

Statement of environmental objectives

for ground based geophysical operations (non-seismic) in South Australia

August 2007



Government of South Australia
Primary Industries and Resources SA

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Preferred way to cite this publication

PIRSA, 2007. *Statement of environmental objectives for ground geophysical operations (non-seismic) in South Australia*. South Australia. Department of Primary Industries and Resources SA.

Abbreviations

DPC-AARD	Department of Premier and Cabinet – Aboriginal Affairs and Reconciliation Division
EIR	Environmental Impact Report
PIRSA	Primary Industries and Resources, South Australia
SEO	Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the Petroleum Act 2000 and Regulations 12 and 13.

Measurement

Units of measurement used in this document are those of the International System of Units (SI) as well as units outside the SI that have been authorised for use within Australia's metric system.

km	kilometre (length; 10^3 m)
m	metre (length)
mm	millimetre (length; 10^{-3} m)
L	litre (volume; 10^{-3} m ³)

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1 INTRODUCTION

A ground based geophysical operation (non-seismic) is deemed to be a regulated activity under the *Petroleum Act 2000* (the Act) and therefore requires an approved Statement of Environmental Objectives (SEO) to be in place before an approval to conduct the survey can be given. Once the SEO is approved it must be reviewed at least once every five years. If, as a result of a review, the Minister considers the SEO should be revised, the Minister will undertake the revision and then submit the statement for consideration under the Act.

As ground based geophysical operations (non-seismic) are generally short term, small scale and low impact, it is considered that the preparation of an SEO for each survey would result in unnecessary expense and delays both for proponents and regulators. PIRSA has therefore proposed that a SEO that applies to the whole state would streamline the approval process required for the activity without compromising protection of the environment.

This document has been prepared to fulfil the requirements of Sections 99 and 100, of the Act and Regulations 12 and 13 of *Regulations under the Petroleum Act 2000*.

1.1 Scope

PIRSA has developed a fit for purpose SEO that can be applied to most types ground based geophysical operations (non-seismic) conducted by proponents and their contractors within the State such as:

- gravimetric;
- magnetic;
- electromagnetic;
- ground-penetrating radar;
- geochemical; and
- geological (including rock sampling).

The intent of this SEO is to outline the environmental objectives to which these activities must conform and the criteria upon which the achievement of these objectives will be assessed. These objectives were developed from an environmental impact assessment developed in the Environmental Impact Report (EIR) (PIRSA 2007) prepared for this regulated activity. This SEO is limited to the state of South Australia.

1.2 Definition

In the Act, environment is broadly defined to include its natural, social, cultural and economic aspects. The environmental objectives outlined in this SEO incorporate these aspects.

This SEO relates to ground based geophysical operations (non-seismic) undertaken in South Australia.

2 ENVIRONMENTAL OBJECTIVES

The objectives of the *Petroleum Act 2000* include:

- to minimise environmental damage from the activities involved for petroleum and other resources; and
- to protect the public from risks inherent in regulated activities.

The overarching aim of this SEO is to manage any impact of ground based geophysical operations (non-seismic) on the biological or cultural features of a region or on other land users.

Potential environmental hazards and consequences associated with ground based geophysical operations (non-seismic) were identified in the EIR (PIRSA 2007). Environmental objectives developed to manage these potential hazards are listed below.

1. Minimise disturbance to other land users.
2. Minimise disturbance to native vegetation and native fauna.
3. Avoid disturbance to sites of cultural and heritage significance.
4. Avoid the introduction or spread of exotic species and bio-security threats.
5. Minimise the risk of initiation and/or propagation of wildfire.
6. Minimise the visual impact of operations.
7. Minimise generation of dust.
8. Minimise soil disturbance and contamination.
9. Optimise waste recovery (recycling and waste minimisation).

The environmental objectives defined above are based on those identified in the:

- EIR for ground geophysical operations (non-seismic) in South Australia (PIRSA 2007);
- South Australian Cooper Basin Operators' EIR: geophysical operations (Santos 2006); and
- South Australian Cooper Basin Operators' SEO: geophysical operations (Santos 2006).

With the above objectives in place, petroleum exploration licensees and their field operatives in South Australia can minimise their short-term and long-term impacts. Adherence to these objectives should provide the means for operators to avoid significant adverse impacts in the State and specifically those which relate to sites of high biological diversity and conflicting land uses and community safety and welfare (e.g. initiation of fire).

Maintaining good working relationships with landholders and other community members is an integral part in achieving acceptable environmental outcomes. The PIRSA information sheet "*Liaison guidelines for landholders and petroleum explorers in South Australia*" (PIRSA 2001) is a valuable tool for recommended communication techniques.

