

7 IMPLEMENTATION STRATEGY

7.1 Project Management Systems

The Santos EHS Management System (EHSMS) is a significant component in the management of Santos' environmental responsibilities, issues and risks associated with the proposed seismic survey in the Northern Territory. The EHSMS provides a framework for the co-ordinated and consistent management of environmental issues by ensuring the:

- Establishment of the Company's Environmental Policy;
- Identification of environmental risks and legal and other requirements relevant to seismic and other exploration, development and production operations;
- Setting of appropriate performance objectives and targets;
- Establishment of a structure and program to implement the Environmental Policy and achieve objectives and targets including the development of procedures and guidelines for specific activities and education and induction programs; and
- Facilitation of planning, control monitoring, corrective action, auditing and review of activities to ensure that the requirements and aspirations of the Environmental Policy (Figure 1-1) are achieved.

The Santos EHSMS applies to all Santos operations within Australia. The framework has been developed to ensure compliance with Australian Standard 4801:2001 *Occupational Health and Safety Management Systems - Specification with guidance for use*, and AS/NZS ISO 14001:2004 *Environmental Management Systems - Specification with guidance for use*.

Santos' seismic survey should achieve or establish accepted best practice and industry-accepted standards. Audits of management system should be regularly conducted using a risk-based approach to ensure that systems are maintained and operations are undertaken in accordance with industry-accepted practices and regulatory requirements.

Santos has specific operating procedures in place for seismic operations that, along with the EHSMS, form a system of operational controls (as defined in *AZ/NZS ISO14001*). The EHSMS framework consists of multiple layers, as shown in Figure 7-1. These operating procedures are maintained as controlled documents in electronic form on a central intranet server and are available through 'The Well' to all Santos sites and employees.



Figure 7-1: Santos EHSMS structure

7.2 Current operating procedures used to minimise impacts

Operational controls have been included in Table 6-1 to mitigate the identified risks and potential impacts of activities undertaken during the conduct of this seismic survey (as identified in this EP Section 5) and to achieve the performance objectives (see Section 1.2 and Table 6-1).

7.3 Chain of Command

The Manager, Operations Geophysics (Santos) and the Seismic Contractor Operations Manager are jointly responsible for implementation of this EP. Their responsibilities include:

- Conformance with the Santos EHSMS.
- Ensuring all required permits and approvals are in place and complied with.
- Management of non-compliances and non-conformances.
- Inductions of new staff.
- Monitoring and reporting.
- Incident management and reporting.
- Internal and external audits.
- Ensuring contractor competencies.

All personnel are responsible for the environmental performance of their activities and for complying with the general environmental duty as outlined in the Santos Environmental Policy (see Figure 1-1) and with any conditions of approval which may have been imposed on the survey.

Table 7-1: Key personnel roles and responsibilities

Position	Responsibility
Environmental Advisor – Santos	<ul style="list-style-type: none"> • Provide Environmental guidance and support to personnel in respect to implementing and complying with the EP.
Landholder Relations Field Supervisor – Santos	<ul style="list-style-type: none"> • The point of contact for the landholder with respect to the project, Santos and its contractors. • Provide guidance and support to all personnel in respect of implementing and complying with all landholder agreements and requests. • Responsible for receiving, recording and closing out any landholder complaints in respect of the project.
Operations Geophysics Manager – Santos	<ul style="list-style-type: none"> • Has overall responsibility for the management of the environment potentially impacted by operations. • Ensure the development, implementation and maintenance of the EMP and associated procedures. • Ensure the required monitoring is undertaken. • Oversee any updates of the EP and communicate changes. • Ensure contractors are made aware of EP requirements through inductions. • Ensure compliance with all environmental regulations and the EP. • Provide and maintain effective emergency response arrangements for all operations where there is potential environmental risk. • Ensure all required plans, audits and reviews are undertaken as required by this EP. • Report via the reporting system any event or incident which may result in a release of contaminant and / or impact upon the environment in relation to the project. • Notify all reportable incidents within the specified time frames. • Perform incident investigation
Authorised Representative – Seismic Contractor	<ul style="list-style-type: none"> • Monitor, assess and provide feedback on all data compiled from the survey. • Ensure effective data dissemination to management and workforce. • Monitor, assess and report on processes undertaken throughout the survey.

