PEL 495

Annual Report

Licence Year 5

2 March 2013 to 1 March 2014

Onshore Otway Basin

South Australia

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1 Introduction

Petroleum Exploration Licence (PEL) 495 was granted on 2 March 2009. The Licence is located in the onshore Otway Basin, South Australia over an area of approximately 793 square km.

The Annual Report for PEL 495 details the work conducted during Licence Year 5 which corresponds to the period 2 March 2013 to 1 March 2014.

This Annual Report has been prepared to comply with the Regulation 33 of the *Petroleum and Geothermal Energy Act 2000*.

2 Permit Summary

PEL 495 was originally awarded to Cooper Energy Limited (Cooper), 100% interest, effective on 2 March 2009 for a term of five years.

Beach Energy Limited (Beach) earned 35% interest in PEL 495 from Cooper and Somerton Energy Limited (Somerton) earned 15% interest in PEL 495 from Cooper by undertaking the drilling of Sawpit-2.

Following execution of the Farmin Agreement – PEL 494, 495 and PRL 32 dated 18 November 2013 between Cooper, Beach, Adelaide Energy Ltd Pty and Somerton, the registered interests in PEL 495 are:

- Beach Energy Limited 70% (and Operator)
- Somerton Energy Pty Ltd 30%

The work commitments for the first term of PEL 495 are detailed in Table 1.

Table 1 - Original Work Commitments for PEL 495

Licence Year	Licence Dates	Minimum Work Program
Year 1	2 March 2009 – 1 March 2010	Geological & Geophysical Studies
Year 2	2 March 2010 – 1 March 2011	Geological & Geophysical Studies; Seismic reprocessing
Year 3	2 March 2011 – 1 March 2012	Geological & Geophysical Studies
Year 4	2 March 2012 – 1 March 2013	Drill one well; Geological & Geophysical Studies
Year 5	2 March 2013 – 1 March 2014*	Drill one well

* 12 month suspension and extension granted – permit term to expire 1 March 2015

On 11 December 2013, approval was granted pursuant to section 76A of the Act to suspend the Year 5 work commitment for a period of 12 months. The term of PEL 495 was also extended for a period of 12 months such that the term of PEL 495 will now expire on 1 March 2015. The Licence carries the rights to one further renewal subject to the provisions of the Act.

Table 2 below summarises the work completed by the Joint Venture as at 1 March 2014. The minimum work commitments for the first term of PEL 495 have been met with the drilling of Sawpit-2 and Jolly-1.

Table 2 - Work Program and Work Completed (as of 1 March 2014) by Licence Year

Licence Year	Minimum Work Program	Work Completed
Year 1	Geological & Geophysical Studies	G&G studies, seismic reprocessing & petrophysics
Year 2	Geological & Geophysical Studies; Seismic reprocessing	Geological & Geophysical Studies
Year 3	Geological & Geophysical Studies	Geological & Geophysical Studies
Year 4	Drill one well; Geological & Geophysical Studies	Sawpit-2; Geological & Geophysical Studies
Year 5	Drill one well	Jolly-1; Geological & Geophysical Studies

3 Regulated Activities

Pursuant to Regulations 33(2) (a), an Annual Report must include:

"A summary of the regulated activities conducted during the licence year."

3.1 Seismic Activities

No seismic data was acquired or reprocessed in PEL 495 during the reporting period.

3.2 Drilling and Related Activities

Drilling of two exploration wells was carried out during the permit year within the area of PEL 495. Sawpit-2 was spudded on 18 February 2013 (in permit year 4) and drilling operations continued during the current permit year (year 5). The well is located approximately 350 metres north and updip of the Sawpit-1 well which had oil shows in the Crayfish group and fractured Basement. The primary objective of the well was to test the

hydrocarbon potential of the Sawpit Sandstone but the well was also deepened to assess the shale gas/shale liquid potential of the shale within the Lower Sawpit Shale and Casterton Formation. Sawpit-2 reached a total depth of 2,585 metres and encountered minor oil shows in the Upper Sawpit Shale and Basement. The well was plugged and abandoned. A total of 56 metres of core from shales in the Casterton Formation and Lower Sawpit Shale was recovered.

The Jolly-1 exploration well in PEL 495 was designed to evaluate the potential of shale and tight sandstone in the Lower Sawpit Shale and the Casterton Formation. Jolly-1 was spudded on 11 January 2014 and was drilled to 2,406 metres, with drilling including a deviation in the Upper Sawpit Shale. The side track, Jolly-1 ST1, commenced on the 30 January 2014.

Jolly-1 ST1 was drilled to a total depth of 4,026 metres and intersected thick sections of shales and sandstones, with elevated gas readings in the Lower Sawpit Shale and Casterton Formation from a depth of 3,430 meters. Cores were retrieved from the Lower Sawpit Shale (26.7 metres) and the Casterton Formation (51.1 metres) and will be analysed for porosity, permeability and gas content as well as geochemical and geomechanical properties. After completing the drilling operations and well site evaluation program of Jolly-1 ST1, the well was plugged and abandoned.

A summary of the wells drilled in PEL 495 during the licence year is provided in Table 3.

Table 3 – Summary of Wells in PEL 495 in Year 5.

Well Name	Sawpit-2
Type of well	Exploration
Contractor	Ensign International Energy Services (Rig 930)
Date Spudded	18 February 2013
Formations Intersected	Full representation of Otway Basin strata was intersected. The depths at which each of the formation tops was intersected was provided to DMITRE in the Well Completion Report
Status	Plugged and Abandoned
Rig release	17 March 2013
Construction	Borrow pit, access and lease construction were undertaken in accordance with the Drilling, Completion and Initial Production Testing, PEL 255, Otway Basin, Statement of Environmental Objectives (SEO), May 2007

Well Name	Jolly-1 ST1
Type of well	Exploration
Contractor	Ensign International Energy Services (Rig 916)
Date Spudded	11 January 2014
Formations Intersected	Full representation of Otway Basin strata was intersected. The depths at which each of the formation tops was intersected will be provided to DMITRE in the Well Completion Report
Status	Plugged and Abandoned
Rig release	9 April 2014
Construction	Borrow pit, access and lease construction were undertaken in accordance with the Statement of Environmental Objectives: Drilling, Completion and Initial Production Testing, Otway Basin (Beach Energy November 2013)

3.3 Geochemical, Gravity, Magnetic and other Surveys

No other surveys were undertaken in PEL 495 during the reporting period.

3.4 Production and Processing

No production activities were undertaken in PEL 495 during the reporting period.

4 Compliance Issues

Pursuant to Regulations 33(2) (b) & (c), an Annual Report must include:

"A report for the year on compliance with the Act, these regulations, the licence and any relevant statement of environmental objectives;" and

"A statement concerning any action to rectify non compliance with obligations imposed by the Act, these regulations or the licence, and to minimise the likelihood of recurrence of any such non-compliances."

Overall compliance with the *Petroleum and Geothermal Energy Act 2000*, the Petroleum and Geothermal Energy Regulations 2013, the Licence Conditions for PEL 495 and the relevant Statements of Environmental Objectives was achieved.

