Adelaide Pipeline, access to compressor stations and pipeline south of Compressor Station 6, is by public roads. Access to pipeline north of Compressor Station 6 is generally via the Right of Way which is a well formed gravel road within the pipeline easement corridor running from CS6 to the intersection of the Strzelecki Track, just north of CS2. North of this point to Moomba, the ROW contains an access track of variable condition.

Vehicle access between CS6 and CS5 is barred to through traffic by locked gates. Access between these points is only permitted to the affected Pastoral Lessees or authorised Epic contractors or employees that have work duties within this area. Through traffic has been banned as a measure to control the spread of a weed that is prevalent in this area. Access to CS 5 is obtained by the Orroroo to Barrata homestead mail road, which intersects the Right of Way approximately 1km south of the Station.

The Strzelecki Track is used as access to facilities at CS1 and Moomba. A well formed gravel

road, approximately 10km in length, maintained by Epic, connects CS1 to the Strzelecki Track.

For facilities such as communication towers and CP, access is generally via tracks across pastoral leases or private land. Access to these tracks is generally covered in the leases or easements agreements which allow access rights to maintain and repair facilities. Access tracks are gated and secured by lock and chain.

Maintenance of access roads has generally been confined to the repair of water erosion damage, following periods of unusually heavy rainfall.

A.9 SWER LINES

A.9.1 MOOMBA TO COMPRESSOR STATION 1

Santos (at Moomba) operates a Three Phase, 11kV Power Line from their 'South Central' feeder ring main which feeds a 19KV SWER line to KP 62 on the MAP. Step down Transformers are installed on the SWER Line to supply power for the Cathodic Protection TRU located on the Gas and Liquids Pipelines. In 1997, the original SWER from Santos was extended to KP 62.0. This extension powers additional Cathodic Protection TRU sites on the pipeline and is owned and operated by Epic Energy.

A.9.2 COMPRESSOR STATION 1 - SOUTH TO KP 116.6

Epic Energy owns and operates a SWER from Compressor Station 1 to KP116.6. This SWER is powered by the GEA's at CS1 and is supplied from a 10 KVA, 415 V to 19 kV step-up transformers. This SWER line services 9 Cathodic Protection TRU sites and 1 Communications Site.

A.9.3 COMPRESSOR STATION 2 - SOUTH TO KP 290.1

In 1996, Hawker Council constructed the 19kv SWER line from CS2 South. This 47.7-km line is powered by the GEA's at CS2 and provides power for a Radio Communications Facility (KP 209), owned by Santos and operated by Epic Energy together with 11 Cathodic Protection TRU units.

A.9.4 COMPRESSOR STATION 5 – NORTH TO KP 402.6

Epic's "CS5" SWER line draws power from ETSA's Yalpara SWER line which operates at 19kV. The SWER line runs from KP 524 to KP 386.3 a distance of 138.2km. The SWER line powers 3 radio communications facilities and 17 cathodic protection installations.

A.10 COMMUNICATIONS SYSTEMS

Communication links between the compressor stations, meter stations and MLV RTU's with TSCC consist of Epic Energy owned and leased infrastructure, as well as Santos owned infrastructure. The Epic Energy owned infrastructure consists of Microwave Data Systems digital microwave bearer and RAD multiplexer. The infrastructure originates at Peterborough and terminates at compressor station 4. The bearer and it's associated multiplexer provide the backbone of the transmission path.

Epic Energy utilises the Santos infrastructure to communicate from compressor station 4, north to Moomba. This consists of an NEC microwave bearer and Nokia multiplexer. The infrastructure originates at Port Bonython and terminates at Moomba. The bearer and it's associated multiplexer provide the backbone of the transmission path.

The Epic Energy owned or leased infrastructure, provide the transmission path from Peterborough to Adelaide and also from Port Bonython to Adelaide then through to TSCC in Melbourne. The leased infrastructure consists of Telstra frame relay services. Epic Energy owns the Cisco routers, which provide the SCADA path to Adelaide and Melbourne..

