South Australian

Cooper Basin Operators

Statement of environmental objectives: geophysical operations

Prepared for

South Australian Cooper Basin Operators

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1 SUMMARY

This statement of environmental objectives (SEO) was prepared in accordance with section 99 of the South Australian *Petroleum Act 2000*.

The objectives contained in this document are based on information identified in the environmental impact report (EIR; Santos Ltd, 2006) and are a revision of those contained in the *Statement of environmental objectives for seismic operations in the Cooper and Eromanga Basins* (Cockshell, 1998). Typical seismic and other ground-based geophysical proposals in the Cooper Basin that use current field techniques as identified in the EIR are covered by this SEO.

This SEO has been developed by Santos in collaboration with the operators of current petroleum tenements in the Cooper Basin and has been subject to an appropriate consultation process. It contains a list of environmental objectives to be achieved in undertaking geophysical operations and a description of the assessment criteria and methodology for evaluating the level of achievement of these objectives.

2 INTRODUCTION

This document details the environmental objectives for geophysical exploration activities that are required to be achieved by any licensee operating in the South Australian part of the Cooper Basin and adjacent areas as indicated in Figure 1. It identifies the means by which the achievement of these objectives will be measured by both licensees and the Government. The objectives contained in this document are based on information identified in the EIR (Santos, 2006) and are a revision of those contained in Cockshell (1998).

2.1 Scope

Figure 1 outlines the Cooper Basin and adjacent areas in the NE corner of South Australia to which this SEO applies. Parks and reserves under the *Parks and Wildlife Act 1972*, the *Crown Lands Act 1923* and other legislation in this region are listed in Appendix 1.

There are a number of parks and reserves within the area of interest with no access for petroleum exploration. These areas are not covered in this SEO.

Two large reserves, the Innamincka and Strzelecki Regional Reserves, are areas of multiple land use and have access for petroleum exploration and development. Specific conditions should be sourced from Government gazettals relating to the specific park or reserve, or through the Petroleum and Geothermal Group of the South Australian Department of Primary Industries and Resources (PIRSA).

Vegetation clearance resulting from the petroleum exploration activities covered by this SEO, are exempt from the clearance controls under the Native Vegetation Act 1991 (Regulation 5(1)(zc) refers).

Relevant legislation is included in Appendix 2 of the EIR (Santos, 2006).

Activities associated with the geophysical operations that are covered by this SEO are as follows:

- line and access track preparation (starts after cultural heritage clearance has been completed);
- line surveying (starts after line preparation);
- recording (seismic, gravimetric, ground magnetic, electromagnetic and others);
- campsites and associated activities;
- uphole drilling and logging (during or after recording phase, as and when required);
- monitoring and auditing of selected locations (before and after line preparation and after restoration); and
- line access track and campsite restoration where required (after completion of recording and uphole drilling/logging).

The nature of these activities is outlined in detail in the EIR (Santos, 2006). Activities associated with Cooper Basin operations that are not discussed in the EIR or covered by this SEO, are:

- drilling and well operations;
- airborne geophysical operations; and
- production and processing operations.

Three separate SEOs cover airborne geophysical operations, production and processing and drilling and well operations in the South Australian Cooper Basin. These are:

- Statement of environmental objectives for airborne geophysical operations in South Australia (PIRSA 2006);
- Statement of environmental objectives for drilling and well operations in the Cooper Basin, South Australia (Santos 2003a); and
- Statement of environmental objectives for production and processing operations in the Cooper Basin, South Australia (Santos 2003e).

2.2 Definition

In the *Petroleum Act 2000,* environment is broadly defined to include natural, social, cultural and economic aspects. The environmental objectives outlined in this statement incorporate all of these aspects.

3 ENVIRONMENTAL OBJECTIVES

Important environmental objectives of the *Petroleum Act 2000*, include:

- to minimise environmental damage from activities involved in exploration for, or the recovery or commercial utilisation of, petroleum and other resources and;
- to minimise environmental damage from activities involved in geophysical operations.

Potential hazards and consequences associated with geophysical operations in the South Australian Cooper Basin are identified in the EIR (Santos, 2006). Under the Act, operators need to achieve a range of environmental objectives with respect to these potential hazards and consequences that are in keeping with the above objectives of the Act.

Environmental objectives for geophysical operations are to:

- minimise the visual impact of operations
- minimise disturbance to soil resources
- minimise disturbance to native vegetation and native fauna
- avoid disturbance to sites of cultural and heritage significance
- minimise disturbance to livestock, pastoral infrastructure and landholders
- avoid the introduction or spread of exotic species and implement control measures as necessary
- minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources, and
- optimise waste reduction and recovery.

As a result of the above specific objectives, the operator will maintain and enhance partnerships with the Cooper Basin community as well as adhering to the principles of ecologically sustainable development (ESD). Adherence to the principles of ESD will ensure the avoidance of long term significant adverse impact(s) on biological diversity, cultural components of the environment, groundwater and other land uses.