4.1 Regulatory Compliance

There was one case during the current reporting period in which the PEL 495 Operator submitted technical report later than the required timeframe pursuant to Regulation 40 of the Act. A summary of the non-compliance is provided in Table 4.

Table 4 - Regulatory non-compliances in Licence Year 5

Activity	Details of Non-Compliance	Rectification of Non-Compliance
Submission of Logs for Sawpit-2	Regulation 39 – Logs for Sawpit-2 submitted late	Ongoing discussions with contractors regarding provision of data and resourcing issues. Operator to apply for extension of time to avoid non-compliance.
Submission of Well Completion Report for Sawpit-2	Regulation 40 – WCR for Sawpit-2 submitted late	Ongoing discussions with contractors regarding provision of data and resourcing issues. Operator to apply for extension of time to avoid non-compliance.

4.2 Compliance with Licence conditions

The holders of PEL 495 have complied with the licence conditions during the current reporting period.

4.3 Compliance with Statements of Environmental Objectives

The activities at Sawpit-2 were carried out under the *Drilling, Completion and Initial Production Testing, PEL 255, Otway Basin, Statement of Environmental Objectives (SEO), May 2007.*

The activities at Jolly-1 were carried out under the *Statement of Environmental Objectives: Drilling, Completion and Initial Production Testing, Otway Basin (Beach Energy November 2013).*

The holders of PEL 495 have complied with the relevant SEOs for regulated activities within PEL 495. An assessment with each environment objective and recommended management strategies for each environmental objective is provided in Appendix 1.

4.4 Management System Audits

Pursuant to Regulation 33(2) (d) under the Act, an annual report must include:

"a summary of any management system audits undertaken during the relevant licence year including information on any failure or deficiency identified by the audit and any corrective actions that have, or will be taken".

No management system audits specific to PEL 495 were undertaken during the licence year.

4.5 Report and Data Submissions

Pursuant to Regulation 33(2) (e) under the Act, an annual report must include:

"A list of all reports and data relevant to the operation of the Act generated by the licensee during the licence year".

A list of the reports and data generated in relation to the operations undertaken during the reporting period is provided in Table 5.

Table 5: List of Reports and Data Submissions for the Current Reporting Period

Description of Report / Data	***Date Due***	***Date Submitted***	***Compliant***
Annual Report for Year 4 of PEL 495	30 April 2013	29 April 2013	*Compliant*
Draft SEO & EIR for Otway Basin (1)		October 2013	
Final SEO & EIR for Otway Basin (1)		November 2013	
Sawpit-2 Wireline logs	28 April 2013	26 August 2013	*Non-Compliant* (2)
Sawpit-2 Well Completion Report	17 September 2013	8 November 2013	*Non-Compliant* (2)
Sawpit-2 Well Samples	17 September 2013	23 October 2013	*Compliant* (3)
Jolly-1 Activity Notification	20 December 2013	25 November 2013	*Compliant*
Compliance Report Q1 2013	30 April 2013	30 April 2013	*Compliant*
Compliance Report Q2 2013	31 July 2013	31 July 2013	*Compliant*
Compliance Report Q3 2013	31 October 2013	31 October 2013	*Compliant*
Compliance Report Q4 2013	31 January 2014	31 January 2014	*Compliant*

Cased Hole Report for Q1 2013	30 April 2013	30 April 2013	*Compliant*
Cased Hole Report for Q2 2013	31 July 2013	31 July 2013	*Compliant*
Cased Hole Report for Q3 2013	31 October 2013	31 October 2013	*Compliant*
Cased Hole Report for Q4 2013	31 January 2014	31 January 2014	*Compliant*

(1) Beach Energy Limited's SEO for Drilling, Completions and Initial Production Testing in the Otway Basin was approved and gazetted on 14 November 2013.
(2) Non-compliant due to late submission
(3) Well Samples provided to Challenger but not delivered to core library within 6 months. DMITRE advise that if samples are at Challenger, it is considered complaint under Regulation 40.

4.6 Incidents

Pursuant to Regulation 33(2) (f), an annual report must include:

"In relation to any incidents reported to the Minister under the Act and these Regulations during the relevant licence year –

(i) an overall assessment and analysis of the incidents, including the identification and analysis of any trends that have emerged; and

(ii) an overall assessment of the effectiveness of any action taken to rectify non-compliance with obligations imposed by the Act, these regulations or the licence, or to minimise the risk of recurrence of any such non-compliance".

There were no serious incidents or reportable incidents in PEL 495 during the reporting period. A serious incident is defined in section 85(1) of the Act and a reportable incident is defined in section 85(1) and regulation 32 of the Act.

4.7 Threat Prevention

Pursuant to Regulation 33(2) (g) under the Act, an annual report must include:

"a report on any reasonably foreseeable threats (other than threats previously reported on) that reasonably presents, or may present, a hazard to facilities or activities under the licence, and a report on any corrective action that has, or will be taken".

There were no new threats to report within PEL 495 during the reporting period.

4.8 Future Work Program

Pursuant to Regulation 33(2) (h) under the Act, an annual report must include:

"unless the relevant licence year is the last year in which the licence is to remain in force – a statement outlining operations proposed for the ensuing year".

The future work for PEL 495 will build upon the work undertaken during the previous licence years, focussing on both prospect and play evaluation. GG&E studies will focus on well evaluation and basin studies with the aim of working up prospects to drillable status.

5 Expenditure Statement

Pursuant to Regulation 33(3) under the Act, an annual report must contain:

"An annual report must be accompanied by a statement of expenditure on regulated activities conducted under the licence for the relevant licence year, showing expenditure under each of the following headings:
a) drilling activities;
b) seismic activities;
c) technical evaluation and analysis;
d) other surveys;
e) facility construction and modification;
f) operating and administration expenses (not already covered under another heading)"

An Expenditure Summary for the Licence for the period is presented in Appendix 2.

Appendix 1

Beach Energy Sawpit-2 Drilling: SEO Assessment

Sawpit-2 will be drilled under the *Statement of Environmental Objectives: Drilling, Completion and Initial Production Testing, PEL 255 Otway Basin* (Adelaide Energy May 2007). On 14 August DMITRE approved an extension to the PEL 255 Drilling, Completion and Initial Production Testing SEO until May 2013.

The following table provides a cross-check of the requirements of the SEO against the proposed Sawpit-2 drilling operations.

The columns containing the requirements of the SEO are shown in grey. Further detail and a comment on Beach's management strategy is provided for each SEO item where required. Where Beach is planning to simply comply with straightforward SEO items, no additional comment is made.

Note: The "Assessment Criteria" are mandatory requirements under the *Petroleum and Geothermal Energy Act 2000* that **must** be met. The "Guide to How Objectives Can Be Achieved" column indicates the measures that would be expected to be put in place, to ensure that the Assessment Criteria are met. Alternative measures may be acceptable provided that they also result in the Assessment Criteria (and the Environmental Objectives) being achieved.