A number of communications services have been purchased from major telecommunication vendor Telstra to transmit data to TSCC and control instructions from TSCC to the field.

DDS, PAPL (Leased Lines), PSTN (Dialup) and Frame Relay are the communication services provided by Telstra and utilised by Epic. These products provide communication from Meter Stations, Valve Sites, Radio and Epic Energy owned communication infrastructure to TSCC via a leased Virtual Private Network.

Trials are currently underway to evaluate Next-G Mobile services and IP-Telemetry Services provided by Telstra to replace DDS and PAPL Services which will be discontinued by 2008 and 2009 respectively.

A.11 PIPELINE MONITORING SYSTEMS

Epic Energy operates and controls the Moomba to Adelaide Pipeline from the Transportation Services Control Centre (TSCC) in Melbourne, Victoria, using the Telvent SCADA System. The Moomba to Adelaide Pipeline can also be monitored and controlled from Epic Energy's emergency recovery control centre at Hansens, Doncaster, Victoria.

The Epic Energy SCADA system is a distributed, dual redundant, SCADA system which utilises Epic Energy and third party communications providers to communicate to the remote field telemetry devices. A volume based Pipeline Leak Monitoring system is configured in the SCADA system to alarm when a defined volume imbalance is experienced in a defined period of time.
The SCADA system is well supported technically by a services level agreement with TUSC in Melbourne and Telvent in Canada who provide regular services.

Epic in 2007 have perform a major SCADA upgrade with TUSC and Telvent to replace the current Unix platform Telvent 5.2.2 OASyS SCADA system with the Windows platform Telvent DNA7.4

APPENDIX 2
SAFETY POLICY

epic energy

OCCUPATIONAL HEALTH AND SAFETY

Safety is our most important value

Epic Energy is committed to providing an accident free and healthy workplace for all employees, contractors, visitors and the public by implementing an integrated safety management system and maintaining the highest standards possible.

We believe that good OHS performance and practices are the responsibility of everyone at Epic Energy and are critical to the success of our business.

To achieve this, Epic Energy will:

- Ensure that systems are in place to protect the Health and Safety of all personnel on Epic Energy facilities as well as the environment surrounding its facilities.
- Ensure vehicle and driver safety standards are communicated to all employees and contractors.
- Develop and maintain systems to promote employee involvement and communication in Health and Safety issues.
- Demonstrate effective management of Health and Safety through risk assessments and the development and implementation of safe operational procedures.
- Evaluate and manage changes to process, equipment, organisation and personnel to ensure that safety and environmental risks remain as low as practicable.
- Promote a health system that ensures employees are not, as far as reasonably practicable, exposed to risks which may affect their health whilst at the workplace.
- Provide a system for the reporting and investigation of incidents and ensure follow-up and remedial actions are implemented to prevent recurrence.
- Assess compliance with Health and Safety performance standards, good practice and legislative requirements and communicate this to all employees and other interested parties.
- Review the OHS policy periodically to ensure relevance, in line with our business.

Steve Banning
Managing Director
August 2007

APPENDIX 3
ENVIRONMENTAL POLICY

epicenergy

ENVIRONMENTAL POLICY

Epic Energy will Operate in an Environmentally Friendly Manner

Epic Energy is a large gas transmission company who constructs, owns, and/or operates gas transmission pipelines throughout Australia. Epic is committed to minimising the impact of its activities on the environment in keeping with its belief that companies should be increasingly responsible in their management of environmental issues.

To achieve this objective, Epic will:

- Comply with all relevant environmental legislation and the requirements of industry standards as a minimum requirement.
- Integrate care for the environment into the responsibilities and work ethics of all personnel.
- Continue to adopt appropriate new technologies and best practices that reduce the impact of its activities on the environment.
- Minimise land and habitat disturbance by applying environmentally sustainable solutions.
- Promote open communication with landholders and interested parties.
- Avoid disturbance to known or identifies sites of cultural, historical, natural or scientific significance.
- Implement work practices to minimise erosion and sedimentation impacts on neighbouring properties and land.
- Develop opportunities for recycling and more efficiently using energy, water and other resources.

