



ACN 078 607 682

**PEL 106**

**Cooper/Eromanga Basin  
South Australia**

**ANNUAL REPORT  
PERMIT YEAR TWO**

**April 9<sup>th</sup> 2004 to April 8<sup>th</sup> 2005**

## CONTENTS

1. [INTRODUCTION](#)
2. [PERMIT SUMMARY](#)
3. [EXPLORATION ACTIVITY](#)
4. [ADMINISTRATION](#)
5. [EXPENDITURE STATEMENT](#)
6. [ANNUAL COMPLIANCE REPORT PERMIT YEAR TWO](#)

**Appendix 1  
Nutmeg-1 Well Testing Programme**

**Appendix 2  
Paranta-1 Well Testing Programme**

**Appendix 3  
Nutmeg-1 Chrome Completion Programme**

**Appendix 4  
Paranta-1 Chrome Completion Programme**

**Appendix 5  
Smegsy-1 Well Testing Programme**

**Appendix 6  
Smegsy-1 Well Completion Programme**

**Appendix 7  
Environmental Report Malleus Seismic Survey**

**Appendix 8  
Environmental Report Lena Seismic Survey**

## 1. INTRODUCTION

Petroleum Exploration Licence (PEL) 106 is situated on the southwestern margin of the Patchawarra Trough, one of the major depocentres in the South Australian portion of the Cooper Basin. PEL 106 covers an area of approximately 1000 square kilometres. The permit was granted to the Great Artesian Oil and Gas Limited on 9<sup>th</sup> April 2003 for an initial term of five years.

This Report covers work undertaken by the Licensee during the Second Permit Year, from 9<sup>th</sup> April 2004 to 8<sup>th</sup> April 2005, in accordance with the requirements of Section 33 of the Petroleum Regulations, 2002.

## 2. PERMIT SUMMARY

The working interests in PEL 106 as at the end of the reporting period were:

Great Artesian Oil and Gas Limited      (“GAOG”)      100%

Beach Petroleum Limited and Traditional Oil Exploration N.L. (a wholly owned subsidiary of Enterprise Energy Limited) held equitable interests in the following portions of PEL 106.

<b>Holder</b>	<b>Nature of Equitable Interest Held</b>
<b>Beach Petroleum</b>	Under the terms of an agreement between GAOG and Beach dated 10 November 2003, Beach will earn a 50% interest in any exploration and production licences granted subsequent to, and encompassing any commercial discovery, made as a result of farmin wells drilled under the Agreement within the “Farmout Block”. A formal Farmin Agreement and JOA, ratifying the details of this Agreement, has been concluded.
<b>Traditional Oil</b>	Under the terms of a Farmin Agreement and JOA signed on 10 March 2004, Traditional will earn a 25% interest in any exploration and production licence granted subsequent to, and encompassing any commercial discovery made as a result of drilling the Smegsy-1

	well within the Smegsy Farmout Block
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The original work commitments for PEL 106 are summarised as follows.

Licence Year	Minimum Work Program	Actual Work
Year 1* (9/04/03-8/04/04)	2 wells; 100 km 2D seismic; geological and geophysical review; seismic processing	90 km of 2D seismic; 2 wells; 379 km of reprocessing**
Year 2* (9/04/04-8/04/05)	2 wells; 100 km 2D seismic or detailed 3D seismic program***	1 well; 245 km of 2D seismic program (2 surveys)
Year 3* (9/04/05-8/04/06)	3 wells; 100 km 2D seismic or detailed 3D seismic program***	
Year 4 (9/04/06-8/04/07)	3 wells	
Year 5 (9/04/07-8/04/08)	3 wells	

\* Compulsory Program

\*\* A request to offset the Permit Year One deficit of 10 km of new seismic acquisition with Permit Year Two seismic acquisition was sought from PIRSA on 1 June 2004.

\*\*\*A request was made to PIRSA to combine Years 2 and 3 minimum work programmes on 22 March 2005. Variation of PEL 106 was granted on 29 March 2005 (refer to the table below).

Year of Term of Licence	Minimum Work Requirements
One	2 wells; 90 km 2D seismic; Geological and Geophysical review; Seismic reprocessing
Two	1 well; 110 km 2D Seismic or detailed 3D seismic program
Three	4 wells; 100 km 2D Seismic or detailed 3D seismic program
Four	3 wells
Five	3 wells

## 3 EXPLORATION ACTIVITY

### 3.1 Drilling

One exploration well, Smegsy-1 was drilled during the Permit Year, in July and August 2004. The well was drilled to evaluate the hydrocarbon potential of a four-way dip closed anticline situated on the western margin of the Patchawarra Trough. The well is located approximately 2.5 km north of the Aratna-1 and 5.5 km west of the Jack Lake Gas Field. Smegsy-1 spudded on 16<sup>th</sup> July 2004 and drilled to 2723 m (Driller) before the first inflate-straddle DST was run to evaluate good gas shows over the interval 2692-2712.4 m (Driller). DST#1 was a misrun after the tool string hung up and weight could not be applied to open the hydraulic tool. Drilling continued to 2849 m at which depth DST#2A was run over the interval 2828.96-2843.27 m (Driller). This test was also a misrun. The intended reset interval, 2729-2743.3 m (Driller) (DST#2B) was attempted but was also unsuccessful owing to the ruptured packers. Good gas shows were recorded in the Patchawarra Formation and one poor oil fluorescence show was recorded from the Tirrawarra Sandstone. Drilling continued to a total depth of 2976 m (Driller) terminating in the Tirrawarra Sandstone. Following log evaluation, an inflate-straddle test (DST#3, 2731.0-2736.1 m (Driller) was attempted in the Patchawarra Formation. However, this test was also a misrun due to ruptured packers brought about by poor hole conditions. The hole was conditioned prior to running a velocity survey. However, this survey was aborted owing to equipment failure.

Owing to the overall poor hole conditions preventing drill stem testing of the good gas shows and associated good FMT pressure responses, Smegsy-1 was cased for later work-over evaluation (refer section 3.2). A Well Completion Report for Smegsy-1 was submitted to PIRSA in February 2005.

### 3.2 Cased Hole Production Testing (CHPT)

During the Permit Year Two three wells were subjects to cased hole production testing (Appendix 1 is related to CHPT of the Nutmeg-1 and Paranta-1 and Appendix 2 is related to CHPT of the Smegsy-1).

During July 2004 production testing was undertaken on the Nutmeg-1 and Paranta-1 gas discoveries. In **Nutmeg-1** production testing confirmed that all zones, other than that which originally flowed gas, contained water. Extended production testing of the interval 2706-2718 m flowed gas at uneconomic rate of 0.2 MMCF, condensate at a rate of 3 to 6 barrels, and water at a rate of approximately 30 barrels per day. Gas rates continued to decline and never built back up to those measured during the initial open hole tests. The rates are considered very marginal and currently not commercial. The well has been suspended pending further engineering investigations. Currently the engineering view point is that Nutmeg-1 was drilled near a gas-water transition zone and consequently the proposed Paranta 3D seismic program will investigate the up-dip opportunities.

**Paranta-1** was drilled immediately after and approximately 4 km southeast of Nutmeg-1. Of the five open hole drill stem tests attempted only one, DST#3 (Side Track), as successful, and it only partially so, being terminated after 40 minutes of

flow following packer failure. Subsequently and in the accordance with the details of the CHPT Program (Appendix 1), the interval 2885-2890 m was subject to cased hole production testing resulting in a flow of gas and condensate at rates of 1.86 MMCF and 75 barrels, respectively, per day. The well has been declared a new gas field discovery. The production testing confirmed the Paranta Gas Field discovery and sufficient rates to justify the drilling of a Paranta-2 development well on a field. However, a decision was made to conduct a 3D seismic program prior to selecting a development well location for Paranta-2.