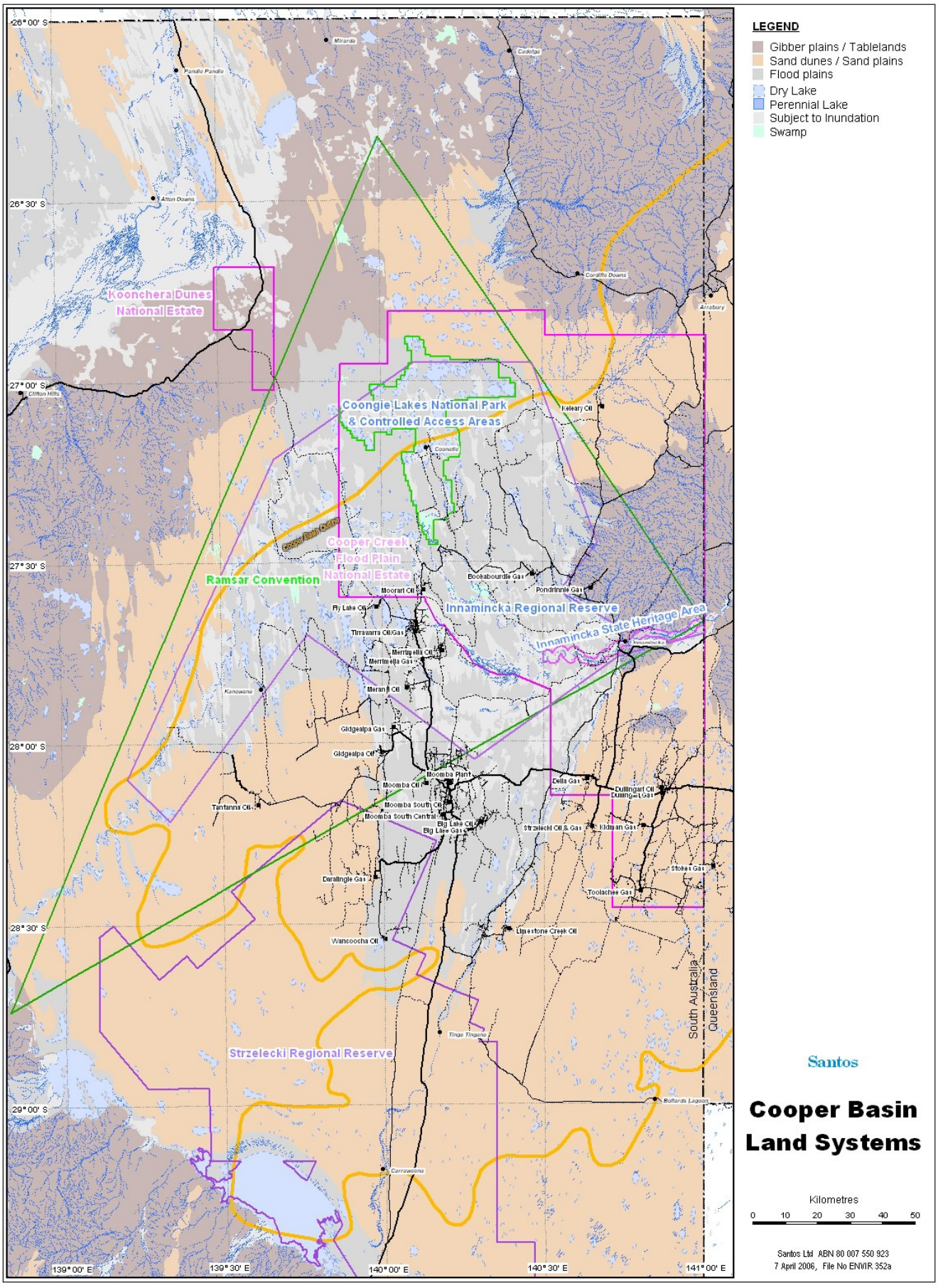

Figure 1 **Locality map for the Cooper Basin in South Australia showing reserves and parks within the area of interest to which this SEO is applicable.**

The environmental objectives defined above are based on those identified in the EIR (Santos, 2006) and Statement of environmental objectives for seismic operations in the Cooper and Eromanga Basins, South Australia (Cockshell, 1998) and can be grouped into three main categories as in Cockshell (1998); planning/procedures, management of temporary impacts and avoidance of long-term impacts.

The considerable experience of the PIRSA Petroleum and Geothermal Group and industry operators undertaking geophysical operations in this region are also important contributory sources. The environmental objectives also embrace the results of studies and research projects relating to environmental impacts of seismic operations undertaken in the region and other parts of the State. Many of these studies are listed in the bibliography of this document.

4 ASSESSMENT METHODS

One of the implications of objective based regulation is the need for a means of identifying and assessing the level of achievement of environmental objectives. This SEO contains the criteria that have been developed to address this requirement. The criteria are given in specific terms and clearly define what is an acceptable practice or not.

The criteria for measuring the achievement of environmental objectives covered in the SEO will take one or more of the following forms:

4.1 Defined conditions

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

- prohibitions on the undertaking of specific actions that can have long-term consequences and can only be adequately managed through the avoidance of defined unacceptable activities. For example, bulldozing of mature trees has a long-term impact that is not acceptable or warranted, and
- requirements to carry out certain actions in accordance with approved procedures or industry standards. For example, compliance with fire fighting standards, as included in the *Country Fires Act 1989* and Australian Petroleum Production and Exploration Association (APPEA) Code of Practice, is required to provide appropriate protection measures against survey initiated and spread of wildfire.

4.2 Goal attainment scaling

Some environmental objectives are likely to be subject to a certain degree of subjective judgement. To minimise the discrepancy from one observer to another in this situation, Goal Attainment Scaling (GAS) is used to measure the degree to which such objectives are met. A series of criteria is used, which is described in writing and/or photographically. GAS is particularly useful in measuring achievement of objectives relating to disturbances to natural vegetation and soil.

4.3 Scientific surveys/studies

In some cases, the assessment of the environmental objectives may not be possible in the shorter term and may require longer term monitoring and/or scientific evaluation. In such cases, the assessment criteria may be in the form of longer-term data and information gathering and scientific studies. Such surveys may include ecological, social or cultural studies, or other scientific investigations on specific aspects.

The results of such work could then be used to develop additional or refine existing defined conditions and GAS criteria.

4.4 Photo monitoring

Photographic evidence provided by an operator can provide visual documentation on the state of impact. Re-occupation of photo points over time can provide visual evidence of the level of recovery of geophysical impact.

4.5 Other techniques as appropriate

Other techniques may exist, or could be developed in the future, which could be beneficial. Use of other techniques can be included where they are appropriate and effective.

5 ASSESSMENT CRITERIA

Each objective identified above will be assessed using a selection of the assessment options identified in the preceding 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 2. Specific GAS criteria are presented in Appendix 3.

6 AUDITING AND REPORTING

6.1 Operator internal audits

Prior to commencement of, or during a geophysical survey, the operator may nominate a representative sample of lines to be audited in environmentally sensitive areas (e.g. the Cooper or Strzelecki floodplains, wetlands, tablelands and gibber plains). Representative sample sites, ideally, should be easily accessible from existing roads or tracks. Other sites may be selected away from existing tracks or in less sensitive areas on a random basis to provide a check of standards throughout the licence area, and provide representative sampling of all land units. The geophysical survey crew is to be made aware that a sample of lines will be audited but the precise lines will not be made known.

The operator's field representative shall audit the nominated lines for compliance with the environmental objectives within the period of the survey and any shortfall will be made good before the survey is completed and an audit report prepared. Such an audit report will be referenced in the licensee's annual report to PIRSA. This annual report requires a statement on compliance of operations with the *SA Petroleum Act 2000*, Regulations and this SEO.

6.2 PIRSA audits

PIRSA may undertake random audits of geophysical surveys, both in the field and in the office, using the assessment techniques defined above. The aim of these audits is to ascertain achievement or otherwise of the environmental objectives as well as to test the veracity of the licensee's annual report on compliance.

The selection of sites to be audited will be random, to ensure vigilance on behalf of the operator and contractors. Even so, the more environmentally sensitive land units, particularly those covered by company audits would be amongst the most likely sites for PIRSA audits. PIRSA will advise of any specific photo monitoring that is deemed to be required, in addition to any which has been initiated through the operator's environmental management system (EMS).

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

6.3 Third party audits

Third parties may also undertake audits of the field outcomes of company geophysical operations. The audits may be commissioned by PIRSA, or the licensee, or by any independent parties. If these audit findings are to be compared to those of the operator and/or PIRSA, the same assessment criteria must be used. Items of note from these reports can be included in PIRSA's reporting on environmental management.

6.4 Incidents

Petroleum Regulation 12(2) requires an SEO to identify events that could cause a serious incident or a reportable incident within the meaning of Section 85 of the *Petroleum Act 2000*.