Table 1: Environmental Objectives and Management Strategies

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
1. Avoid disturbance to sites of Aboriginal and non-indigenous heritage significance.	No disturbance to Aboriginal and non-indigenous heritage sites.	Appropriate earthworks personnel to be reminded of identification of heritage items/objects and remains. Also to be reminded of their obligations to respond appropriately to any sites discovered during construction and operation activities. Compliance with the *Aboriginal Heritage Act 1988*. The proposed well site and access tracks will be traversed prior to commencement of any activity to ensure any sites of Aboriginal and European heritage are identified. The Kungari Aboriginal Organisation will be consulted and invited for a site visit.	Beach inductions and on-site briefings include reference to cultural heritage obligations. Activities have been confined to the area that has been subject to cultural heritage inspection (see below). A cultural heritage inspection of the site with the Murrapeena Heritage Association was carried out on 16 October 2012.
2. Avoid disturbance to rare, vulnerable and endangered flora and fauna species.	<u>Wellsite and Access Track Construction</u> Any sites of rare, vulnerable and endangered flora and fauna have been identified, flagged and subsequently	Prior to any earthworks the farming land will be checked for native flora and fauna.	An environmental impact report was written for the site following a site inspection on 10 October 2012. The access and well site are located in exotic pasture. Very few native understorey species were noted on the site or the access and no species of conservation significance were detected. Damage to River Red Gum trees was avoided. The likelihood that Red-tailed Black-Cockatoos could nest in

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
	avoided. <u>Drilling and Production Testing Activities</u> No fires during drilling and production testing activities.		the vicinity of the well was assessed to be low as the site was in the order of 5 km from the nearest foraging habitat. Given this low likelihood, the very small proportion of potential breeding habitat that is near the site and the likely timing of drilling outside peak breeding season, it was considered unlikely that there would be any significant impacts to the species resulting from disturbance to nesting Red-tailed Black-Cockatoos. Red-tailed Black-Cockatoos were not detected near the well lease No threatened fauna were impacted.
		Excavation areas like the sumps, flarepit, grey water and septics will also be checked regularly.	Excavations were regularly checked for trapped fauna. There were no reports of trapped fauna during drilling operations.
		Wellsite and these open pits will remain fenced whenever wellsite is vacated.	Open pits at the site were fenced to discourage fauna access. All open pits are backfilled during reinstatement activities.
		Clearance of remnant vegetation and habitats will be avoided and/or minimised by locating wellsites and access tracks appropriately.	The wellsite and access track was located to avoid damaging trees. The access track was aligned to avoid trees or cause significant soil disturbance within the 'dripline' of trees. The flare pit was located so that potential radiant heat did not impact trees. No flaring was undertaken at the site.
		Fire prevention is important and dependent on construction, drilling and testing timing, fire breaks may need to be cleared. The local CFS may also be required at any testing.	Firebreaks were installed and maintained at the camp and well lease as per CFS guidelines.
		Local CFS will be invited to attend during the initial drilling stage to make themselves familiar with the site, water availability etc.	Beach undertook liaison with the CFS regarding drilling operations and permits for 'hot work' on fire ban days (where required) and followed necessary precautions on those days.
		Current daily Fire Danger sign present on site. This will be changed daily if in the fire danger season.	
		Response to fire will be included in the Emergency Response Plan.	
3. Prevent the introduction and establishment of exotic weed species and other pathogens.	No introduced exotic weed species as a consequence of activities.	All vehicles, equipment and personnel entering the region to be assessed for risk of transporting weeds and plant pathogens.	Vehicles and equipment were required to be clean and free of soil and plant material prior to arrival at site. No significant weed issues were noted at the site or on the access. The landholder did not raised any specific weed issues. The NRM regional pest plant management officer

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
			indicated that there were no significant weed issues known to the NRM Board that need to be addressed.
		Paving materials will be sourced from sites free of weeds.	Paving materials were sourced from a licensed quarry that is free of weeds.
		The site and access will be monitored on a regular basis for new weed species and treated as necessary in accordance with the landowner's wishes.	
4. Minimise impacts to soil.	Wellsite and Access Track Construction and Restoration No disturbance to soil profiles as a result of construction activities. No significant increase of surface limestone on surface following restoration.	Wellsite and Access Track Construction and Restoration Consult "Wellsite and Access Track Construction and Restoration" (PIRSA) as a guideline.	
		Place wellsite to minimise amount of cut and fill.	Wellsite was level and no significant cut and fill was needed. The area of disturbance was restricted to the minimum necessary.
		Soil removed in construction to be stored on site and returned to its original stratigraphic level upon restoration of the drill site.	Topsoil was stripped from the well lease, camp area and access track for use in restoration.
		Restoration of the drill site to be approved by the landowner or in accordance with landowner's wishes should retention of specific parts of the site be requested (e.g. pad).	The landholder has requested that the first approx. 1.4 km of access track is left in place permanently.
		Landowner to be consulted about earthworks required, location of access tracks and general information to minimise surface damage and to facilitate rehabilitation.	Ongoing consultation with the landowner has been occurring.
		Separate storage of topsoil, subsoil and clays or marls to assist rehabilitation will be undertaken to assist in regeneration of pasture or crops.	Beach will avoid mixing subsoil from excavations (e.g. the sump or flare pit) with stockpiled topsoil.
		During rehabilitation the soil beneath the tracks, camp and pad will be ripped after removal of imported fill but before the returning of topsoil.	Site rehabilitation activities are in progress.
	Drilling and Production Testing Activities No soil contamination as a result of drilling and production testing activities.	Drilling and Production Testing Any oil contamination of sump from drill cuttings to be controlled by an absorbent barrier and pumped out to a disposal tank.	
		All bunded areas will be in accordance with EPA guideline 080/04 "Bunding and Spill Management".	The storage and bunding of fuel and chemicals was undertaken.
		Camp and drill rig generators to be located in polyethylene lined bunded areas to contain any spills.	
		Production storage tanks, fuels, oils and chemicals to be stored in polyethylene lined bunded areas.	Fuels, oils and chemicals were stored in polyethylene lined bunded areas. Self-bunded pallets were also used where appropriate.