The **Smegsy-1** work-over and production testing of the Patchawarra Formation commenced in December 2004 and followed a program as outlined in Appendix 2. The best flow was a stabilised rate of 8.3 MMCFD from the upper Patchawarra interval 2734-2741 m through a 0.75" choke with a surface pressure of 950 psi. Log interpretation has identified 4.19 m of gas pay in this interval. The initial 12 hour clean-up flow from the lower Patchawarra interval, 2783.5-2795 m and 2796.5-2806 m, was gas to surface through a 0.625" choke at a rate of 7.6 MMCFD with a flow of 156 barrels of water per day. A total of 4.29 m of gas pay has been ascribed to the uppermost zone, 2783.5-2795 m. Smegsy-1 has been completed as a Patchawarra Formation gas producer.

### **3.3 Seismic Data Acquisition**

Two 2D seismic surveys (Lena and Malleus Seismic Surveys) were acquired within the Permit during the Second Permit Year in order to confirm the presence of structural targets. At the conclusion of the Second Permit Year these seismic data were being processed and were not yet available for interpretation.

PEL 106 Malleus Seismic Survey was recorded by Beach Petroleum in June 2004 as part of its farmin commitment. The seismic survey was designed to identify future drilling targets within the PEL 106 Farmin Block, though the western part of the survey spilled over into adjacent PEL 91. These operations greatly rationalise the overall exploration approach to this portion of the permit and the adjacent PEL 91. It covers that portion of the Patchawarra Trough anticipated to be liquids rich, and in which the Patchawarra Formation reservoirs are considered the principal zones of interest. 176.625 km of 2D seismic data was recorded on 18 lines, GA04-14 to GA04-30 and BC04-50. Parts of two lines were charged to PEL 91 and one of the Beach Petroleum PEL 91 lines, BC04-50 was recorded in conjunction with this PEL 106 program. The data were recorded using a 37.5 m group interval, vibroseis energy source and symmetrical spread (2306.25-93.75-0-93.75-2306.25m).

Lena 2D seismic survey was conducted by Great Artesian Oil and Gas during October 2004. The survey consisted of six lines, GA04-31 to GA04-36 that ran through and around the Smegsy-1 discovery well location and adjacent Jack Lake Gas Field. This survey comprised 67.95 km of 62 fold 2D seismic data recorded using a 37.5 m group interval, vibroseis energy source and symmetrical spread (2306.25-18.75-0-18.75-2306.25m). All lines were processed by Velseis Pty Ltd using a conventional post-stack migration processing sequence using refraction statics that were tied to 18 new upholes and 16 old upholes. All of the lines tied very well at intersections.

### **3.4 Seismic Reprocessing**

In conjunction with the Paranta Seismic Survey, 377 km of pre-existing 2D seismic data were reprocessed. These data cover the area in which the Paranta Seismic Survey was recorded (in and adjacent to the Nutmeg-1 and Paranta-1 wells). Reprocessing was taking additional time due to the complex nature of the surface topography, particularly large sand dunes. These impacted upon the seismic imaging of underlying geological layers and considerable attention was being made to ensure that these near surface effects were properly compensated for. The results of this interpretation provided a comprehensive and consistent seismic data set across the northern portion of the PEL 106, from which new drilling targets were identified. Particularly, the results helped to delineate the Rossco Prospect which will be drilled during the next Permit Year.

### **3.5 Geological and Geophysical Studies**

Technical studies during the Second Permit Year were chiefly directed towards, firstly, the drilling of a gas exploration well Smegsy-1 and compiling well completion reports for Nutmeg-1, Paranta-1 and Smegsy-1, and secondly, planning the positioning of additional infill seismic coverage of the Malleus and Lena Seismic Surveys and compiling of the Paranta Seismic Survey Interpretation Report.

## 4. ADMINISTRATION

### 4.1 Regulatory Compliance

A Compliance Report is attached which details the Licensee's compliance with the 2000 Petroleum Act, its Regulations, the terms and conditions of the Licence, and the agreed Statements of Environmental Objectives governing field operations undertaken during the permit term.

### 4.2 Data Submissions

A list of the reports submitted during the Year Two period is tabulated below:

Document	Date Submitted
Nutmeg-1 Well Completion Report	18 July 2004
Paranta-1 Well Completion Report	20 September 2004
Lena Seismic Survey Environmental Report	30 September 2004
Malleus Seismic Survey Environmental Report	7 December 2004
Smegsy-1 Well Completion Report	15 February 2005
Paranta Seismic Survey Interpretation Report	15 February 2005
Paranta Seismic Survey Data & Report	15 May 2005

### 4.3 Planned Exploration Program for Permit Year Three

It is intended that 4 wells will be drilled and at least 100 km of 2D seismic data or detailed 3D seismic data will be acquired in the fulfilment of the combined Permit Year Two-Three program. At this stage the main focus of Year 3 exploration will be contingent upon the outcome of the Rossco-1 and Middleton-1 wells, planned for Q3 and Q4 2005. However, our geological and geophysical studies have led GOAG to concentrate on the more liquids rich portion of PEL 106, in and around the Paranta area and also around the Smegsy area where reservoir risk appears to be somewhat reduced. Studies are currently underway to appreciate where analogs to the Raven field may be developed, especially along the western corridor of the Permit.

### 4.4 Associated Facilities Licences (AFL)

In order to conduct operations in PEL 106 two AFLs were applied for and surrendered during the Permit Year Two (refer to the tables below).

AFL 16 within PPL 66 (Jack Lake):

Application lodged	3 September 2004
AFL granted	26 October 2004
Request to surrender lodged	22 March 2005
Offer to surrender granted	30 March 2005

AFL 7 within PPL 148 (Welcome Lake):

Application lodged	5 December 2003
AFL granted	29 January 2004
Request to surrender lodged	22 March 2005
Offer to surrender granted	30 March 2005

## **5. EXPENDITURE STATEMENT**

A licence expenditure summary for the period from 9 April 2004 to 8 April 2005 is presented in the following Table.

### **Table: Statement of Expenditure in PEL 106 for Second Permit Year**

Commercial in confidence



ACN 078 607 682

**PEL 106**

**Cooper/Eromanga Basin  
South Australia**

**ANNUAL COMPLIANCE REPORT  
PERMIT YEAR TWO**

**April 9<sup>th</sup> 2004 to April 8<sup>th</sup> 2005**

## CONTENTS

1. [INTRODUCTION](#)
2. [CHECKLIST FOR SUBMITTING DATA](#)
3. [COMPLIANCE – DRILLING OPERATIONS  
STATEMENTS OF ENVIRONMENTAL OBJECTIVES](#)
4. [COMPLIANCE – SEISMIC OPERATIONS  
STATEMENTS OF ENVIRONMENTAL OBJECTIVES](#)

### *Internal References to this Section:*

#### **Appendix 7**

**PEL 106 Lena 2D Seismic Survey Environmental Report**

#### **Appendix 8**

**PEL 106/91 Malleus 2D Seismic Survey Environmental Report**

## 1. INTRODUCTION

Pursuant to Regulation 33(2) of the 2000 Petroleum Act, Great Artesian Oil and Gas Limited, as Licensee and Operator of PEL 106, in the Cooper Basin South Australia, herewith submits its report on compliance with:

- The Petroleum Act
- Regulations of the Petroleum Act
- The PEL Licence Conditions, and
- The various Statements of Environmental Objectives (SEO) to which Great Artesian Oil and Gas was committed in conducting its work commitments for Permit Year Two of the Licence.

A table is attached summarising the instances during the Permit Year Two wherein Great Artesian did not comply either with the Regulations of the Act or with the requirements of the relevant SEO under which it conducted its operations, or conducted operations which if not redressed would have led to non-compliance.

Further details of the circumstances surrounding the non-compliances, or potential non-compliance issues, are outlined below.

### **Petroleum Act and PEL Licence Conditions**

There were no instances of non-compliance with the 2000 Petroleum Act during the Second Permit Year of PEL 106.

