



**FITNESS FOR PURPOSE REPORT
2002**

for

**Pipeline Licence No 6
RIVERLAND PIPELINE SYSTEM**

**Document No JDK-TR-1026-01
February 2003**

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

1. EXECUTIVE SUMMARY	6
2. FACILITY AND DESCRIPTION	7
2.1 OVERVIEW	7
2.2 PIPELINE	8
2.2.1 PIPELINE DESCRIPTION AND SPECIFICATION	8
2.2.2 LATERAL DESCRIPTION AND SPECIFICATION	9
2.3 COMPRESSOR STATION	10
2.4 METER STATIONS	10
2.5 PIG TRAP FACILITIES	15
2.6 MAIN LINE VALVES	15
2.7 RIGHT OF WAY (ROW)	16
2.7.1 ACCESS ROADS	16
2.8 PIPELINE MONITORING SYSTEMS	16
2.8.1 COMMUNICATION and SCADA SYSTEM	16
2.8.2 LEAK DETECTION SYSTEM	17
3. RISK ASSESSMENT SUMMARY	18
3.1 AS2885 PIPELINE RISK ASSESSMENT	18
3.2 HAZOP RISK ASSESSMENT	18
4. FITNESS FOR PURPOSE STATEMENT	19
4.1 GROUNDS FOR FITNESS FOR PURPOSE	19
4.1.1 OVERVIEW OF GROUNDS FOR FITNESS FOR PURPOSE	19
4.1.2 EPIC ENERGY SAFETY POLICY	20
4.1.3 EPIC ENERGY ENVIRONMENTAL POLICY	21
4.1.4 LANDOWNER LIAISON	22
4.1.5 EMERGENCY RESPONSE POLICY	23
4.1.6 MAINTENANCE PROGRAM	24
4.1.6.1 Maintenance	24
4.1.6.2 Computerised Maintenance Management System	24
4.1.6.3 Work Instructions	24
4.1.7 FIELD PERSONNEL	24
4.1.7.1 Training/Competency	24
4.1.7.2 Experience	25
4.1.8 AUDITS	25
4.2 PHYSICAL ASSESSMENT OF FACILITIES	25

4.2.1	PIPELINE	25
4.2.1.1	Corrosion Control	25
4.2.1.1.1	Performance	26
4.2.1.1.2	Internal Corrosion	26
4.2.1.1.3	Coating Condition	26
4.2.1.2	DCVG Surveys and Pipeline Excavations	26
4.2.1.3	Conclusion on Pipeline Condition	27
4.2.1.3.1	Pipeline Coating Condition	28
4.2.1.3.2	Cathodic Protection System	28
4.2.1.3.3	Pipeline Integrity	28
4.2.2	MAIN LINE VALVES	29
4.2.2.1	Plant and Equipment	29
4.2.2.2	Site Security	29
4.2.2.3	Environmental Conditions	29
4.2.3	METER STATIONS	29
4.2.3.1	Plant and Equipment	29
4.2.3.2	Buildings and Enclosures	30
4.2.3.3	Site Security	30
4.2.3.4	Environmental Conditions	30
4.3	MANAGEMENT SYSTEMS	31
4.3.1	SAFETY MANAGEMENT SYSTEMS	31
4.3.2	ENVIRONMENTAL MANAGEMENT	32
4.3.3	EMERGENCY RESPONSE	33
4.3.4	MAINTENANCE PROGRAM	33
4.3.4.1	Maintenance	33
4.3.4.2	Maximo	33
4.3.4.3	Work Instructions	33
4.3.5	FIELD PERSONNEL	33
4.3.5.1	Training	33
4.3.5.2	Experience	34
4.3.6	AUDITS	34
4.3.6.1	Class Location Changes	35
4.3.7	RIGHT OF WAY MAINTENANCE	35
4.3.7.1	Wash Outs	35
4.3.7.2	Signage	35
4.3.7.3	Road Patrols	35
4.3.7.4	Pipeline Location Service	35
4.3.7.5	Landholder Contact Program	36
4.4	OTHER RELEVANT INFORMATION	36
4.4.1	PIPELINE THROUGHPUT	36
4.4.2	PIPELINE SECURITY	36
4.4.3	OTHER REPORTING REQUIREMENTS	36
4.4.4	OTHER RELEVANT INFORMATION	36
4.4.5	FUTURE OPERATIONS	37
4.5	ADVERSE FACTORS	37
4.5.1	REPORT ON HAZARDS TO THE PIPELINES	37
4.6	FITNESS FOR PURPOSE SUMMARY	38
5.	CONCLUSIONS	39
6.	RECOMMENDATIONS	40
7.	APPENDICES:	41

7.1	Appendix 1 : Pipeline Cathodic Protection Potential Profiles	41
7.2	Appendix 2: DCVG Coating Survey Results (June 2000)	41

LIST OF ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
AS2885	Australian Standard 2885 – Pipelines- Gas and Liquid Petroleum
CHRIS	Complete Human Resources Integrated System
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
GPS	Geographical Positioning System
HAZOP	Hazard Operability
KP	Kilometre Point
LMS	Land Management System
MAOP	Maximum Allowable Operating Pressure
MAP	Moomba to Adelaide Pipeline
MLV	Mainline Valve
NB	Nominal Bore
NGL	Natural Gas Liquid
P&ID	Piping and Instrumentation Drawing
PIRSA	Primary Industries and Resources of South Australia
PSV	Pressure Safety Valve
ROC	Remote Operation Controller
ROW	Right of Way
SCADA	Supervisory Control and Data Acquisition
SEO	Statement of Environmental Objectives
SMS	Safety Management System
TSCC	Transportation Services Control Centre

1. EXECUTIVE SUMMARY

Envestra owns the Riverland Pipeline System that consists of a pipeline from Angaston to Berri and Sedan to Murray Bridge. This pipeline system is licensed under Pipeline Licence 6 and is operated and maintained by Epic Energy, on behalf of Origin Energy Limited [Asset Management]. The term of PL6 is 21 years, commencing 27th of January 1994 to 26th of January 2015. The Petroleum Act 2000 requires a Fitness for Purpose Report to be completed for the Riverland Pipeline System at five-yearly intervals.

The Riverland Pipeline System supplies natural gas to the Berri and Murray Bridge areas with the main pipeline 114mm diameter and approximately 231 kilometres in length. The system is made up of two 114mm laterals from Angaston to Berri and Sedan to Murray Bridge. Three minor laterals 60.3mm in diameter are not covered by PL6, because they are distribution pipelines, which operate at 1400 kPa and are not covered by AS 2885.

The Standard requires that they are risk assessed every five years, which has been included in this Fitness for Purpose report. Along the pipeline, there are ten manually operated mainline valves, two major gate stations and 11 regulated metering stations. The pipeline system has an external corrosion prevention system to protect the buried pipeline from corrosion.

A detailed Risk Assessment of the Pipeline System was completed by Epic Energy in October 1999. Epic Energy contributed to an Environmental Risk Assessment of the Riverland Pipeline System, conducted by Origin Energy and facilitated by Mr Bob Anderson of Kinhill Brown & Root, in August 2002.

A Risk Assessment of the Riverland System management processes was carried out by Origin Energy and facilitated by Ibis Business Solutions in October 2002.

The last Direct Current Voltage Gradient (DCVG) survey was conducted in June 2000.

The last Emergency Response Exercise was carried out in February 2001.

Based on the physical assessment of the Pipeline, a review of the management systems governing the manner in which the Pipeline is operated and maintained and all other relevant information, the Riverland Pipeline System is assessed as being in good condition and fit for current and future purpose, for at least the next five years.

2. FACILITY AND DESCRIPTION

2.1 OVERVIEW

The Petroleum Act 2000 requires a Fitness for Purpose Report to be completed for the Riverland Pipeline System at five-yearly intervals. This Report must be submitted to the regulatory authority, Primary Industries and Resources South Australia for approval.

The Riverland Pipeline System transports odorised natural gas for domestic and light industrial customers in the Berri and Murray Bridge area, with gas processed from Moomba and transported to the Riverland system via the Epic Energy owned Moomba – Adelaide Pipeline. The gas in the Riverland pipeline system is odorised via an Origin Energy owned odorant injection facility located at the Riverland Pipeline System off-take from the Moomba to Adelaide Pipeline at Wasleys.

The design parameters and description of the facilities for the Riverland Pipeline are provided in the following sections.

