
BEVERLEY URANIUM MINE

Gas Pipeline Management

Annual Report

 **HEATHGATE RESOURCES PTY. LTD.**

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1. INTRODUCTION

This Pipeline Annual Report has been prepared to fulfil the requirements of Regulation 33 of the Petroleum Regulations 2000 (the Regulations), and section 7.4 of Pipeline Licence 12 (the licence) issued by Primary Industries and Resources SA (PIRSA) on 16th March 2000.

The report covers this commissioning and operation of the Beverley Gas Lateral Pipeline (the pipeline) for the licence year 16th March 2000 to 16th March 2001.

2. SUMMARY OF REGULATED ACTIVITIES

Regulated activities carried out under licence for the year include:

- Commissioning of the pipeline;
- Operation of the pipeline;
- Regular pipeline patrols and facilities inspections as set out in *Operating, Maintenance and Repair Procedures - Gas Pipeline Management*.

3. AUDIT REPORT

An internal compliance audit has been undertaken with respect to the Petroleum Act 2000, the Regulations and the Statement of Environmental Objectives / Code of Environmental Practice - Beverley Pipeline February 2000 (SEO), issued by PIRSA.

This audit included the implementation of procedures prepared by Heathgate Resources to satisfy the requirements of section 2.2 AS 2885.3.

The results of the audit indicated compliance with all items excepting those found in Appendix 1. For such items actions are stated to rectify non-compliance, and to minimise the likelihood of the recurrence of any such non-compliance.

In addition an audit was undertaken against the objectives of the SEO. Results of this audit are contained in Appendix 2, with remedial actions stated where the objective goal has not been met. One item which was assessed as a shortfall, was that at Appendix 2, Objective 4 of the SEO. Heathgate Resources argues that the assessment criteria associated with this objective is unrealistically harsh and suggests an alternative. This argument and proposed alternative is included in Appendix 3.

4. NON COMPLIANCE STATEMENT

Actions to be taken to rectify non-compliant items are detailed in Appendix 1.

5. MANAGEMENT SYSTEM AUDIT SUMMARY

No management system audits were undertaken during the licence year.

6. LIST OF REPORTS

The following is a list of reports prepared by Heathgate Resources during the licence year:

- *Beverley Lateral Gas Pipeline Risk Assessment;*
- *Beverley Uranium Mine—Gas Pipeline Commissioning Report;*

- Fitness for Purpose Report;
- *Operating, Maintenance and Repair Procedures—Gas Pipeline Management;*
- *Environmental Code of Practice—Gas Pipeline Management;*
- *Safety, Operating and Emergency Plan—Gas Pipeline Management.*

7. INCIDENTS REPORTED

No incidents were reported during the licence year.

8. FORESEEABLE THREATS

As a result of operating in accordance with AS 2885 and management plans derived there from, the likelihood of any unauthorised activity which may impact the pipeline is considered low.

9. OPERATIONS FOR NEXT LICENCE YEAR

It is envisaged that operations for the next licence year will include the following:

- transfer of approximately 60,000 GJ of gas;
- continued implementation of monitoring plan as outlined in section 5.6 of the *Safety, Operating and Emergency Plan—Gas Pipeline Management;*
- undertake documented emergency response practice drill as required in section 6.8 of the *Safety, Operating and Emergency Plan—Gas Pipeline Management;*
- corrective actions as outlined in Appendix 1 and 2.

10. VOLUME OF GAS TRANSPORTED

The volume of gas transported through the pipeline during the licence year was 17,666 GJ.

APPENDIX 1
NON COMPLIANCE ITEMS AND CORRECTIVE
ACTIONS

Section or Part	Non-compliance items	Comment / Corrective Measures
Pipeline Licence Condition 7.3 - emergency procedures drill	Emergency procedures drill was not undertaken and hence report not submitted.	Undertake the drill and provide written report as soon as possible
2.1 Operating, Maintenance And Repair Procedures—Gas Pipeline Management 5.6 Safety, Operating and Emergency plan—Gas Pipeline Management	No cathodic protection surveys were undertaken during the licence period.	Relevant staff to undertake training by a competent person and implement as soon as possible
5.1 Safety, Operating and Emergency plan—Gas Pipeline Management	Repair / maintenance signage and radios, flashlights and hand lanterns are available that are safe for use in Zone 1 hazardous location as defined in AS 2430.1	Maintenance signage to be ordered. Current procedures prohibit use of any radios, flashlights and hand lanterns in immediate vicinity of work. Procedure is to be changed and Zone 1 items purchased as necessary.
6.7 Safety, Operating and Emergency plan—Gas Pipeline Management	On site response equipment not readily accessible	Identify all equipment required
6.7 Safety, Operating and Emergency plan—Gas Pipeline Management	Off site repair arrangements in place with nominated contractor	Formalise arrangements with an off site contractor with access to by pass and hot tap fittings.
6.8 Safety, Operating and Emergency plan—Gas Pipeline Management	Training provided by a competent person undertaken by nominated Emergency Response Personnel, following training outline in Appendix 4 of the Safety, Operating and Emergency Plan— Gas Pipeline Management.	Follow up training to personnel as soon as possible by a competent person