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
	Fuel and Chemical Storage and Handling Areas affected by any spill are removed and/or bio-remediated. No soil contamination as a result of fuel and chemical storage and handling	Initial production lines and tanks to be inspected prior to use. MSDS info readily available on the wellsite. Fuel and Chemical Storage and Handling Fuel tanks and delivery systems are to be inspected by Adelaide Energy Drilling Supervisor for any potential leaks and refused entry to the site if found to be unsuitable. Hazardous material stored, used and disposed of in accordance with relevant legislation on dangerous substances. All hazardous materials stored in approved containers in polyethylene lined bunded area. Contaminated soil will be removed and replaced with clean fill or will undergo bio-remediation. "Sokerol" (or similar) absorbent material will be stored at the rig for use in the event of a spill. Any contaminated soil removed from the site will be treated / disposed of at an EPA approved facility. All wastes generated on wellsite (except grey water) recycled or disposed of at an EPA licensed facility. Septic tanks will be used at camp and drill rig ablutions. Septic tanks will be pumped out on an "as required basis" by a licensed septic waste removal contractor and disposed of at a licensed facility. All wastewater disposed in accordance with the *Public and Environmental Health (Waste Control) Regulations1995*.	Drip / spill capture methods were implemented in refuelling areas (e.g. use of drip trays or lined areas). Solid wastes were securely stored on site in well covered bins, prior to disposal off site at an EPA licensed facility. Septic tanks were approved by the local council and pumped out by an appropriately licensed contractor for disposal at an appropriately licensed facility prior to demobilisation of the camp. Wastewater is managed in accordance with the SEO and the requirements of the *Public and Environmental Health (Waste Control) Regulations 2010.*
5. Minimise loss of reservoir and aquifer pressures and avoid aquifer contamination.	No aquifer contamination as a result of drilling, completion or production testing activities. Drilling and Completion Activities No uncontrolled flow to surface (i.e. blow out). Sufficient barriers exist in casing annulus to prevent crossflow between separate aquifers or hydrocarbon reservoirs.	Drilling and Completion Activities Observed volumes of cement return to surface match calculations. Where there is evidence of insufficient isolation, remedial action such as cement squeeze to be conducted. Casing will be centred with centralisers to ensure full radial cement coverage, mud cake will be removed to maximize cement bond to formation and excess cement volumes will be pumped to cater for unforeseen cavities and overgauge hole. Casing seating depths will be designed to cover formations at risk and the cementing programme will allow for sufficient cement returns at surface to ensure bond to the Formation. Water bore to be drilled by local licensed driller with knowledge of	The seal to the Dilwyn formation was not penetrated by the

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
	Dilwyn is not penetrated in any water bore. <u>Production Testing and Well Abandonment Activities</u> No cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by the Department of Water, Land and Biodiversity Conservation.	telltale signs of seal above Dilwyn formation. The seal to this aquifer is not to be penetrated. Water bore license to be restricted to stock/domestic to ensure future use by landowner is not for irrigation. <u>Well Abandonment Activities</u> Well abandonment program to be submitted to PIRSA with wireline logs for prior approval. Plugs set to isolate potential aquifers through the well bore. Records of plug depths and intervals are kept.	water bore. A water well permit taken out in Beach's name. Beach will ensure compliance with DEWNR's licensing requirements.
6. Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources.	No disruption to drainage patterns as a result of construction activities. No contamination of surface waters and shallow groundwater resources.	<u>Wellsite and Access Track Construction and Restoration</u> Any soil removed during the construction of the drill pad will be respread over the disturbed area during restoration. Any area artificially elevated via pad or access track construction will be lowered to original ground level by removal of paving material unless otherwise instructed by the landowner. Temporary drainage depressions / culverts may be required to maintain surface runoff Original drainage patterns will be restored. Restoration will be completed by ripping, cultivating and sowing a pasture or crop depending on landowner requests. <u>Drilling and Production Testing Activities</u> Information on muds and chemicals to be readily available on the rig. The sump will be lined with a 20 micron HPDE impermeable plastic membrane to prevent percolation into the soil. If required the sump may be pumped and excess fluid disposed of as appropriate. On completion of drilling the drill cuttings and sump water will be tested to analyse their suitability for industrial recycle, fill or contaminated fill and will be disposed of accordingly, along with the sump liner. Fluid losses will be controlled during drilling.	Paving material will be removed and the natural ground level reinstated, with the exception of the section of access track that the landowner has requested remain in place permanently. The landowner has indicated that the disused irrigation drain near the Dergholm Road boundary does not need to be maintained. The sump was lined with a suitable impermeable liner. Following drilling, the sump contents will be removed and disposed of appropriately.

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
		Any oil contamination of sump from contaminated drill cuttings will be controlled and pumped out to a disposal tank. Camp and drill rig generators will be located in polyethylene lined bunded areas. Production storage tanks, fuels, oils and chemicals will be stored in polyethylene lined bunded areas. Initial production lines and tanks will be inspected prior to use. No spills/leaks outside areas designed to contain them. <u>Fuel and Chemical Storage and Handling</u> Fuel tanks and delivery systems are to be inspected by Adelaide Energy Drilling Supervisor for any potential leaks and refused entry to the site if found to be unsuitable. All hazardous materials stored in approved containers in polyethylene lined bunded area. Drilling fluid materials that may contribute to pollution will be clearly identified and stored with MSDS. No spills/leaks outside areas designed to contain them.	Flaring was not conducted at the site. See comment above under Objective 4. Runoff from the rig area was directed to the sump. No spills or leaks occurred outside areas designed to contain them. No reported spill incidents during the drilling of Saw pit-2.
7. Minimise risks to the safety of the public, employees and other third parties.	No injuries to the public or third parties.	<u>Unauthorised Access by Third Parties</u> "No Entry" signs warning of dangers associated with drilling operations placed at the entry to the site access track Site area to be fenced with a gate on the access track. Wellsite office and parking area located within the lease area. Drilling Supervisor and Drilling Contractor Manager given authority to refuse entry of unauthorized third parties. Access gate to wellsite will be closed during testing and appropriate signage will be in place to restrict entry. No access to the site by uninvited third parties. Log kept of Safety induction for all invited visitors. Fence around sump and wellhead if no immediate production /cleanup action is to be undertaken.	

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
		Necessary measures taken to prevent the public accessing the wellhead equipment or waste relating to the well.	
		Wellhead and sump to be individually fenced if delay in cleanup / workover rig operations to occur.	
		Drilling and Completion Activities	
		Drill rig, ancillary and any testing equipment to comply with Regulations, meet relevant industry standards and be "Fit for Purpose".	
		Casing design carried out to meet worst case expected loads and environmental conditions determined for the specific geology intercepted by the well. Details of work to be performed are set out in the Drilling Program.	
		Casing set in accordance with design parameters.	
		Casing cemented to surface with visible return.	
		Blow out prevention precautions in place in accordance with defined procedures and appropriate to the expected downhole conditions.	
		Satisfactory kick tolerance in casing program design.	
		Emergency Response Procedures in place.	
		Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire fighting equipment.	
		Well Abandonment and Site Restoration Activities	
		Downhole abandonment is carried out to meet worst case expected loads and downhole environmental conditions.	
		Effective isolation maintained between any potential aquifers to prevent crossflow.	
		Abandonment plugs must be set to ensure long term isolation of any potential aquifers intersected to avoid shallow zones becoming overpressured.	
		All minor holes eg septics and grey water to be backfilled soon after rig release.	
		Effective rehabilitation of the wellsite so that potentially dangerous perturbations in ground level do not remain.	
		Vehicle Movement Control production and dispersion of dust on unsealed roads and	Dust control measures (e.g. water spraying) were implemented where required.