2.2 PIPELINE

2.2.1 PIPELINE DESCRIPTION AND SPECIFICATION

	Angaston - Berri	Sedan - Murray Bridge
Commissioned	October 1994	December 1994
Length, km	167	64.1
Diameter [OD [mm	114.3	114.3
Wall Thickness : Normal	3.0	3.0
Wall Thickness : Special Crossings, roads, rivers	4.8	4.8
Wall Thickness : MLV sites	4.8	4.8
Pipe Grade	API 5L X42	API 5L X42
Pipe Jointing Method	Mechanical joints [Zaplock]	Mechanical joints [Zaplock]
MAOP, kPa	10,000 kPa	10,000 kPa
Pipe Supplier	Tubemakers	Tubemakers
Coating : Main Pipe	Co-extruded mastic and polyethylene system [Yellow jacket]	Co-extruded mastic and polyethylene system [Yellow jacket]
Coating : Field joints	Polyethylene/Butylmastic tape system	Polyethylene/Butylmastic tape system
Coating : Special crossings	Fusion Bonded Epoxy [including 5 km downstream of Angaston compression station]	Fusion Bonded Epoxy [including 5 km downstream of Angaston compression station]
Mainline Valves	8	2
Actuators	0	0
Scraper Stations	Provisions made	Provisions made
Meter stations	7	2

Table 1 Pipeline Description / Specification

2.2.2 LATERAL DESCRIPTION AND SPECIFICATION

	Tooravale Lateral	Visy Board Lateral	National Dairies Lateral
Date commissioned	October 1994	October 1994	December 1994
Length, km	2.33	0.46	1.83
Diameter [OD] mm	60.3	60.3	60.3
Wall Thickness : Normal	3.2	3.2	3.2
Wall Thickness : Special Crossings, roads, rivers	3.2	3.2	3.2
Pipe Grade	API 5L X42	API 5L X42	API 5L X42
Pipe Jointing Method	Welded	Welded	Welded
MAOP, kPa	1800	1800	1800
Pipe Supplier	Tubemakers	Tubemakers	Tubemakers
Coating : Main Pipe	Co-extruded mastic and polyethylene system [Yellow jacket]	Co-extruded mastic and polyethylene system [Yellow jacket]	Co-extruded mastic and polyethylene system [Yellow jacket]
Coating : Field joints	Polyethylene/Butyl mastic tape system	Polyethylene/Butyl mastic tape system	Polyethylene/Butyl mastic tape system
Mainline Valves	2	2	2
Actuators	0	0	0
Scraper Stations	No	No	No
Meter stations	1	1	2

Table 2. Laterals Description and Specification

2.3 COMPRESSOR STATION

Epic Energy own and operate an electric motor driven compressor located at the inlet of the Riverland Pipeline System at the Angaston meter station.

The Gemini HPD model compressor consists of a 2 cylinder reciprocating compressor, driven by a 150 kW/200 HP electric motor, with a flow capacity of 5200 standard cubic meters per hour.

For environmental reasons, the compressor is not depressurised or blown down when stopped or shut down, except in an ESD situation. The unit has two relief valves, fast & slow. The fast one is always kept closed except when an ESD exists. The slow one is used to depressurise the unit to 900 kPa during start up.

The compressor unit has a capacity of 8280 kPa maximum working pressure and the relief valves are set at 8620 kPa.

2.4 METER STATIONS

Ten of the 13 meter stations on the Riverland System are maintained by Epic Energy under the O & M contract and three stations (Berri Township, Murray Bridge Township and a regulator station at McKay Road) are operated by Origin Energy. The ten stations operated by Epic Energy were designed for reliability and low maintenance.

The reliability of these stations is enhanced by having active monitor regulators with pressure sensing between each regulator. This ensures Epic's Control Centre is aware within seconds of the active regulator failing.

All stations are protected with an over pressure valve controlled by the on site flow computer. If the flow computer senses an increase in pressure, the valve will shut and re-open when sales pressure falls to the correct level.

A further protection is given to each site by using a small relief valve in the event of a regulator or pressure valve passing when the station is shut in. Should the sales pressure increase, the relief will vent off small amounts of gas to ensure the downstream equipment is protected. The Epic Control Centre will be aware of a high-pressure alarm before the relief valve operates. This added protection is taken to minimise methane emissions to atmosphere as well as preventing over pressurising the customer's equipment.

The facilities operated by Origin Energy also have telemetry installed and alarm conditions eg. over pressure, slam shut valve operation are monitored by the Origin Energy Control Centre.

All stations have either a large dust filter installed or a "Y" type stainer at the inlet pipework. The two main gate stations, Murray Bridge and Berri, have high quality dust filters installed to filter all gas being supplied to the smaller meter stations.

At all meter stations and laterals downstream of the gate stations, the pressure has been reduced to 1400 kPa and metered prior to being supplied. This metering is part of the specification break system.

Berri Gate Station

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	600 #
Active Regulator	Fiorentini Aperflux	1400 kPa
Monitor regulator	Fiorentini Aperflux	1450 kPa
Filter	Pall Filter	600#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 1600 kPa Opens @ 1450 kPa
Relief valve	None	
Telemetry	Continuous monitoring	

Murray Bridge Gate Station

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	600 #
Active Regulator	Fiorentini Aperflux	1400 kPa
Monitor regulator	Fiorentini Aperflux	1450 kPa
Filter	Pall Filter	600#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 1600 kPa Opens @ 1450 kPa
Relief valve	None	
Telemetry	Continuous monitoring	

Berrivale Cannery

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	100 kPa
Monitor regulator	Fiorentini Aperflux	120 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 130 kPa Opens @ 100 kPa
Relief valve	Fisher FS298H-43	160 kPa
Telemetry	Continuous monitoring	

Berrivale Orchards

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	100 kPa
Monitor regulator	Fiorentini Aperflux	120 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 130 kPa Opens @ 100 kPa
Relief valve	Fisher FS298H-43	160 kPa
Telemetry	Continuous monitoring	

Tooravale

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	50 kPa
Monitor regulator	Fiorentini Aperflux	60 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 70 kPa Opens @ 50 kPa
Relief valve	Fisher FS298H-43	100 kPa
Telemetry	Continuous monitoring	

Tarac

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	50 kPa
Monitor regulator	Fiorentini Aperflux	60 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 70 kPa Opens @ 50 kPa
Relief valve	Fisher FS298H-43	100 kPa
Telemetry	Continuous monitoring	

Visy Board

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	50 kPa
Monitor regulator	Fiorentini Aperflux	60 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 70 kPa Opens @ 50 kPa
Relief valve	Fisher FS298H-43	100 kPa
Telemetry	Continuous monitoring	

National Dairies

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	50 kPa
Monitor regulator	Fiorentini Aperflux	60 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 70 kPa Opens @ 50 kPa
Relief valve	Fisher FS298H-43	100 kPa
Telemetry	Continuous monitoring	

BLR Hardies

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	50 kPa
Monitor regulator	Fiorentini Aperflux	60 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 70 kPa Opens @ 50 kPa
Relief valve	Fisher FS298H-43	100 kPa
Telemetry	Continuous monitoring	

Metro Meats

Equipment List	Type	Set Point/Rating
Meter	Schlumberger Fluxi 100mm	150 #
Active Regulator	Fiorentini Aperflux	50 kPa
Monitor regulator	Fiorentini Aperflux	60 kPa
Filter	Clam 76 Micron	150#
Flow computer	Fisher ROC 312	
Control valve	Fiorentini ball valve	Closes @ 70 kPa Opens @ 50 kPa
Relief valve	Fisher FS298H-43	100 kPa
Telemetry	Continuous monitoring	

McKay Road:

Equipment List	Type	Set Point/Rating
Meter	No meter installed	-
Filter	Clam strainer 50mm	Class 300
Active stream active	Axial flow valve 50mm	Class 300 set 100 kPa
Active stream monitor	Axial flow valve 50mm	Class 300 set 140 kPa
Standby stream active	Axial flow valve 50mm	Class 300 set 80 kPa
Standby stream monitor	Axial flow valve 50mm	Class 300 set 120 kPa
Relief valve	Axial flow valve 80mm	Class 300 set 170 kPa
Instrumentation Telemetry	Pressure alarms Slam shut alarm	
Slam shut actuator	Keystone	Set at 160 kPa

Berri Township:

Equipment List	Type	Set Point/Rating
Meter	Elster GI-150, 80mm	Class 150
Filter	Clam strainer, 50mm	Class 600
Active Stream; Active regulator	Axial flow valve (AFV) 50mm	Class 600/140 kPa
Monitor regulator	AFV, 50mm	Class 600/160 kPa
Standby stream; Active regulator	AFV, 50mm	Class 600/100 kPa
Monitor regulator	AFV, 50mm	Class 600/120 kPa
Slam shut valve	Tartarini BMS/Horizontal	Class 600/200 kPa
Relief valve	AFV, 100mm	Class 300/250 kPa
Instrumentation	Inline P&T correcting Instruments	
Telemetry	Alarm conditions	

Murray Bridge Township:

Equipment	Type	Rating/Set Point
Meter	Elster G250, 80mm	Class 300
Filter	Clam strainer, 50mm	Class 300
Active Stream; Active regulator	Axial flow valve (AFV) 50mm	Class 300/330 kPa
Monitor regulator	AFV, 50mm	Class 300/370 kPa
Standby stream; Active regulator	AFV, 50mm	Class 300/350 kPa
Monitor regulator	AFV, 50mm	Class 300/390 kPa
Relief valve	AFV, 80mm	Class 300/420 kPa
Instrumentation	Inline, pressure and Temperature correcting instrument	
Telemetry	Alarm conditions	
Slam shut actuator	Keystone	Set 410 kPa

2.5 PIG TRAP FACILITIES

There are no pig launcher or receiver vessels installed on the Riverland Pipeline system. 100mm x 600# " Sure Close " IPSCO flanges have been installed at both ends of the Angaston to Berri Pipeline Lateral, at MLV 5 and at each end of the Murray Bridge lateral. This will allow easy fitting of pig trap assemblies if required in the future. Pig trap vessels have not been fabricated for this system to date. This will also enable the Angaston to Berri section to be pigged in two sections and the Sedan to Murray Bridge Lateral in one section.