6.4.1 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 repercussions occur.

- A person is seriously injured or killed.
- An imminent risk to public health or safety arises.
- Serious environmental damage occurs or an imminent risk of serious environmental damage arises, and
- Security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises.

6.4.2 Reportable incidents

Reportable incidents are incidents (other than a serious incident) arising from activities conducted under a license issued under the Petroleum Regulations. Pursuant to Regulation 12(2), incidents that may arise from geophysical activities that are considered to be reportable include:

- verified complaint from a landowner or other land user as a result of operations
- any disturbance to sites of Aboriginal or non-Aboriginal heritage significance
- removal of rare, vulnerable or endangered flora and fauna species without appropriate permits and approvals)
- any introduction of exotic species (pest weed or animal), and
- uncontrolled flows to the surface from shallow drilling operations (upholes).

7 DOCUMENT REVISION

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

APPENDIXES

Appendix 1 Parks and reserves listing

Park–Reserve name	Reserve type	Status of access for petroleum exploration and development activities
Simpson Desert	Conservation Park	No Access
Coongie Lakes	National Park	No Access / Conditional Access
Lake Callabonna	Fossil Reserve	No Access
Innamincka	Regional Reserve	Access Provided
Innamincka	State Heritage Area	Access Provided
Strzelecki	Regional Reserve	Access Provided

Appendix 2 Environmental objectives and assessment criteria

Environmental Objective	Assessment Criteria	Guide to How Objectives can be Achieved	Comments
Objective 1: Minimise the visual impact of operations.	**Campsite and survey line preparation** Proposed survey lines and campsites have been appropriately located and prepared to minimise the visual impact. The attainment of 0, +1 or +2 GAS criteria for 'visual impact' objective listed in Appendix 3.	Pre-survey planning has been undertaken to minimise visibility of operations and records are available for audit. Maximise use of vegetation or land forms to disguise operations. Offset sand dune crest cuts along the length of the survey line to minimise visibility. Avoid extensive side cuts on dune flanks. Lessen visual impact of uphole cuttings, where they contrast with the surface, e.g. by use of appropriate colouring agents. Avoid cutting sand dunes facing tourist access tracks. All litter is to be disposed of correctly.	If techniques to disguise their presence are not implemented, the visual impact of survey lines can be significant. Location of and preparation techniques for survey lines are key factors in determining visual impact.
Objective 2: Minimise disturbance to and contamination of soil resources.	**Campsite and survey line preparation** Attainment of 0, +1 or +2 GAS criteria for 'Minimise impacts to land surface' objective, as listed in Appendix 3. Proposed survey lines and campsites have been appropriately located and prepared to minimise the disturbance to soil resources. **Fuel Storage and Handling** No refuelling occurs outside designated refuelling/servicing areas. Spills or leaks are immediately reported and clean up actions initiated. Records of spill events and corrective actions are maintained in accordance with company procedures. Appropriate spill response equipment is available on site.	Pre-survey planning has been undertaken to minimise impacts of operations and records are available for audit. Survey line preparation techniques are monitored and documented to minimise soil disturbance, particularly in gibber and floodplain/wetland terrains. Gibber mantle has not been removed in gibber and tableland land systems. Gibber surface is not ripped at campsites. Any requirement to traverse sensitive land systems and the method of managing the impacts should be justified in accordance with company procedures. Any records should be available for audit. There is no evidence of off-road driving or creation of shortcuts. No survey line or access track preparation is carried out on salt lakes. Areas subject to inundation have been assessed for conduciveness to support vehicles. Oil spills areas have been ripped to an appropriate depth.	The main sources of disturbance to soils are survey line preparation, vehicle traffic along tracks and restoration activity. The impacts associated with soil disturbance can potentially include wind and water erosion and dust generation. All fuel stored and used should be under the control of qualified or trained personnel.

Environmental Objective	Assessment Criteria	Guide to How Objectives can be Achieved	Comments
Objective 3: Minimise disturbance to native vegetation and fauna.	**<u>Campsite and survey line preparation</u>** The attainment of either 0, +1 or +2 GAS criteria for 'Impact on native vegetation' objective listed in Appendix 3. No mature trees are removed. Vehicle access to survey lines is to be via existing access tracks or pre-existing survey 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. **<u>Fuel and Chemical Storage and Management</u>** Refer to assessment criteria for objective. **<u>Fire Danger Season restrictions and education</u>** All personnel are fully informed on the fire danger season and associated restrictions.	Terrain and vegetation is considered in planning stage when designing layout of the survey. Records of vegetation clearance/habitat disturbance are kept and available for auditing. Appropriately trained and experienced personnel have scouted proposed survey lines access tracks and campsites. Native vegetation clearance has been minimised and the conservation needs of specific species have been considered. Campsites are established in locations where the preparation of a new access track is not necessary. **<u>Waste Management</u>** Covered bins are provided for the collection and storage of wastes, while all loads of rubbish are covered during transport to the central waste facility. **<u>Fire Danger Season restrictions and education</u>** Include Fire Season education as part of the induction.	Primary risks to native fauna include clearing of habitat and obstruction of movement through prepared areas. Current survey line and access track preparation techniques have been shown by a number of studies to have an insignificant impact on wildlife habitat and minimal impact on vegetation. This is due to the small and confined area of impact of survey lines and the rate of recovery of most vegetation types and surface morphology. The aim of this objective is to also maximise the potential for vegetation regrowth. Potential impacts of waste on vegetation and fauna also addressed under Objective 8.
Objective 4: Avoid disturbance to sites of cultural and heritage significance.	The following is one possible procedure to achieve the objective. Appropriately trained and experienced cultural/heritage advisors have scouted proposed survey line locations and access tracks. The operator has a mechanism in place to appropriately report and respond to any sites discovered during survey operations. Any sites identified have been flagged and subsequently avoided. *<u>Note:</u>* Where a negotiated agreement or determination for heritage is in place, compliance with the negotiated agreement or determination takes precedence over the above criteria. The EIR details this possible procedure.	The possible procedure may well be achieved by the following: Documents and/or reports of scouting for cultural/heritage are available for audit. Environmental Report Forms (ERF) to be completed for any sites or artefacts identified. The ERFs relating to Aboriginal sites are forwarded to Department for Aboriginal Affairs and Reconciliation (DAARE). *<u>Note</u>*: Where a negotiated agreement or determination for heritage is in place, provisions may include that appropriately trained and experienced cultural/heritage advisors will carry out a Work Area Clearance (WAC) and produce a report for sites of cultural and heritage significance before commencement of line preparation. This provision will take precedence over the above guideline. The EIR details these criteria for the possible procedure.	The aim of this objective is to ensure that any sites of Aboriginal and non-Aboriginal heritage significance are identified and protected. New suspected sites located should be recorded and copies of the records submitted to DAARE.