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
		drilling lease areas. Roads will be sprayed with water as required to minimise dust generation. Appropriate speed limit on unsealed roads included in all inductions. Speed reduction signs to be positioned on unsealed roads in vicinity of wellsite.	Appropriate warning signage / traffic management measures were utilised at the access on the Dergholm Road.
8. Minimise disturbance to the local community and other land users.	No adverse impact on livestock, cropping and pasture as a result of activities. No complaints from the local community or other land users No fires initiated during construction, drilling or rehabilitation.	Driver behaviour and vehicle speed limits to be included in compulsory induction. Rig mobilization and demobilization to detour around town centres where possible. Major vehicle movements on minor roads to be scheduled so as to not clash with school bus times. Noise limitation to be included as part of induction procedures (e.g. noisy tubular/pipe handling, unnecessary use of horns). Heavy truck drivers to be instructed not to use engine brake near dwellings. Vehicle speed limits observed. Adequate fencing of wellsite area to landholders' satisfaction. In the event of an oil spill, contingency plan to be implemented after the spill event. In the case of an abandoned restored site, the entire area will be restored to original land surface topography with no irregularities likely to cause injury to running stock. Consultation with local CFS during construction/drilling/rehabilitation phases to ensure fire concerns are addressed. Compliance with Part 10 of the *Petroleum Act 2000* (notice of entry requirements).	Noise limitation (particularly at night) was part of induction procedures (e.g. noisy tubular / pipe handling, unnecessary use of horns, reversing of forklifts). Ongoing liaison with the landholder and neighbours has occurred regarding the activities. Beach will continue liaising with the Wattle Range Council regarding activities and requirements for additional permits.
9. Minimise visual impact.	The attainment of 0, +1 or +2 GAS criteria (refer to PIRSA Field Guide	In the case of an abandoned restored site, the entire area will be restored to original land surface topography with no irregularities.	

Environmental Objective	Assessment Criteria	Guide to How Objectives Can Be Achieved	Beach Comment / Strategy
	2002) for minimising visual impact.		
10. Minimise impact of domestic and industrial waste.	No soil or groundwater contamination as a result of waste storage and disposal. No impact on landowner as a result of waste storage and disposal. No uncontained domestic waste on site.	All wastes generated on the wellsite (except greywater) recycled or disposed of at an EPA licensed facility. Greywater will be contained in a pit and pumped into the sump or onto the adjoining paddock as appropriate. If required the sump may be pumped and excess fluid disposed at an approved waste facility. Septic tanks will be used at camp and drill rig ablutions. Septic tanks will be pumped out on an "as required basis" by a licensed septic waste removal contractor and disposed of at a licensed facility. All wastewater disposed in accordance with the *Public and Environmental Health (Waste Control) Regulations1995.* Wellsite will be kept free of litter/rubbish.	Solid wastes were securely stored on site in well covered bins, prior to disposal off site at an EPA licensed facility. Greywater was handled by the septic tanks. Wastewater was managed in accordance with the SEO and the requirements of the *Public and Environmental Health (Waste Control) Regulations 2010.*
11. Remediate and rehabilitate operational areas to agreed standards.	No complaints from the local community or other land users <u>Well Site and Access Track Restoration</u> The attainment of 0, +1 or +2 GAS criteria (refer to PIRSA Field Guide 2002) for the revegetation of indigenous species. Note: Remediation of contamination addressed under objective 4. Well abandonment issues addressed under objective 6. Visual impact addressed under objective 9.	Rehabilitation/ abandonment plans for surface activities will be developed in consultation with relevant stakeholders <u>Well Site and Access Track Restoration</u> Compacted soil areas will be ripped and soil profile and contours are reinstated following completion of operations.	Rehabilitation of the lease is being undertaken following the completion of drilling activities.

Beach Energy Jolly-1 Drilling: SEO Assessment

Jolly-1 will be drilled under the *Statement of Environmental Objectives: Drilling, Completion and Initial Production Testing, Otway Basin* (Beach Energy November 2013). The following table provides a cross-check of the requirements of the SEO against the proposed Jolly-1 drilling operations.

The columns containing the requirements of the SEO are shown in grey. Further detail and a comment on Beach's management strategy is provided for each SEO item where required. Where Beach is planning to simply comply with straightforward SEO items, no additional comment is made.

Note: The "Assessment Criteria" are mandatory requirements under the *Petroleum and Geothermal Energy Act 2000* that **must** be met. The "Guide to How Objectives Can Be Achieved" column indicates the measures that would be expected to be put in place, to ensure that the Assessment Criteria are met. Alternative measures may be acceptable provided that they also result in the Assessment Criteria (and the Environmental Objectives) being achieved.

Table 1: Environmental Objectives and Management Strategies

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
1. Avoid disturbance to sites of cultural and heritage significance	No disturbance to Aboriginal and non-indigenous heritage sites	Cultural heritage inspection of proposed well sites and access tracks undertaken with the relevant Aboriginal heritage group. Known sites identified and protected from operations (e.g. using temporary flagging). Cultural heritage issues covered in inductions. Key personnel (e.g. supervisors, machinery operators) receive appropriate cultural heritage training. Procedure in place for the appropriate response to any sites discovered during activities. Records of sites forwarded to the Aboriginal Heritage Branch in compliance with the Aboriginal Heritage Act. Records relating to sites of cultural heritage significance kept and available for audit. Heritage site registers and Heritage Branch, DEWNR, consulted regarding the location of non-indigenous heritage sites where appropriate.	Beach inductions and on-site briefings cover cultural heritage obligations. Activities have been carried out within the area that has been subject to cultural heritage inspection (see below). A cultural heritage inspection of the site with the Murrapeena Heritage Association was conducted.
2. Minimise disturbance to native vegetation and native fauna (including wetland communities)	<u>Well site and Access Track Construction</u> Any sites of rare, vulnerable or endangered species or threatened communities have been identified, flagged and	Appropriately trained and experienced personnel have assessed or scouted proposed well site, access track and camp locations to identify and flag significant (or rare, vulnerable or endangered) species and communities. Native vegetation clearance avoided or minimised by locating well sites and access tracks appropriately. Removal of large trees (including dead trees with hollows) is avoided. Areas of low quality native vegetation are avoided unless there are no viable alternatives (e.g. use	An environmental impact report was written for the site following a site inspection on 8 November 2013. The access and well site are located in exotic pasture. Very few native understorey species and no species of conservation significance were detected. Damage to River Red Gum trees was avoided. The likelihood that Red-tailed Black-Cockatoos