The considerable experience of the PIRSA Petroleum and Geothermal Group and industry operators undertaking ground geophysical operations (non-seismic) in South Australia are an important contributory source in developing this document.

3 ASSESSMENT METHODS

One of the implications of objective based regulation is the need for a means for identifying and assessing the level and achievement of environmental objectives. This document contains the criteria that have been developed to address this requirement.

3.1 Defined conditions

In some cases the achievement of an objective can be assessed through insuring that defined conditions are met or acted upon. Such conditions include:

- prohibiting specific actions that may have short or long-term implications, such as undertaking operations in national parks in which access for petroleum exploration activity is not permitted; and
- requirements to carry out specific actions to minimise potential impacts in accordance with relevant legislation, approved procedures or industry standards such as required procedures under the *Fire and Emergency Services Act 2005* and the Australian Petroleum Production and Exploration Association (APPEA) code of practice to ensure protective measures are taken about the initiating and/or spreading of wildfires.

3.2 Other techniques as appropriate

Other techniques may exist or could be developed in the future, which could be useful. Therefore they can be utilised if they are appropriate and effective.

4 ASSESSMENT CRITERIA

Each environmental objective contained in this SEO will be assessed using a selection of the assessment options described in the previous section. This will enable operators, regulators and others to determine the level of achievement of the objectives. Criteria relevant to each environmental objective are presented in Appendix 1.

5 MITIGATION STRATEGIES

In addition to the defined assessment criteria outlined in Appendix 1, proponents shall implement the general management procedures discussed below.

5.1 Awareness Program

All personnel involved with ground based geophysical operations (non-seismic) will be provided with a copy of this SEO. Proponents shall ensure that all personnel are adequately aware of the relevant environmental objectives and impact mitigation strategies and assessment criteria contained within this SEO.

5.2 Implementation Strategies

Proponents and contractors shall develop site-specific mitigation strategies. In undertaking activities proponents need to be mindful of their obligations under relevant legislation including but not limited to:

- *Environment Protection Act 1993*;
- *National Parks and Wildlife Act 1972*;
- *Native Vegetation Act 1991*;
- *Natural Resources Management Act 2004*;
- *Petroleum Act 2000*; and
- *Public and Environmental Health (Waste Control) Regulations 1995*.

5.3 Contractual Obligations

All contractors with companies undertaking ground based geophysical operations (non-seismic) for the proponent shall include a requirement to:

- operate in a manner consistent with the proponent's environmental policy; and
- meet the assessment criteria outlined in this SEO.

6 AUDITING AND REPORTING

6.1 Operator field inspections

The operator's field representative shall undertake an audit of the various aspects of the operation to ascertain whether the survey's environmental objectives were achieved. Any matter requiring a resolution will be actioned before the survey can be deemed to be completed. An audit report will be prepared and will be submitted to PIRSA and will be referenced in the licensee's annual report to PIRSA. This annual report also requires a statement of compliance of operations with the South Australian *Petroleum Act 2000, Regulations* and this SEO.

6.2 PIRSA audits

PIRSA may undertake random audits of geophysical surveys, both in the field and office using the assessed methods described in this SEO. The aim of these audits is to ascertain the achievement or otherwise of the licensees' environmental objectives as well as to test the veracity of the licensee's annual report on compliance.

A summary of the results of PIRSA audits will be included as a part of PIRSA's reporting on the environmental management of petroleum operations and will be made public in PIRSA's Annual Report.

6.3 Third party audits

Third parties may also carry out audits of the field outcomes of company geophysical operations. These audits may be commissioned by PIRSA, or the licensee, or by any other independent parties. If these audit findings are to be compared with those of the operator and/or PIRSA, then the same assessment criteria must be used. Pertinent items from these reports may be included in PIRSA's reporting on environmental management.

7 INCIDENTS

Section 100 (1) (d) of the Act requires an SEO to impose reporting obligations on a person carrying out regulated activities. Petroleum Regulation 12(2) requires an SEO to identify events that could cause a serious incident or reportable incident within the meaning of Section 85 of the Act.

7.1 Serious incidents

Section 85 of the Act defines a serious incident as an incident arising from activities conducted under a licence in which any of the following may occur.

- A person is seriously injured.
- An imminent risk to public health or safety arises.
- Serious environmental damage occurs or an imminent risk of serious environmental damage arises.
- Any disturbance to sites of Aboriginal or non-Aboriginal heritage significance.