Environmental Objective	Assessment Criteria	Guide to How Objectives can be Achieved	Comments
Objective 5: Minimise disturbance to livestock, pastoral infrastructure and landholders.	The attainment of 0, +1 or +2 GAS criteria for 'Impact on infrastructure' objective listed in Appendix 3. No reasonable concerns raised by stakeholders are left unresolved. The extent to which the relevant sections of the Petroleum Act and Regulations have been followed and implemented and in particular in relation to landowner liaison and notification.	Relevant landowners and occupiers are notified prior to survey of preparation of campsites, preparation of survey lines and undertaking of operations (pursuant to the Petroleum Regulations). Compliance with requirements of the Cattle Care and Organic Beef accreditation programmes. System is in place for logging landholder complaints to ensure that issues are addressed as appropriate. Seismic sources are not to operate within 20 m of any pipeline, utility, installation or building. This distance may need to be larger for explosive-sources, pending size of explosive used. Damage to station tracks is avoided. Operations in wet weather are not allowed. All gates are left in the condition in which they were found (i.e. open/closed). When necessary, all fences are restored to satisfaction of landowner/managers Inductions for all employees and contractors covers pastoral, conservation, legislation and infrastructure issues.	Communication and the establishment of good relations with landowners and community are fundamental to minimising disturbance as much as practicably possible. Many pastoral properties are certified under the Organic Beef or Cattle Care accreditation schemes and therefore may be affected by fuel and chemical storage, moving machinery and contaminated sites. *Note:* The PIRSA publication "*Liaison guidelines for landholders and petroleum explorers in South Australia* is a recommended source for effective liaison with landowners. Access to land is a key factor for a long-term sustainable petroleum industry. Community support is vital for the petroleum industry to access land and hence realise the resources beneath the land. It is imperative that the industry establishes and maintains good relations with the landowner/occupier particularly pastoralists and managers of parks and reserves and tourist interests.
Objective 6: Avoid the introduction or spread of exotic species and implement control measures as necessary.	Weeds or feral animals are not introduced into, or spread, in operational areas	All vehicles and equipment appropriately cleaned prior to entering the Cooper Basin. Vehicles and equipment are to be cleaned when moving from areas within the Cooper Basin where weeds are present. Cleaning carried out in accordance with specified company procedures and accepted practices. Records of vehicle and equipment cleaning are kept and available for auditing. Records of detection, monitoring or eradication of exotic weed or other pest or noxious species introduced by industry activities are kept and are available for audit.	A potential source of weed or pest introduction is from vehicles and equipment brought in from other regions of the State or interstate. The most effective way of preventing such introduction is by thoroughly cleaning vehicles and equipment prior to entering the Cooper Basin.

Environmental Objective	Assessment Criteria	Guide to How Objectives can be Achieved	Comments
Objective 7: Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.	**Campsite and survey line preparation** Campsites and survey lines/traverses are located and constructed to avoid diversion of water flows. The attainment of 0, +1 or +2 GAS criteria for 'disturbance to land surface' objective listed in Appendix 3. No uncontrolled flows to surface from aquifers intersected in upholes/shallow boreholes. There is no unnecessary interference with natural drainage features. **Fuel Storage and Handling** No spills occur outside of areas designed to contain them. Refuelling occurs at least 1km from watercourses or sensitive ecological environments (wetlands). Appropriate spill response equipment is available on site. Spills or leaks are immediately reported and clean up actions initiated promptly.	All access through watercourses area carefully assessed to determine the locations of least impact to channels and creek banks. Any artesian flows are to be immediately plugged and monitored to ensure effectiveness of plug(s). Any required remediation work carried out as soon as possible after completion of all activities If any contamination from spillage of oils or fuel occurs during vehicular operations, immediate effective clean-up procedures must be employed.	The main threat to drainage patterns and surface waters is the interruption of natural flows as a result of access track preparation through watercourse channels and creek bank disturbance. Campsite and line preparation should aim to minimise impacts to drainage systems, by avoiding sensitive areas and using appropriate preparation methods to avoid or minimise the development of windrows. Any remediation work should be undertaken immediately upon completion of all activities. Localised contamination may result from spills or leaks of vehicles during storage and handling or vehicle travel. The major threat of spills is the threat to soil, vegetation and watercourses directly impacted by the spill. Therefore, the achievement of this objective also consequently contributes to the achievement of Objectives 2 and 4 in relation to minimising impacts on soil and natural habitats.
Objective 8: Optimise waste reduction and recovery.	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. 0, +1 or +2 GAS criteria are attained for 'Negligible survey markers and rubbish in situ' objective listed in Appendix 3.	Production of waste is minimised by purchasing biodegradable or recyclable materials where practical.	Waste reduction requires continual improvements in purchasing, efficiency of use and reuse. Due to the distances 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.

Appendix 3 Goal attainment scaling (GAS) criteria for assessing seismic lines on completion of survey in the Cooper Basin South Australia

LAND SYSTEM	MEASURE	SCORE				
	Associated goals	+2[b & d]	+1[b & d]	0[b & d]	-1[a & d]	-2[a, c & d]
Non land system specific	***Visual impact (Obj 1)*** [g]	• No evidence of survey operations.	• Only wheel tracks are evident. • Line of sight is significantly impaired.	• Established roads and tracks have been reshouldered. • Doglegs have been placed at established roads and tracks in vegetated areas. • Dozer or grader has been walked 40m either side of established road or track. • Line weaves through vegetated areas at least every 100m. • Line of sight is impaired. • Line follows route that is most conducive to access by utilising naturally clear areas through vegetation.	• No doglegs at established roads or tracks in vegetated areas. • Weaving is not appropriate to terrain traversed. • Line of sight is unimpaired. • Uphole cuttings clearly visible in landscape.	• Line is clearly evident and dominates the landscape.
	Impact on infrastructure (Obj 5) [g]	• No impact to any pastoral, tourist or production infrastructure.	• No observable repair or damage to infrastructure.	• Any impact to infrastructure has been reported and reinstated or repaired.	• Repair to damaged infrastructure is incomplete or inappropriate. • Damage has not been reported.	• Damage to any infrastructure has been left un-repaired and not reported.
	Uphole site restoration (Obj 1,2,3,5,7) [g]	• No evidence of upholes.	• No evidence of cuttings. • Some evidence of operations.	• Cuttings are evident but dispersed around hole. • No subsidence. • Hole has been plugged.	• Cuttings form mound. • Subsidence is evident. • Cuttings markedly discoloured compared to surface.	• Hole is open.
	Pollution or litter (All Objectives[g])	• No pollution or litter.	• No evidence of water or oil pollution. • Maximum of 1 pin flag/km.	• Wastewater and vehicle oil spills have been managed appropriately. • Maximum of 2 pin flags/km. • No other litter.	• Wastewater forms ponds or extensive boggy ground. • Vehicle oil spills have not been remedied. • Maximum of 9 pin flags/km. • Maximum of 4 items of other litter/km.	• Extensive wastewater ponding. • Oil spills of more than 20L have not been remedied. • Ten or more pin flags/km. • Five or more items of other litter/km.
Dunefield	***Impact on vegetation (Obj 1,2,3,5)*** [g]	• No removal of vegetation.	• Only herbs and shrubs less than 0.5m high removed on dunes. • No removal of vegetation in swales.	• No removal of Priority 1 and 2 vegetation[e]. • No removal of Priority 3 shrubs >2m high[e]. • Less than 30% of tree branches have been removed from individual trees.	• Priority 1 or 2 vegetation[e] <2m high have been removed, including rootstock. • Priority 3 shrubs[e] >2m high have been removed, including rootstock.	• Priority 1 or 2 vegetation[e] >2m high have been removed.
	Disturbance to land surface (Obj 1-5 & 7) [g]	• No dune cuts. • No windrows.	• Dune cuts are <0.5m deep. • No blade cutting in swales.	• Dune cuts are 0.5–1m deep. • Clay-rich dune cuts are <1m deep. • Side cuts in clay rich dunes <0.75m. • Sand is stacked along side of cut. • Windrows in swale are <0.1m high and not continuous.	• Dune cuts are 1–2m deep. • Side cuts in clay dunes >0.75m. • Clay dune cuts >1m. • Off line trafficking is evident. • Minor ramping of sand onto swale. • Windrows in swale are 0.1–0.3m high.	• Dune cuts are >2m deep. • Extensive ramping of sand onto swale. • Windrows in swales are continuous. • Windrows in swales are >0.3m high. • Claypans have been cut.