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
	subsequently avoided. High quality or significant remnant vegetation has not been cleared. Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act. No significant adverse impacts on native fauna through any stage of construction, drilling or production testing. <u>Drilling and Production Testing Activities</u> No fires during drilling and production activities. <u>Fuel and Chemical Storage and Handling</u> Refer to Assessment Criteria for Objective 4. <u>Waste Management</u> Refer to Assessment Criteria for Objective 10.	of adjacent cleared areas). Areas of high quality or significant[1] remnant vegetation or Heritage Agreement Areas are avoided. Activities are not carried out in parks or reserves established under the National Parks and Wildlife Act. If well sites are in close proximity to a park or reserve established under the National Parks and Wildlife Act and indirect impacts are likely, consultation is undertaken with DEWNR to determine appropriate mitigation measures. Excavations (e.g. sump, flare pit) checked regularly for trapped fauna. Sumps and well site are appropriately fenced to minimise fauna access. If threatened species (e.g. Red-tailed Black-Cockatoos) are detected or likely to occur near the well site, specialist advice is sought regarding measures to mitigate potential impacts, particularly during breeding season. Undertake detailed assessments and EPBC Act referral (if required) if avoidance of species or habitats is not possible. Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire fighting equipment. Liaise with CFS regarding operations and Fire and Emergency Services Act requirements (e.g. permits for 'hot work' on fire ban days if required). Where necessary (e.g. in fire danger season), fire break constructed around well lease. Flare pit located to ensure that radiant heat does not impact trees. Response to fire included in Emergency Response Plan. Ensure fire risk is included in the induction and all personnel are fully informed on the fire danger season and associated restrictions.	could nest in the vicinity of the well was assessed to be low as the site was in the order of 5 km from the nearest foraging habitat. Given this low likelihood, the very small proportion of potential breeding habitat that is near the site and the likely timing of drilling outside peak breeding season, it was considered unlikely that there would be any significant impacts to the species resulting from disturbance to nesting Red-tailed Black-Cockatoos. Threatened fauna have not been impacted. Excavations have been regularly checked for trapped fauna. A mesh fence has been erected around the sump to discourage fauna access. There have been no reports of trapped fauna during drilling operations. The flare pit has been located so that potential radiant heat did not impact trees. No flaring has been undertaken at the site. Suitable firebreaks have been installed and maintained at the camp and well lease as per CFS guidelines. Beach have been liaising with the CFS regarding drilling operations and permits for 'hot work' on fire ban days if required.
3. Avoid the introduction and spread of weeds, exotic pest fauna and pathogens	Weeds, exotic pest fauna and pathogens are not introduced into, or spread in, operational areas as a consequence of activities.	All reasonable and practical endeavours taken to minimise the risks of introducing weeds, exotic pest fauna and pathogens into the areas of operations. Appropriate consultation regarding weeds or pathogens carried out with landholders and NRM Board officers. Vehicles and equipment arriving at the site must be clean and free of soil and plant material. Vehicles and equipment entering the region or moving between sites (especially from weed or pathogen infested areas into non-infested areas) will be assessed for the risk of transporting weeds and pathogens and cleaned down where appropriate. All records of vehicle or equipment inspections and cleaning will be kept for auditing. Paving materials will be sourced from licensed quarries that are free of weeds. Sites and access tracks will be monitored on a regular basis for new weed species / infestations, and treated as necessary in accordance with requirements of the landholder, and if appropriate the	Vehicles and equipment arriving at site were required to be clean and free of soil and plant material. No significant weed issues were noted at the site or on the access. The landholder did not raise any specific weed issues. The NRM regional pest plant management officer indicated that there were no significant weed issues known to the NRM Board that need to be addressed. Beach will continue to consult the landowner (and NRM Board where relevant) regarding requirements for management of any weeds

[1] Significant in this context includes listed plant species, listed communities or important fauna habitat

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
		NRM Board. Records of detection, monitoring or eradication of weeds or pathogens introduced by activities are kept and available for review.	detected on site. None have been detected to date.
4. Minimise disturbance and avoid contamination of soil	<u>Well Site and Access Track Construction and Restoration</u> No disturbance to soil profiles resulting from activities remains after restoration. Local erosion rates are not significantly accelerated above those of surrounding land. No significant increase of limestone on surface following restoration. <u>Drilling and Production Testing Activities</u> No soil contamination as a result of drilling and production testing activities. <u>Fuel and Chemical Storage and Handling</u> Soil in areas affected by any spill is removed and / or bioremediated. No soil contamination as a result of fuel and chemical storage and handling. <u>Waste Management</u> Refer to Assessment Criteria for Objective 10.	<u>Well Site and Access Track Construction and Restoration</u> Locate and orientate well lease and access to minimise soil removal and area of cut and fill. Soil removed in construction to be stored on site and returned to its original stratigraphic level upon restoration of the drill site. Separate storage of topsoil, subsoil and clays will be undertaken to assist in regeneration of pasture or crops. Restoration of the well site to be approved by the landowner or in accordance with landowner's wishes should retention of specific parts of the site be requested (e.g. pad or access track). Landowner to be consulted about earthworks required, location of access tracks and general information to minimise surface damage and to facilitate rehabilitation. Well sites are rehabilitated following drilling or the lease area reduced to the minimum size necessary if the well is successful. During rehabilitation the soil beneath the tracks, camp and pad will be ripped after removal of imported fill and before returning of stockpiled topsoil. Soil profile and contours will be reinstated following completion of operations. <u>Drilling and Production Testing Activities</u> Sump to have sufficient capacity. All drill pad runoff from high risk areas (e.g. drill rig, generators) directed into sump. Flooding risk is considered in well lease location and construction and additional measures implemented if required (e.g. a small berm around the sump to prevent floodwater entering the sump). Camp and drill rig generators to be appropriately located to contain any spills (e.g. in polyethylene lined bunded areas or with suitable alternative spill containment). Bunded areas must have sufficient freeboard. All bunded areas will be in accordance with EPA guidelines *080/12 Bunding and Spill Management*. Safety Data Sheet information readily available at the well site. Refer to additional measures under Objective 6. <u>Fuel and Chemical Storage and Handling</u> Hazardous material stored, used and disposed of in accordance with relevant legislation on dangerous substances. All hazardous materials including fuels, oils and chemicals are to be stored in approved containers in polythene lined bunded areas or on bunded pallets. Production tanks to be located in polythene lined bunded areas. Initial production lines and tanks to be inspected prior to use.	Well site is relatively level and no significant cut and fill was needed. Due to the nature of the heavy clay soils and the lack of top soil, pad and road construction involved laying geotextile matting on top of the clay before adding crushed hardstand. Use of the geotextile will assist with rehabilitation which will involve removal of the hardstand, followed by removal of the geotextile and a light ripping of the clay surface. Beach have restricted the area of disturbance to the minimum necessary. Mixing subsoil from excavations (e.g. the sump or flare pit) with any stockpiled topsoil has been avoided. Beach will ensure that storage and bunding of fuel and chemicals are in accordance with appropriate standards and guidelines including EPA guideline 080/12 Bunding and Spill Management. Fuels, oils and chemicals are stored in polyethylene lined bunded areas. Self-bunded pallets have also be used where appropriate. Appropriate drip / spill capture methods have been implemented in refuelling areas (e.g. use of drip trays or lined areas). Solid wastes have been securely stored on site in well covered bins, prior to disposal off