7.2 Reportable incidents

Reportable incidents are incidents (other than a serious incident) arising from activities conducted under a licence issued in the *Regulations under the Petroleum Act 2000*. Pursuant to Regulation 12(2) incidents relevant to ground geophysical activities (non-seismic) listed below are considered to be reportable incidents under Section 85 (1) of the Act.

- Verified complaint from a landowner/occupier/manager as a result of ground based geophysical operations (non-seismic).
- Removal of rare, vulnerable or endangered flora and fauna species (without appropriate permits and approvals).
- Any introduction of exotic species (pest weed or animal).

8 DOCUMENT REVISION

This document will be subject to review within five years of its date of gazettal as per the requirements set out the Regulation 14 in *Regulations under the Petroleum Act 2000*.

9 REFERENCES

The following documents were key resources used in the preparation of this Statement of Environmental Objectives.

Ecos Consulting (Aust) Pty Ltd 2001. *Primary Survey Licence – South Australian Environmental Impact Report*. Unpublished Report to PIRSA.

Ecos Consulting (Aust) Pty Ltd 2001. *Primary Survey Licence – Statement of Environmental Objectives*. Unpublished Report to PIRSA .

Kane, A. 2007. Statement of environmental objectives for geophysical operations in the Otway Basin, South Australia. *South Australia. Department of Primary Industries and Resources SA. Report Book 2006/020*.

Santos Ltd. 2006. *South Australian Cooper Basin Operators Statement of environmental objectives: geophysical operations*. Primary Industries & Resources SA. Adelaide.

Santos Ltd. 2006. *South Australian Cooper Basin Operators Environmental impact report: geophysical operations*. Primary Industries & Resources SA. Adelaide.

APPENDIX 1 ENVIRONMENTAL OBJECTIVES AND ASSESSMENT CRITERIA

Environmental Objective	Assessment Criteria	Guide to How Objectives can be Achieved	Comments
<p>Objective 1 Minimise the disturbance to other land users.</p>	<p>All reasonable landowner complaints are addressed and resolved.</p> <p><u>Traverse surveying, data acquisition, campsite preparation & rehabilitation</u></p> <p>Upon completion of the geophysical survey and after any rehabilitation or reparation (if determined prior to survey), the level to which the impacts on other land users is determined by the absence of existing stakeholder complaints.</p>	<p>Notices of entry are to be distributed to all landowners and operators (including owners of community assets) whose land is impacted by the survey, campsites or survey traverses prior to commencement. (This is a requirement under Part 10 of the <i>Petroleum Act 2000</i> and Regulation 22 of Regulations <i>under the Petroleum Act 2000</i>).</p> <p>A system is in place to log landowner objections and complaints.</p> <p>An agreement to the timing and level of disturbance to pastoral, horticultural, agricultural or other land user activities or infrastructure can facilitate landholder relations.</p> <p>All gates are left in the position in which they were originally found.</p> <p>All fences are restored to a level satisfactory to the landowner.</p> <p>Inductions should be carried out for all employees and contractors, covering conservation, legislative, infrastructure and social and community issues.</p> <p>Existing tracks are used where possible.</p> <p>Properties accessed only sufficiently to acquire data.</p> <p>Vehicles drive at appropriate speeds to minimise stock disturbance.</p> <p>Wet weather operations are banned to prevent station track damage.</p>	<p>Communication and establishing working partnerships with landowners and the wider community are fundamental in minimising disturbance and decreasing issues and hold-ups with the survey. Consulting stakeholders on a range of issues (including areas with known plant or animal disease) can assist in decreasing impacts and ease community concerns.</p> <p><u>Note:</u> The PIRSA publication <i>Liaison guideline for landholders and petroleum explorers in South Australia</i> is a valuable tool in promoting effective communication channels.</p>
<p>Objective 2 Minimise disturbance to native vegetation, fauna and associated wildlife habitats.</p>	<p><u>Traverse surveying, data acquisition, campsite preparation & rehabilitation</u></p> <p>Vehicle access to survey traverses is to be via existing access tracks or existing seismic lines, except where they have rehabilitated. Other temporary access tracks may be utilised where such use is likely to result in less environmental impact than other options.</p> <p>No off-traverse driving recorded.</p> <p>No native vegetation clearance has occurred.</p> <p>Known significant species sites have been flagged and avoided.</p> <p>Waste materials do not pollute the environment and contaminate soils.</p> <p><u>Fuel and Chemical Storage Management</u></p> <p>No refuelling outside designated refuelling areas.</p> <p>No spills/leaks outside areas designated to contain them.</p> <p>Spills and leaks are immediately reported and clean up actions initiated.</p> <p>Records of spill events are maintained.</p> <p>Appropriate spill response equipment is available on site.</p>	<p>Terrain and vegetation is considered in planning stage when designing layout of the survey.</p> <p>The conservation needs of particular species have been considered.</p> <p>Campsites are established in locations where the preparation of a new access track is not necessary.</p> <p>Campsites are established on clear areas where no impact to vegetation occurs.</p> <p>Only vehicles engaged in actual data acquisition process are permitted to drive along survey traverses.</p> <p><u>Waste Management</u></p> <p>Covered bins are provided for the collection and storage of wastes.</p> <p>All loads of rubbish are covered during transport to the central waste facility.</p>	<p>Primary risks to native fauna include disturbing of habitat and obstruction of movement through prepared areas.</p> <p>As no vehicles other than those used to acquire survey data are permitted, the survey operations will have an insignificant impact on wildlife habitat and vegetation. This is due to the small and confined area of impact of survey traverse and the rate of recovery of most vegetation types and surface morphology.</p> <p>Potential impacts of waste on vegetation and fauna also addressed under Objective 9.</p>