The Smegsy-1 well was drilled during Permit Year Second to satisfy the original work commitments for the Licence. Likewise, seismic work in the permit was conducted in order to satisfy the original work commitments for the Licence. It is proposed that the excess in 2D seismic work over the original work program (amounting to 145 km) could be taken into consideration for the contingent Year 2 and Year 3 programs and that the seismic commitment for these years has already been met. A letter seeking to combine minimum work programs for Years 2 and 3 was sent to PIRSA on 22 March 2005 in order that a potential non-compliance was avoided.

### **Regulations of the 2000 Petroleum Act**

- ***Drilling***

There were no instances of non-compliance with the Regulations during the drilling operations of the Smegsy-1 well.

- ***Submission of Data and Reports Relating to Drilling***

Well completion reports for the Nutmeg-1, Paranta-1 and Smegsy-1 wells which were drilled in February, March and August 2004, respectively, have been compiled and submitted to PIRSA during Permit Year Two.

- ***Seismic***

Regulation 35 requires that, for any seismic survey, an Operations Report is to be submitted to PIRSA within 12 months of the completion of recording, and that this Report includes a report on the processing of the data.

The Malleus Seismic Survey was conducted in PEL 106 in June 2004 by Beach Petroleum. The Operation Report will be submitted to PIRSA during the Third Permit Year. The Lena Seismic Survey was conducted by Great Artesian Oil and Gas in PEL 106 during 20 – 23 October 2004. The Field Operation Report and the Data Processing Report have been already submitted to PIRSA. As this is still within the 12 months period, Great Artesian has complied with the Regulations in this regard.

Likewise, Regulation 36 requires that the Interpretation Report be submitted within 12 months following the completion of the processing of these data.

The Paranta Seismic Survey was acquired during the 27 January 2004 to 19 February 2004. Field Operations Report was hand-submitted to PIRSA on 7 April 2004. It included an Environmental Monitoring Report. Paranta Seismic Survey Interpretation Report, which includes Field Operation Report and Processing Report, has been submitted to PIRSA on 15 February 2005. As this is still within the 12 months period, Great Artesian has complied with the Regulations in this regard.

- ***Submission of Data and Reports Relating to Data Reprocessing Commitments***

Reprocessing of archive seismic data from PEL 106 was carried out in conjunction with the processing of the new data acquired during the Paranta Seismic Survey. 377 line kilometres of existing multi-vintage seismic (total of 35 lines) were reprocessed and interpreted and a further 87 line kilometres of new 2D seismic data were recorded, processed and interpreted during the Second Permit Year. The results of this work are presented in The Paranta Seismic Survey Interpretation Report which was submitted to PIRSA on 15 February 2005.

## **2. CHECKLIST FOR SUBMITTING DATA**

Records of non-compliance with Regulations, submission of notifications of drilling operations, drilling reports and geophysical data reports are presented in the following tables.

**TABLE 1: RECORD OF NON-COMPLIANCE WITH REGULATIONS**  
**PERMIT: PEL 106**  
**YEAR TWO: 9 April 2004 – 8 April 2005**

<b>Drilling</b>				
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**SEO Non Compliance**

Field Operation	Date		Description of Incident	Resolution
<i>No incidents of Non-Compliance arising from the drilling operations of Smegsy-1.</i>				

**Report Non Compliance**

Name of Report	Date Due	Date Submitted	Cause of Overdue Submission	Resolution
<i>No incidents of Non-Compliance</i>				
<i>Well Completion Report for Nutmeg-1 submitted</i>	11 Aug 2004	18 July 2004		
<i>Well Completion Report for Paranta-1 submitted</i>	30 Sept 2004	20 Sept 2004		
<i>Well Completion Report for Smegsy-1 submitted</i>	28 Feb 2005	20 Feb 2005		

**Data Submission Non-Compliance**

Data Type	Date Due	Data Submitted	Cause of Overdue Submission	Resolution
<i>No incidents of Non-Compliance</i>				

<b>Seismic</b>				
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**SEO Non Compliance**

Field Operation	Date		Description of Incident	Resolution
No incidents of non-compliance arising from the field operations of the 2004 Malleus Seismic Survey.				
No incidents of non-compliance arising from the field operations of the 2004 Lena Seismic Survey.				
No incidents of non-compliance arising from application for AFL 16 within PPL 66 (Jack Lake).				
No incidents of non-compliance arising from application for AFL 7 within PPL 148 (Welcome Lake).				

**Report Non Compliance**

*No incidents of Non-Compliance*

**Data Submission Non-Compliance**

*No incidents of Non-Compliance*

**TABLE 2: CHECKLIST FOR NOTIFICATIONS OF DRILLING OPERATIONS FOR SMEGSY-1  
 PERMIT: PEL 106  
 YEAR TWO: 9 April 2004 to 8 April 2005**

Drilling Operations Commenced: 16 July 2004

Drilling Operations Completed: 28 August 2004

REPORT /DATA SET	FORMAT	Person/agency to whom information is to be provided	Period allowed for submitting data	Date Due	Date Submitted	Great Artesian Officer Responsible for Compliance	Comments
Notification of proposed drilling activity including demonstration of the suitability of an existing SEO.		PIRSA/Mike Malavazos	35 days prior to proposed start date	11 June 2004	19 Dec 03	Managing Director	Approval granted 13 Feb 2004
Notification of proposed commencement of earthworks – preparation of access tracks and well leases.			21 days prior to proposed start date	25 June 04	23 June 04	Managing Director	
Notification to landowner(s)		Pastoral Lessee	21 days prior to proposed start date	25 June 04*	19 Dec 03	Managing Director	
		National Parks	21 days prior to proposed start date	Not Applicable			
		Native Title Claimant(s)	21 days prior to proposed start date	25 June 04	19 Dec 03	Managing Director	Ngayana Dieri Kama
		Other PEL or PL licensees as appropriate	21 days prior to proposed start date	25 June 04	19 Dec 03	Managing Director	

**TABLE 3: CHECKLIST FOR SUBMISSION OF DRILLING REPORTS**

**Permit: PEL 106**

**Permit Year Two: 9 April 2004 to 8 April 2005**

**Well: Nutmeg-1**

Drilling Operations Commenced: 16 January 2004

Drilling Operations Completed: 12 February 2004

Report/Data Set	Format	Person/agency to whom information is to be provided	Period allowed for submitting data	Date Due	Date Submitted	Great Artesian Officer Responsible	Comments
Daily Drilling Reports		PIRSA	Within 12 hours of report period	During drilling operations	During drilling operations	Ray Shaw	
Wireline Logs		PIRSA	Within 1 month of acquisition of data	7 March 2004	Feb 2004	Ray Shaw	Non-compliance with submission of logs - incorrect format.
Mud Logging Data		PIRSA	Included with Daily Drilling Reports, then subsequently with the Well Completion Report	During drilling operations	During drilling operations	Ray Shaw	
Well Samples		PIRSA	Within 6 months of rig release	<b>11 Aug 2004</b>	<b>Samples sent on 17 and 29 June 2004</b>	Ray Shaw	
Well Completion Report		PIRSA	Within 6 months of rig release	<b>11 Aug 2004</b>	<b>18 July 2004</b>	Ray Shaw	
Reportable Incidents		PIRSA	Serious incidents must be reported immediately (within 24 hours), with a written report following within 3 months	No Reportable Incidents		Ray Shaw	

Note: Submission of relevant data during Permit Year Two in bold

**TABLE 4: CHECKLIST FOR SUBMISSION OF DRILLING REPORTS**

**Permit: PEL 106**

**Permit Year Two: 9 April 2004 to 8 April 2005**

**Well: Paranta-1**

Drilling Operations Commenced: 14 February 2004

Drilling Operations Completed: 31 March 2004

Report/Data Set	Format	Person/agency to whom information is to be provided	Period allowed for submitting data	Date Due	Date Submitted	Great Artesian Officer Responsible	Comments
Daily Drilling Reports		PIRSA	Within 12 hours of report period	During drilling operations	During drilling operations	Ray Shaw	
Wireline Logs		PIRSA	Within 1 month of acquisition of data	<b>30 April 2004</b>	<b>April 2004</b>	Ray Shaw	
Mud Logging Data		PIRSA	Included with Daily Drilling Reports, then subsequently with the Well Completion Report	During drilling operations	During drilling operations	Ray Shaw	
Well Samples		PIRSA	Within 6 months of rig release	<b>30 Sept 2004</b>	<b>Samples sent on 17 and 29 June 2004</b>	Ray Shaw	
Well Completion Report		PIRSA	Within 6 months of rig release	<b>30 Sept 2004</b>	<b>20 Sept 2004</b>	Ray Shaw	
Reportable Incidents		PIRSA	Serious incidents must be reported immediately (within 24 hours), with a written report following within 3 months	No Reportable Incidents		Ray Shaw	