2.6 MAIN LINE VALVES

Most of the main line valves are installed in pits. Exceptions are Berri MLV1, which is in the Angaston compound, MLV8, which is in the Berri meter station compound and Murray Bridge MLV2, which is in the Murray Bridge compound.

Berri MLV's 2, 4, 6, and Murray Bridge MLV1 are fitted with bypasses and vents. These allow for blowing down the line as required and for emergency work in the future, if such an occurrence arises.

Berri MLV 2 and Murray Bridge MLV 1 have check valves associated with them. They are automatic protection in the event of a line failure and will work in conjunction with the three line break valves.

The main line valves and check valves are full bore allowing for pigging of the pipeline system at a future date if required.

The pits for the buried MLV's are concrete. They extend 150mm above ground level and to a depth below the pipe. They are supported on concrete blocks to eliminate any settling effects and contact with the pipe. Sandbags have been used on the inside edge to hold back any soil and a gravel base has been used

as a drain and provides a suitable work surface. The pits are also vented to atmosphere.

The pits have an aluminium cover and are secured with metal braces and padlocks.

2.7 RIGHT OF WAY (ROW)

The ROW is inspected monthly by vehicle to ensure there are no identifiable leaks, no threats to the pipeline from third party activities or any environmental incidents on or near the pipeline easement. There have been very few incidents of unauthorised encroachment on the Riverland Pipeline System. In the five year period to 2002, there have been two recorded encroachments; one was located during the routine road patrol and the second resulted from a request for a pipeline location.

The first incident (in 2001) occurred when a landowner on the Tooravale Lateral requested a pipeline location to extend his vineyard. It was determined no Pipeline Easement had been claimed during construction and the landowner had to be compensated for a new easement and not being able to develop his vineyard. Work was stopped prior to any physical development work that could have threatened the pipeline.

The second encroachment (in 2002) resulted from a landowner constructing a fence across the Murray Bridge Pipeline easement without notification. A hole for a fence post was completed with a hand operated posthole borer without authorisation. The landowner was made aware of the potential of pipeline and coating damage from this type of incident and how it can interfere with the cathodic protection system, resulting in possible corrosion. The owner was also made aware of the penalties that exist under the SA Petroleum Act for unauthorised work on a pipeline easement.

2.7.1 ACCESS ROADS

Access to all above ground facilities and MLV sites on the Riverland Pipeline System can be gained via sealed public roads.

2.8 PIPELINE MONITORING SYSTEMS

2.8.1 COMMUNICATION AND SCADA SYSTEM

The reasons for providing SCADA on the Riverland Pipeline System are to enable monitoring of a leak detection system, assist with the safe and economic operation of the pipeline system and to provide Epic Energy and Origin Energy with information for their needs and customer information.

Epic Energy operates and controls the Riverland Pipeline for Origin Energy from the Transportation Services Control Centre (TSCC) in Perth, Western Australia, using a licensed Metso SCADA System. The Riverland Pipeline system can also be monitored and controlled from Epic Energy's emergency backup control centre in Dry Creek, South Australia. Data acquisition from all sites is via Telstra leased lines allowing continuous monitoring at all sites.

Alarming, eventing and historic data collection is performed by the SCADA system.

The Epic Energy SCADA system is a distributed, dual redundant SCADA system, which utilises Epic Energy and Telstra communications infrastructures to communicate to Fisher ROC RTU's for the monitoring and control of the Riverland Pipeline system. Riverland Pipeline facilities at Angaston, Murray Bridge and Berri are monitored and controlled by the SCADA system.

2.8.2 LEAK DETECTION SYSTEM

The leak detection system implemented is an extension of Epic Energy's existing system. This is a continuously monitored line volume balance system that runs on a minute by minute basis. The section including Angaston to Murray Bridge and Berri is treated as a single entity and separate from other Epic Energy leak detection segments. In addition to this system, a rupture detection system has been implemented based on "rate of pressure drop".

3. RISK ASSESSMENT SUMMARY

3.1 AS2885 PIPELINE RISK ASSESSMENT

In October 1999, Epic Energy facilitated a Pipeline Risk Assessment of the Riverland Pipeline System. This risk assessment was conducted in accordance with AS2885.1 and the associated *HB105-1998: Guide to pipeline risk assessment in accordance with AS2885.1*.

This Risk Assessment was limited to the pipeline and did not address the above ground facilities on the Pipeline system.

The intent of the Pipeline Risk Assessment was to update the diverse locations through which the pipeline passes and review the potential threats to and from the pipeline. Moreover, the Risk Assessment process ensured that all possible threats at the different locations are identified, evaluated and appropriately managed.

The study indicated the risk to the pipeline is, in general, at an acceptable level. Following the review of the location and non-location specific threats to the pipeline, 16 action items resulted and 15 have been completed to date.

The outstanding action item to be completed is to eliminate the danger to the pipeline and persons working on the pipeline from currents induced by high voltage power lines. In March 2001, Phil Cheeseman and Associates carried out a Low Frequency Induction Assessment and determined 27 zinc anodes to be installed to mitigate LFI and the associated risks. This work will be completed in 2003.

Epic Energy have developed and implemented a Safe Work Instruction for the use of earth mats for personnel protection when working on the pipeline system as a temporary measure until the zinc anode system has been installed.

3.2 HAZOP RISK ASSESSMENT

No formal Hazard and Operability study of the above ground facilities on the Riverland Pipeline System was carried out as part of the Risk Assessment process in 1999.

A HAZOP of meter stations, MLV sites and other above ground facilities is scheduled for completion in 2003.

4. FITNESS FOR PURPOSE STATEMENT

The Riverland Pipeline System was constructed and commissioned in 1994. The pipeline has a Maximum Allowable Operating Pressure of 10,000 kPa but generally operates between 3,500 and 7,500 kPa. The Pipeline was designed for the express purpose of transporting natural gas from the Moomba to Adelaide Pipeline to the Berri and Murray Bridge areas for Origin Energy.

A “Risk Assessment” in accordance with AS2885, conducted in 1999, confirmed that there are no threats to the asset, which are not being managed appropriately and that the asset poses an acceptable risk to public health, safety and the environment.

The Pipeline is being operated and maintained by Epic Energy, an experienced Australian pipeline owner and operator. Epic Energy has appropriate management systems in place to ensure the integrity of the Pipeline is maintained at all times.

Above ground coating surveys, coating inspections during excavations and analysis of data collected during pigging operations of the MAP confirm that internal and external corrosion would be minimal and acceptable.

Noting the above, the Riverland Pipeline System is assessed as being in good condition and fit for current and future purpose.

4.1 GROUNDS FOR FITNESS FOR PURPOSE

4.1.1 OVERVIEW OF GROUNDS FOR FITNESS FOR PURPOSE

The Fitness for Purpose statement in Section 4 is made on the basis of:

- 1999 AS 2885 Pipeline Risk Assessment;
- 2000 Coating defect survey [DCVG];
- 2002 Environmental Risk Assessment;
- Coating and pipeline inspections and assessments during excavations;
- Physical assessment of above ground facilities during routine maintenance activities;
- 2002 Risk Assessment of the Riverland System management processes;
- Audits of Epic Energy’s management systems;
- Lessons learned from Emergency Response Exercises; and
- A training review of people employed to operate and maintain the asset.

4.1.2 EPIC ENERGY SAFETY POLICY

Safety is our most important value

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

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 it.
- 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 which ensures that employees are not, as far as reasonable practicable, exposed to risks which may effect 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 interested parties.
- Review the OHS policy periodically to ensure relevance, in line with our business.

Sue Ortenstone

Chief Executive Officer

4.1.3 EPIC ENERGY ENVIRONMENTAL POLICY

Epic Energy Operates in an Environmentally Friendly Manner

Epic Energy is Australia's largest gas transmission company, who construct, own and/or operate 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 be increasingly responsible in their management of environmental issues.

To achieve this, Epic will:

- Ensure that it continues to research into and apply new technologies and procedures that reduce the impact of its activities on the environment.
- 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.
- Minimise land and habitat disturbance by adopting best proactive environmentally sensitive means where no other requirements exists.
- Promote open communication with landholders and interested parties.
- Avoid disturbance to known or identified 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.