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
		No refuelling outside designated refuelling or servicing areas. Appropriate drip capture / spill capture methods implemented in refuelling areas (e.g. use of drip trays or liners). Appropriate spill response equipment is available on site. Personnel have received training in the use of spill response equipment. Spills or leaks are immediately reported and clean up actions initiated. All contaminated soil will either be treated in-situ or removed for treatment / disposal at an EPA approved facility. Any areas of contamination are remediated in accordance with criteria developed with the principles of the National Environment Protection Measure for contaminated sites, and in consultation with DMITRE and EPA. Records of spill events and corrective actions are maintained. All fuel and chemical storage areas will be in accordance with EPA guidelines *080/12 Bunding and Spill Management*. <u>Waste Management</u> Refer to Objective 10.	site at an EPA licensed facility. Septic tanks have been approved by the local council and pumped out by an appropriately licensed contractor for disposal at an appropriately licensed facility. Wastewater is being managed in accordance with the SEO and the requirements of the *Public and Environmental Health (Waste Control) Regulations 2010*.
5. Minimise loss of reservoir and aquifer pressures and avoid aquifer contamination	No aquifer contamination as a result of drilling, completion or production testing activities. No impact on other groundwater users due to water extraction activities. <u>Drilling and Completion Activities</u> No uncontrolled flow to surface (e.g. blow out). Sufficient barriers exist in casing annulus to prevent crossflow between separate aquifers or hydrocarbon reservoirs. <u>Production Testing and Well Abandonment Activities</u> No cross-flow behind casing between	<u>Drilling and Completion Activities</u> New casing and wellhead installed. Casing and well head designed to meet pressure, temperature, operational stresses and loads. Aquifers isolated behind multiple casing strings. Casing to be cemented to surface with visible return. Observed volumes of cement return to surface match calculations. Casing will be centred with centralisers to assist full radial cement coverage, mud cake will be removed to maximise cement bond to formation and excess cement volumes will be pumped to cater for unforeseen cavities and overgauge hole. Casing seating depths will be designed to cover formations at risk and the cementing programme will allow for sufficient cement returns at surface to ensure bond to the formation. Cement bond logs run on production casings to confirm quality of cement. Where there is evidence of insufficient isolation, remedial action to be conducted. Ongoing well integrity monitoring (minimum every two years). Immediate retrieval of any radioactive source lost downhole. If retrieval is not possible, tool is cemented in hole to isolate it from adjacent formations. Relevant government approval obtained for abandonment of any radioactive tool left downhole. Emergency Response Plan in place and drills conducted. Water bore to be drilled by licensed driller with knowledge of local aquifers (e.g. the seal above the Dilwyn formation which must not be penetrated). Water extracted from shallow bores in accordance with the local Water Allocation Plan.	A water well permit taken out in Beach's name. Beach will ensure compliance with DEWNR's licensing requirements. The seal to the Dilwyn Formation was not

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
	aquifers, and between aquifers and hydrocarbon reservoirs unless approved by the department responsible for Water (currently DEWNR).	Monitor existing bores within close proximity to drilling activities. Well Abandonment Activities Well abandonment program to be submitted to DMITRE with wireline logs for prior approval. Isolation barriers to be set in place to ensure that crossflow, contamination or pressure reduction does not occur. Records of plug depths and intervals are kept.	penetrated in the water bore. Beach have installed groundwater monitoring bores and implemented a groundwater monitoring program to monitor drilling activities at the site.
6. Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow groundwater resources	Well Lease and Access Track Construction and Restoration No disruption to drainage patterns as a result of construction activities. Drilling and Production Testing No overflow of drill cuttings, muds and other drilling fluids from mud sumps. No contamination of surface waters and shallow groundwater resources as a result of drilling and initial production testing activities. Fuel and Chemical Storage and Handling No contamination of surface waters and shallow groundwater resources as a result of fuel or chemical storage and handling. Waste Management Refer to Assessment Criteria for Objective 10.	Well Lease and Access Track Construction and Restoration Well sites and access tracks are located to avoid surface water features such as swamps and significant wetland areas and to maintain pre-existing water flows. Temporary drainage depressions / culverts installed where required to maintain surface runoff. Landowners or infrastructure owners consulted regarding requirements for crossings of artificial drainage channels. Appropriate measures implemented where required (e.g. culverts). Sediment and erosion control measures (e.g. sediment fences) installed where necessary (e.g. if in close proximity to drains or surface water features). Any soil removed during the construction of the drill pad will be respread over the disturbed area during restoration. Any area artificially elevated by pad or access track construction will be lowered to original ground level by removal of paving material unless otherwise instructed by the landowner. Original drainage patterns will be restored. Well sites are not constructed in locations where they are likely to impact the marine environment. Drilling and Production Testing Information on muds and chemicals to be readily available on the rig. The sump will be lined with a suitable impermeable liner to prevent percolation into the soil. Water based drilling muds are used. If required the sump may be pumped and excess fluid disposed of as appropriate. On completion of drilling the drill cuttings and sump water will be tested to analyse their suitability for reuse, industrial recycle, fill or waste and will be disposed of accordingly, along with the sump liner. Waste water (e.g. excess water from the sump) will not be disposed to land (e.g. by irrigation) unless it has landowner agreement and water quality meets applicable criteria and any relevant approvals (e.g. DMITRE / EPA) have been obtained. Wastewater is not allowed to drain to surface water drainage features such as swamps. Fluid losses will be controlled during drilling. Any oil contamination of sump from contaminated drill cuttings will be controlled and pumped out to a disposal tank. Fresh water mud is used in the top hole to prevent saline mud filtrate impacting shallow freshwater aquifers.	At the conclusion of site activities paving material will be removed and the natural ground level reinstated, with the exception of the section of access track that the landowner has requested remain in place permanently. The sump has been lined with a suitable impermeable liner. Following drilling, the sump contents will be removed and disposed of appropriately. Wastewater or any fuel, oil or chemical spills must be managed appropriately (e.g. spills must be promptly contained and cleaned up; wastewater or spills must not be allowed to drain to surface water drainage features such as the swamp to the south of the camp location). To date there have been no reported spill incidents during drilling activities at the site.

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
		Separator tank used during initial production testing to separate any produced liquids from gas before gas is sent to a vertical flare. No fluids are disposed to the flare pit, including produced water. Flare pit is only used for emergency well control situations while drilling and operated to avoid carry-over of unburnt hydrocarbons; immediate clean up implemented if it occurs. Refer to measures under Objective 4. <u>Fuel and Chemical Storage and Handling</u> Refer to Objective 4 <u>Waste Management</u> Refer to Assessment Criteria for Objective 10.	The flare pit has not been used during drilling operations.
7. Minimise risks to the health and safety of the public, employees and other third parties	No injuries to the public or third parties as a result of drilling, completion and production testing activities.	<u>Unauthorised Access by Third Parties</u> "No Entry" signs warning of dangers associated with drilling operations placed at the entry to the site access track. Site area to be fenced with a gate on the access track. Access gate to well site will be closed during testing and appropriate signage will be in place to restrict entry. Drilling Supervisor and Drilling Contractor Manager given authority to refuse entry of unauthorised third parties. All minor excavations (e.g. for septic tank) to be backfilled soon after rig release. Well head and sump to be individually fenced if delay in clean-up / workover rig operations to occur. <u>Drilling and Completion Activities</u> Drill rig, ancillary and any testing equipment to comply with Regulations, meet relevant industry standards and be 'Fit for Purpose'. Casing set in accordance with design parameters. Details of work to be performed are set out in the Drilling Program. Blow out prevention precautions in place in accordance with defined procedures and appropriate to the expected downhole conditions. Well control equipment used during coiled tubing, wireline and workover activities. Satisfactory kick tolerance in casing program design. Emergency response procedures in place. Personnel remain on site during production testing. Confinement of flammable sources, restrictions on certain procedures and ready access to suitable fire fighting equipment (e.g. fire unit consisting of trailer with water tank, pump and hoses in high fire danger season). <u>Well Abandonment Activities</u> Downhole abandonment is carried out to meet worst case expected loads and downhole	Beach have implemented dust control measures (e.g. water spraying) where required. Appropriate warning signage has been installed on the site access. Appropriate signage / traffic management measures have also been employed at the access on the Riddoch Highway. There have been no fires associated with drilling activities.