LAND SYSTEM	MEASURE	SCORE				
	Associated goals	+2[b & d]	+1[b & d]	0[b & d]	-1[a & d]	-2[a, c & d]
Floodplain and wetlands	***Impact on vegetation (Obj 1,2,3,5)*** [g]	• No removal of vegetation.	• No removal of Priority 1 and 2 vegetation[e]. • No removal of Priority 3 vegetation[e] >1m.	• No removal of Priority 1 and 2 vegetation[e]. • No removal of Priority 3 shrubs >2m high[e]. • Less than 10% of tree branches have been removed from individual trees. • Rootstock is intact.	• Priority 1 and 2 vegetation[e] <2m high have been removed. • Priority 3[e] shrubs >2m high have been removed.	• Trees and/or shrubs >2m high have been removed. • Rootstock has been removed.
	Disturbance to land surface (Obj 1-5 & 7) [g]	• No windrows. • No interference with drainage channels.	• Windrows are <0.1m high for more than 50% of line length. • Only creek banks <0.5m high have been cut.	• Windrows are <0.1m high. • Creek banks <1m high have been cut. • Creeks are not blocked. • Wheel tracks are <0.1m deep.	• Windrows are <0.3m high. • Windrows are generally continuous. • Creek banks 1–2m high have been cut and not restored. • Creeks are blocked by material <1m deep. • Wheel tracks are >0.1m deep.	• Windrows are >0.3m high. • Windrows are continuous. • Creek banks >2m high have been cut. • Creeks are blocked by material >1m deep.
Gibber plain and tableland	***Impact on vegetation (Obj 1,2,3,5)*** [g]	• No disturbance to vegetation.	• No removal of vegetation.	• Maximum of two trees 1–3m high have been unavoidably removed at creek crossings or escarpments. • Less than 10% of tree branches have been removed from individual trees. • Creek crossings are doglegged.	• Vegetation has been removed unnecessarily. • Three or more trees 1–3m high have been removed at creek crossings or escarpments.	• Trees have been removed unnecessarily. • Two or more trees >3m high have been removed at creek crossings or escarpments.
	Disturbance to land surface (Obj 1-5 & 7) [g]	• No evidence of survey line.	• Only wheel tracks are evident.	• Line has been rolled or walked. • No blade work. • Creek banks have been cut only where necessary. • Creeks are not blocked.	• Creek banks 1–2m high have been cut and not restored. • Creeks are blocked by material <1m deep. • Windrows [f] exist but are <0.5m high. • Off line trafficking is evident. • Extensive wheel ruts exist.	• Gibber mantle has been removed. • Creek banks >2m high have been cut and not restored. • Creeks are blocked by material >1m deep. • Windrows [f] are >0.5m high.
Salt lake	***Disturbance to land surface (Obj 1)*** [g]	• No evidence of survey line.	• No evidence of shotholes. • Little evidence of foot trafficking.	• Only footprints are evident. • No significant evidence of shotholes.	• Wheel tracks exist and are <0.2m deep. • Minor evidence of shotholes.	• Wheel tracks exist and are >0.2m deep. • Bog holes are evident. • Dominant evidence of shotholes (e.g. cratering, blow out, discolouration).

(a) If any criterion (dot point) within a -1 or -2 cell occurs, then a score of -1 or -2 will be allocated.

(b) For 0, +1 and +2 cells, all relevant criteria (dot point) within the cell must be satisfied to score at that level.

(c) Some criteria at -2 levels may also be subject to defined conditions, but are included in this table to ensure that they are clearly identified.

(d) All vertical measurements to be measured from normal ground surface.

(e) Priority classification refers to Wiltshire and Schmidt (1997).

(f) Windrows in this context means mounding of gibbers through the action of wheel trafficking and associated dispersal of gibbers away from wheel tracks.

(g) Relevant environmental objective.

Appendix 4 Summary of the common plants of the Cooper Basin

	Priority 1 Avoid clearance	Priority 2 Avoid if possible	Priority 3 Clear minimum possible	Priority 4 Clearance acceptable
Tree	Broughton willow (*Acacia salicina)*	Mulga (*Acacia aneura)*		
	Wild Orange (*Capparis mitchellii)*	Gidgee, Stinking Wattle (*Acacia cambagei*)		
	Bloodwood (*Corymbia tumescens)*	Red Mulga, Minni-ritchi (*Acacia cyperophylla*)		
	River Red Gum (*Eucalyptus camaldulensisvar.obtusa)*	River cooba (*Acacia stenophylla*)		
	Coolibah (*Eucalyptus coolabah)*	Whitewood *(Atalaya hemiglauca)*		
	Beefwood (*Grevillia striata*)	Yapunyah (*Eucalyptus ochrophloia*)		
	Queensland Bean Tree, Bauhinia *(Lysiphyllum glivum*)	Straggly Corkbark (*Hakea eyreana)*		
	River Paperbark *(Melaleuca trichostachya*)	Emu Apple, Sour Plum (*Owenia acidula*)		
Scrub		Mimosa Bush, Sweet Acacia *(Acacia farnesiana)*	Marpoo, Sandhill Wattle (*Acacia ligulata*)	Bluebush Pea, Loose Flowered (*Crotalaria eremaea)*
		Murray's Wattle, Sandplain Wattle *(Acacia murrayana)*	Prickly Wattle, Elegant Wattle *(Acacia victoriae)*	Buckbush, Roly Poly (*Salsola kali)*
		Dead Finish (*Acacia tetragonopylla)*	Bladder Saltbush (*Atriplex vesicaria)*	
		Old Man Saltbush (*Atriplex nummularia)*	Golden Goosefoot (*Chenopodium auricomum)*	
		Native Currant (*Canthium latifolium*)	Nitre Bush, Nitre Goosefoot (*Chenopodium nitrariaceum)*	
		Desert Fuchsia (*Eremophila dalyana*)	Hop Bush *(Dodonaea viscosa ssp. augustissima)*	
		Spotted Emu Bush (*Eromophila maculata var. maculata)*	Eurah, Bignonia Emu Bush (*Eremophila bignoniflora)*	
		Flowering Lignum (*Eromophila polyclada)*	Emu Bush (*Eremophila longifolia)*	
		Sandhill Spider-flower (*Grevillea stenobotrya*)	Honey Suckle Spider-flower *(Grevillea juncifolia)*	
		Needlewood (*Hakea leucoptera*)	Samphire (*Halosarcia indica)*	
		Tangled Lechenaultia (*Leschenaultia divaricata)*	Spiny Saltbush, Thorny Saltbush (*Rhagodia spinescens)*	

