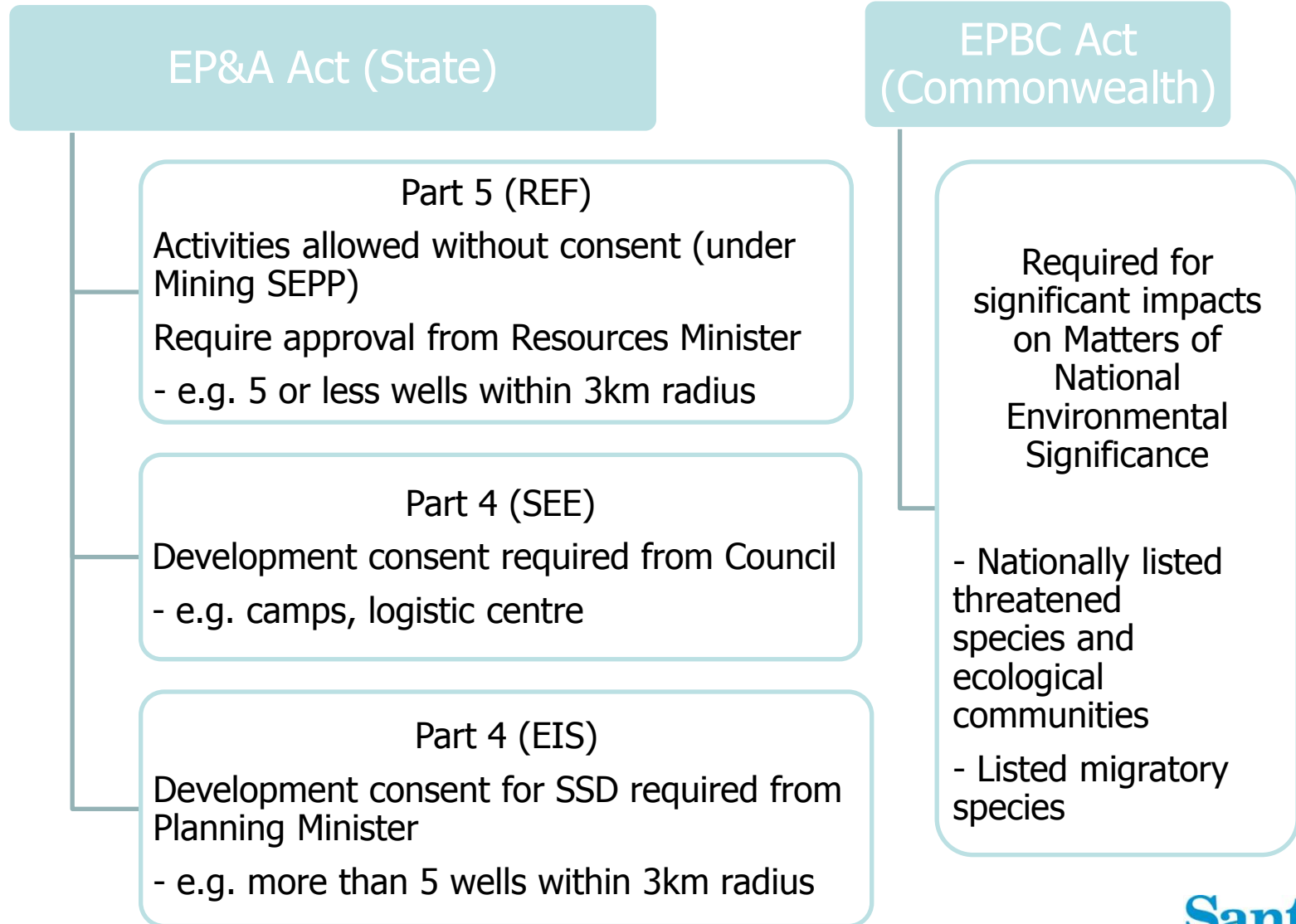
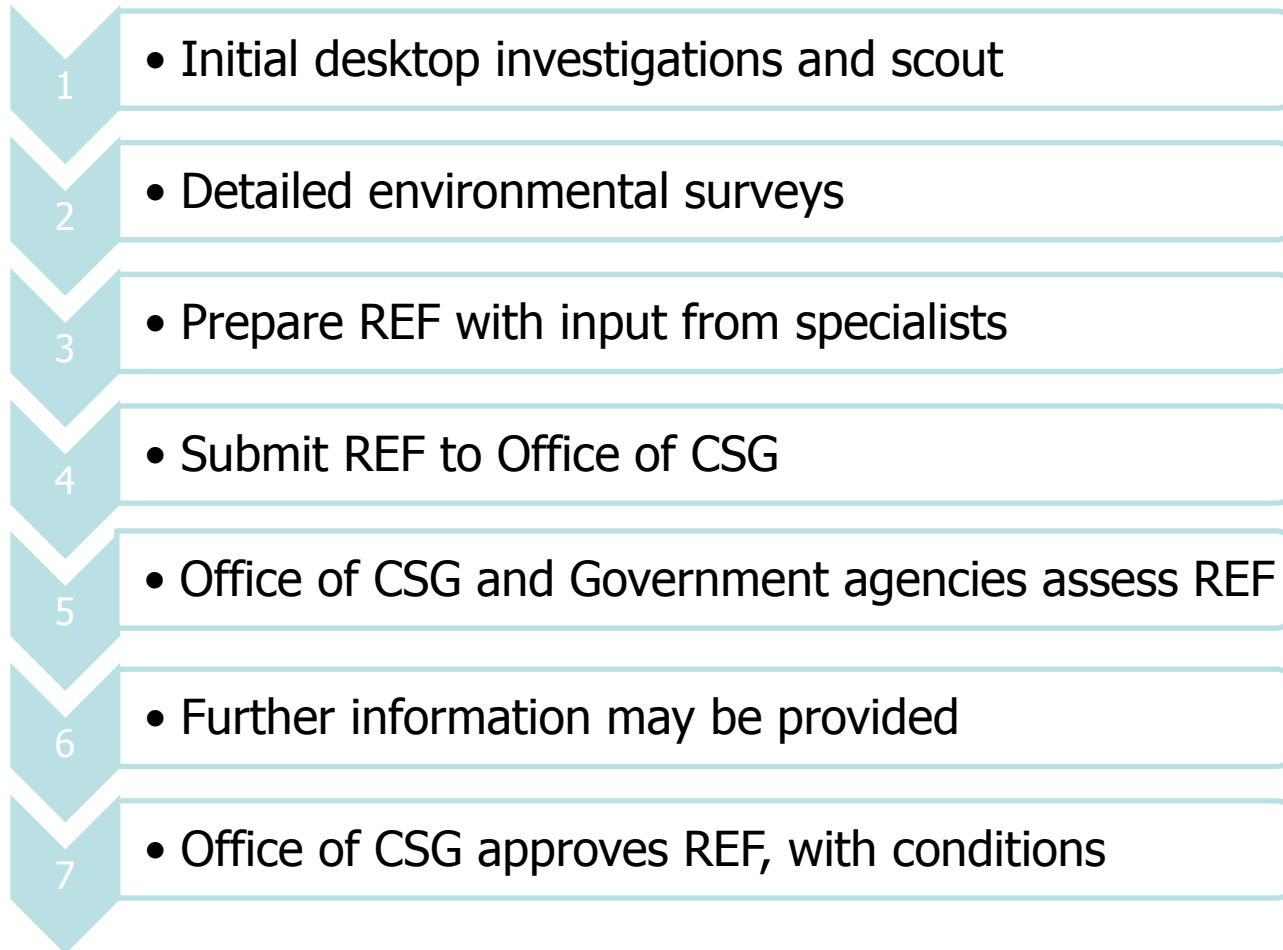