Environmental performance will be monitored regularly and the information communicated to all employees and interested parties/members of the community.

Steve Banning
Managing Director
August 2007

APPENDIX 4
2002/03 MAP ILI RESULTS FOR ERF > 1 AND REFURBISHMENT

Pipeline	Log distance	Record	ERF RSTRENG (Rosen ILI)	Internal	Year Refurbished	Comment
CS1 CS2	1684.68	Defect #19	1.02	NO	2005	No clock springs needed
CS1 CS2	2922.52	Dig 4	1.01	NO	2006	Two Clock Springs
CS1 CS2	3307.2		1.01	NO	2005	One Clock Spring
CS1 CS2	4485.75	Dig 7	1.01	NO	2006	No clock springs needed
CS1 CS2	28865.68	Defect #1	1.01	NO	2005	Three Clock Springs
CS1 CS2	29525.57	Defect #2	1.01	NO	2005	Two Clock Springs
CS1 CS2	29537.07	Defect #3	1.03	NO	2005	Two Clock Springs
CS1 CS2	29590.87	Defect #4	1.02	NO	2005	One Clock Spring
CS1 CS2	29686.02	Dig 10	1.01	NO	2006	No clock springs needed
CS1 CS2	30522.8	5024	1.02	NO	1995	No clock springs needed
CS1 CS2	30551.01	Defect #21	1.01	NO	2005	Two Clock Springs
CS1 CS2	30568.82	Defect #22	1.01	NO	2005	One Clock Spring
CS1 CS2	30604.57	KP 98.416	1.02	NO	2004	One Clock Spring
CS1 CS2	34001.73	Dig 11	1.01	NO	2006	No clock springs needed
CS1 CS2	34018.91	Dig 12	1.01	NO	2006	No clock springs needed
CS1 CS2	35362.73	KP 103.126	1.09	NO	2004	One Clock Spring
CS1 CS2	35501.4	Defect #5	1.02	NO	2005	One Clock Spring
CS1 CS2	37249.1	Defect #6	1.01	NO	2005	No clock springs needed
CS1 CS2	37320.52	Defect #23	1.01	NO	2005	One Clock Spring
CS1 CS2	48524.85	Dig 18	1.02	NO	2006	No clock springs needed
CS1 CS2	67213.86	Defect #24	1.01	NO	2005	One Clock Spring
CS1 CS2	67898.39	Dig 22	1.01	NO	2006	No clock springs needed
CS1 CS2	67931	Dig 23	1.01	NO	2006	Two Clock Spring
CS1 CS2	68635.35	Defect #7	1.01	NO	2005	One Clock Spring
CS1 CS2	69139.51		1.03	NO	2004	No clock springs needed
CS1 CS2	69277.89	Defect #8	1.01	NO	2005	One Clock Spring
CS1 CS2	69278.87	4512	1.01	NO	1997	No clock springs needed
CS1 CS2	69803.22	NO	1.01	NO	NO	Mistaken for close by defect. This ERF value of 1.01 is a four year corrosion growth rate value of 3% per year. Based on 2008 new ILI run this defect should be prioritised accordingly.
CS1 CS2	70708.74	Dig 24	1.01	NO	2006	No clock springs needed
CS1 CS2	75085.32	Defect #9	1.01	NO	2005	One Clock Spring
CS1 CS2	75428.76	Defect #10	1.01	NO	2005	One Clock Spring
CS1 CS2	76058.56	Dig 25	1.01	NO	2006	No clock springs needed
CS1 CS2	79558.08	4512	1.02	NO	1997	No clock springs needed
CS1 CS2	79789.63	Defect #11	1.03	NO	2005	Two Clock Springs
CS1 CS2	79802.95	Defect #12	1.01	NO	2005	One Clock Spring
CS1 CS2	80343.48	Defect #25	1.01	NO	2005	No clock springs needed
CS1 CS2	80486.34	Dig 27	1.01	NO	2006	No clock springs needed
CS1 CS2	82246.94	Defect #13	1.01	NO	2005	One Clock Spring
CS1 CS2	82419.76		1.27	NO	2004	One Clock Spring
CS1 CS2	83899.87	Defect #14	1.01	NO	2005	Two Clock Springs