APPENDIX 2 SEO AUDIT RESULTS

SEO Objective	Assessment	Corrective Measures / Comments
<p>Objective 1</p> <p>Minimise vegetation and habitat clearance outside of the approved pipeline trench.</p> <p>1.1 Minimise R.O.W. width adjacent to mine access road (4 metres).</p> <p>1.2 No un-authorized off-ROW activity.</p>	<p>Minor shortfall against 1.1</p>	<p>Retrospective works are considered detrimental at this stage to the objective.</p>
<p>Objective 2</p> <p>Minimise the period and extent of vegetation and habitat loss around the pipeline trench</p>	<p>Minor shortfall.</p>	<p>Retrospective works are considered detrimental at this stage to the objective.</p>
<p>Objective 3</p> <p>Rare and endangered species managed in accordance with stated protocols.</p>	<p>Goal attained</p>	
<p>Objective 4</p> <p>Prevent the establishment of additional alien species</p> <p>4.1 No alien species on ROW (after "one month audit")</p> <p>4.2 No alien species on ROW (annual audits)</p>	<p>Significant shortfall (-2) against 4.1 and 4.2.</p>	<p>Heathgate would argue the validity of the GAS scale and propose an alternative - see Appendix 3.</p> <p>No records are available to substantiate the requirement for drivers of vehicles to remove any excess soil and plant debris from their vehicles prior to entering the area, during construction and installation of the gas pipeline (section 9. DEF). Notably the consultants report found in Appendix 3 does state that "there is no indication of any new alien invasion" on the pipeline ROW.</p>
<p>Objective 5</p> <p>Design and construct the pipeline trench to avoid where possible, and to minimise where not, impacts on major creek habitats</p>	<p>Goal attained</p>	
<p>Objective 6</p> <p>Avoid the entrapment of vertebrates in the pipeline trench during construction</p>	<p>Goal attained</p>	
<p>Objective 7</p> <p>Ensure the protection of heritage sites in accordance with State and Commonwealth legislation.</p>	<p>Goal attained</p>	
<p>Objective 8</p> <p>Minimise the generation of waste.</p>	<p>No assessment criteria</p>	
<p>Objective 9</p> <p>Minimise the impact on the environment of waste handling and disposal methods.</p>	<p>Minor shortfall</p>	<p>All assessment criteria were met excepting that although procedures regarding disposal of hydrotest water were followed, no disposal records are available.</p>
<p>Objective 10</p> <p>Maximise opportunity for rehabilitation success.</p> <p>10.1 Stockpile and respread of topsoil where appropriate.</p> <p>10.2 Stockpile and respread of vegetation where appropriate (i.e. where ROW passes through vegetated areas).</p>	<p>Goal attained for 10.1 and 10.3.</p> <p>Minor shortfall against 10.2 and 10.4.</p>	<p>Retrospective works are considered detrimental at this stage to the objective, with the need to be re-assessed given on going monitoring data.</p>

10.3 Supplementary seeding where first annual monitoring results record no new seedlings.		
10.4 Scarifying / ripping of compacted soil.		
Objective 11 Total cover of perennials and dominant perennial reach 80% of cover compared to relevant control sites.	Not applicable	This objective can only be assessed at least 5 years after restoration using the criteria given in Appendix #2 of the SEO.
Objective 12 Risk to the safety of the public and property during construction are acceptable and ALARP.	Goal attained	
Objective 13 Risk to the safety of the public and property during operation are acceptable and ALARP.	Minor shortfall	See non-compliance item for Pipeline Licence Condition 7.3 - emergency procedures drill, in Appendix 1 of this report.
Objective 14 Ongoing monitoring of rehabilitation carried out.	Goal attained	Monitoring carried as part of the report contained in Appendix 3. On going annual monitoring of the pipeline ROW will be incorporated with annual flora monitoring for the mine site (reading of photopoint quadrats), carried out under the approved Environmental Management and Monitoring Plan.
Objective 15 Environmental management and rehabilitation carried out in accordance with construction objectives for any operational dig-ups.	N/A	No operational dig ups have been undertaken or required, but procedures are in place.
Objective 16 Compliance with the requirements of Petroleum Bill 1999, Petroleum Regulations 1999.	Minor shortfall, as Annual Report was submitted late.	Internal mechanism to be finalised to ensure timely submittal of reports.
Objective 17 Supply of Moomba to Adelaide is not affected by an emergency on the Beverley Pipeline.	Goal attained	
Objective 18 Environmental management and rehabilitation carried out in accordance with construction objectives for any emergency dig-ups.	N/A	No emergency dig ups have been undertaken or required, but procedures are in place.