Regulatory approvals overview



Assessment process (REF)

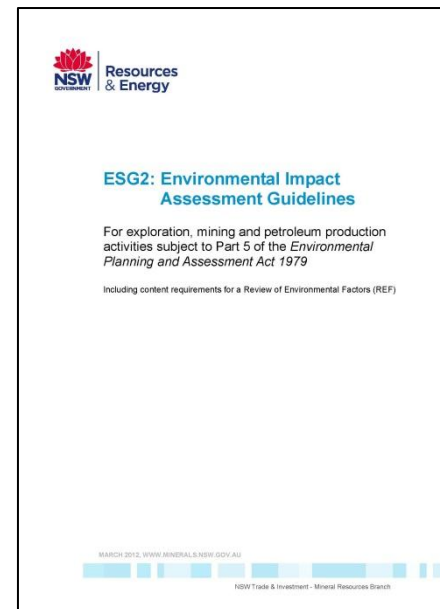


REF preparation

- Site scout includes ecological, environmental and archaeological specialists
 - Micro siting to avoid/reduce impacts
- REF includes specialists reports such as:
 - Ecological assessment
 - Cultural heritage assessment
 - Agricultural impact study
 - Groundwater assessment (if relevant)
- REF sets out:
 - Details of the existing environment
 - Potential impacts described and category assigned
 - Mitigation measures and commitments