Position	Responsibility
	<ul style="list-style-type: none"> • Provide timely advice to management and the workforce on environmental aspects, this may include written and verbal reporting. • Coordinate environmental audits and inspections to monitor compliance against environmental commitments. • Report all incidents and high potential hazards to the Santos Operations Geophysics Manager within the required timeframe. • Ensure all equipment is maintained and in an operable condition. • Ensure appropriate emergency response plan is in place for the Project.
HSE Advisor – Seismic Contractor	<ul style="list-style-type: none"> • Reports to the HSE Manager (Seismic Contractor) and advises the Crew Manager on matters pertaining to Health, Safety and Environment. • Ensure effective data dissemination to management and workforce. • Present health, safety and environmental induction. • Provide timely advice to management and the workforce on health, safety and environmental aspects. • Liaise on the coordination of processes undertaken throughout the survey. • Coordinate timely health and safety database maintenance. • Coordinate health and safety activities. • Provide timely feedback to management and the workforce on health, safety and environmental aspects, this may include written and verbal reporting. • Coordinate health and safety audits and inspections to monitor compliance against health and safety commitments.
Project personnel and contractors	<ul style="list-style-type: none"> • All personnel are responsible for the environmental performance of their activities and for complying with the general environmental duty as outlined in the Santos Environmental Policy (see Figure 1-1).

7.4 Induction and Training

In accordance with *EHSMS 06 - Training and Competency*, all Santos personnel, contractors and visitors are required to undertake appropriate environmental training and induction programs.

Personnel undergo the following levels of training:

- Level 1 – Santos generic induction

- Level 2 – Site induction
- Level 3 – Activity specific induction (where applicable).

Training can be booked through *The Well*. Records of all training are maintained in 'Traccess' as well as on the Human Resources Oracle database.

7.5 Monitoring

The Santos Management Standard *EHSMS 14: Monitoring, Evaluation and Reporting* requires that environmental monitoring, evaluation and reporting be considered and where appropriate implemented. Ongoing monitoring and auditing of geophysical operations is necessary to determine whether significant environmental risks are being managed, minimised and where reasonably possible, eliminated.

Operational monitoring for the activity is undertaken through a combination of planned monitoring through the establishment of photopoints, regular inspections / spot checks and ad-hoc monitoring in response to an incident or unplanned event.

Photopoints

Photopoints are established along each line and at each camp location, as shown in Table 7-2. Photopoints are used in an Environmental Line Report to document:

- Visual impact of the operations;
- Disturbance to flora, fauna and general biodiversity;
- Site condition following program completion and restoration activity;
- Long term rehabilitation success and site revegetation.

Table 7-2: Photopoint Monitoring Summary

Photopoint	Location	Photo direction	Timing				Revisit
			Pre-line prep (pre-camp)	Post-line prep	Post-recording (post-camp)	Post-restoration	
Seismic Lines	Approx 5km intervals	Along alignment (both directions)	✓	✓	✓	✓	1 - 4 years ³ (selected photopoints)
Campsites	All camps	Generally N, S, E, W	✓		✓	✓	

Post survey monitoring using photopoints is discussed further in Section 3.3.5.

Operational Inspections and Spot-checks

Environmental workplace inspections are coordinated throughout operations by the Authorised Representative of the Seismic Contractor. These inspections and spot-checks are aimed at monitoring compliance against environmental commitments and regulatory requirements. Inspection findings are communicated to the workforce and Santos Operations Geophysics Manager and remedial actions or improvements are implemented as necessary.

³ Revisit timing is dependent on weather conditions throughout the year(s) to ensure the restoration is successful following a range of weather conditions.

Ad-Hoc (Reactive) Monitoring

Reactive monitoring may be undertaken in response to an unplanned event or incident. This type of monitoring is generally scoped following an incident, with the scope, extent and duration of monitoring dependant on the nature and scale of the incident.

Record Keeping

Monitoring records maintained through the project generally include:

- Environmental Line Reports;
- Photopoint data;
- Induction records;
- Waste register and records;
- Water usage, source location, dates and volumes;
- Equipment/vehicle wash-down/cleanliness records;
- Hazardous goods storage, handling and disposal records;
- Non-compliance and corrective actions records;
- Internal audit reports;
- Inspection records; and
- Equipment maintenance records.