	Priority 1 Avoid clearance	Priority 2 Avoid if possible	Priority 3 Clear minimum possible	Priority 4 Clearance acceptable
		Lignum (*Muehlenbeckia florulenta*)	Silver Cassia (*Senna artemisiodes ssp artemisoides)*	
Herb		Lobed Spinifex (*Triodia basedowii*)		Mulga Grass, Kerosene Grass (*Aristida contorta)* Barley Mitchell Grass *(Astrebia pectinata)* Swamp Canegrass (*Eragrostis australasica*) Nardoo (*Marsilea drummondii)* Fleshy Groundsel, Yellow-tops *(Orthonna gregorii)* Poached Egg Daisies (*Polycalymma stuartii)* Long-tails, Pussy-tails (*Ptilotus polystachyus)* Pea Flower (*Swainsona campylantha)* *Cat-head (Tribulus terrestris)* *Cattle Bush (Trichodesma zeylanicum)* Sandhill Canegrass (*Zygochloa paradoxa)*

Source: Wiltshire.D. and Schmidt, M., 1997. Field Guide to the Common Plants of the Cooper Basin (South Australia and Queensland). Santos. Adelaide, South Australia.

Appendix 5 Stakeholder comments and responses

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
DEH	P1 Para 1. Both documents are in need of editorial revision	EIR and SEO	To be reviewed by editor
P1 Para 2	Cover with insufficient depth most environmental aspects associated with geophysical activity in the Cooper Basin	EIR and SEO	No specific details provided. Subsequent changes should address this.
P1 Para 3	The SEO relies heavily on industry jargon and thus needs to clarify the terms and concepts that are used. The document is a public document and as such needs to be written for a relatively broad audience	SEO	As above – Note: abbreviations and particular terms expanded.
P1 Para 4	The use of editorial revision would hopefully achieve a document that; is logically set out Does not contradict itself Uses consistent meanings for terms and concepts.	EIR and SEO	Format is consistent with previously accepted industry EIR and SEO documents.
P2 penultimate paragraph	The treatment of Campsites and Associated Supplies (5.3.5) by both documents is not as thorough as that for the treatment of on ground operations.	EIR and SEO	Campsites represent a very small impact compared to the preparation and use of seismic lines. In addition, as seismic and other activity has been ongoing in the area for several decades, most seismic camps these days are established on previously occupied areas.
P2 last paragraph to P3 first two paragraphs	Whilst it is acknowledged that campsites are sited on ground that is "conducive to camping" (clear of vegetation), the documents ignore that there are a range of impacts associated with camps as described in the EIR. Housing up to 60 personnel More than 20 trailers About 36 vehicles Majority of vehicles transiting to adjacent road and back each day, some several times; Main camp static for up to two months Some camps may require multiple access routes to minimise the potential for bulldust creation The above points could potentially contribute to intense point impacts associated with the campsite. Such impacts include the destruction of any vegetation present that is not an established tree, the pulverising of the soil surface, and compaction of soil. From the photograph provided in the document there is clearly visible evidence of multiple tracks and of vehicles parked under trees.	EIR and SEO	Impacts of campsites are localised and, as stated in the documents, rehabilitation of the impacts are sometimes required. Referenced and covered in EIR sections 5.3.5, 5.3.7, 5.4, 6 and 7.

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
P3 fifth paragraph	The SEO as it stands at the moment does not lend itself to the development of an EIR that is an appropriate reflection of the impacts associated with on ground geophysical operations.	SEO	The EIR is prepared first (and provides the details) and the SEO is developed on the basis of the risk assessment made in the EIR.
Camatta Lempens P1 Comment 2	I note that objective 4 of the SEO recognises the importance of avoiding disturbances to sites of cultural significance. However, the guide as to how these objectives can be achieved and the comments are not sufficient. Whilst paragraph 5.3.1 of the EIR sets out procedures for the cultural clearance, I do not believe this is adequately reflected in the guide.	SEO Objective 4, EIR sec.5.3.1	No suggestions as to additional guidelines have been proposed. We believe that the procedures are appropriately reflected in this document but should be read in conjunction with handbooks/posters/procedures used in the field (eg Environmental Procedures for Management of Aboriginal Heritage sites - referenced in EIR)
P1 Comment 2 part 2	I suggest that objective 4 of the SEO be amended to make it a requirement that a cultural heritage clearance be carried out with representatives of the Native Title Claimants. I should point out that at the present time, cultural heritage clearances as outlined in paragraph 5.3.1 are not being carried out by any explorer or producer in the area except those who have negotiated agreement with the Native Title Claimants. This is unsatisfactory as it significantly increases the risk of damage to sites of significance.	SEO Objective 4; EIR sec 5.3.1	The suggestion actually proposes a possible process by which objective 4 can be achieved. As these documents are meant to be Objective based it is preferable not to incorporate prescriptive requirements into the objectives (Objective 4 states: "Avoid disturbance to sites of cultural and heritage significance")
P2 Comment 2 part 3	Currently, objective 4 does not require any notification to the Aboriginal Claimants nor does it require their participation in a cultural heritage clearance. This is in contrast to objective 5 concerning the minimisation of disruption to pastoral activities, which does require notification, so that the comments under objective 5 are also important as it is a key factor for the long-term sustainability of the petroleum industry that they have good relationships with the Aboriginal people.	SEO Objective 4	Objective 5 ("Minimise disturbance to livestock, pastoral infrastructure and landholders") does not specify the need for notification. However, notification and consultation is required under the Petroleum Act.
P2 Comment 2 part 4	The requirement that all environmental report forms relating to Aboriginal sites are to be forwarded to the Department of Aboriginal Affairs and Reconciliation causes some concern to the Claimants as in some cases sites are secret and if they are notified to the Claimants it is not necessarily the case that they want those sites notified to the Department for their own cultural reasons. The ownership of knowledge of sites is an important matter to Aboriginal people and it is not always the case that they are willing to make that knowledge publicly available, nor is it appropriate for them to do so. Consequently the notifications should only be made with the consent of the Native Title Claimants.	SEO	Operators are required under the Legislation to report all sites to DAARE. It is unlikely that DAARE would provide the Operators with dispensation to report any sites that the Claimants would not want reported to DAARE (see DAARE comment emphasising the legal requirement to report). Operators are not allowed to make any Aboriginal site/location public and further publication is, of course, at the discretion of DAARE who would presumably take the Claimants' views into account.
P2 Comment 3 part 4	The rights of Aboriginal People in the matter are outlined in the State Aboriginal Heritage Act 1988 and the Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984. I believe both these acts should be mentioned in your legislative requirements.	SEO and EIR	SA Act acknowledged in EIR Appendix F. Commonwealth Act added.