Sue Ortenstone
Chief Executive Officer

4.1.4 LANDOWNER LIAISON

An integral part of Epic Energy's Environmental Management System and thereby compliance with the Environmental Policy is landowner liaison. There are a total of 81 landowner/residents whose property is crossed by the Riverland Pipeline.

A property owner contact scheme is operated by Epic Energy. The Land Management Officer visits each owner or occupier along the Riverland Pipeline annually.

Other contacts made by Field Maintenance Officers and Superintendents during the course of daily business or other land related issues that arise occasionally are recorded in our Land Management System.

Land Management is supported by dedicated LMS software that provides a powerful data base and MapInfo facilities. All property details and notes relating to discussions or issues with the property owners are recorded in the LMS. Through its MapInfo facility, an image of the cadastral boundaries of each property relative to the pipeline route can be displayed for any property. During the year, each property owner dwelling has been captured by GPS and will be displayed on the pipeline/cadastral plans.

If personal contact cannot be made, the occupier or owner is telephoned or mailed a letter explaining the reason for the visit. The contact officer's business card and an information brochure on the pipeline are included.

Safety and our "**Dial Before You Dig**" contact phone number are left at all unattended residences visited. All property owners receive a pipeline safety brochure.

These items all contain our "**Dial Before You Dig**" contact phone number and strongly reinforce safe working practices near high pressure pipelines.

A hard file is maintained for each of the land parcels crossed by the Riverland Pipeline.

Public awareness presentations for the Riverland Pipeline are held annually at regional centres such as Mannum, Murray Bridge, Swan Reach or Berri. Up to two presentations are made annually. Local earthmoving contractors, utilities and emergency service providers are specifically targeted for attendance of these information evenings.

The focus of these presentations are on the specific nature and characteristics of the products carried by the Pipeline, the route of the pipeline, basic information about the pipeline and its monitoring, control and emergency procedures.

4.1.5 EMERGENCY RESPONSE POLICY

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

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

Epic Energy will maintain a comprehensive team structure, equipment and services, all of which are tested regularly to ensure their preparedness and responsiveness to emergency events.

To enable this, the Emergency Response Manual and the mapped business process of *Responding to Breakdowns and Emergencies* shall be utilised.

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

Epic Energy's Emergency Response will follow a process based on Incident Command System that will work towards the establishment and maintenance of a uniform, fully integrated, well-coordinated response effort. Its aim will be to move the response from a reactive to a pro-active 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 will be utilised in achieving this aim.

Under PL6, an Emergency Response Exercise is required to be carried out every two years. Epic Energy reviews and tests its preparedness to respond to an emergency as follows:

- The first emergency response exercise on each pipeline system is performed as a desktop exercise;
- The second emergency response exercise on each pipeline involves considerable mobilisation and limited involvement of external parties; and
- The third emergency response exercise on each pipeline system involves full mobilisation and maximum involvement of external parties.

Epic Energy has conducted two emergency response exercises on the Riverland pipeline system in the last 5 years with the most recent being held on 15th of February 2001.

4.1.6 MAINTENANCE PROGRAM

4.1.6.1 Maintenance

Epic Energy's Maintenance Program is designed to provide timely, quality and cost-effective service along with technical guidance in support of operating facilities. This drives action rather than reaction and ensures that assets are maintained to support the required level of reliability, availability, output capacity and quality. This is to be fulfilled within a working environment fostering safety, high morale and job fulfilment for all members, while protecting the environment.

The program outlines Epic Energy's maintenance organisation, detailing maintenance commitment and resource structure and work control philosophy.

The maintenance commitment 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 their responsibilities in the maintenance organisation.

The work control philosophy details the methodology on how the work is to be controlled.

4.1.6.2 Computerised Maintenance Management System

Maximo is the Computerised Maintenance Management System (CMMS) utilised by Epic Energy to implement the Maintenance Program. The CMMS is the work management tool for planning, scheduling, executing and controlling the maintenance work.

4.1.6.3 Work Instructions

Work Instructions are a method statement of how routine maintenance or project work is to be progressed. All works on Epic Energy owned and operated sites, that may in any way constitute a safety hazard or could impact on the integrity of the system, must have a Work Instruction developed for the work to be performed, prior to work commencing.

The intent of the Work Instruction is to enable a competently trained person to carry out a task in a manner that does not compromise the individual's safety, the integrity of the equipment or the integrity of the transmission process.

4.1.7 FIELD PERSONNEL

4.1.7.1 Training/Competency

Epic Energy provides for appropriate training for all employees. Field Maintenance employees undertake a range of training covering basic induction courses, job ready courses, corporate training and technical training. Refresher training is provided on a scheduled or as required basis (dictated by the course involved).

Epic Energy is in the process of implementing a Complete Human Resources Integrated System (CHRIS), which will include a detailed training database for all employees. For the past five years, training records have been managed locally by Administration Coordinators and Maintenance Planning Officers.

To further improve the current training management arrangements, in 2002, Epic Energy maintenance department assessed ways of developing the training and development structure to ensure it's personnel are trained sufficiently to enhance their skills and maintain the assets. The Pipeline Licence dictates AS 2885 as the guiding standard, AS 2885.3 addresses the operation and maintenance of pipelines and repeatedly states the need to ensure employees are trained to do their job and the need to ensure competence of those employees.

Epic Energy appointed Leng Saw of Romeo Consulting Pty Ltd as it's training coordinator to effectively manage operations training needs. The training coordinator will manage employee training development to ensure a national accreditation and competency based learning is achieved for all operations maintenance staff.

4.1.7.2 Experience

Maintenance on the Riverland Pipeline System is performed by Epic Energy Field Maintenance Officers. Those Officers have cumulative skills covering all aspects of pipeline maintenance and emergency response. Many of those officers have worked for Epic Energy or its predecessors since the Riverland Pipeline System was constructed, with the average years of service on these pipelines, or within the industry, exceeding 15 years.

4.1.8 AUDITS

The next internal audit of Epic Energy's Safety Management System will be completed prior to the fourth quarter of 2003.

4.2 PHYSICAL ASSESSMENT OF FACILITIES

4.2.1 PIPELINE

4.2.1.1 Corrosion Control

To mitigate corrosion, the Riverland pipelines are coated with a protective extruded butyl mastic and polyethylene coating system, which serves to isolate the external pipeline surfaces from corrosive elements in the surrounding environment. Field joints are coated with a polyethylene backed butyl mastic tape system. Secondary protection at coating holidays and imperfections is achieved by applying cathodic protection.

The galvanic system installed during construction of the pipeline, as a temporary system, comprises of magnesium anodes. This system is still being utilised, as the pipeline current requirement is still very low at an average of 4 micro A/m². An impressed current system was designed for the pipeline but has not been installed.

4.2.1.1.1 PERFORMANCE

The effectiveness of the cathodic protection system is monitored by carrying out two full line potential surveys annually. The protection levels are assessed according to the criteria set by AS 2832.1 1998.

The Year 2002 potential profiles of the pipeline system are given in Appendix 1. These profiles show that:

- **Berri Lateral:**
The potential profiles of this lateral indicate that the lateral potential were lower than -850 mV Cu/ Cu SO₄ on some test points during February survey but they improved in the September survey most probably due to increased in the soil moisture. This effect is particularly significant as the existing magnesium anodes on the lateral are aging and any increase in the soil resistivity will reduce their current output significantly.
- **Murray Bridge Lateral:**
The potential profiles of this lateral indicate that the pipeline was fully protected to the cathodic protection criteria on its entire length in 2002.

4.2.1.1.2 INTERNAL CORROSION

As the gas from the Moomba to Adelaide Pipeline (MAP) is free of moisture and corrosive species, the Riverland pipelines are not prone to internal corrosion. The results of several intelligent PIG survey programs revealed no internal corrosion on the MAP on its entire length including the upstream section of the Riverland Pipelines.

4.2.1.1.3 COATING CONDITION

The condition of the pipeline coating is monitored by five-yearly DCVG survey on the pipeline. The last such survey was conducted in June 2000. Major defects were excavated and inspected in year 2002 as detailed in the next section.

4.2.1.2 DCVG Surveys and Pipeline Excavations

The following table shows locations on the Riverland Pipeline System exposed for investigation condition of the pipe, pipe coating and performance of the cathodic protection system during January and September 2002. These locations were selected according to the June 2000 DCVG Survey data:

Kilometre Point	% of IR Drop
Berri Lateral	
43.895	4
44.227	14
45.753	8
47.500	4
166.498	5
Murray Bridge Lateral	
8.826	4
8.834	2
18.924	4
44.00	0

The dig up at 44.00 Km with 0.0% IR Drop on Murray Bridge was selected to check the following aspects:

- Accuracy of 0.0 % IR drop in an area with low resistivity soils and high water table. A small % of IR drop usually corresponds to a significant defect due to lower values of potential drop.
- Performance of the pipeline coating in an area with clay soils and wet/dry cycles.
- Performance of the coating in an area close to the injection point of a magnesium anode with high current output.