7.6 Audits

The Santos Management Standard *EHSMS 16 - EHS Audit and Inspection* outlines the requirements to provide assurance that EHS systems and processes are effectively implemented, fit for purpose and are meeting relevant statutory requirements.

Assessments of Seismic operations against requirements of the EHSMS are performed periodically. Results of these assessments form the basis for targeted improvement initiatives.

Corrective actions raised during these audits and inspections are entered into the Audit and Inspection Manager (AIM) electronic database for action assignment and tracking of action progress to closure.

7.6.1 Santos internal audits

Prior to commencement of, or during a geophysical survey, the operator may nominate a representative sample of lines to be audited. 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 Santos field representative shall audit the nominated lines for compliance with the performance objectives within the period of the survey and any shortfall will be made good before the survey is completed and an audit report prepared.

7.6.2 Third party audits

Third parties may also undertake audits of the field outcomes of company geophysical operations. The audits may be commissioned by DME, or Santos, or by an independent party. If these audit findings are to be compared to those of Santos and/or DME, the same assessment criteria should be used.

7.7 Management of Non-conformance

The Santos Management Standard *EHSMS 15 - Incident Investigation and Response* requires that all incidents, hazards, near misses, property damage, significant process incidents, non-conformance events and third party complaints, including those related to environmental issues, are managed using the Santos Incident Management System (IMS).

The IMS is used to record, track and close out incidents and non-conformances. The system also provides a mechanism to analyse the collated data and identify areas requiring improvement. For each recorded incident, IMS records the date, location, volume, substance, root cause, event descriptions, reporting to regulatory bodies, and any remedial action taken.

Incident and non-conformance data are summarised weekly with management review against performance objectives and targets. Incidents and investigation findings are reviewed at regular site EHS communication meetings.

All incidents must be reported in accordance with the requirements of the NT *Petroleum Act 2011* and the *Schedule for Onshore Petroleum Requirements 2012*.

7.8 Emergency Response Plan

The Emergency Response Plan for the activity is to be prepared by the Seismic Contractor and will form part of the EP application.

Emergency response drills should be undertaken at least annually to ensure that personnel are familiar with the plans and the types of emergencies to which it applies and that there will be a rapid and effective response in the event of a real emergency occurring.

Emergency response plans must be reviewed and updated on a regular basis to incorporate new information arising from any incidents, near misses and hazards and learnings from emergency response drills. These plans would also include the facilitation of Fire Danger Season restrictions and requirements.

7.9 Inspection and Maintenance Activities

All operational equipment should be inspected and maintained in accordance with industry accepted standards and product operational requirements.

Seismic contracting companies will also have their own inspection and maintenance procedures.

7.10 Management of Change

Proposed changes associated with the activity are subject to a Management of Change (MoC) process in accordance with Santos Management Standard *EHSMS 12 – Management of Change*. The MoC process ensures that changes potentially affecting the integrity, EHS and regulatory compliance aspects of the



program are systematically reviewed, assessed, documented and communicated prior to implementation.

The standard applies to equipment, operations, organisation structure, personnel, process conditions, legal requirements and standards of operation.

8 REPORTING

Santos will implement internal and external reporting procedures to ensure that environmental issues and/or incidents are appropriately responded to, reported and actions tracked and closed out.

Reporting may include:

- Weekly progress report to DME in accordance with clause 712 of the *Schedule of Onshore Petroleum Exploration and Production Requirements 2012*.
- Site EHS inductions and meetings
- Incident or near miss investigation (as required by EHSMS15 – Incident Investigation and Response).
- Number, severity and close out status of incident
- Progress against key performance indicators
- Audit schedule and findings; and
- External meetings and / or liaison with key stakeholders.

In accordance with *EHSMS 12 – Incident Investigation and Response* all incidents, hazards, near misses, property damage, significant process incidents, non-conformance events and third party complaints, including those related to environmental issues are reported internally through IMS.

Environmental Line Reports & Rehabilitation

Environmental Line Reports will be progressively prepared and provided to DME as live documents at various stages of the activity, such as:

- *Post-restoration Environmental Line Report*: Incorporating pre-line prep, post-line prep, post-recording and post-restoration photopoint monitoring.
- *Long-term Re-visit Environmental Line Report*: Incorporating all of above, plus the long-term revisit photopoint monitoring.
- *Final Rehabilitation Report*: Incorporating the Final Environmental Line Report and confirming the efficacy of line rehabilitation following at least one wet-season.