CS1 CS2	83935.35	Defect #15	1.01	NO	2005	One Clock Spring
CS1 CS2	84958.43	KP 152.49	1.05	NO	2004	No clock springs needed
CS1 CS2	84971.27	Dig 30	1.01	NO	2006	No clock springs needed
CS1 CS2	85241.95	KP 152.81	1.01	NO	2004	No clock springs needed
CS1 CS2	85565.14	Defect #26	1.01	NO	2005	No clock springs needed
CS1 CS2	85615.29	Dig 31	1.01	NO	2006	Two Clock Springs
CS1 CS2	85679.32	Dig 32	1.01	NO	2006	No clock springs needed
CS1 CS2	88457.05	Defect #28	1.01	NO	2005	One Clock Spring
CS1 CS2	91966.91	Dig 33	1.01	NO	2006	No clock springs needed
CS1 CS2	92133.17	Dig 34	1.01	NO	2006	Three Clock Springs
CS1 CS2	92156.45	Dig 35	1.01	NO	2006	No clock springs needed
CS1 CS2	92174.52	KP 159.9	1.03	NO	2004	No clock springs needed
CS1 CS2	92875.5	Kp 160.6	1.08	NO	2005	One Clock Spring
CS2 CS3	2,051.20	KP 163.9	1.13	NO	2004	Two Clock Springs
CS2 CS3	2087.28	5094	1.05	NO	2007	Two Clock Springs
CS2 CS3	3311.22	4502	1.01	NO	1997	No clock springs needed
CS2 CS3	3477.34	Dig 37	1.01	NO	2006	No clock springs needed
CS2 CS3	49227.34	5147	1.02	NO	2004	No clock springs needed
CS2 CS3	49532.87	Dig 38	1.01	NO	2006	No clock springs needed
CS2 CS3	50,047.97	Dig 30	1.13	NO	2007	Two Clock Springs
CS2 CS3	73815.29	Dig 32	1.02	NO	2007	Two Clock Springs
CS3 CS4	61257.75	Dig 37	1.03	NO	2007	No clock springs needed
CS3 CS4	74645.4	Dig 40	1.01	NO	2007	No clock springs needed
CS3 CS4	80295.81	Dig 48	1.03	NO	2006	Three Clock Springs
CS3 CS4	90,914.12		1.07	NO	2004	The photo shows that the depth of the defect may have been over estimated. Based on 2008 new ILI run this defect will be prioritised accordingly.
CS5 CS6	15,409.24		1.04	NO	NO	Defect Assessed and passed effective area by 100kpa. It is noted that the defect could be longer and the quality of assessment is about 80%. Based on 2008 ILI run this defect will be considered for review.