Note: Submission of relevant data during Permit Year Two in bold

**TABLE 5: CHECKLIST FOR SUBMISSION OF DRILLING REPORTS**

**Permit: PEL 106**

**Permit Year Two: 9 April 2004 to 8 April 2005**

**Well: Smegsy-1**

Drilling Operations Commenced: 16 July 2004

Drilling Operations Completed: 28 August 2004

Report/Data Set	Format	Person/agency to whom information is to be provided	Period allowed for submitting data	Date Due	Date Submitted	Great Artesian Officer Responsible	Comments
Daily Drilling Reports		PIRSA	Within 12 hours of report period	During drilling operations	During drilling operations	Ray Shaw	
Wireline Logs		PIRSA	Within 1 month of acquisition of data	30 Sept 2004	8 Sept 2004	Ray Shaw	
Mud Logging Data		PIRSA	Included with Daily Drilling Reports, then subsequently with the Well Completion Report	During drilling operations	During drilling operations	Ray Shaw	
Well Samples		PIRSA	Within 6 months of rig release	28 Feb 2005	12 Oct 2004	Ray Shaw	
Well Completion Report		PIRSA	Within 6 months of rig release	28 Feb 2005	20 Feb 2005	Ray Shaw	
Reportable Incidents		PIRSA	Serious incidents must be reported immediately (within 24 hours), with a written report following within 3 months	No Reportable Incidents		Ray Shaw	

**TABLE 6: CHECKLIST FOR SUBMISSION OF GEOPHYSICAL DATA AND REPORTS TO PIRSA**  
**Permit: PEL 106                      Permit Year Two: 9 April 2004 to 8 April 2005                      PARANTA SEISMIC SURVEY**

Geophysical Data	Specifics	Format	Transmittal	Sent To	Time Period	Due Date	Comments
Geophysical Progress Reports Paranta 2D Seismic Survey		Word or PDF	15 May 2005	Email or fax to cockshell.david@ saugov.sa.gov.au	Periodic basis determined by consultation with the Minister		Daily field reports forwarded by email to PIRSA
Geophysical Operations Reports – recording and processing		Hardcopy, PDF	15 May 2005	Prelim report provided 7 Apr 2004	Within 12 months of completion of recording data	Feb 2005	
Geophysical Data - Seismic	Seismic Processed Data		15 May 2005	Director Petroleum Group		Same time as associated Operations Report	Notices reissued following delay from original notification date in November to January
Geophysical Data - Seismic	Seismic Field Data		15 May 2005	same			
Geophysical Data - Seismic	Obs Logs	GDA 94	15 May 2005	same			
Geophysical Data - Seismic	Nav data including elevations and bathymetry	GDA 94	15 May 2005	same			
Geophysical Data - Seismic	Field Statics		15 May 2005	same			
Geophysical Data - Seismic	Processed 2D seismic sections	CGM+	15 May 2005	same			
Geophysical Interpretation Report		Hardcopy, PDF	15 May 2005	same	Within 12 months of completion of processing data		
Geophysical Data - Seismic	Processed 3D data vols and velocities					N/A	No 3D surveys recorded during Permit year
Geophysical Data - Seismic	Processed 3D time slices (if they have been produced)					N/A	No 3D surveys recorded during Permit year
Geophysical Data	Any other field acquisition detail					N/A	

**Note: Paranta Seismic Survey was conducted 27 January – 19 February 2004**

**TABLE 7: CHECKLIST FOR SUBMISSION OF GEOPHYSICAL DATA AND REPORTS TO PIRSA**  
**Permit: PEL 106                      Permit Year Two: 9 April 2004 to 8 April 2005                      MALLEUS SEISMIC SURVEY**

Geophysical Data	Specifics	Format	Transmittal	Sent To	Time Period	Due Date	Comments
Geophysical Progress Reports Malleus 2D Seismic Survey		Word or PDF		Email or fax to cockshell.david@ saugov.sa.gov.au	Periodic basis determined by consultation with the Minister		Daily field reports forwarded by email to PIRSA
Geophysical Operations Reports – recording and processing		Hardcopy, PDF			Within 12 months of completion of recording data	June 2005	
Geophysical Data - Seismic	Seismic Processed Data				Not required until Permit Year 3	Same time as associated Operations Report	
Geophysical Data - Seismic	Seismic Field Data				same		
Geophysical Data - Seismic	Obs Logs	GDA 94			same		
Geophysical Data - Seismic	Nav data including elevations and bathymetry	GDA 94			same		
Geophysical Data - Seismic	Field Statics				same		
Geophysical Data - Seismic	Processed 2D seismic sections	CGM+			same		
Geophysical Interpretation Report		Hardcopy, PDF			Within 12 months of completion of processing data		June 2005
Geophysical Data - Seismic	Processed 3D data vols and velocities					N/A	No 3D surveys recorded during Permit year
Geophysical Data - Seismic	Processed 3D time slices (if they have been produced)					N/A	No 3D surveys recorded during Permit year
Geophysical Data	Any other field acquisition detail					N/A	

**Note: Malleus Seismic Survey was conducted from 17<sup>th</sup> to 24<sup>th</sup> of June 2004**

**TABLE 8: CHECKLIST FOR SUBMISSION OF GEOPHYSICAL DATA AND REPORTS TO PIRSA**

Geophysical Data	Specifics	Format	Transmittal	Sent To	Time Period	Due Date	Comments
Geophysical Progress Reports Lena 2D Seismic Survey		Word or PDF		Email or fax to <a href="mailto:cockshell.david@saugov.sa.gov.au">cockshell.david@saugov.sa.gov.au</a>	Periodic basis determined by consultation with the Minister		Daily field reports forwarded by email to PIRSA
Geophysical Operations Reports – recording and processing		Hardcopy, PDF			Within 12 months of completion of recording data		
Geophysical Data – Seismic	Seismic Processed Data				Not required until Permit Year 3	Same time as associated Operations Report	
Geophysical Data – Seismic	Seismic Field Data						
Geophysical Data – Seismic	Obs Logs	GDA 94					
Geophysical Data – Seismic	Nav data including elevations and bathymetry	GDA 94					
Geophysical Data – Seismic	Field Statics						
Geophysical Data – Seismic	Processed 2D seismic sections	CGM+					
Geophysical Data – Seismic							
Geophysical Interpretation Report		Hardcopy, PDF			Within 12 months of completion of processing data		
Geophysical Data – Seismic	Processed 3D data vols and velocities					N/A	No 3D surveys recorded during Permit year
Geophysical Data – Seismic	Processed 3D time slices (if they have been produced)					N/A	No 3D surveys recorded during Permit year
Geophysical Data	Any other field acquisition detail					N/A	

**Permit: PEL 106**

**Permit Year Two: 9 April 2004 to 8 April 2005**

**LENA SEISMIC SURVEY**

**Note: Lena Seismic Survey was conducted from 20<sup>th</sup> to 23rd of October 2004**

**TABLE 9: CHECKLIST FOR SUBMISSION OF GEOPHYSICAL DATA AND REPORTS TO PIRSA**  
**Permit: PEL 106                      Permit Year Two: 9 April 2004 to 8 April 2005                      REPROCESSED SEISMIC DATA**