External Environmental Incident Reporting

External environmental reporting requirements are defined in the *Schedule of Onshore Petroleum Exploration and Production Requirements 2012*. As relevant to this EMP, reportable environmental incidents are defined in clause 289 and include:

- *A significant spillage of hydrocarbons which in areas of inland waters is in excess of 80L, in other areas is in excess of 300L and if in a gaseous form is in excess of 500 m³.*
- *Any uncontrolled escape or ignition of petroleum or any other flammable or combustible material causing a potentially hazardous situation.*

9 CONSULTATION

Santos is committed to upholding its long-held reputation as a trusted Australian energy company. Santos seeks to establish and maintain enduring and mutually beneficial relationships with the communities of which it is a part; ensuring that Santos' activities generate positive economic and social benefits for and in partnership with these communities.

The Santos Environment, Health and Safety Management System Standard *EHSMS 07 – Consultation and Communication* details the requirements for appropriate communication and consultation mechanisms. The standard includes requirements to establish and maintain communication links with employees, contractors and external stakeholders, including local communities, government agencies and other organisations. Reporting and notification of EHS incidents to the appropriate government agency occurs if and as required.

9.1 Stakeholder Identification

Stakeholder identification was conducted early in the project. Stakeholders include:

- Community
- Landholders
- Traditional Owners and Aboriginal Peoples
- Representatives of Local Government
- Northern Territory Government departments
- Media
- Other key non-commercial external stakeholders (e.g. NGOs and industry bodies)
- Industrial Relations stakeholders
- Other commercial external stakeholders
- Internal stakeholders

9.2 Stakeholder Consultation

Santos has undertaken consultation to ensure that the key stakeholders are aware of the components of the exploration program. The purpose of the consultation has been to:

- Educate and inform key stakeholders of the elements of the Southern Amadeus Basin Exploration Program and possible future production
- Build and maintain stakeholder confidence through key relationships
- Gain trust and acceptance in the local communities as a responsible member of society
- Listen to and address concerns or queries
- Educate the community, landholders, business operators and Traditional Owners on why and how Santos operates

The key component of the engagement program has been face-to-face briefing sessions with key individuals and groups with timely feedback on issues and concerns.

Santos also participated in the information roadshow conducted by APPEA and the Department of Mines and Energy throughout the Northern Territory.

Issues addressed during consultation include:

- Environmental disturbance and the use of chemicals
- Cultural heritage issues
- Potential impact on the groundwater
- Impact to roads through increased traffic
- Hydraulic fracture stimulation activity
- Well integrity
- Economic benefits from increased activity - including local employment and training, funding sponsorships and capacity building for local businesses
- Local procurement of goods and services

Table 9-1 lists the stakeholders consulted in relation to the Program, the date of consultation, a summary of the stakeholder response and the current status and actions by Santos.

Table 9-1 Stakeholder consultation records

Information arising from stakeholder consultation contained within Table 9-1 is confidential to the stakeholders and has been redacted.

9.3 Ongoing Consultation

Santos will have 2 field based members of the LHRT based in Eldunda and Alice Spring on back to back rotation. They will be the primary point of contact for all landholders and community members during the project planning and execution phases.

Prior to any land access, the LHRT will carry out onground scouting and consultation to ensure that any impact or interruption to landholders is minimised.

Santos will not access any person's land without prior consent in the form of a written agreement and in accordance with the DME policies and guidelines.

Where stakeholders have requested or Santos believes it would be beneficial to engage with stakeholders on an ongoing basis during the survey, communications will continue until the survey has concluded.

10 REFERENCES

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- Department of Land Resource Management (DLRM) (2014a). *NR Maps NT*. Available from <http://www.ntlis.nt.gov.au/imfPublic/imf.jsp?site=nreta>. Accessed 25 June 2014.
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- Fatchen, T.J. and Woodburn, J.A., (2000). Criteria for the abandonment of seismic lines and wellsites in the Cooper Basin. Stage 4 — Derivation of criteria. Fatchen Environmental Pty Ltd for the Office of Minerals and Energy Resources. *South Australia. Department of Primary Industries and Resources. Open file envelope*, DME-97-02.
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- Stoklosa R. (1999). *Practical Application of Environmental Risk Management – Gorgon LNG Project Case Study*. The APPEA Journal, 39 (1), 606-621.
- Wiltshire. D. and Schmidt, M., Fourth Edition (2003). *Field Guide to the Common Plants of the Cooper Basin (South Australia and Queensland)*. Santos Ltd., Adelaide, South Australia.