<p>Objective 3 Avoid disturbance to sites of cultural and heritage significance.</p>	<p><u>Traverse surveying, data acquisition, campsite preparation & rehabilitation</u> Appropriately qualified and experienced personnel have scouted proposed survey area. These sites are flagged off and detoured around. Any aboriginal cultural locations found are identified, recorded and reported accordingly to DPC-AARD.</p> <p><u>Note:</u> Where a negotiated Native Title agreement is in place, compliance with the agreement takes precedence over the above criteria. (However the <i>Aboriginal Heritage Act 1998</i> is not set aside by an agreement).</p>	<p>Cultural and heritage site registers have been consulted in relation to survey traverse and adjusted accordingly. A cultural heritage clearance report has been undertaken with qualified and experienced personnel and is available for audit upon request. Environmental Report Forms are completed for any suspected aboriginal sites or individual artefacts identified, which are forwarded to DPC-AARD. Copies may also be forwarded to the Aboriginal Legal Rights Movement and representatives of local claimants as is appropriate and when cultural sensitivity permits. Operators have a reporting system in place for cultural sites discovered during the survey process.</p> <p><u>Note:</u> Where a negotiated Native Title agreement is in place, a Work Area Clearance and subsequent report, undertaken by qualified and experienced personnel, may be required before line preparation can commence. Compliance with this agreement takes precedence over the above criteria (However the <i>Aboriginal Heritage Act 1998</i> is not set aside by an agreement).</p>	<p>The aim of this objective is to ensure that any sites of Aboriginal and non-indigenous heritage significance are identified and protected. Disturbance to these sites is considered a long-term impact and is deemed to be unacceptable under this SEO. Disturbance to any cultural sites or removal of any artefacts is an offence under the <i>Aboriginal Heritage Act 1998</i>.</p>
<p>Objective 4 Minimise the risk of introduction and/or spread of introduced species and bio-security threats.</p>	<p><u>Traverse surveying, data acquisition, campsite preparation & rehabilitation</u> Weeds, feral animals or plant and animal diseases are not introduced to, or spread within South Australia.</p>	<p>Any vehicles upon entering the State need to be washed down to remove all likely infesting agents. Cleaning of equipment must be carried out in accordance with pre-determined company procedures and/or industry standards (i.e. accepted APPEA standards). Liaison with the animal and plant control officer of applicable local councils and regional NRM boards can provide important information of local issues to factor into planning. Contact with any infected plants or animals should result in cleaning of the relevant machinery before relocation, even within the survey area. Details or logs of equipment cleaning are kept and are available for audit upon request. Records of detection (whether introduced by a geophysical operator or not), monitoring, eradication or control of introduced species are kept and are available for audit upon request. Areas of known disease infestation (such as phytophthora, phylloxera, Mundulla Yellows) are identified with landowners and relevant boards or control officers and be avoided. No pets are to be kept by the survey crew whilst on field operations.</p>	<p>The most likely source of introducing a pest, weed or disease is through unwashed vehicles and equipment; therefore it is imperative that washing of all machinery and other equipment occurs. Identifying locations of weed and pest outbreaks should be a priority in planning stages. Landowners are often aware of locations of such outbreaks. It is recommended that if any introduced pests or outbreaks are found during the course of geophysical operations that the information is forwarded onto relevant parties, such as the land owner and the regional NRM board. This will facilitate the monitoring and control of such issues and will also improve the working relationships between the upstream petroleum and geothermal industries and the community.</p>