APPENDIX 5
ANGASTON LATERAL ILI SURVEY RESULTS

Location (KP)	Type of Defect	Length (mm)	Width (mm)	Depth (%)	ERF RSTRENG	Internal	Comment
35.04	General	50	96	46	1.08	No	Defect grit blasted, FFP calculation performed and recoated
32.74	Circ Grooving	13	31	46	0.93	No	Poor coating condition, pitting cluster inactive, possibly due to the application of CP
31.45	Pitting	12	29	35	0.92	No	Poor coating condition, Pitting cluster inactive, possibly due to the application of CP
15.36	Circ Grooving	12	31	31		n/a	Internal defect most likely a manufacturing defect. Re-inspect following next ILI
33.52	Circ Grooving	15	30	29	0.93	No	Poor coating condition, pitting cluster inactive, possibly due to the application of CP
8.23	Pitting	14	29	26	0.92	No	Defect grit blasted and recoated
34.07	General	57	65	26		n/a	
8.23	Circ Grooving	13	30	24	0.92	No	Defect grit blasted and recoated
9.25	Pitting	12	14	24	0.92	No	
16.60	Circ Grooving	9	21	24	0.91	No	
32.63	Pitting	13	26	23	0.92	No	
30.59	l Circ Grooving	13	44	22	0.92	No	
34.10	Axial Grooving	94	15	22		n/a	
23.10	Pitting	26	24	21	0.94	No	
30.00	Circ Grooving	17	58	21	0.92	No	
30.02	Circ Grooving	11	38	21	0.92	No	
31.45	Pitting	11	21	21	0.92	No	
25.46	Pitting	25	23	21		n/a	
7.72	Pitting	21	17	20	0.93	No	
11.45	Pitting	18	26	20	0.92	No	
22.29	Pitting	11	14	20	0.92	No	
34.08	Pitting	49	68	20		n/a	