Geophysical Data	Specifics	Format	Transmittal	Sent To	Time Period	Due Date	Comments
Geophysical Operations Report - reprocessing	Description of techniques applied for reprocessing	Hardcopy, PDF	15 May 2005	Director Petroleum Group	Within 2 months of completion of the reprocessing report *	1 Feb 2004*	
Geophysical Data - Seismic	Reprocessing – transcribed copy of field data		15 May 2005				
Geophysical Data - Seismic	Reprocessing – Sections of reprocessed data	PDF	15 May 2005				
Geophysical Data - Seismic	Reprocessing – field tape transcription log		15 May 2005				
Geophysical Data - Seismic	Reprocessing – tape and file listing of field data that has been copied and reprocessed	Ops Report-archive listing	15 May 2005				
Geophysical Interpretation Report		Hardcopy , PDF	15 May 2005		Within 6 months of completion of reprocessing data**	1 May 2005*	

\*\* Reprocessing completed on 1 December 2004

### **3. COMPLIANCE - DRILLING OPERATIONS**

#### **STATEMENTS OF ENVIRONMENTAL OBJECTIVES**

Government approval for Great Artesian to drill the Nutmeg-1, Paranta-1 and Smegsy-1 wells in PEL 106 was conditional upon Great Artesian committing to achieving the objectives defined in the “Statement of Environmental Objectives for Drilling and Well Operations in the Cooper/Eromanga Basins – South Australia (August, 2000)”.

All wells did encounter commercial indications of hydrocarbons and were cased and suspended pending extended production testing. The testing was undertaken on Nutmeg-1 and Paranta-1 in July 2004 and on Smegsy-1 in December 2004. Until all engineering studies have been completed each of these wells remain cased and suspended and as such access to the well sites is required. Due to this fact no rehabilitation has yet been undertaken of the sites or access to these sites.

To-date Great Artesian is satisfied that all the objectives required by the SEO have been met, and spreadsheets presented herein summarise the strategies that have been, and will be, employed to achieve compliance.

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
<p>1. Avoid disturbance to known Aboriginal and European heritage significance.</p>	<p>The aim of this objective is to ensure that any sites of Aboriginal and European heritage are identified and protected. Sites can be identified during the planning stages of well site and access track construction activities. To ensure the achievement of this objective personnel must be appropriately trained and experienced in identifying and protecting sites of Aboriginal and European heritage significance at both the planning and construction stages.</p> <p>Following comment from PIRSA an additional scouting exercise was initiated to identify the whereabouts of any Priority 1 and 2 vegetation, particularly old man saltbush. No occurrences were reported at the proposed camp site.</p>	<ul style="list-style-type: none"> <li>• Proposed well site and access track locations have been scouted by appropriately trained and experienced personnel for sites of Aboriginal and European heritage significance before commencement of construction.</li> <li>• Records of scouting are kept and available for auditing.</li> <li>• The operator has a mechanism in place to appropriately report and respond appropriately to any sites discovered during construction and operation activities.</li> <li>• Any sites identified have been flagged and subsequently avoided.</li> </ul> <p><b>Note:</b> Where a negotiated agreement or determination for heritage clearance is in place, compliance to that agreement or determination takes precedence over the above criteria.</p>	<p>Great Artesian has an agreement with the Ngayana Dieri Karna Native Title Claimant group which specifies the requirements for scouting proposed well and access tracks to identify and avoid areas of heritage value and archaeological significance.</p> <p>A site visit was carried out by a scouting team from the Ngayana Dieri Karna Native Title Claimant Group. The proposed drilling location and access route were given heritage clearance.</p> <p>There were no sites identified near the proposed operations areas as having particular cultural significance.</p>
<p>2. Avoid disturbances which have long term impact on biological or wilderness values of a particular area.</p>	<p>No areas which are considered to have high biological or wilderness values in terms of those shown in Figure 1 of the SEO.</p>	<ul style="list-style-type: none"> <li>• No activities that are assessed to be located in the regions described in the scope above arte to be carried out without the prior specific approval of the Minister.</li> </ul>	<p>The well is not located in or near areas of high biological or wilderness values shown in Figure 1 of the SEO. The drilling operations presented no danger of long term impact on the biological or wilderness values of this particular area.</p>

## ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
<p>3. Minimise disturbance to native vegetation and wildlife habitat.</p>	<p>Well site and access track construction has been shown to have an insignificant impact on native vegetation and wildlife habitat by a number of studies (1). This is due to the small and confined area impacted on by the well site and access track. Nevertheless, due to the significance of native vegetation and fauna it is important to monitor the achievement of this objective.</p> <p>The aim of this objective is to also maximise the potential for revegetation success.</p>	<ul style="list-style-type: none"> <li>• Proposed well site and access track locations have been scouted by appropriately trained and experienced personnel for native vegetation and wildlife habitats.</li> <li>• Vegetation clearance has been minimised and has taken into account the conservation needs of particular species.</li> <li>• Records of vegetation clearance are kept and available for auditing.</li> <li>• The attainment of either 0, +1 or + 2 GAS criteria for "Re-establish natural vegetation on abandoned well sites and access tracks" objective listed in Appendix 2.</li> </ul> <p>Hazardous material stored, used and disposed of in accordance with relevant legislation on dangerous substances.</p>	<ul style="list-style-type: none"> <li>• Only 3500 metres of new access track was required. Very little further clearing was required. The well site contained only sparse grassy vegetation. No significant trees or shrubs needed to be cleared.</li> <li>• The well site and access track will be rehabilitated and restored in accordance with the guidelines set down in PIRSA's Field Guide for the Environmental Assessment of Abandoned Petroleum Well sites in the Cooper Basin, South Australia, to attain the highest feasible GAS rating, if the production testing does not lead to commercial production.</li> <li>• Great Artesian's Rig Representative reported no instances of the spillage of hazardous chemicals during Drilling Operations.</li> <li>• Topsoil was stockpiled for subsequent respreading when restoration activities are conducted.</li> </ul>

(1) Leigh, J.H. and Briggs, J.D. (eds), 1994. Threatened Australian Plants: Overview and Case Studies. Australian National Parks and Wildlife Service, Canberra.

Garnett, S., 1992a. The Action Plan for Australian Birds of Australia. Australian National Parks and Wildlife Service. Endangered Species Program, Project 121.

Garnett, S. (ed.) 1992b. Threatened and Extinct Birds of Australia. Royal Australian Ornithologists Union. Report 82.

Wagner, R. and Jackson, P., 1993. The Action Plan for Australian Fresh Water Fishes. Australian Nature Conservation Agency. Endangered Species Program, Project 147.

Lee, A.K., 1995. The Action Plan for Australian Rodents. Australian Nature Conservation Agency. Endangered Species Program, Project 130.

Kennedy, M., 1992. Australian Endangered Marsupials and Monotremes: An Action Plan for their Conservation. IVCN Glan, Switzerland.

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

<b>WELL NAME</b>	<b>SMEGSY-1</b>	<b>PEL 106</b>	<b>SPUD DATE: 16 JULY 2004</b>
<b>OBJECTIVE</b>	<b>COMMENT</b>	<b>ASSESSMENT CRITERIA</b>	<b>LEVEL OF ACHIEVEMENT</b>
4. Avoid disturbance to rare, vulnerable and endangered flora and fauna species.	<p>Rare, vulnerable and endangered flora and fauna species are defined by Schedules 7, 8 and 9 of the National Parks and Wildlife Act, 1972.</p> <p>The aim of this objective is to also maximise the potential for revegetation success.</p>	<ul style="list-style-type: none"> <li>Proposed well site and access track locations have been scouted by appropriately trained and experienced personnel before the commencement of construction for rare, vulnerable and endangered species.</li> <li>Any sites of rare, vulnerable and endangered flora and fauna have been identified, flagged and subsequently avoided.</li> <li>Records of such scouting are kept and available for auditing.</li> </ul>	<ul style="list-style-type: none"> <li>National Parks and Wildlife flora/ fauna data-bases contain no recorded of vulnerable or endangered species within 20 km of the site.</li> </ul>
5. Prevent the introduction and establishment of exotic weed species.	<p>The major potential source of weed introduction is from vehicles and equipment brought in from other regions of the state or interstate for the various well activities. The most effective way of preventing weed introduction is by thoroughly cleaning vehicles and equipment prior to entering the Cooper-Eromanga Basins.</p>	<ul style="list-style-type: none"> <li>All vehicles and equipment appropriately cleaned prior to entering the Cooper-Eromanga Basins.</li> <li>Cleaning carried out in accordance with specified company procedures and accepted practices.</li> <li>Reports of vehicle and equipment cleaning are kept and available for auditing.</li> <li>Detection of exotic weed species as a consequence of industry activities.</li> </ul>	<ul style="list-style-type: none"> <li>All vehicles involved with the drilling operation were already in services in the Cooper Basin prior to commencing work at the Smegsy-1 well.</li> </ul>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