REF Guidelines

- REFs must address the NSW Government's *Environmental Impact Assessment Guidelines* and include:
 - Activity description
 - Site/property description (land use, existing infrastructure)
 - Stakeholder consultation
 - Access arrangements
 - Other approval requirements
 - Impact assessment (environment and community)
 - Ecological and cultural heritage assessments
 - Mitigation measures including rehabilitation commitments



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REF example: Commitments

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Kandool 1 core hole – PEL 238, Gunnedah Basin, NSW

9.0 Statement of commitments

Table 9-1 provides a statement of commitments for the proposed activity.

Table 9-1 Statement of commitments

Item	Commitment
Activity type and location	<ul style="list-style-type: none"> The proposed activity will be carried out at 545 Culgoora Road, Narrabri, as described in section 2 of the REF and will include: <ul style="list-style-type: none"> using the existing 1.9 km long access track from Culgoora Road to transport materials, equipment and personnel to the lease area upgrading the existing access track, including constructing approximately 100 m of new access track, should this be determined necessary during detailed design establishing a lease area up to one hectare in size drilling Kandool 1 to a depth of approximately 1,000 m sampling, testing and logging of the core hole installing, operating and maintaining a deep aquifer monitoring bore (DAMB) and supporting infrastructure, similar to existing groundwater monitoring bores operating within the region rehabilitating the majority of the lease area to reduce its size to nine square metres for the DAMB, surface infrastructure and fencing (partial rehabilitation) rehabilitating the remainder of the lease area, including removal of surface infrastructure and fencing, once the DAMB is no longer required for operation (full rehabilitation).
Hours of operation	<ul style="list-style-type: none"> Hours of operation will be negotiated with the landowner and may be up to 24 hours a day, seven days a week.
Activity duration	<ul style="list-style-type: none"> Approximately three months for the drilling, construction, completion and rehabilitation of the core hole and establishment of the DAMB and approximately 30 years for the operation and rehabilitation of the DAMB.
Proposed commencement date	<ul style="list-style-type: none"> Works will commence in the first quarter of 2013.
Maximum area of disturbance	<ul style="list-style-type: none"> 2.2 ha
Rehabilitation commitments and timeframes	<ul style="list-style-type: none"> Partial rehabilitation of the site will occur within six months of completion of the DAMB, where practicable. The site will be rehabilitated to its pre-operational condition or better as agreed with the landowner. Final rehabilitation of the site will occur once the DAMB is no longer required for groundwater monitoring purposes.
Community consultation and complaint management	<ul style="list-style-type: none"> Community consultation and complaint management will be undertaken in accordance with section 2.3.1 of the REF.
Soil quality and land stability	<ul style="list-style-type: none"> Culgoora Road will be closely monitored during the works and where necessary, a street sweeper will be called to clean up any sediment tracked onto the road. Where the lease area is constructed using traditional methods (instead of using industrial matting), topsoil and other soil horizons will be stripped, handled and stockpiled separately. Excess spoil generated during site preparation activities will be stockpiled on site and used as backfill during site rehabilitation. No uncontaminated soil or spoil will be removed from the site. Stockpiles will be managed according to best management practices such as the measures outlined in <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom 2004) ('the Blue Book') or the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2008) (IECA Guidelines). This will include: <ul style="list-style-type: none"> Maintaining topsoil stockpiles at a height of no greater than two metres to preserve the seed bank. Stabilising stockpiles using a temporary sterile cover crop or other acceptable materials