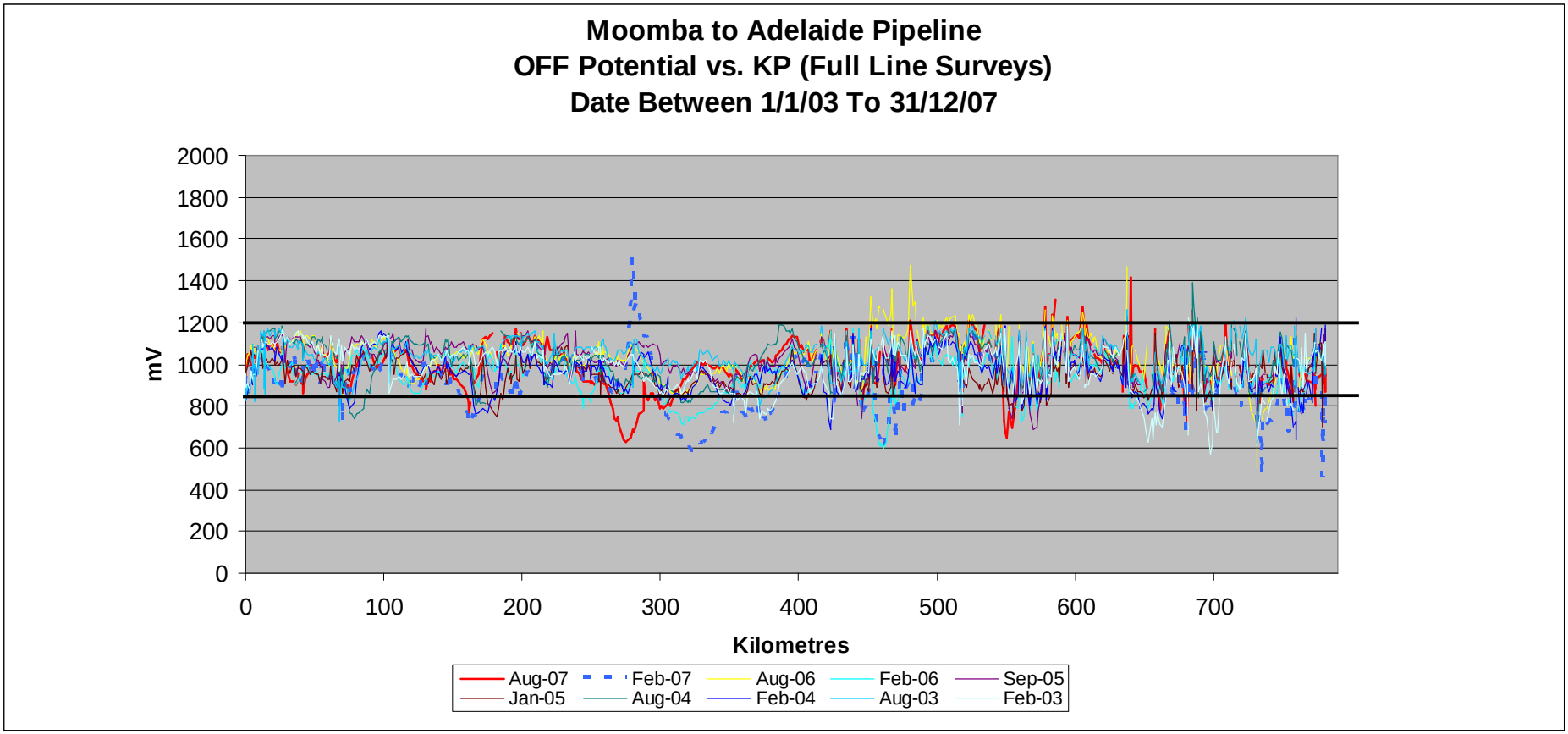
APPENDIX 6
PORT PIRIE AND WHYALLA LATERAL ILI RESULTS

Log Distance	Type of Defect	Length (mm)	Depth (%)	ERF RSTRENG	Internal	Comment
53919.77	Cluster	64	17	0.98	Yes	Further investigation planned to verify ILI results and internal corrosion.
18228.58	Cluster	41	14	0.95	No	Further investigation planned due to defect length
41600.06	Metal loss corrosion	19	30	0.94	Yes	Further investigation planned to verify ILI results and internal corrosion.
39745.8	Metal loss milling feature	2	24	n/a	Yes	
26746.46	Metal loss corrosion	9	21	0.92	No	
27981.97	Metal loss corrosion	9	21	0.92	No	
45204.53	Metal loss corrosion	11	21	0.92	No	
12860.01	Metal loss corrosion	10	20	0.92	No	
61737.29	Metal loss corrosion	10	20	0.92	No	
6949.85	Metal loss milling feature	23	20	n/a	Yes	
11979.48	Metal loss milling feature	14	22	n/a	Yes	Further investigation planned to verify ILI result and internal corrosion

APPENDIX 7
DCVG SURVEY RESULT

Survey Date	Pipeline	Location (KP)	%IR	Remarks
2002	Burra Lateral	7.853	22	April 03, coating repair only, no SCC
2002	Peterborough Lateral	0.599	16	April 03, coating repair only, no SCC
2002	Port Bonython Lateral	4.625	14	April 03, Southern Cross Off take Valve
2002	Port Pirie Lateral	52.424	46	April 03, coating repair only, no SCC
2002	Port Pirie Lateral	72.798	46	
2002	Whyalla Lateral	41.2	56	April Valve No 2 supports repainted
2002	Whyalla Lateral	70.955	44	April 03, coating repair only, no SCC
2002	Whyalla Lateral	0.009	58	April 03, coating repair only, no SCC
June 2003	Wasleys to TI	0.12	21	July 03 Anchor Block
June 2003	Wasleys to TI	750.002	40	April 04 coating blistered, stripped, blasted and recoated
June 2003	Wasleys to TI	750.052	29	April 04, Anchor Block
June 2003	Wasleys to TI	764.349	16	Resurvey 2008 planned to validate results
June 2003	Wasleys to TI	764.530	19	Resurvey 2008 planned to validate results
June 2003	Wasleys to TI		27	Resurvey 2008 planned to validate results
June 2003	Wasleys to TI		21	Resurvey 2008 planned to validate results
June 2003	Wasleys to TI	773.004	30	Resurvey 2008 planned to validate results
June 2003	Dry Creek Lateral		20	Resurvey 2008 planned to validate results
June 2003	Taperoo Lateral	0.218	42	Resurvey 2008 planned to validate results
June 2003	Taperoo Lateral	0.227	35	Resurvey 2008 planned to validate results
June 2003	Taperoo Lateral	0.856	15	Resurvey 2008 planned to validate results
2004	Moomba Plant to KP 30	D/S Moomba		Total survey distance 30 km
2004	CS1 to Kp 97.9	D/S CS1		Total survey distance 30 km
2004	CS2 to Kp 191.3	D/S CS2		Total survey distance 30 km
2004	CS3 to Kp 263.9, Kp 280 to Kp 286.3	D/S CS3		Total survey distance 22.4 km
2004	CS4 to Kp 382.8	D/S CS4		Total survey distance 30 km
2004	CS5 to Kp 463.6, 464.9 to 469.7, 471.3 to 474.5.	D/S CS5		Total survey distance approx 26.8 km
2004	CS6 from Kp 542.9 to Kp 565.4	D/S CS6		Total survey distance 22.5 km
2004	CS7 Kp 648.2 to Kp 668.4	D/S CS7		Total survey distance 20.2 km
2007	Whyalla & Pt Pirie Laterals	24 defects	> 15	Engineering Review to occur and assess
2007	Angaston Lateral	168 defects	> 15	Engineering Review to occur and assess
2007	Burra Lateral	1 defect	> 15	Engineering Review to occur and assess
2007	CS3 Loop	0 defects	> 15	Engineering Review to occur and assess
2007	Peterborough Lateral	2 defects	> 15	Engineering Review to occur and assess