<b>WELL NAME</b>	<b>SMEGSY-1</b>	<b>PEL 106</b>	<b>SPUD DATE: 16 JULY 2004</b>
<b>OBJECTIVE</b>	<b>COMMENT</b>	<b>ASSESSMENT CRITERIA</b>	<b>LEVEL OF ACHIEVEMENT</b>
6. Minimise impacts to soil.	<p>The main impact to soil is caused by the removal of existing soil and/ or the importation of foreign material for the construction of well sites and access tracks. This creates a visual impact and can also alter the soil characteristics which can, in turn, impact on the effective re-establishment of native species.</p> <p>Another potential impact to soil is soil contamination from accidental spillages of chemicals or hazardous during construction and operation.</p>	<ul style="list-style-type: none"> <li>• The attainment of 0, +1, or +2 GAS Criteria for "Minimise Visual Impact of Abandoned Well sites" objective listed in Appendix 2.</li> <li>• The attainment of 0, +1, or +2 GAS Criteria for "Minimise Visual Impact of Abandoned Access Tracks" objective listed in Appendix 2.</li> <li>• The attainment of 0, +1, or +2 GAS Criteria for "Re-establish natural vegetation on abandoned well sites and access tracks" objective listed in Appendix 2.</li> </ul> <p>Hazardous material sorted, used and disposed of in accordance with relevant legislation on dangerous substances.</p>	<ul style="list-style-type: none"> <li>• Clay material was extracted from several borrow pits alongside the station track that was used for the majority of the access route. The clay was used for upgrading the track previously developed by SANTOS to the Aratna-1 well location site.</li> <li>• The access track to the well site will be rehabilitated if the extended production testing does not indicate commercially producible quantities of hydrocarbons.</li> </ul>
7. Avoid initiating erosion on gibber pavements.	<p>It is recognised that the removal of the overlying gibber mantle inevitably leads to severe gully erosion on the gibber plains with a slope greater than two degrees in the Cooper Basin (2). It is therefore important to avoid removal of gibber stones in the construction of well sites and access tracks.</p>	<ul style="list-style-type: none"> <li>• The attainment of 0, +1, or +2 GAS Criteria for "Minimise Visual Impact of Abandoned Well sites" objective listed in Appendix 2.</li> <li>• The attainment of 0, +1, or +2 GAS Criteria for "Minimise Visual Impact of Abandoned Access Tracks" objective listed in Appendix 2.</li> <li>• Gibber mantle on access tracks has not been removed, only rolled to allow vehicle and equipment access</li> <li>• Gibber mantle removed on well sites confined to the mud pit, cellar and turkeys nest.</li> </ul>	<ul style="list-style-type: none"> <li>• There are no gibber pavements along the access site to Smegsy-1</li> </ul>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

<b>WELL NAME</b>	<b>SMEGSY-1</b>	<b>PEL 106</b>	<b>SPUD DATE: 16 JULY 2004</b>
<b>OBJECTIVE</b>	<b>COMMENT</b>	<b>ASSESSMENT CRITERIA</b>	<b>LEVEL OF ACHIEVEMENT</b>
<p>8. Minimise loss of reservoir and aquifer pressures and contamination of freshwater aquifers.</p>	<p>This objective seeks to protect the water quality and water pressure of aquifers that may potentially be useful as water supplies, and to maintain pressure in sands that may host petroleum accumulations elsewhere.</p> <p>To address this objective, the risks of cross flow between formations known to be permeable and in natural hydraulic isolation from each other, or where there is insufficient information to determine that they are permeable or in hydraulic communication, must be assessed on a case by case basis and procedures implemented to isolate these formations.</p> <p>The following geological formations in the Cooper-Eromanga Basins may contain permeable sands (aquifers) which may be in natural hydraulic isolation from each other (from shallowest to deepest):                      Eyre Formation                      Winton Formation                      Mackunda Formation                      Coorikiana Sandstone                      Cadna-Owie Formation                      Namur Sandstone                      Adori Sandstone                      Hutton Sandstone</p>	<p><u>Drilling and Completion Activities</u></p> <ul style="list-style-type: none"> <li>• Casing design (including setting depths) have been carried out in accordance with company defined procedures which satisfy worst case expected loads and environmental conditions determined for the particular well.</li> <li>• Casing set in accord with design parameters and company approved procedures.</li> <li>• Sufficient isolation between any of the formations listed in the adjacent column – where present – is substantiated (eg. Through well logs, pressure measurements, or casing integrity measurements).</li> <li>• For cases where isolation of these formations is not established, sufficient evidence is available to demonstrate that they are in natural hydraulic communication.</li> </ul> <p><u>Producing Wells</u></p> <ul style="list-style-type: none"> <li>• Monitoring programs, carried out in accord with company approved procedures(s), demonstrate no cross-flow or fluid migration occurring behind casing.</li> </ul>	<p>The Smegsy-1 well has been fully cased and suspended prior to tie-in to the Jake Lake – Moonanga gas pipeline and production. The well has been completed as the Patchawarra Formation gas producer.</p>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
	Poolowanna Formation Nappamerri Formation Toolachee Formation (multiple sands) Daralingie Formation (multiple sands) Epsilon Formation (multiple sands) Patchawarra Formation Tirrawarra Sandstone Merrimelia Formation Basement Reservoirs	<ul style="list-style-type: none"> <li>Casing integrity and corrosion monitoring programs, carried out in accordance with company approved procedures, show adequate casing condition to satisfy the objective.</li> </ul> <p><u>Inactive Wells</u>                      In the case where a well is suspended for a prolonged period of time :</p> <ul style="list-style-type: none"> <li>Monitoring methods for detecting fluid migration, carried out in accord with company approved procedures for this purpose, are in place and show no fluid migration.</li> </ul> <p><u>Well Abandonment Activities</u></p> <ul style="list-style-type: none"> <li>Plugs set to isolate aquifers through the well bore, designed and set in accord with defined procedures to satisfy worst case expected loads and downhole environmental conditions.</li> <li>Plugs have been set to isolate aquifers which are present which are not in natural hydraulic communication nor have been isolated by cement behind casing.</li> </ul>	

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
9. Minimise impact on surface water and drainage patterns.	Due to the small and confined area impacted on well sites, there should be minimal impact to surface water drainage patterns in the region. The only foreseeable threat to drainage patterns could arise from long and wide access tracks which could divert a portion of the natural water flow. The main threat to the surface water is contamination from spills during times of major flooding. Potential spills can originate from the well while the well is producing or from the mud pits during drilling.	<u>Drilling and Completion Activities</u> <ul style="list-style-type: none"> <li>• Oil well producing operations shut in during period of flood inundation.</li> <li>• Upon completion of drilling, mud pits allowed to dry out and then backfilled level with the surrounding landscape.</li> <li>• Access tracks have been designed and located to avoid any diversion of water during flood inundation.</li> </ul>	<ul style="list-style-type: none"> <li>• The Smegsy-1 well site is located in a dune field environment and is remote from any significant drainage features.</li> <li>• There was no significant rainfall during the period of the drilling operations.</li> </ul>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