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
		environmental conditions. Effective isolation maintained between any potential aquifers to prevent crossflow. Abandonment plugs must be set to ensure long term isolation of any potential aquifers intersected to avoid shallow zones becoming over-pressurised. <u>Vehicle Movement</u> Control production and dispersion of dust on unsealed roads and drilling lease areas. Compliance with relevant speed restrictions on access roads and tracks. Warning signage and traffic management measures installed where appropriate in the vicinity of well sites. If necessary, unsealed roads will be sprayed with water as required to minimise dust generation. <u>Well Site Restoration Activities</u> Necessary measures (e.g. fencing, signage) taken to prevent the public accessing the well head equipment or waste relating to the well. Effective rehabilitation of the well site so that potentially dangerous perturbations in ground level do not remain.	
8. Minimise the visual impact of operations	Well site maintained in a clean and tidy condition. Restored well site contours and colour blend with the surroundings.	Landholders and relevant stakeholders (e.g. local council, industry associations) consulted regarding location of proposed activities. Drill rigs and camps removed from site promptly following completion of activities, particularly in visible locations. In the case of an abandoned restored site, the entire area will be restored to original land surface topography with no irregularities. Refer to Objective 4 and 11 for further details on well site restoration measures.	The well location is not close to the Riddoch Highway (approximately 1 km). The rig is visible from the road. A high standard of site management and 'housekeeping' was implemented.
9. Minimise disturbance to the local community and other land users	No adverse impact (outside agreed disturbance / compensation areas) on land use as a result of activities. No reasonable concerns raised by stakeholders are left unresolved. No uncontrolled fires initiated during construction, drilling or rehabilitation.	Driver behaviour and vehicle speed limits to be included in compulsory induction. Rig mobilisation and demobilisation to detour around town centres where possible. Noise limitation (particularly at night) to be included as part of induction procedures (e.g. noisy tubular / pipe handing, unnecessary use of horns, reversing of forklifts). Adequate buffer maintained between well site and residences. Equipment operated and maintained in accordance with manufacturer specifications. Well site and access track construction restricted to daylight hours. Transport trucks to be restricted to daylight hours as far as possible. Heavy truck drivers to be instructed not to use engine brake near dwellings. Vehicle speed limits to be observed. Landholders, local councils, potentially affected residents and emergency services will be informed of significant activities such as rig mobilisation and demobilisation. All required authorisations (e.g. local council, DPTI, police) obtained where required for movement of rig along public roads, including joint inspections of roads before and after transport moves if necessary.	There are no houses within close proximity (closest is approx. 1.3 km). Preliminary calculations and past experience suggested that noise from drill rig operation was not likely to be a significant issue at these distances particularly given the proximity of the Riddoch Highway which carries significant heavy vehicle traffic. Based on a loss of 6dB for a doubling of distance from a point source, noise from a drill rig operating at 100 dB would be less than 40 dB at 1.3 km. Noise limitation (particularly at night) was part of induction procedures (e.g. noisy tubular / pipe handling, unnecessary use of horns, reversing of forklifts). Beach will continue liaising with the landholder and liaise with / notify neighbours regarding

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
		Any deterioration of property tracks or infrastructure as a result of drilling-related traffic is rectified. All gates left in the condition in which they were found (open / closed). Any lighting required is positioned to minimise light emanating from the well site. Systems in place for logging stakeholder complaints to ensure that issues are addressed as appropriate. In the case of an abandoned restored site, the entire area will be restored to original land surface topography with no irregularities likely to cause injury to stock. Liaise with CFS regarding operations to ensure fire concerns are addressed and any Fire and Emergency Services Act requirements are met (e.g. permits for 'hot work' on fire ban days if required). Landholder is consulted regarding the location, management and timing of proposed activities. Ongoing landholder liaison during and following operations. Activities are restricted to agreed / defined areas. Compliance with Part 10 of the Petroleum and Geothermal Energy Act (Notice of Entry requirements). Flaring during initial production testing kept to minimum length of time necessary.	site activities. Where appropriate, Beach will continue liaising with the Wattle Range Council regarding drilling activities. Landholders, local councils, potentially affected residents and emergency services have been informed of significant activities such as rig mobilisation/demobilisation.
10. Minimise the impact on the environment of waste storage, handling and disposal	No soil, surface water or ground water contamination as a result of waste storage and disposal. All waste disposal is at an EPA licensed facility. No uncontained domestic waste on site. Wastewater (sewage and grey water) disposed of in accordance with the *Public and Environmental Health (Waste Control) Regulations 2010*.	Covered bins are provided for the collection and storage of wastes. All loads of rubbish are covered during transport to an approved waste facility. Waste streams are segregated on site and transported to appropriate facilities to maximise waste recovery, reuse and recycling. Production of waste is minimised by purchasing reusable, biodegradable or recyclable materials where practical. Hazardous wastes handled in accordance with relevant legislation and standards. Licensed contractors used for waste transport. All wastewater is disposed in accordance with the *Public and Environmental Health (Waste Control) Regulations 2010*. Septic tanks used at camp and drill rig ablutions. Septic tanks pumped out on an 'as required' basis by a licensed septic waste removal contractor and disposed of at a licensed facility. Any necessary approvals are obtained for use of septic tanks. EPA's Waste Hierarchy model (avoid, reduce, reuse recycle, recover, treat, dispose) should be complied with. Well site is kept free of litter and rubbish. Refer to measures Objective 6 regarding disposal of sump contents.	Solid wastes have been securely stored on site in well covered bins, prior to disposal off site at an EPA licensed facility. Grey and black water has been handled by the septic tanks. Wastewater has been managed in accordance with the SEO and the requirements of the *Public and Environmental Health (Waste Control) Regulations 2010*.
11. Remediate and rehabilitate operational areas	No reasonable stakeholder complaints left unresolved. No rubbish or litter on site.	Refer to Objectives 4, 5, 6, 7, 8, 10. Rehabilitation plans for surface activities will be developed in consultation with relevant stakeholders. Imported materials are removed from site and soil profiles and contours restored unless otherwise agreed with the landowner. See Objective 4 for details.	Beach will promptly rehabilitate the lease following the completion of drilling activities.

Environmental Objectives	Assessment Criteria	Guide to How Objectives Can be Achieved	Beach Management Strategies / Comment
	Refer to Assessment Criteria for Objective 4.	Well sites with native vegetation are rehabilitated in consultation with DMITRE, DEWNR and other relevant stakeholders.	