APPENDIX 3
OBJECTIVE 4 OF THE SEO

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BEVERLEY URANIUM MINE

ALIEN PLANTS ON THE BEVERLEY GAS PIPELINE AND THE NEED FOR CHANGED G.A.S. CRITERIA

Introduction

As of an update 28 February 2000, the draft Beverley pipeline GAS (Goal Attainment Scaling) criteria contain an Objective to prevent the establishment of alien species as a result of the pipeline construction (Table 1, "Existing criteria"). Heathgate Resources Pty Ltd requested Fatchen Environmental to audit this aspect of the pipeline, applying the GAS criteria.

Field observations for assessment of the alien species criteria were made in association with annual biological monitoring, in late March. While this timing was intermediate between the "one month audit" and annual audit, this does not affect either the observations, the findings or comment on the utility of the existing GAS scaling.

In discussions prior to undertaking the work, we indicated that the criteria as regards alien species may be too restrictive, and the objective as currently stated impossible to obtain, given that the pipeline, as with the mine lease itself, is in an area with some 150 years of pastoral occupation, with multiple alien species naturalised and present in the pastures modified by domestic grazing. It is inevitable that such species will appear on the pipeline, in some cases in advance of any native plant. The goal of "no alien species on Right of Way" will not be attainable, ever, and the lack of attainment will be outside the control of mine management.

The intention of the GAS criteria, we believe, was to allow the monitoring and detection of particular, or additional, weed infestations. This may be achieved by revision of the GAS criteria, which, in view of the field observations, we strongly recommend (Table 1, "Suggested criteria").

The following provides the observations and assessment for the GAS criteria as applied to the Beverley pipeline right of way.

Methods

Sampling for alien species associated with the natural gas pipeline was undertaken 27-28 March 2001, at the same points for which other GAS scoring had been earlier undertaken by Heathgate Resources. Eight "open country" sites were examined between the pipeline takeoff from the main Moomba-Adelaide trunk pipeline, together with both banks of Paralana Creek at the pipe crossing.

At each sampling point, "online" and "offline" sampling was carried out. Points were reached using a vehicle odometer. At each point, 200 1m² quadrats were scrutinised for alien plants. Quadrats were arranged on two contiguous 50m x 2m grids, one aligned along the centre of the

pipe easement for "online" records, and the other parallel but offset 50m northward for the "offline" measurements. The 50m offset was sufficient to avoid overt or even subtle effects of the pipeline construction.

Within each quadrat, the alien species present were scored for presence/absence. For each "online" and "offline" sampling pair, species present and overall frequency were determined. Whilst frequency as a measure has some drawbacks, for the present comparative purposes it is sufficient, and has the benefit of being relatively rapid.

In the case of the Paralana Creek crossing, the quadrats were laid similarly, but with the 50x2m grid starting at the top of the creek bank and extending onto terraces. The actual streambed was not sampled.

Results

Table 2 clearly shows the following.

- Alien species have established on the pipeline easement at every point examined.
- Nevertheless, there are few alien species actually represented, and with the exception of the stream-associated *Datura ferox*, all are species commonly found throughout the area. The *D. ferox* itself is also present along other major streams flowing from the Flinders Ranges. All were reported in surveys associated with the EIS, and most have been reported as frequent in subsequent monitoring.
- There are areas, especially between the Moomba-Adelaide gas pipeline and Paralana Creek, where the pipeline easement is almost entirely clothed (at the time of survey) with *Salsola kali*, while away from the easement it is abundant but not overwhelmingly so (eg sites at 2km and 4km). In the clay gibber soils to the west of the Creek (8km - 14km), alien frequencies are generally marginally higher online than offline.
- There are also areas such as the moderately heavily grazed 6km site near Paralana Creek, and one bank of the creek itself, where aliens, primarily *S. kali*, are equally abundant on and off the pipeline easement. Similarly, in gibber landscapes at 12km, there are far more occurrences of *Salsola kali* offline than online.
- The ubiquitous *Salsola kali*, a standard though alien member of arid zone communities and a rapid coloniser of any disturbed or bare ground, dominates all estimates of aliens.

Tests for greater alien presence on and offline return non-significant outcomes (binomial test, t-test).

Discussion

On the GAS scaling of Table 1, currently applied to the pipeline, the criteria 4.1 (no alien species on Right of Way after "one month audit") and 4.2 (no alien species on ROW in annual audits) will return a score of -2, "significant shortfall" (ie, unacceptable). However, given that the three most common alien species, *Salsola kali*, *Citrullus colocynthis*, and *Tribulus terrestris* are abundant species throughout, it is unlikely that this criterion could ever register anything other than a permanently significant shortfall. Nor is there any ready means for "rectifying" such a situation, since these species are likely to be present on more than 10% of even a totally rehabilitated Right of Way.