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

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[Summary](#)

[Details](#)

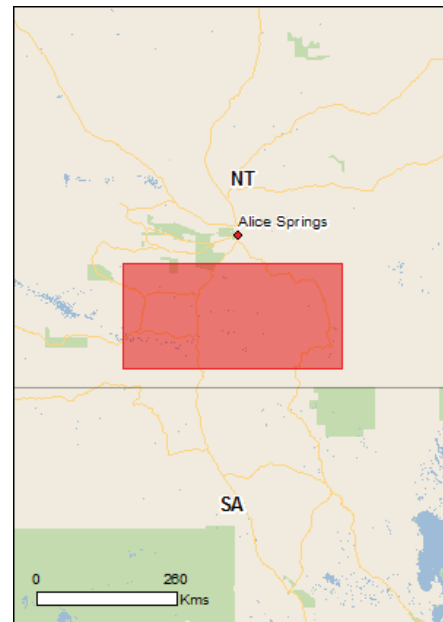
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

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Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	24
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	8
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Amytornis modestus Thick-billed Grasswren [84121]	Vulnerable	Species or species habitat likely to occur within area
Erythroriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Insects		
Croitana aestiva Desert Sand-skipper, Aestiva Skipper [26238]	Endangered	Species or species habitat may occur within area
Mammals		
Dasycercus cristicauda Crest-tailed Mulgara [328]	Vulnerable	Species or species habitat likely to occur within area
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Petrogale lateralis MacDonnell Ranges race Warru, Black-footed Rock-wallaby (MacDonnell Ranges race) [66649]	Vulnerable	Species or species habitat known to occur within area
Pseudomys australis Plains Rat, Palyoora [108]	Vulnerable	Species or species habitat known to occur within area
Zyzomys pedunculatus Central Rock-rat, Antina [68]	Endangered	Species or species habitat may occur within area
Other		
Macrozamia macdonnellii MacDonnell Ranges Cycad [11843]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Plants		
Acacia latzii Latz's Wattle [14275]	Vulnerable	Species or species habitat known to occur within area
Acacia peuce Waddy, Waddi, Waddy-wood, Birdsville Wattle [8301]	Vulnerable	Species or species habitat likely to occur within area
Acacia pickardii Birds Nest Wattle [17259]	Vulnerable	Species or species habitat likely to occur within area
Eleocharis papillosa Dwarf Desert Spike-rush [2519]	Vulnerable	Species or species habitat known to occur within area
Eremophila prostrata Rainbow Valley Fuchsia Bush [56749]	Vulnerable	Species or species habitat likely to occur within area
Frankenia plicata [4225]	Endangered	Species or species habitat likely to occur within area
Livistona mariae Central Australian Cabbage Palm [2036]	Vulnerable	Species or species habitat known to occur within area
Minuria tridens Minnie Daisy [13753]	Vulnerable	Species or species habitat known to occur within area
Thryptomene wittweri Mountain Thryptomene [16645]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160]	Vulnerable	Species or species habitat may occur within area
Liopholis slateri slateri Slater's Skink, Floodplain Skink [83163]	Endangered	Species or species habitat known to occur within area
Ophidiocephalus taeniatus Bronzeback Snake-lizard [1630]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Migratory Wetlands Species		
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum		
Oriental Pratincole [840]		Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum		
Oriental Pratincole [840]		Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
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Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Angas Downs	NT
Chamber's Pillar	NT
Finke Gorge	NT
Henbury Meteorites	NT
Illamurta Springs	NT
Mac Clark (Acacia peuce)	NT
Owen Springs Reserve	NT
Rainbow Valley	NT

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
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Birds

Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area

Mammals

Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species

Name	Status	Type of Presence
Mus musculus House Mouse [120]		habitat likely to occur within area Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Andropogon gayanus Gamba Grass [66895]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Nationally Important Wetlands		[Resource Information]
Name		State
Karinga Creek Palaeodrainage System		NT