The audit program confirmed that:

- Majority of the defects were mechanical in nature and were typical of direct impingement of heavy objects like stones on the pipe coating or dragging of the coated pipes on rough surfaces of the trench.
- Corrosion was moderate and confined to the exposed areas of the coating defects and underneath the disbonded areas near the coating openings.
- No signs of disbondment due to cathodic over-protection were detectable. The pH values on the defects' surfaces confirmed adequate levels of cathodic protection on the pipeline.
- No significant pitting and shielding were detectable on the defects.
- No Stress Corrosion Cracking or similar defects on the pipe metal were detectable when the exposed surfaces were checked with Magnetic Particle Inspection, MPI technique.
- The DCVG pegs were found to be on the epicentres of the excavated defects.

4.2.1.3 Conclusion on Pipeline Condition

4.2.1.3.1 PIPELINE COATING CONDITION

The Year 2000 DCVG Survey program and Year 2002 cathodic protection audit and coating inspection programs have indicated that the pipeline coating is in satisfactory condition. The low protective current demand of the pipeline also supports the fact that the pipeline coating is in very good condition.

4.2.1.3.2 CATHODIC PROTECTION SYSTEM

Monitoring cathodic protection parameters including the potential profiles of the Riverland Pipeline System has indicated that the cathodic protection system is providing the pipelines with adequate protective currents to polarise them to the criteria levels set by Australian standards and Epic Energy's maintenance requirements.

4.2.1.3.3 PIPELINE INTEGRITY

Pipeline coating inspections and cathodic protection monitoring have indicated that the pipeline is in good condition and is capable of operating at set parameters with no restrictions.

4.2.2 MAIN LINE VALVES

4.2.2.1 Plant and Equipment

All mainline valves are manually operated valves. All valves other than the MLVs at Angaston, Berri and Murray Bridge Gate Stations are installed in buried pits. MLVs 2, 4, & 6 on the Angaston to Berri Lateral and MLV1 on the Murray Bridge Lateral have a bypass valve assembly.

Valve maintenance and valve operational testing is completed six monthly on both the main line valve and bypass valves. A visual inspection to check for leaks is carried out monthly as part of the road patrol and six monthly cathodic protection surveys confirm pipe to ground potential readings are adequate.

4.2.2.2 Site Security

All MLV pits have locked aluminium plate covers to prevent access to the MLV's. Berri MLV's 1 & 8 and one of the Murray Bridge MLV's are within Epic Energy compounds, secured by a 1800mm high chain wire mesh fence topped with three strands of barbed wire. All gates to these compounds are locked with Epic Energy's standard locking system. MLVs 2, 3, 4, 5 & 7 and Murray Bridge MLV1 are located back from any public road and not easily visible to passing traffic. MLV 6 at Swan Reach is located within the boundary of a landowner and protected by guardrail, from the road.

All mainline valves and bypass valves are locked in accordance with Epic Energy's common locking system. Regular maintenance visits along with routine road patrols provide additional security checks.

4.2.2.3 Environmental Conditions

The environmental conditions at the MLV sites do not differ significantly from the conditions at the meter stations.

4.2.3 METER STATIONS

4.2.3.1 Plant and Equipment

The basic designs of the ten meter stations Epic Energy maintain do not differ other than the capacity and sizing of the equipment. Each station has active/monitor regulator runs, turbine meters, full capacity pressure relief system, E.S.D. valves and Fisher remote operation controllers [RTU]. The Berri Gate Station and the Murray Bridge gate station have dust filter vessels in the upstream piping prior to any regulation and metering facilities.

Two monthly routine maintenance schedules require Accuracy Verification testing to be completed on the gas measurement equipment and records forwarded to Origin Energy.

Every two months, lock up tests are performed on the active and monitor regulators, relief valve operation and set points tested, ESD valve operation and set points tested, transmitter calibration checked and all alarm monitoring functions tested back to TSCC.

Filter inspections are scheduled for six monthly inspections and filters changed on condition. The filter vessels are inspected and tested in accordance with AS 3788.

Site cathodic protection surveys are carried out six monthly, including earthing and lightning protection equipment.

Compound inspections are carried out monthly. This includes monitoring equipment, checking flanges and pipework for minor leaks, pesticide and herbicide control, corrosion control of above ground piping and inspection of locks and signage.

Fire extinguisher inspections and maintenance are completed six monthly in accordance with Australian Standards.

At the three sites Origin Energy operate and maintain, routine checks are carried out on the filter banks, lock up checks on the active and monitor regulators, relief valves tested and the pressure transmitters are calibrated.

4.2.3.2 Buildings and Enclosures

All meter stations are located within seven compounds and each compound has a small metal garden shed on site to accommodate the Fisher RTU. The sheds are locked with Epic Energy's standard locking system and the structure doors have entry alarms back to TSCC.

4.2.3.3 Site Security

An 1800mm high, chain mesh fence topped with three strands of barbed wire surrounds all compounds to secure the above ground facilities. All gates to these compounds are locked in accordance with Epic Energy and Origin Energy's common locking systems.

All critical valves within the compounds are locked, the shed accommodating the Fisher RTU is locked, the shed has an entry alarm to TSCC and valve status and site conditions are monitored 24 hours with alarms back to TSCC.

Regular maintenance visits, compound inspections and routine road patrols provide additional security checks.

4.2.3.4 Environmental Conditions

Approved maintenance plans and work procedures eliminate uncontrolled methane to atmosphere. Controlled venting during maintenance activities reduces gas emissions to a minimum.

Approved maintenance procedures and waste disposal practices eliminate any ground contamination from oil and hydrocarbons during filter inspections and changes.

Approved procedures and chemicals eliminate environmental hazards during pesticide and herbicide control activities.

4.3 MANAGEMENT SYSTEMS

4.3.1 SAFETY MANAGEMENT SYSTEMS

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 Riverland Pipeline 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.

SCOPE

The Safety Management System document has been specifically designed for Epic Energy and applies to all employees, contractors and visitors on facilities.

COMMITMENT

Epic Energy management believes that all incidents are preventable and that the safety and health for all employees is the foremost business priority. As such, Epic Energy has demonstrated its commitment to ensure compliance with good safety management practices by developing the Epic Energy Safety Management System in line with relevant standards and industry good practice guidelines.

SAFETY MANAGEMENT SYSTEM STRUCTURE

The Safety Management System Standards define the goals, deemed by Epic Energy, to be necessary to achieve a high level of health and safety performance and reduce risk.

The Safety Management System structure comprises of:

Standards: There are fourteen (14) Health and Safety Standards
Objectives: Objectives are defined for each Standard
Requirements: The requirements address the scope of each element

The fourteen (14) Standards are as follows:

1. Policy and Objectives
2. Organisation and Responsibility
3. Risk Assessment and Risk Management
4. Employee Involvement
5. Employee Selection, Competency and Training
6. Contractors and Support Services
7. Design, Construction and Commissioning
8. Safe Operational Procedures
9. Maintenance, Inspection, Testing and Modification
10. Management of Change
11. Health System
12. Emergency Response
13. Accident/Incident Investigation and Reporting
14. Performance Audit and Review

SAFETY MANAGEMENT REVIEW

The Safety Management System will be periodically reviewed and updated as a result of operational, personnel, legislative and/or management changes. Epic Energy will also audit and monitor compliance with the Safety Management System on a yearly basis.

4.3.2 ENVIRONMENTAL MANAGEMENT

The contractor is required to have in place an Environmental Management System responsible for the operation and maintenance of the Riverland Pipeline System.

Epic Energy currently operate the Riverland Pipeline System in accordance with a Statement of Environmental Objectives [SEO] dated August 2000 and prepared in accordance with the requirements of section 99 of the Petroleum Act 2000.

Origin Energy is currently developing a new Statement of Environmental Objectives for the Riverland Pipeline System and will be due for release in early 2003.

Epic Energy contributed to an “Environmental Risk Assessment” of the Riverland Pipeline System, conducted by Origin Energy and facilitated by Mr Bob Anderson of Kinhill Brown & Root in August 2002.

4.3.3 EMERGENCY RESPONSE

Epic Energy's Emergency Response policy requires two "Emergency Response Exercises" to be carried out in each state annually. During the period covered by this report, emergency response exercises on the Riverland Pipeline System were carried out in July/August 1999 and February 2001.

4.3.4 MAINTENANCE PROGRAM

4.3.4.1 Maintenance

The maintenance program for Epic Energy operated assets has been developed from years of practical experience. Opportunities to further improve maintenance practices are constantly embraced, with "Bottom up" suggestions, technical recommendations and equipment failure characteristics taken into consideration. Statutory and regulatory requirements of the items and the relative criticality of the equipment/system is determined, based on Safety, Environmental and Business risk.

4.3.4.2 Maximo

The CMMS functionality continues to be explored to return maximum benefit for the company. Areas identified for further investigation include:

- The methodology in which the workload is grouped in the CMMS, which should create improved opportunities for interrogation of maintenance records;
- The functionality of the CMMS with regard to incorporation of lock out/ tag out and Safety instructions will be explored; and
- Improved grouping of labour resources will enable more efficient utilisation of those resources.