Yet from Table 2, it is evident that there are some areas where fewer aliens actually appear on the easement than in the non-impacted nearby pastures. Further, there is no indication of any new alien invasion. Conversely, if one ignores *Salsola kali* for the moment, Table 2 does indicate some points (eg 4km and the southeast Paralana Creek terraces, where there is clearly a dense alien stand on the ROW compared with what is present offline.

We therefore recommend that the GAS criteria for alien species be changed to:

- Recognize that numerous aliens, while not necessarily desirable, are nevertheless naturalised in the area and will accompany (or precede) any re-invasion of bared ground by other pasture constituents;
- Allow for detection of new appearances of alien species;
- Provide some assessment for those aliens already present, to scale for local, dense occurrences.

Suggested changes are given in Table 1 ("Suggested criteria")

As regards the pipeline easement generally, we note that great care was taken by the contractors in smoothing the surface of the trenching and earthworks. While we appreciate the good intent behind the action, nevertheless the very smooth surface is not as effective as a rough surface for purposes of natural rehabilitation. Irregular surfaces are needed to impede runoff, prevent windsheeting and scalding, and provide for litter and seed traps. The level of natural invasion or regrowth of native species at the time of observations was disappointing in the circumstances: rains sufficient to raise the observed crop of *Salsola kali* on the easement should have resulted also in some native species growth, and we suspect that the smoothness of the finish of the easement is partly to blame.



(Dr) TJ Fatchen
for Fatchen Environmental
6 June 2001

TABLE 1. EXISTING AND SUGGESTED BEVERLEY PIPELINE GAS CRITERIA FOR ALIEN PLANT SPECIES

Ref.	Goal	Goal exceeded +2	Goal exceeded +1	Goal attained 0	Minor shortfall -1	Significant shortfall -2
<i>Existing criteria</i>						
4	Objective 4: Prevent the establishment of alien species					
4.1	No alien species on ROW (after "one month audit")	n.a.	n.a.	No alien species on ROW	Alien species evident on less than 10% of the ROW	Alien species evident on greater than 10% of the ROW
4.2	No alien species on Row (annual audits)	n.a.	n.a.	No alien species on ROW	Alien species evident on less than 10% of the ROW	Alien species evident on greater than 10% of the ROW
<i>Suggested criteria</i>						
4	Objective 4: Limit the establishment of alien species					
4.1	No alien species on ROW beyond those commonly met in adjoining vegetation (after "one month audit")		Alien species present, same species, at lower abundances than adjoining land	Alien species present, same species and at equivalent abundances to adjoining land	Alien species present, same species and at higher abundances than adjoining land	Alien species introduced, not previously present.
4.2	No alien species on ROW beyond those commonly met in adjoining vegetation (annual audit)		Alien species present, same species, at lower abundances than adjoining land	Alien species present, same species and at equivalent abundances to adjoining land	Alien species present, same species and at higher abundances than adjoining land	Alien species introduced, not previously present.

TABLE 2. FREQUENCY OF ALIEN PLANTS IN QUADRATS ON AND OFF PIPELINE EASEMENT

Sampling Point	Landform and vegetation	No. of alien species	Total alien frequency	No. of <i>Salsola kali</i>	Frequency	Aliens other than <i>Salsola kali</i>	<i>Salsola kali</i>	<i>Malvasrum americanum</i>	<i>Citrullus colocynthis</i>	<i>Tribulus terrestris</i>	<i>Datura ferox</i>
0 km	Low dune/field	7	1	0	0	7					
	offline	5	1	0	0	5					
2 km	Sandplain	51	3	9	2	42		7	2		
	offline	12	3	4	2	8		0	4		
4 km	Sandplain/occasional	101	3	11	2	90		10	1		
	offline	18	1	0	0	18					
6 km	Floodplain, near Paralana Creek	95	1	0	0	95					
	offline	104	2	5	1	99		5			
Paralana Ck	Terraces	10	2	2	1	8	2				
Northwest bank		9	3	4	2	5	1			3	
Paralana Ck	Terraces	46	4	20	3	26	2			10	8
Southeast bank		57	2	6	1	51				6	
8 km	Clays, Mitchell grass	1	1	1	1					1	
	offline	1	1	1	1					1	
10 km	Clays, Mitchell grass	7	1	0	0	7					
	offline	5	1	0	0	5					
12 km	Clays, Mitchell grass	6	1	0	0	6					
	offline	25	1	0	0	25					
14 km	Clays, Mitchell grass	4	1	0	0	4					
	offline	2	1	0	0	2					

(Distance in km from Moomba-Adelaide gas pipeline) (All frequencies expressed as percentages)