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-24.12915 131.96191,-24.12915 135.62036,-25.71325 135.62036,-25.71325 131.96191,-24.12915 131.96191

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Parks and Wildlife Commission NT, Northern Territory Government](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

APPENDIX B Environment Plan Commitments Summary

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Santos will ensure that prior to commencement of the Program, necessary consents and approvals will have been identified, obtained and be in place and the work will be undertaken in accordance with the terms and conditions as detailed in the CLC Agreement and the Sacred Site Clearance Certificate.	X						
Contractors will be required to comply with environmental standards, guidelines and codes of practice: <ul style="list-style-type: none"> Santos Environmental Health and Safety Management System (EHSMS). Santos environmental hazard standards (EHS). Santos Health and Safety Hazard Standards (HSHS). Conditions of Sacred Site Clearance Certificates. Australian Petroleum Production and Exploration Association (APPEA) Code of Environmental Practice (2008). 	X						
Campsites are set up, where possible, on sites previously used, or in areas naturally devoid of vegetation and always adjacent to any existing tracks.					X		
The dozers will simply 'walk' with the blade up in easily traversable terrain, with the marks of the tracks being sufficient for the surveyors and recording crew to follow.			X				
All line preparation personnel are given environmental and cultural heritage inductions prior to commencing work.			X				

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
All machinery operators are required to observe for cultural heritage sites that may have been missed during the Site Clearance process. Any additional sites discovered, must be avoided and reported to the Santos Cultural Heritage Team.							
Campsites are sited on ground conducive to camping but never on clay pans or salt lakes. Camps are located as near as practical to existing tracks or roads to avoid the need for clearance of native vegetation and subsequent disturbance to animal habitats. The campsite is located on a previously disturbed area wherever possible.					X		
Vehicles are restricted to the perimeter of the camp and parking areas are also defined.					X		
Wastewater from laundry, showers and kitchen is piped to an irrigation area about 50m outside the camp.					X		
Wastepaper, cardboard and food scraps are disposed of into sealed bins set up adjacent to the camp area. The sealed bins are transported regularly for waste disposal at a licensed landfill. Recyclable materials are segregated on camp and regularly transported to a licensed waste depot in Alice Springs.					X		
Unusable tyres are returned to Alice Springs for recycling. Sewage management practices at all camps consist of the use of port-a-loos and grey water capture and disposal to a ground pit with the aim to minimise any risks to human health or the environment.					X		

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Fuel drums are stored within portable bunding and bulk fuel is stored within tankers, which have safety features such as double-skins (or temporary bunding), safety cut-off valves, top accessing etc. Spill leak and drip trays are used to address minor drips and spills resulting from re-fuelling operations. Any uncontained spillage will be treated in situ, and impacted areas remediated.					X		
Once the campsite has been vacated, rehabilitation is undertaken including removal of rubbish and any man made items. When necessary, and terrain permitting, the area is tyned ripped to remove compaction and wheel tracks. Shoulders of adjacent formed tracks are reinstated.					X		
Prior to the commencement of any survey, environmental monitoring point's (EMPs) are selected to give a balanced representation of the various landform and vegetation type encountered.							X
One nationally important wetland being the Karinga Creek Palaeodrainage System will be avoided by the proposed activities.	X						
Where relevant, weed management strategies are developed by Santos to ensure that vehicles and equipment are washed down if moving from areas of known weed infestations. Weed control measures are implemented as required.	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
A register of vehicle / equipment / machinery cleaning is kept.	X						
Absorbent and containment material (e.g. absorbent matting) will be available where hazardous materials are used and stored and personnel trained in correct use.	X						
All access through watercourses area carefully assessed to determine the locations of least impact to channels and creek banks.		X	X				
All access will be clearly identified and all vehicles and machinery shall remain within the designated access ways and surveyed seismic lines.	X						
All chemical and fuel storage areas shall be banded.	X						
All cleared areas will be rehabilitated at the completion of Operations.						X	
All earthworks shall be confined to the survey lines, access tracks and camp sites.	X						
All empty drums must be stored on impervious areas with their closures in place, or transported immediately off-site.	X						
All fuel stored and used should be under the control of qualified or trained personnel.	X						
All gates are left in the condition in which they were found (i.e. open / closed).	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
All generated waste (including consumable rubbish such as lunch wrappers) shall be returned to the camp and placed in the appropriately waste receptacle.	X						
All litter is to be managed and disposed of correctly.	X						
All loads of rubbish are covered during transport.	X						
All marking, flagging and signage not required shall be removed.	X						
All vehicles are thoroughly cleaned prior to entry into the survey area.	X						
All vehicles will be equipped with portable fire extinguishers.	X						
All vehicles, plant and equipment shall be cleaned and inspected prior to arrival at the project area.	X						
All windrows are removed either during or on completion of work.						X	
Any remediation work should be undertaken immediately upon completion of all activities.						X	
Any spills have been contained and retrieved.	X						
Appropriate fire fighting gear available to the crew.	X						
Appropriate fire prevention procedures in place.	X						