4.3.4.3 Work Instructions

Work Instructions are progressively reviewed to ensure they accurately reflect the work performed. These Instructions will be transferred into a new national standard format and stored within the central filing system.

4.3.5 FIELD PERSONNEL

4.3.5.1 Training

In 1999, Epic Energy undertook an Organisation Review that resulted in the centralisation of corporate functions into the Head Office in Perth. Included in that review was the level of Maintenance staff and their work patterns.

Epic Energy introduced a new philosophy surrounding performance management. This relied on the cascading of corporate objectives through the Strategic Plan, to the Corporate Business Plan, to Departmental Business Plans, to Workgroup Charters, to individual Tasks and Targets. An integral component of that process was the assessment

of current skills and competencies within the workforce. From that skill assessment, Epic Energy was able to identify key training needs for individuals.

Specific training arising from the above process included:

- Baseline training for all Operations personnel. This training provided an overview/introduction of all aspects of field maintenance (eg metering, CP, valve maintenance and emergency response).
- Every two years, each employee undertakes mandatory training in Epic Energy's Safety Induction, Permit to Work System, Senior First Aid, Fire Fighting and defensive Driver training.
- Specific technical training. Personnel associated with the Riverland Pipeline System carried out a five day Fisher ROC training module, a four day Cathodic Protection System module and a two day pipe location training module.

In 2002, Epic Energy maintenance department assessed ways of developing the training and development structure to ensure our people are trained sufficiently to enhance their skills and maintain our assets. The Pipeline Licence dictates AS 2885 as the guiding standard, AS 2885.3 addresses the operation and maintenance of pipelines and repeatedly states the need to ensure employees are trained to do their job and the need to ensure competence of those employees.

Epic Energy appointed Leng Saw of Romeo Consulting Pty Ltd as it's training coordinator to effectively manage operations training needs. The training coordinator will manage employee training development to ensure a national accreditation and competency based learning is achieved for all operations maintenance staff.

The Tasks and Targets philosophy continues to be embedded in the Epic Energy culture. Along with that, Training and Development Plans are being refined and implemented for employees.

4.3.5.2 Experience

Turnover within Epic Energy is monitored as a key performance indicator. While turnover is currently running at about 10% per year, this remains below the national average. Notwithstanding this, the national turnover among personnel directly associated with the operation and maintenance of the Riverland Pipeline System is less than 5%.

4.3.6 AUDITS

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.

Epic Energy contributed to detailed risk assessment of the Riverland Pipeline System management processes, the study was conducted by Origin Energy and facilitated Mark Lapworth of Ibis Business Solutions in October 2002.

Recent audits indicate a satisfactory level of compliance and action finalisation.

4.3.6.1 Class Location Changes

Through the audit process, no class location changes along the Riverland Pipeline System have been identified.

4.3.7 RIGHT OF WAY MAINTENANCE

4.3.7.1 Wash Outs

Through the period covered by this report, there have been several washouts as a result of heavy rains. The wash outs were all classified as minor with no real risk to the pipeline. All washouts were identified through routine patrols or site visits for maintenance. Repairs were carried out at the first opportunity after the wash outs were identified.

The pipeline was exposed on one occasion in December 1997 at Reedy Creek, on the Murray Bridge lateral. Successful repairs were carried out in conjunction with the Mannum District Council and no additional problems have been detected at this location. This site is monitored monthly during routine road patrols.

4.3.7.2 Signage

Patrols are carried out monthly on the Riverland Pipeline System. During this activity, damaged signposts and warning signs are replaced frequently, in order to ensure the pipeline signage is in line with the requirements of AS2885. At least once per year, a thorough investigation is carried out to ensure complete line of sight is maintained. On average, approximately 50 additional "Pipeline Warning " signs are installed during this exercise.

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

4.3.7.3 Road Patrols

Road patrols are conducted monthly and after heavy rains. Being much closer to the asset, the road patrol is usually the most efficient and effective in identifying anomalies, such as third party activities, wash outs and signage.

4.3.7.4 Pipeline Location Service

Epic Energy provides a free service to locate pipelines for which they are responsible. This service is primarily used by landowners/occupiers, councils or contractors carrying out civil works in the vicinity of any of the pipelines administered by Epic Energy.

Epic Energy also subscribes to the “**Dial Before You Dig**” program and offers the same free pipeline location service.

Any work carried out within the easement, as a result of a pipe location, is subject to the Epic Energy “Safe Work Permit System” and constant supervision to ensure the safety and integrity of the pipeline systems.

There were 40 actual pipe locations carried out on the Riverland Pipeline System in 2002 as a result of direct requests or via the “**Dial Before you Dig**” process.

4.3.7.5 Landholder Contact Program

Every twelve months, all property owners and local bodies, such as councils and emergency services along the pipeline, are visited 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.

4.4 OTHER RELEVANT INFORMATION

4.4.1 PIPELINE THROUGHPUT

Commercial in Confidence

4.4.2 PIPELINE SECURITY

Epic Energy operates a 24 hour/365 day Control Centre monitoring the Riverland Pipeline System using the Metso SCADA system. All critical valve status and site functionality alarms are directly monitored by Epic Energy TSCC.

4.4.3 OTHER REPORTING REQUIREMENTS

Through the period covered by this report, other reports provided to Origin Energy by Epic Energy related to:

- Annual Pipeline Licence Reports;
- Emergency Response Exercise Reports;
- Monthly Operational Reports and
- Incident Investigation Reports.

4.4.4 OTHER RELEVANT INFORMATION

An ongoing review of increased gas demands on the Riverland Pipeline System and the Berri to Mildura System to determine if upgrading of the Angaston compressor is required.

Consideration has been given in the event it is required, to upgrading the existing compressor or the installation of an additional compressor site at MLV 5 near Magee. MLV 5 has been discussed as a suitable site, as the tie in of a new compressor site can be achieved without blowing down the pipeline or restricting gas flows.

In two locations on the Riverland Pipeline system, it has been determined the pipeline was laid outside the easement during construction. On the Tooravale Lateral, 45 metres of pipeline encroached into private land restricting the landowner from developing his vineyard to the extent he wished. Compensation had to be paid to the landowner to purchase the land and develop a new easement.

In 2002, the Berri Lateral was found to have encroached into private land at Swan Reach. The total encroachment was approximately 4.5 metres. As no easement existed for the pipeline at this point, negotiations are being held with the landowner to obtain an easement.

A quotation for the installation of 27 zinc anodes to mitigate induced voltage into the Riverland Pipeline system from overhead power lines, has been presented to Origin energy for final approval. Work is anticipated to start on this project in early 2003.

4.4.5 FUTURE OPERATIONS

No unusual operations are planned for the Riverland Pipeline System that Epic Energy is aware.

4.5 ADVERSE FACTORS

4.5.1 REPORT ON HAZARDS TO THE PIPELINES

In 1999, Epic Energy carried out an A.S.2885 "Risk Assessment" of the Riverland Pipeline System. The assessment covered the identification of threats along the full length of the pipeline and considered threats from external interference, corrosion, natural events and operational and maintenance activities. Historically, the main threats to gas pipelines has been determined to be external interference. Consequently, the emphasis in the study was on assessing the risks from third parties.

The study indicated the risks to the pipeline were in general at an acceptable level. A total of 16 actions were required as a result of the "Risk Assessment". They included mostly installation of additional signage and marker tape and additional concrete protection at one channel drain on the National Dairies Lateral. The two most significant actions were to increase the pipeline cover at the rail crossing on the National Dairies lateral and to investigate the dangers to personnel working on the pipeline from currents induced from high voltage power lines and determine remedial actions.

All actions, including the additional cover at the railway crossing, were completed. The investigation into the induced voltage was carried out by Phil Cheeseman & Associates and determined there was a risk to personnel working on the pipeline system.

A Safe Work Instruction was developed along with the fabrication of earth mats as a temporary measure for persons working on the pipeline system. An earthing system of zinc anodes to be installed at 27 locations along the pipeline system has been developed.

4.6 FITNESS FOR PURPOSE SUMMARY

Based on the physical assessment of the Riverland Pipeline System, a review of the management systems governing the manner in which the Pipeline is operated and maintained and any other relevant information, the Riverland Pipeline System is assessed as being in good condition and fit for current and future purpose.

5. CONCLUSIONS

This Fitness for Purpose Report has been compiled in accordance with the requirements of the South Australian Petroleum Regulations 2000, Division 4, Regulation 30. It has concluded that the Riverland Pipeline System (covered under Pipeline Licence 6) is fit for purpose.

An assessment of the above ground facilities has identified them to be generally in good condition. A formal hazard and operability study [HAZOP] of all above ground facilities will be carried out in 2003.

The below ground pipework has been verified with pipeline coating inspections, excavations of DCVG defects and cathodic protection monitoring and have indicated that the pipeline is in good condition.