APPENDIX 8
MAP FULL LINE OFF POTENTIAL SURVEY RESULTS



APPENDIX 9
CATHODIC PROTECTION GROUND BED REPLACEMENTS

2003		2004		2005		2006		2007	
Pipeline	Location (KP)	Pipeline	Location (KP)	Pipeline	Location (KP)	Pipeline	Location (KP)	Pipeline	Location (KP)
MAP	Peterborough (KP 559.8)	MAP	Moomba (KP 4.5)	MAP	Mulligan Creek (KP 184.8)	MAP	CS1 Site (KP 67.7)	MAP	CS2 -22 inch (KP 161.4)
MAP	Salter Springs (KP 700.6)	MAP	Tinga North (KP 77.1)	MAP	Mound Springs (KP 188.1)	MAP	Carraweena (KP 116.6)	MAP	Mulligan Creek (KP 184.8)
MAP	Gawler River (748.2)	MAP	Yerila Creek (KP 172.10	MAP	Curnamona (KP 405.2)	MAP	Moorowie Bore Solar (KP 328.2)	MAP	Mosquito Creek (KP 192)
MAP	Kempes Bore (KP 376.7)	MAP	CS4 (KP 352.8)	MAP	Morgan East (KP 554.3)	MAP	CS4 Site (KP 352.8)	MAP	Wertaloona (KP 305.3)
MAP		MAP	Willipa (KP 423)	MAP	Farrell Flat – KP 645	MAP	Baratta (KP 461.5)	MAP	Sleeps Farm (KP 549.4)
		MAP	Wasleys (KP 731.9)	MAP	Elizabeth meter station (KP 759.7)	MAP	Cavenagh (KP 518.2)	MAP	Baratta (KP 461.5)
		Port Pirie Lateral	Galdstone (KP 44.9)	Pelican Point	Replaced anodes on Torrens Island at take off point	MAP	Bermuda Well (KP 564.5)	MAP	CS4 ? Pipe or Station (KP 352.8)
		Port Pirie Lateral	Hughes Gap (KP 56.8)	Osborne Lateral	Eight zinc earthing anodes on Torrens Island at take off	MAP	Gumbowie (KP 570.0)	MAP	CS5 Station (KP 444.8)
		Pelican Point	Replaced anodes at Pelican Point meter station	Osborne Lateral	Replaced earthing anodes at Osborne meter station	MAP loops	CS1 Magnesium anodes (KP 69.1)	MAP	Mintaro M/S (KP 665.8)
		Angaston Lateral	Wasleys East (KP 7.5)	Angaston Lateral	Schuster Road (KP 15.4)	MAP loops	CS2 Magnesium anodes (KP 72.0)		
		Angaston Lateral	Daveyston (KP 26.6)			MAP loops	CS3 Magnesium anodes (KP 253.7)		
		Angaston Lateral	Angaston (KP 38.4)			Whyalla	Anodes require replacement (KP 87.80)		