Commitment		All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Appropriate spill response equipment available on site.	X							
Areas subject to inundation will be assessed for conduciveness to support vehicles.	X							
Avoid extensive side cuts.				X				
Blade work is banned on naturally smooth surfaces or flat easy terrain. Minimal blade work is permitted elsewhere for access.				X				
Camp site areas are ripped, if necessary, on completion of work.							X	
Camp sites are established in locations where the preparation of a new access track is not necessary or minimal.						X		
Camp sites are positioned close to existing roads where possible and are ripped, if necessary, on completion of work.						X		
Chemical use will be minimised where practicable and the minimum practicable volume will be kept on site.	X							
Compliance with requirements of the Cattle Care and Organic Beef accreditation programmes or management as requested by the landholders, including full time monitoring by on field staff and inclusion in site inductions.	X							

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Covered bins are provided for the collection and storage of wastes.	X						
Creek bank vegetation is left intact and detours sought if too dense to pass through.			X				
Damage to station tracks is avoided.	X						
Dozers are walked with blade up wherever possible.			X				
During rehabilitation operations, work will cease if weather conditions inhibit access.						X	
EMPs will be established to monitor and document soil disturbance and recovery.	X						
Fences will be reinstated after all access is completed.						X	
Fuel and oil spills are reported, treated and or remediated and the ground ripped.	X						
Fuel and other lubricants will be appropriately stored and managed.	X						
Fuel storage contained within double skin tanker with safety valves.	X						
Fuels, lubricants and chemicals shall be stored and handled within containment facilities away from the vicinity of watercourses and water storage areas.	X						

Commitment		All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
If any contamination from spillage of oils or fuel occurs during vehicular operations, immediate effective clean-up procedures must be employed.	X							
Include Fire Season education as part of the induction.	X							
Inductions for all employees and contractors cover pastoral, conservation, legislation and infrastructure issues.	X							
Known sites of sacred or cultural significance are identified and where required flagged so the lines can be deviated around them.	X							
Lines adjacent to public roads may also be blocked with timber as an access deterrent.							X	
Lines are doglegged at road and track crossings preferably around vegetation.				X				
Lines are prepared to a single blade width only (approximately 4m to 5m).				X				
Lines are weaved at least every 75m to 100m about the general line of traverse and stands of vegetation.				X				
Machinery and vehicles should be parked in areas of low fire risk and be free of any combustible material, for example in the case of dry grass build up.	X							