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
SATC	The South Australian Tourism Commission has reviewed the EIR and Statement and has not identified specific issues for tourism that have not already been addressed in the report and statement.	SEO and EIR	
P1 paragraphs 3 to 5	However the SATC has an interest in improving basic infrastructure along the Strzelecki track to support visitors to this remote and sometimes inhospitable region. From a tourism perspective it is regrettable that Moomba, the main population centre of the area presently does not provide any services to the visitor. We therefore encourage any steps to co-locate basic services in the vicinity of Moomba where infrastructure already exists. This could help address growing waste management issues and minimise environmental waste and impact. We also encourage closer cooperation between stakeholders in the region to improve public infrastructure and waste management, especially at areas that are experiencing increased visitor impact, for example at Strzelecki Creek Crossing near to the Strzelecki Regional Reserve.		Comments noted.
CFS	Include a statement as part of the objectives relating to ensuring Fire Restrictions during the Fire Danger Season are complied with and personnel operating in rural areas are aware of the restrictions and requirements.	SEO and EIR	Added to Objective 3 in SEO and sec 6.3, Table 7-4 and sec 7-2-2 in EIR
	Acknowledges the requirement for companies to undertake Emergency Response and Contingency Planning.		
SADAARE	We would encourage you to stress the following aspects of the Aboriginal Heritage Act 1988 ("the Act") in all appropriate documentation:-		
P1 Point 3	3. The Register does not purport to be a comprehensive record of all Aboriginal sites and objects in SA and sites and objects may well exist on the land, even though the Register does not identify them. All Aboriginal sites and objects are protected under the Act regardless of whether they are listed in the Register. It is appropriate therefore to emphasise that it is an offence under the Act to damage, disturb or interfere with any Aboriginal site or damage any Aboriginal object (registered or not) without the authority of the Minister. All sites discovered are to be reported.	SEO	Objective 4 plus the associated booklet (Santos 1998a) covers this.
P2 Point 4	The Act requires that any sites, objects or remains discovered on the land are to be reported to the Minister and that penalties apply for failure to comply with the Act.		All sites, objects and remains are reported as part of the Environmental Report Form (ERF) system

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
DWBLC	In general the documents are considered comprehensive and thorough. There are, however, some specific concerns and these are listed below:-		
P2 bullet 10	App.2 Objective 7 there is no mention of bunding around refuelling areas nor any mention of how they respond to any spills into watercourses.	SEO	Bunding is deemed unnecessary for the volume of diesel on the crew. There is no refuelling in or near watercourses (EIR Section - 5.4 camps to be 1km away from stock watering locations - i.e. waterholes, creeks, etc).
P3 bullet 1	App.3 Floodplain and Wetlands land system - there is no GAS criteria for spills/leaks - this is a major omission. I would have thought they would have an emergency response plan to deal with spills/leaks.	SEO	There is a GAS for ALL landforms under Non land specific: Pollution or Litter.
P3 bullet 2	App.2 Objective 7 Guide to How Objectives can be achieved - an additional objective point could be added that upholes and shallow bores are to be drilled and abandoned in accordance with the General Specifications for the Construction and Abandonment of Mineral Wells. These are available as an information sheet from the PIRSA website.	SEO	All drilling procedures and abandonment are addressed within the Petroleum Industry procedures and regulations.
P3 bullet 3	App.2 reference to GAS Table 3.1 should be Appendix 3.	SEO	Corrected.
P3 bullet 4	App.2 Objective 7 the Comment "*The main threat to drainage patterns and surface waters is the interruption of natural flows as a result of access track preparation through watercourse channels*" should include an additional comment related to locating and constructing access tracks such as to minimise impacts on bed and bank stability.	SEO	Modified to include creek banks as well as channel/bed disruption.
P3 bullet 5	App.3 - An additional Land System with associated measures and scores needs to be introduced for water courses/or drainage path/channel.	SEO	This category is already included within the Floodplain and other land systems. It would be difficult to define these as separate land systems on topographic maps and in the field.
P3 bullet 6	App.2 Objective 6 The main weed issue would be seeds of annual weeds such as caltrop or onion weed on vehicles.	SEO	All vehicles are washed down when required to eliminate weed infestation (EIR sec.7.2.7).
P3 penultimate paragraph	The point about keeping records of detection of weeds is good. However, I suggest adding a point to the effect that The Animal and Plant Control consultant for the pastoral region to be consulted regarding the detection, recording and control of weeds or any other pest species by industry activities.	SEO	Added in section 7.2.7
P3 last paragraph	Regarding feral animals, it may be worth adding a point to avoid feeding wild dog and dingoes so they don't become habituated around human habitation. For example: Food waste should be removed from camp sites and staff should not feed wild dogs or dingoes.	SEO	Encapsulated within Objective 3.

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
DWLBC - Native Vegetation Group P1	The Native Vegetation Group is concerned with impacts on native vegetation, soils and wildlife habitat in the form of:- direct disturbance by blading, grading and/or traversing areas of native vegetation indirect disturbances such as weed infestation resulting from unclean machinery, formation of artificial water sources for stock, wildlife and/or feral animals through possible creation of pits as a result of works (this can also significantly change plant species composition at the site) and soil erosion preventing successful re-establishment of vegetation following works. The Objectives listed in the SEO cover these issues.	SEO	
P2 paragraphs 1 and 2	It is difficult to comment on the suitability of the assessment criteria and the guide to achieving the objectives without knowing and understanding how the criteria were developed and what processes will be used to achieve the objectives. For example, the assessment criterion for the objective concerning minimising disturbance to native vegetation (objective 3) reads "the attainment of either 0, +1 or +2 GAS criteria", which in turns talks about the extent of removal of Priority 1, 2, 3 and/or 4 plant species. However, there is no explanation for the placing of the plant species in the different plant categories. Presumably the species in the higher priority categories take longer to regenerate. It would be expected that some of the species listed in the four priority categories are of conservation significance, however only one species of conservation significance is included.	SEO	Appendix 3 sub-text (f) modified to give correct reference.
P2 paragraph 3	To achieve Objective 3, one of the dot points under the "Guide to How Objectives can be Achieved" states that "appropriately trained and experienced personnel have scouted proposed survey lines, access tracks and campsites". However, there is no follow-up statement to explain under what circumstances the line placement is amended (eg. when certain plants/habitats are encountered). Another dot point states that "the conservation needs of particular species have been considered" but there is no explanation of this point.	SEO	The details of any possible procedure are presented in the EIR. The SEO is a 'statement' developed from the EIR, which provides the possible procedures.
P3 paragraph 3	While it is mentioned briefly on p8 of the SEO that in some cases the assessment of the environmental objectives may require longer-term monitoring and/or scientific evaluation that could then be used to refine	SEO	Long term monitoring is not a requirement of the SEO, EIR or *Petroleum Act 2000*.