The AS2885 Risk Assessment and HAZOP carried out in 1999 confirmed that the pipeline is adequately protected from external threats and poses an acceptable threat to the public and the environment.

The management systems employed by Epic Energy in the operation and maintenance of the Riverland Pipeline System are robust and regularly audited. Incorporation of the Environmental Impact Review and Statement of Environmental Objectives has further reinforced the integrity of managing environmental issues on the Pipeline.

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 Riverland Pipeline System are competent and have appropriate levels of experience. Improvements to the management of training will be ongoing and will be aided by the introduction of a new Complete Human Resources Integrated System.

Emergency response exercises have historically been targeted at field response with limited mobilisation and minimal involvement of external authorities. A training program needs to be implemented that achieves routine training at a higher level, focusing on full mobilisation and maximum involvement of external stakeholders.

The Computerised Maintenance Management System provides functionality based on previous best practices. The world of maintenance management has changed and the manner in which maintenance is managed on the Riverland Pipeline System will be reviewed.

It is concluded that the Riverland Pipeline System is fit for purpose and will continue to be fit for purpose for the foreseeable future. As a minimum, the Pipeline is assessed as being fit for purpose for the next five years, whereupon a further Fitness for Purpose Report will be compiled. Should the operational circumstances surrounding this asset change within that five year period, this Fitness for Purpose Report will be reviewed to determine whether any operational adjustment is required.

6. RECOMMENDATIONS

Notwithstanding the fitness for purpose of the Riverland Pipeline system, the following recommendations have arisen from this Report:

- A complete review of the pipeline fitness for purpose to be carried out in 2007, or before, if operational conditions impacting the pipeline are determined to significantly affect the pipeline.
- A hazard and operability study [HAZOP] of above ground facilities to be carried out with the AS 2885 Pipeline Risk Assessment in 2003.
- The installation of twenty seven zinc anodes be installed in early 2003, to mitigate induced voltage onto the pipeline system from overhead high voltage power lines.
- Emergency response training be elevated to encompass full field mobilisation and maximum involvement of external stakeholders. The next scheduled exercise is during the fourth quarter of 2003 and should advance the level of training previously carried out.
- The functionality of Epic Energy's CMMS be enhanced to reflect modern maintenance management strategies, in so far as they impact maintenance on the Riverland Pipeline System.

7. APPENDICES:

7.1 Appendix 1 : Pipeline Cathodic Protection Potential Profiles

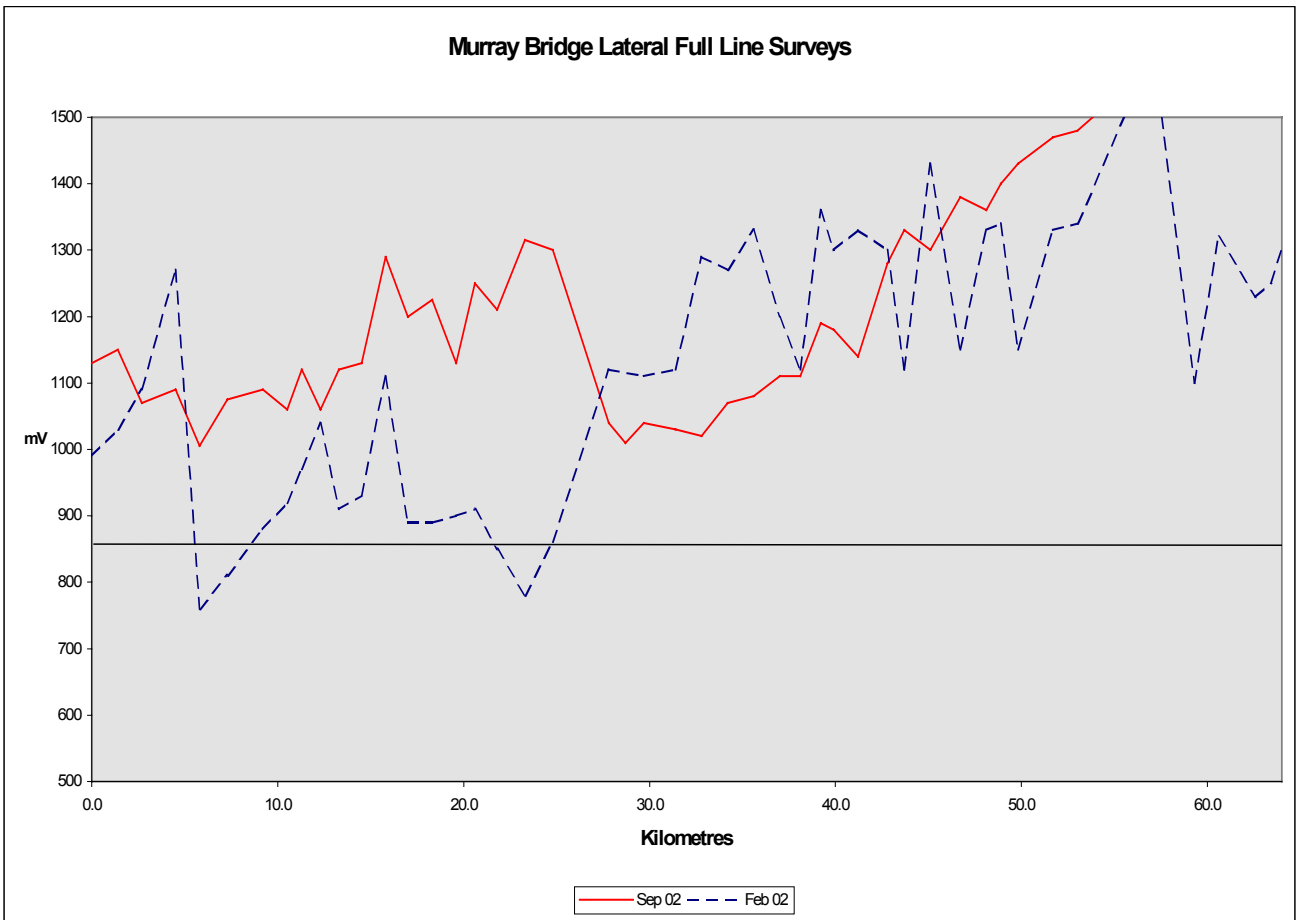
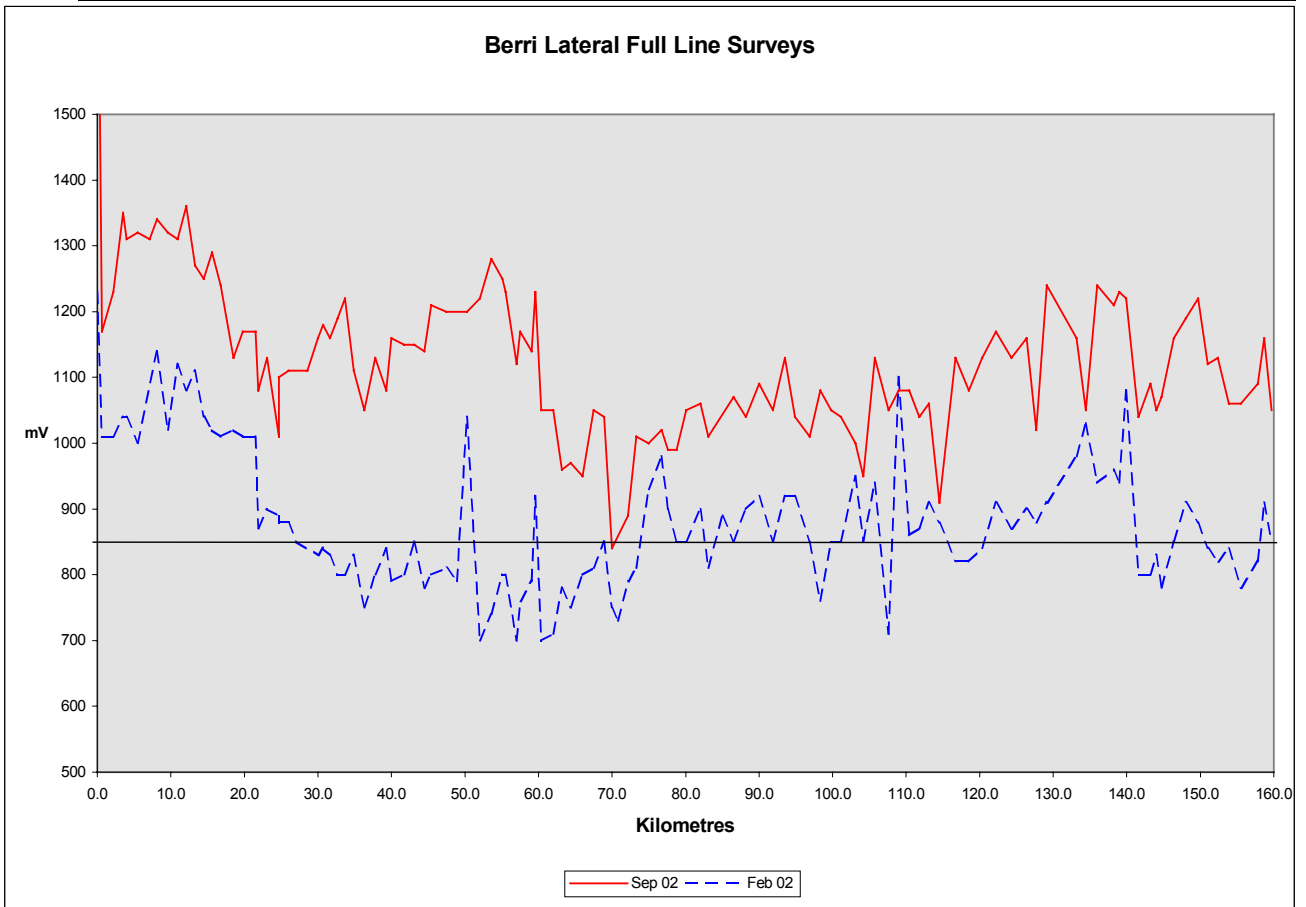
7.2 Appendix 2: DCVG Coating Survey Results (June 2000)