<p>Objective 5 Minimise the risk of initiation and/or propagation of wildfire.</p>	<p><u>Fire risk minimisation and situation management</u> Appropriate plans in place and equipment available to identify hazards, initiate hazard mitigation and response training, fire-fighting equipment available and maintained accordingly, and fire bans adhered to.</p>	<p>Procedures are in place to minimise risk of initiating and propagating fire during periods of high temperatures and high winds. A hazard identification plan is in place for immediate implementation on days of high temperatures and winds. A response plan is in place for the safety of crew personnel should a fire approach, or be initiated by, the field crew. The risks of fire to crews are clearly defined. Contact with the local Country Fire Service is maintained in order to keep roads clear during episodes of fire. Reporting procedures in place to CFS and PIRSA Petroleum & Geothermal Group. Crews are trained in use of fire fighting equipment.</p>	<p>The crew is vulnerable to externally generated fires and procedures must be in place to minimise potential impact to the crew and equipment. Fire prevention should include assistance to the Country Fire Service in the course of their duties and compliance with their requests. Under the <i>Fire and Emergency Services Act 2005</i>, section 97, an officer may 'take, or cause to be taken, any action that appears necessary or desirable for the purpose of fire-fighting', including (f) '...prohibit, direct or regulate the movement of persons, vehicles or animals'. Guides, codes and standards are available to provide appropriate prevention and management measures, as provided by the <i>Fire and Emergency Services Act 2005</i>, APPEA Code of environmental practice, local Country Fire Services and forestry codes and rules (companies such as PIRSA Forestry, CSR and Auspine produce similar publications). Wildfire has the potential to impact on most environmental, social and community values. Refer also to Objective 9</p>
<p>Objective 6 Minimise the visual impacts of geophysical operations.</p>	<p>Surveying, creation of wheel tracks and campsite preparation. Proposed survey traverses have been appropriately located to minimise visual impacts. Vegetation and terrain variations have been used to minimise survey traverse visibility. Planning procedures to minimise visibility aspects are evident and available for audit upon request.</p>	<p>The conduciveness of an area to support survey vehicles (and potential impacts) should be considered to lessen on-ground visual impacts, especially in salt lake systems. Campsites should have a low visibility from likely public viewpoints. All litter is removed.</p>	<p>No preparation for vehicle access is permitted under this SEO, thus any visual impact is temporary and insignificant. However every effort to be made to disguise the presence of any wheel tracks (e.g. by doglegging around existing vegetation and landscape features).</p>
<p>Objective 7 Minimise generation of dust.</p>	<p>Access to properties is kept to minimum required to acquire data. Vehicles are driven at speeds slow enough to not generate dust.</p>	<p>The importance of driving slowly to avoid raising dust is stressed during crew induction sessions.</p>	<p>As much of the state receives low rainfall and often experiences drought conditions, dust generation is usual. The issue of dust management can be of great concern to landowners.</p>

<p>Objective 8 Minimise soil disturbance and contamination.</p>	<p>Campsites have been appropriately located to minimise disturbance and contamination of soils.</p> <p>No refuelling outside designated refuelling/servicing areas.</p> <p>Spills and leaks are immediately reported and clean up actions undertaken.</p> <p>All appropriate spill cleanup equipment held at campsites.</p> <p>Waste materials do not pollute the environment and contaminate soils.</p> <p>Only vehicles engaged in actual data acquisition process are permitted to drive along survey traverses.</p>	<p>The ability of an area to support the weight of survey vehicles (and potential impacts) should be considered in order to lessen any disturbances, especially in salt lake systems.</p> <p>Oil spill areas have been ripped to an appropriate depth.</p>	<p>Vehicles acquiring survey data drive along survey traverses where no prior preparation has occurred.</p> <p>Generally refuelling and servicing of vehicles takes place in service stations located in towns.</p> <p>Accommodation of crews is usually in towns or use is made of shearers' quarters and other camps etc (e.g. seismic camps, accommodation facilities at Moomba, Sellicks and Tirrawarra).</p>
<p>Objective 9 Optimise waste reduction and recovery.</p>	<p>Wastes with the exception of sewage and grey water wastes are segregated, burnt or transported to an Environment Protection Authority (EPA) approved waste disposal facility for recycling or burial in accordance with approved procedures.</p>	<p>Production of waste is minimised by purchasing biodegradable or recyclable materials where practical.</p> <p>All wastewater disposed of in accordance with the <i>Public and Environmental Health (Waste Control) Regulation 1995</i>.</p>	<p>Due to the distances that can be involved, the cost of recycling a large range of products may be prohibitive. However, continual review of recycling options is required to ensure that improvements are implemented as far as practical.</p> <p>Responsible handling and disposal of waste will reduce both short-term and long term impacts of waste on the environment.</p>