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
	GAS criteria etc, it appears there is no such monitoring in place at this time. The fact that a significant amount of exploration work has already been undertaken should mean that the situations in which more detailed or longer-term monitoring needs to be undertaken should be apparent.		PIRSA as part of is regulatory regime, undertakes longer term monitoring and scientific studies to validate the appropriateness of GAS criteria. A number of these are referenced in the SEO.
P3 paragraphs 4, 5 and 6	The main type of monitoring that appears to have been undertaken in recent years is photo point monitoring in the form of the establishment of "environmental monitoring points". The aim of EMPs appears to be to give an idea of the various landform and vegetation types encountered and then track the recovery process visually over a four-year (minimum) period. It appears that GAS audits are carried out after completion of the activity to record the extent of damage to specific tree and shrub species (those listed in Appendix 4). This monitoring program as proposed is only equipped to provide visual information on regrowth cover. There is no allowance for recording changes to particular species distribution or abundance. It may be that there have been studies undertaken to show that for the types of works no significant changes is likely to occur within the different land systems. This is implied in the documents but not referenced. Auditing for compliance with the environmental objectives, as described on p9, is important and will form an important part of the overall monitoring program.	EIR and SEO	Further studies have been carried out over the years to demonstrate that seismic activity leads to no significant changes in the various land systems. These are referenced. It has also been demonstrated that GAS audits and photo-monitoring are good proxies for these more detailed studies and are therefore preferable as they can be carried out more frequently and over a variety of different land systems.
P3 bullet 1	Assessment Criteria confuses Appendices 2, 3 and 4.	SEO p.9	Corrected
P3 bullet 2	Disturbance to certain land systems (eg. gibber) and by way of certain activities (no creation of new access tracks for campsites; cleaning of equipment to prevent introduction of exotic plant species) will be largely prevented by means of actions detailed in the SEO	SEO	Agreed.
P3 bullet 3	An addition to the comments on standard operating procedures relating to minimising impacts on fauna could include that special care is taken to look out for particular habitat types or signs of habitation by certain species, in particular species of conservation significance. For example, sand mounds can be indicative of Kowaris and should be avoided. Pavement gibber areas with sand mounds can be indicative of the Fawn Hopping-mouse, which is considered Endangered under state legislation.		Agreed. This could be incorporated into field procedures.
EPA	The EPA has reviewed the proposed South Australian Cooper Basin Operators' EIR and SEO for Geophysical Operations and has no additional comment.		

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
EDO P1 Item 2	There is no prioritization of Environmental Objectives. Objectives are likely to conflict: for example, the route taken that least disturbs pastoral infrastructure and is least visible may conflict with minimising vegetation disturbance. A decision making hierarchy should be set at this stage.	SEO	Difficult to achieve given the different stakeholders involved. All objectives are equal and the route taken will be to avoid or minimise all impacts.
P1 Item 3	Objective 7 regarding avoiding contamination to surface and shallow ground water is too constrained to effectively protect environmental values. There are many other potential impacts to water bodies such as bank and bed erosion, sedimentation, eutrophication, water percolation disturbance. Also water resources not covered here are not protected; eg artesian and other deep waters.	SEO	All aspects of impacts by the seismic crew are covered. Other possible impacts stated are not affected by these activities.
P1/2 Item 4	Objective 8 We cannot determine any waste where burning would be an appropriate disposal method. All wastes should be transported to a less pristine environment for disposal.	SEO	Burning of paper/cardboard waste is currently one of the agreed methods of disposal.
P2 Item 5	Objective 3 (vegetation removal) is not in line with rigor of other criteria. There are complex requirements relating to removal of vegetation however, unlike under the cultural heritage criteria, there is no requirement to employ an appropriately trained or experienced advisor to determine technical issues such as age and species of plants. Assessment criteria should require technical input so that the complex guidelines in Appendix 3 can be followed	SEO	All plants are classified with a priority system (Wiltshire and Schmidt 1997a). Guidelines are presented for their non-removal (App.3)
P2 Item 6	Biodiversity assessment has followed the species list approach. This approach is inadequate in protecting high quality and untouched (and often little known) ecological communities. There should be an additional objective that protects ecosystems that have been minimally disturbed (as an entity). Access should be directed to disturbed environments in preference to more pristine environments.	SEO	All ecosystems in the Cooper Basin have been previously impacted by pastoral activities. The EIR details the procedures for seismic line preparation around large stands of vegetation or particular ecosystems.
ALRM - Native Title Unit	Provided with a copy of Camatta Lempens (Mr Kenny's) comments and agree with points 2, 3 and 4.		
	It is critical that operators take strong measures that heritage clearance be performed by all operators who seek to carry out operations which will affect native title land.	SEO and EIR	Agreed
	In order to keep Native Title Claimants informed it is critical that operators also maintain a policy of providing notification of proposed activities to the Native Title Unit. Notifying the claimants direct or through their legal adviser is also important.		Agreed

Stakeholder	Stakeholder Comment	Document – Relevant section / page	Response / Comment
DWLBC - Animal & Plant Control Unit	The Animal and Plant Control commission staff have reviewed the documents as they relate to feral animal and weed management. The documents are well considered and thorough.		
	App.2 Objective 6 The main weed issue would be seeds of annual weeds such as caltrop or onion weed on vehicles.	as for consolidated DWLBC	All vehicles are washed down when required to eliminate weed infestation (EIR sec.7.2.7).
	The point about keeping records of detection of weeds is good. However, I suggest adding a point to the effect that The Animal and Plant Control consultant for the pastoral region to be consulted regarding the detection, recording and control of weeds or any other pest species by industry activities.	as for consolidated DWLBC	Incorporated into 7.2.7
	Regarding feral animals, it may be worth adding a point to avoid feeding wild dog and dingoes so they don't become habituated around human habitation. For example: Food waste should be removed from camp sites and staff should not feed wild dogs or dingoes.	as for consolidated DWLBC	SEO objective 3 is to minimise disturbance on native fauna - this objective encapsulates the objective to not modify their behaviour
DTUP - EIA Unit	We have reviewed the EIR and SEO documents and are satisfied with them.		
PIRSA	We have no comment to make on these documents.		
Marine	No comment received		
Habitat	No comment received		

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