<b>WELL NAME</b>	<b>SMEGSY-1</b>	<b>PEL 106</b>	<b>SPUD DATE: 16 JULY 2004</b>
<b>OBJECTIVE</b>	<b>COMMENT</b>	<b>ASSESSMENT CRITERIA</b>	<b>LEVEL OF ACHIEVEMENT</b>
10. Minimise visual impacts on the natural landscape.	The major impact of well sites and access tracks is their visual impact (3). Location, construction and restoration practices can significantly reduce the visual impact of well sites and access tracks.	The attainment of 0, +1, or + 2 GAS criteria for "Minimise Visual Impact of Abandoned Well sites" objective listed in Appendix 2. The attainment of 0, +1, or +2 GAS criteria for "Minimise Visual Impact of Abandoned Access Tracks" objective listed in Appendix 2.	<ul style="list-style-type: none"> <li>The well site is located in very flat country in a dune corridor hidden from view between two sand dunes.</li> </ul> <p>The access track to Smegsy-1 turns off the Jack Lake to Raven gas field road and utilises an easement created previously by SANTOS to gain access to the Aratna-1 well location. Smegsy-1 lies approximately 2 km north of Aratna-1 in a swale, for which access was easily obtained across flat, mostly claypan lightly vegetated country.</p> <ul style="list-style-type: none"> <li>The Smegsy-1 well site will be rehabilitated and restored in accordance with the guidelines set out in PIRSA's Field Guild.</li> <li>In view of Smegsy-1 being put onto production, rehabilitation will be undertaken following depletion of the field.</li> </ul>

(3) Refer to Fatchen and Woodburn in the references section of this Statement of Environmental Objectives.

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
<p>11. Minimise risks to the safety of the public and other third parties.</p>	<p>The criteria for assessing the achievement of this objective have been developed on the basis of the current understanding of the risks of wells to third party safety. The key to achieving the third party safety objective in relation to both downhole abandonment and surface well site restoration is to ensure that the visual prominence of the abandonment well site and its access track(s) is minimised to the extent where it is difficult for third parties to detect and therefore access these sites. Also, in the case where a third party encounters an abandoned well site, adequate signage of the well location needs to be displayed to hinder any third party interference with the abandoned well bore. Similarly, the backfilling of the well cellar and the removal of rubbish from the restored well site need to be carried out to further facilitate third party safety.</p>	<p><u>Drilling and Completion Activities</u></p> <ul style="list-style-type: none"> <li>• Casing design (including setting depths) have been carried out in accordance with company defined procedures which satisfy worst case expected loads and environmental conditions determined for the particular well.</li> <li>• Casing set in accord with design parameters and company approved procedures.</li> <li>• Blow out prevention precautions in place and operational in accordance with defined procedures and appropriate to the expected loads and downhole environmental conditions.</li> </ul> <p><u>Producing Wells</u></p> <ul style="list-style-type: none"> <li>• Adequate signage and precautions taken for warning third parties of the potential danger and to keep away from producing or suspended wells.</li> <li>• Casing integrity and corrosion monitoring programs, carried out in accord with the company approved procedures, show adequate casing condition to satisfy the objective. Effective emergency response plan and procedures are in place in the event of a blow out.</li> <li>• Hazardous material stored, used and disposed of in accordance with relevant legislation on dangerous substances for occupational, health and safety.</li> </ul>	<p>The Smegsy-1 well has been fully cased and suspended prior to tie-in to the Jake Lake – Moonanga gas pipeline and production. The site has been fenced off.</p>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
		<p><u>Well Abandonment Activities</u></p> <ul style="list-style-type: none"> <li>Downhole abandonment of a well is carried out in accord with company approved procedures to satisfy worst case expected loads and downhole environmental conditions.</li> </ul> <p><u>Well Site Restoration Activities</u></p> <p>The attainment of 0, +1, or + 2 GAS criteria for "Minimise Visual Impact of Abandoned Wellsites" objective listed in Appendix 2.</p> <p>The attainment of 0, +1, or +2 GAS criteria for "Minimise Visual Impact of Abandoned Access Tracks" objective listed in Appendix 2.</p> <p>The attainment of 0. GAS criteria for "Site left in a Clean, Tidy and Safe Condition after Final Cleanup" objective listed in Appendix 2.</p> <p>The undertaking of a risk assessment study to assess the threats to third party safety from drilling, well completion, well production, downhole abandonment and from inactive and abandoned wells.</p>	

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
12. Minimise the impact on the environment of waste handling and disposal.	Waste refers to all wastes with the exception of Listed Wastes in Schedule 1 Part B of the Environment Protection Act, 1993.	<ul style="list-style-type: none"> <li>• The attainment of 0. GAS criteria for "Site left in a Clean, Tidy and Safe Condition after Final Cleanup" objective listed in Appendix 2.</li> <li>• All wastes generated on a well site (except sewage) to be disposed at an EPA licensed facility.</li> <li>• Records show that sewage at drilling camps was stored and disposed of in a manner which posed no risk to the human health and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>• All hard waste was removed from Smegsy-1 well site in accordance with Great Artesian's policy set out in the company's Drilling Operations Manual.</li> <li>• Putrescible waste will be disposed of in a mud pit following backfilling.</li> </ul>
13. Avoid adverse impacts on livestock.	The main risk posed to livestock is injury from open drill sumps, open well cellars and moving beam pump oil wells.	<ul style="list-style-type: none"> <li>• In the likely presence of livestock, the mud pits and/or flame pits and moving beam pumps are fenced off.</li> <li>• In the case of a producing well, the well cellar, rat hole, and mouse hole are made safe for livestock either through appropriate covering or fencing.</li> <li>• In the case of an abandoned restored well site, the cellar has been backfilled to a level with the surrounding landscape.</li> </ul>	<ul style="list-style-type: none"> <li>• The Smegsy-1 well site has been fenced off, following production testing in order to protect any cattle that may stray onto the site, notwithstanding that it is an area with only low density or negligible grazing.</li> </ul>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

<b>WELL NAME</b>	<b>Smegsy-1</b>	<b>PEL 106</b>	<b>SPUD DATE: 16 JULY 2004</b>
<b>OBJECTIVE</b>	<b>COMMENT</b>	<b>ASSESSMENT CRITERIA</b>	<b>LEVEL OF ACHIEVEMENT</b>
<p>14. Avoid spills of oil or hazardous material outside of impermeable sumps or other areas designed to contain such spills.</p>	<p>The main potential for spills to occur is around the well head. Spills that occur around the well head can normally be contained within the cellar and/or confined to the pad area of the well site.</p> <p>As specified under objective 9, any threat to surface waters are avoided as a result of ceasing oil production during periods of inundation. Similarly, it has been found that in the Cooper Basin, threats to ground water as a result of surface spills are avoided as a result of a) the depth of the underground aquifers; and (b) the entrapment of any contamination in the first 1 or 2 metres of soil. The major threat of spills is the threat to soil and vegetation directly impacted on by the spill. Therefore, the achievement of this objective also consequently contributes to the achievement of objectives 3 and 6 in relation to minimising the impacts on natural vegetation and soil respectively.</p> <p>As spills in the Cooper Basin will tend to be contained by the soil within the area of the spill, any wide scoping environmental threat is considered very unlikely. However, the focus of assessing this objective will primarily be on reducing the number of spills over time. Avoidance of spills will be paramount in areas where the spill can be potentially spread beyond the immediate confines of the spill area into sensitive environments such as creeks or wetlands.</p>	<ul style="list-style-type: none"> <li>• Cumulative number and volume of spills at any point in time during the year is less than the cumulative spills for the same period from the previous year and a general declining trend in number and volume of spills over the long term.</li> <li>• No spills which pose a significant threat to the Cooper Creek System.</li> </ul>	<ul style="list-style-type: none"> <li>• There were no periods of local flood inundation during the drilling operations at Smegsy-1.</li> <li>• There were no spills of oil or hazardous materials of any significance during the drilling operations.</li> <li>• The location of Smegsy-1 is very remote from the nearest significant drainage system forming a tributary of the Cooper Creek that flood inundation is considered unlikely.</li> </ul>