APPENDIX 1

2002 PL6 FITNESS FOR PURPOSE REPORT

DATED FEBRUARY 2003

PIPELINE CATHODIC PROTECTION POTENTIAL PROFILES



APPENDIX 2

2002 PL6 FITNESS FOR PURPOSE REPORT

DATED FEBRUARY 2003

DCVG COATING SURVEY RESULTS (June 2000)



**GIPPSLAND CATHODIC
PROTECTION SERVICES**
ACN 007 314 100

Head Office
141 Brougham Road
(PO Box 48)
Mt Macedon
Victoria, 3441
Tel: (03) 5426 2197
Fax: (03) 5426 1871

Melbourne Office
1 McNab Way
Greenvale
Victoria, 3059
Tel: (03) 9333 4100
Fax: (03) 9333 4100

Gippsland Office
RMB 2245
Stratford
Victoria, 3862
Tel: (03) 5143 1610
Fax: (03) 5143 1618

EPIC ENERGY

Riverland Pipeline System

Pipeline Coating and Protection Assessment Survey.

June, 2000.



GIPPSLAND CATHODIC PROTECTION SERVICES

EPIC ENERGY

Riverland Pipeline System Pipeline Coating and Protection Assessment Survey

In accordance with instructions from Epic Energy, Gippsland Cathodic Protection Services conducted coating defect and protection assessment surveys over sections of the River. Gas Pipeline Systems as detailed below:

The surveys were conducted during the 8th to the 19th of June 2000.

1. Angaston to Berri Pipeline Lateral, 167 kms.
2. Sedan to Murray Bridge Pipeline Lateral, 64 kms.
3. National Dairies Lateral, 1.8 kms.
4. Visyboard Lateral, 0.463 kms.
5. Tooravale Lateral, 2.3 kms.

All coating defects greater than 2% were identified and recorded.

Survey Method

The coating defect surveys were conducted utilising our most recently developed M6OQQ signal, voltage Generator. This generator provides an AC. wavefront, which ensures that standards are maintained and that coating stress and excessive pipe/earth polarisation avoided. The low frequency of the signal ensures that misleading effects and inaccuracies due to reactive circuit components are also avoided.

The basic principle of operation is to apply a signal voltage between the pipeline and earth. This signal voltage is used to assess protection attenuation characteristics and to locate coating defects and IR loss by soil voltage gradient measurement.

The severity of each defect is expressed as a ratio of soil potential measured from a point above the defect to remote earth compared to the pipe to remote earth signal at that point. The ratio expressed as a percentage; (%IR). The %IR at each coating defect represents the loss of protection sustained for any applied level of cathodic protection and is not directly representative of the coating defect size.

For the purpose of the surveys, our signal voltage generator was installed at both the Tooravale Lateral and at the Murray Bridge Metering Compounds. The signal generator was coupled between the pipeline and the compound perimeter fence to provide the required signal current. Two additional temporary installations were also established utilising a 12-Volt battery at the Angaston metering compound and the Sedan to Murray Bridge Lateral Branch Offtake, utilising the existing anodebed.

Survey Results

The survey test results have been tabulated in the attached appendices for each of the pipeline sections nominated above. The results are inclusive of the calculated kilometer distance at each defect detected. The GPS co-ordinates for each of the defects as well as adjoining test points and associated %IR loss.

The results of the coating defect surveys conducted over sections of pipelines nominated above have been summarised as follows. We re-iterate that only defects greater than 2% were recorded.

1. Angaston to Berri Pipeline Lateral, 9 defects 2 - 10%, 1 defect greater than 10%.
2. Sedan to Murray Bridge Pipeline Lateral, 7 defects 2 - 10%.
6. National Dairies Later, no defects detected.
7. Visyboard Lateral, no defects detected.
8. Tooravale Lateral, no defects detected.

A total of seventeen defects greater than 2% were recorded on the above pipelines. None exceeded the 15% IR criteria for coating refurbishment where pipeline protection levels are maintained more negative than -0.850 Volts with respect to a Cu/CuSO₄ Reference.

An additional dozen or so smaller defects were noted during the course of the Angaston to Berri Lateral survey, namely within the 43 to 45 kilometer mark, where rocky ground conditions were encountered.

The following test point anomalies were noted along the Sedan to Murray Bridge Lateral.

1. Test point at 10.5 kms, pulled out of ground.
2. Test point at 17.0 kms, potential cable shorted to test post.
3. Test point at 28.7 kms, possible resistive connection between potential cable and external test stud.
4. Test point at 38.1 kms, potential cable not connected to test stud or pipe.
5. Test point at 43.7 kms, potential cable not connected to test stud.
6. Pipe leaves ground at Murray Bridge compound, PT 100 temperature transducer is connected to the pipe and in turn connected to the standpost supporting the junction box. This results in a potential field gradient at and around the point where the pipe leaves the ground. Pipe to soil potential's measured within this field would indicate a reduced level of protection on the pipeline.

We recommend that the anomalies nominated above should be addressed and where possible rectified.

G.C.P.S. Pty Ltd - Protection Assessment Survey
 Percentage Reduction of Applied Cathodic Protection at Coating Defects

GPS POSITIONING DATA			Calculated Distance Klm	Feature Distance From Original Pipeline Survey	Pipeline Feature Description	Defect Number	June 2000 Measured % IR
Coordinate System: UTM Zone 54 Datum: WGS 84 Differentially Corrected	East	North					
	356516.869	6174948.849	41.800	41.800	Test Point 41.8		
	356925.728	6174989.288	42.211		Coating Defect	1	3
	358651.781	6175063.697	43.895		Coating Defect	2	4
	358984.023	6175078.687	44.227		Coating Defect	3	14
	359256.241	6175091.912	44.500	44.500	Test Point 44.5		
	359475.404	6175095.795	44.719		Coating Defect	4	3
	359534.231	6175098.517	44.778		Coating Defect	5	4
	360179.506	6175111.338	45.400	45.400	Test Point 45.4		
	360524.488	6175038.160	45.753		Coating Defect	6	8
	361760.113	6174970.535	47.009		Coating Defect	7	4
	362236.312	6175088.652	47.500	47.500	Test Point 47.5		
	396881.990	6181238.850	86.925		Coating Defect	8	3
	396902.781	6181254.151	86.950		Coating Defect	9	3
	397931.253	6182015.419	88.230	88.230	Test Point 88.23		
	464170.704	6208743.645	166.498		Coating Defect	10	5
	464169.385	6208745.618	166.500	166.500	Meter Station 37		
					Pipe Leaves Ground		

G.C.P.S. Pty Ltd - Protection Assessment Survey
 Percentage Reduction of Applied Cathodic Protection at Coating Defects

GPS POSITIONING DATA		Calculated Distance		Feature Distance From Original	Pipeline Feature	Description	Defect Number	Measured % IR		
Coordinate System: UTM Zone 54 Datum: WGS 84 Differentially Corrected		Distance		Pipeline Survey	Pipeline Feature	Description	Defect Number	>30%	15-30%	<14%
East	North	Kim	Kim							
339512.315	6166862.698	8.826			Coating Defect		1			4
339512.792	6166854.425	8.834			Coating Defect		2			2
339491.420	6166489.061	9.200	9.200		Test Point 9.2					
339732.833	6158193.397	17.735			Coating Defect		3			2
339732.443	6158186.533	17.742			Coating Defect		4			2
339732.380	6158183.788	17.745			Coating Defect		5			2
339732.137	6158178.916	17.750			Coating Defect		6			2
339691.044	6157004.955	18.924			Coating Defect		7			4
339686.448	6156329.236	19.600	19.600		Test Point 19.6					

EPIC ENERGY PTY LTD

Sedan to Murray Bridge Natural Gas Lateral

June 2000