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Materials Safety Data Sheets shall be obtained upon purchase of chemicals and kept on-site for all chemicals stored and handled.	X						
Maximise use of vegetation or landforms to disguise operations.			X				
Natural drainage channels are left clear at line crossings.			X				
No heavy line preparation machinery is used in wetlands areas.			X	X	X	X	
No heavy machinery is used in wetlands areas for rehabilitation.	X						
No incineration or open burning of waste materials shall occur on-site.	X						
No liquid wastes will be released accidentally or routinely discharged to surface waters.	X						
Off line driving for the main crew is prohibited – no bush bashing or short cuts are permitted.	X						
Oil spills areas will be ripped to an appropriate depth.	X						
Open fires, including open barbecues, billy fires, and brush burning, are banned on the Project.	X						
Operations are shut down during wet weather or flooding and only restarted once potential for extensive damage has	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
passed. Unavoidable damage is reinstated on completion of work.							
Pre-survey planning to minimise visibility of operations with the use of Santos' GIS.		X					
Proper use of access tracks involves travel at safe speeds, utilisation of designated parking areas, sensible use during wet weather, gates being left as found.	X						
Protective clothing, appropriate to the materials in use, will be provided.	X						
Public access along survey lines will be discouraged by the use of signs at public roads.	X						
Records of detection, monitoring or eradication of exotic weed or other pest or noxious species introduced by activities are.	X						
Refuelling will not occur within 1km from major watercourses or sensitive ecological environments (wetlands).	X						
Refuse containers/bags will be available with each crew.	X						
Relevant landowners and occupiers are notified prior to survey of preparation of camp sites, preparation of survey lines and undertaking of operations.	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Relevant mineral and geothermal tenement holders shall be notified of survey of preparation of camp sites, preparation of survey lines and undertaking of operations.	X						
Root stock, topsoil and seeds are left on line during line preparation.			X		X		
Santos and the Seismic Contractor will comply with approval conditions while undertaking all activities.	X						
Santos will obtain all necessary approvals and consents CLC prior to commencement of line activities.	X						
Seismic sources are not to operate within the distance defined by Santos standards, of any pipeline, utility, installation or building.	X						
Storage and handling of hazardous substances shall be in accordance with HSHS08 – Chemical Management and Dangerous Goods.	X						
Supervisors shall ensure that all personnel are familiar with spill prevention measures including refuelling techniques (e.g. use of spill mats) and chemical storage and handling requirements.	X						
System is in place for logging landholder complaints to ensure that issues are addressed as appropriate.	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Terrain and vegetation is considered in planning stage when designing layout of the survey.		X					
The number of camp sites will be minimised with the aim being to share existing sites wherever reasonably practicable.					X		
Unavoidable compaction in areas other than those susceptible to erosion, will be ripped on completion of work.						X	
Use of drip trays for transfers.	X						
Use of road tanker fuel storage.	X						
Vegetation is removed only when absolutely necessary - avoided by weaving lines through vegetated areas.			X		X		
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.	X						
Waste shall be removed from the camp by an appropriately licensed contractor and disposed at an approved facility. Records shall be kept of disposal of waste oils and fluids and hazardous wastes.	X						
When necessary, all fences are restored to satisfaction of landowner / managers.	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Where possible, existing tracks, roads or seismic lines will be used for access.	X						
Where required, access tracks will be watered and is reinstated after use.	X					X	
Windrows/shoulders on public tracks are reinstated on completion of work.						X	
All Santos personnel, contractors and visitors are required to undertake appropriate environmental training and induction programs	X						
Prior to commencement of, or during a geophysical survey, the operator may nominate a representative sample of lines to be audited.		X					
The Santos field representative shall audit the nominated lines for compliance with the performance objectives within the period of the survey and any shortfall will be made good before the survey is completed and an audit report prepared.			X	X		X	X
Incident and non-conformance data are summarised weekly with management review against performance Objectives and Targets.	X						
Incidents and investigation findings are reviewed at regular site EHS communication meetings.							
Emergency response drills should be undertaken at least annually.	X						
Emergency response plans must be reviewed and updated on a regular basis.	X						

Commitment	All	Planning	Line and Access Track Preparation	Seismic Operations (Line Surveying & Recording)	Camp sites and associated supplies	Line & Access Track Restoration	Monitoring of Selected Locations
Seismic contracting companies will also have the own inspection and maintenance procedures.	X						
Santos will implement internal and external reporting.	X						
Reporting may include: <ul style="list-style-type: none"> Progress of line preparation, surveying, and recording activities Site EHS inductions and meetings Incident or near miss investigation (as required by EHSM15 – Incident and Non-conformance Investigation). Number, severity and close out status of incident Progress against key performance indicators Audit schedule and findings; and External meetings and / or liaison with key stakeholders. 	X						
Incident and non-conformance data are summarised weekly with management review against performance Objectives and Targets. Incidents and investigation findings are reviewed at regular site EHS communication meetings.	X						
All incidents must be reported in accordance with the requirements of the NT Petroleum Act 2011 and the Schedule for Onshore Petroleum Requirements 2012.	X						
Where stakeholders have requested or Santos believes it would be beneficial to engage with stakeholders on an ongoing basis during the survey, communications will continue until the survey has concluded.	X						