**ASSESSMENT OF GREAT ARTESIAN'S PERFORMANCE IN ACHIEVING THE ENVIRONMENTAL OBJECTIVES DEFINED IN THE COOPER BASIN DRILLING SEO**

WELL NAME	SMEGSY-1	PEL 106	SPUD DATE: 16 JULY 2004
OBJECTIVE	COMMENT	ASSESSMENT CRITERIA	LEVEL OF ACHIEVEMENT
15. In the event of an oil spill, minimise the impacts on fauna, flora, soil, livestock, and surface and ground water.	In the case of an oil spill, it has been shown that in the Cooper Basin active bio-remediation of the contaminated soil is an effective way for remediating the site to an acceptable level which leaves no environmental adverse effect (4).	<ul style="list-style-type: none"> <li>• In the event of an oil spill, contingency plan implemented after the spill event.</li> <li>• Results of emergency response procedures carried out in accord with Regulation 31 show that oil spill contingency plan in place in the event of a spill is adequate and any necessary remedial action needed to the plan is undertaken promptly by the licensee.</li> <li>• Bio-remediation is undertaken on the affected soil, either on site or offsite.</li> <li>• All oil spill bio-remediation meets end point assessment criteria developed specifically for the relevant environment (eg. Santos Oil Spill Remediation End Point Criteria project).</li> </ul>	<ul style="list-style-type: none"> <li>• There were no spills of oil or hazardous materials of any significance during the drilling operations.</li> </ul>

(4) Megalos, N.P., 1994. Bioremediation of Oil Contaminated Soil, South Australian Department of Mines and Energy, Report Book, No 94/4.

## **4. COMPLIANCE – SEISMIC OPERATIONS**

### **NEW FIELD OPERATIONS**

Seismic field operations for Permit Year Two of PEL 106 consisted of two, Lena and Malleus, seismic surveys. As part of its farmin commitment Beach Petroleum recorded 2D seismic data (Malleus Seismic Survey) in June 2004. 176 km of seismic data was recorded on 18 lines, GA04-14 to GA-4-30 and BC04-50. Parts of two lines were charged to PEL 91 and one of the Beach Petroleum PEL 91 lines, BC04-50 was recorded in conjunction with this PEL 106 program.

Lena 2D seismic survey was conducted by Great Artesian Oil and Gas during October 2004. The survey (a total of 67.95 km) consisted of six lines, GA04-31 to GA04-36 that ran through and around the Smegsy-1 discovery well location and adjacent Jack Lake Gas Field.

Great Artesian's strategies for achieving each of the SEO objectives for the Lena Seismic survey are outlined below.

The SEO requires an Environmental Report to be submitted at the completion of each seismic survey. The Environmental Monitoring Report for the Lena Seismic Survey was submitted on 30 September 2004, together with a draft field operations report, some 6 weeks after the end of recording.

The Environmental Report for the Malleus Seismic Survey was submitted by Beach Petroleum on 7 December 2004.

## STATEMENTS OF ENVIRONMENTAL OBJECTIVES (SEO)

<b>SEO Objective 1:</b>	Ensure that the potential impacts of the proposed seismic operations on biological diversity and cultural requirements of the environments are assessed within a planning process and incorporated into field management procedures.
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### ***Goal 1.1: Identify important or sensitive environmental and cultural components***

Great Artesian has an Agreement with the Ngayana Dieri Karna (NDK) Claimant Group, whose Claim Area covers portion of PEL 106. Prior to the commencement of the line preparation, a Work Area Clearance was undertaken by representatives of the NDK under the terms of the Agreement. The scouting party inspected a representative sample of the proposed lines.

A report was prepared by the accompanying anthropologist, documenting the locations where deviations would be required to the proposed seismic lines to avoid sites of cultural significance. Details of this report were submitted to PIRSA as part of the application process.

All field crews associated with the seismic program attended an induction on cultural heritage issues for this area, with particular emphasis on identification and avoidance of significant cultural material.

### ***Goal 1.2: Identify threatening processes and activities***

No processes or activities associated with the survey operations were considered to be threatening to the subject environment.

### ***Goal 1.3: Assess any adverse impact on biological diversity likely to arise from the proposed operation on a regional basis***

The area covered by PEL 106 in which the activities occurred comprises one land systems: dunefield. GAS criteria for assessing adverse impacts on biodiversity for this land system is provided in the Statement of Environmental Objectives (Table A2.2).

The seismic lines for the Lena and Malleus Seismic Surveys were recorded in PEL 106 during Permit Year Two within a grid of pre-existing seismic lines covering a number of vintages, primarily from 1981 to 1997. No adverse impact have been identified in this region as arising from these previous seismic operations.

### ***Goal 1.4: Ensure that issues raised in the planning process are incorporated into field management procedures***

All personnel involved in the field operations were briefed at the commencement of the survey operations as to appropriate procedures for environmental management and protection of cultural heritage.

A company representative, Mr Bruce Beer, was present with the line clearing and recording crews throughout the field operations to ensure adherence to the planned field management procedures.

<b>SEO Objective 2:</b>	Monitor and manage those activities that have, or are likely to have, temporary impacts on biological diversity, cultural components of the environment, groundwater, or other land uses, and facilitate rehabilitation so as to minimise such impacts if they occur.
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As defined in the SEO, the goals of this objective are to minimize:

- Clearing of native vegetation
- Disturbance to native fauna
- Impacts on soil, surface drainage, visual ambience and other land uses
- The potential for third parties to use survey tracks and sites following completion of operations

Two sets of GAS criteria are defined in the SEO for assessing the extent of these impacts. One set of criteria relates to assessment carried out at the completion of the field operations. The second set relates to assessment carried out when the lines have been left to rehabilitate for some period.

At the completion of the Lena and PEL 106 Malleus Seismic Surveys, an assessment of the impacts was undertaken against the first set of GAS criteria at various locations referred to as Environmental Monitoring Points (EMPs). These EMPs are located in representative areas of the dunefield environment. The results of the GAS audits are presented in the Environmental Report submitted to PIRSA at the completion of the survey. All GAS scores were in the range of 0 to +1.

<b>SEO Objective 3:</b>	Avoid undertaking any activities which have, or are likely to have, long-term significant adverse impact(s) on biological diversity, cultural components of the environment, groundwater, or other land
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uses.
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The seismic recording activities undertaken in the Lena and PEL 106 Malleus Seismic Surveys were similar to many previous seismic surveys undertaken in these dune field environments within the Cooper Basin.

The GAS auditing reported in the Environmental Report for this survey showed that line preparation was carried out according to best practice techniques of minimal blading and clearing of vegetation. As a result, the combination of wind action and occasional rainfall will revegetate the lines to the point they will be indiscernible within a few years. There was no indication of any likely long-term adverse impacts.

The technique of weaving the routes of the seismic lines had been practised extensively during acquisition, enabling the minimising of any visual impact of the operations.

### ***Rehabilitation of the seismic lines recorded in Year Two of the Permit***

The Statement of Environmental Objectives (SEO) for Seismic Operations in the Cooper Basin requires an Environmental Monitoring Report to be submitted to PIRSA following completion of a seismic survey.

Great Artesian submitted an Environmental Monitoring Report for the Lena Seismic Survey as part of the Draft Field Operations Report on 30 September 2004. For the PEL 106 Malleus Seismic Survey the Environmental Report was sent by Beach Petroleum on 7 December 2004. These reports included a description of the location of an Environmental Monitoring Points (EMP-01) in PEL 106 that are to be used for future monitoring of the progress of natural rehabilitation of the disturbed ground.

Photographs were taken at EMP-01 which is at the intersection of two seismic lines, immediately after the survey operations had been completed. The level of environmental impact at EMP-01 resulting from the survey operations was also assessed using the GAS (Goal Attainment Scaling) system specified in the SEO.

As part of the on-going monitoring process, "repeat" photographs will be taken at EMP-01 approximately 12 months after recording operations have finished. Copies of these photographs will be used to provide a comparative study of the regenerative processes.