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Item	Commitment
	<p>once site preparation activities are completed, until rehabilitation can take place.</p> <ul style="list-style-type: none"> Erosion and sediment controls will be implemented where necessary during site preparation activities, including lease area construction and any upgrades to the existing access track, in accordance with best management practices (such as the Blue Book or IECA Guidelines). These controls will be maintained until disturbed areas of the site are stabilised. The site will be rehabilitated in accordance with section 2.6.9 of the REF. The quantity of chemicals, fuels and oils stored on site will be minimised, where practicable. All additives, chemicals, fuels and oils stored on site will be kept in an appropriately secured, bunded storage shed in accordance with the relevant MSDS. An MSDS register of all chemicals used or stored on site will be maintained. Maintenance of vehicles, plant and equipment will occur off site at an appropriately licensed facility unless deemed appropriate to conduct such maintenance on site. Refueling of plant and equipment will occur in a designated, bunded area, at least 40 metres from the nearest waterway. A spill kit will be available on site and personnel will be trained in its use. Any spills or leaks will be contained and cleaned up immediately using the spill kit. Contaminated material (such as contaminated soil or absorbent materials) will be placed in a bag and removed from the site for disposal at a licensed waste facility. Plant and equipment will be inspected daily to ensure these are properly maintained.
Surface water	<ul style="list-style-type: none"> Drilling mud will be contained in surface tanks which will be regularly inspected and maintained. Over-balanced drill techniques will be used to prevent formation fluid from rising through the well to the surface. Drilling mud will be transported to and from the site by an appropriately licensed contractor as outlined in section 2.7.2 of the REF. Wastewater generated through general site activities will be removed by an appropriately licensed contractor for disposal at a licensed facility that is able to accept liquid waste or treated to an appropriate quality prior to discharging. A minimum freeboard of 300 millimetres will be maintained for any pits or tanks containing liquid waste. Weather forecasts will be monitored and in the event that prolonged, severe wet weather or flooding is predicted, works will cease and plant, machinery and any chemicals will be secured and bunded.
Groundwater	<ul style="list-style-type: none"> The well will be designed and constructed in accordance with the <i>NSW Coal Seam Gas Code of Practice Well Integrity</i> (DTIRIS 2012b). A driller that holds a license under the National Water Drillers Licensing Accreditation Scheme will be on site during drilling of the top hole and until the surface casing is set, cemented and pressure tested. During this time, there will be 24 hour coverage by one person working the day shift and on call at site during the night. A NOW hydrogeologist will be notified at least 28 days prior to the commencement of drilling. Drilling operations, well control, waste management and abandonment procedures for the core hole will be in accordance with accepted oil industry practices and in accordance with the processes outlined in this REF. Prior to commencing drilling, Santos will seek permission (from landowners) to access registered groundwater monitoring bores within two kilometres of the site to undertake groundwater monitoring for the purposes of establishing baseline conditions. Where access to bores is granted (and the bore is functioning), monitoring will include water level measurements and quality observations in the field, and sampling for analysis by an accredited laboratory. Santos will offer (to landowners) to undertake groundwater monitoring at registered groundwater monitoring bores within two kilometres of the site at the completion of drilling. Excessive drilling mud losses will be cured by loss circulation material (cellulose material such as sawdust or other benign naturally occurring substances as required) to ensure most fluids return to the surface. The well will be decommissioned as soon as it is no longer required. Data will be collected from the well to measure permeability of the various strata.

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REF example: Commitments

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Review of Environmental Factors
Kiandool 1 core hole – PEL 238, Gunnedah Basin, NSW

Item	Commitment
Hazardous substance and chemical use	<ul style="list-style-type: none"> Random sampling of drilling mud and drill cuttings will be undertaken to monitor for the presence of BTEX. Chemicals and potentially hazardous substances will be used and stored according to regulatory requirements including the <i>Work Health and Safety Act 2011</i>. Any dangerous goods will be transported according to regulatory requirements under the <i>Dangerous Goods (Road and Rail Transport) Act 2008</i>.
Air quality and greenhouse gases	<ul style="list-style-type: none"> The area of disturbance will be limited to the minimum required to carry out the proposed activity safely and efficiently. Dust will be suppressed by spraying water along the access track and lease area. If necessary, the access track will be sealed to prevent excessive dust emissions. Site speed limits will be imposed to minimise dust generated by vehicle movements. Vehicles, plant and equipment will be regularly maintained to ensure they are in good operating condition. Vehicles, plant and machinery will be turned off when not in use rather than left idling.
Noise	<ul style="list-style-type: none"> Consultation with the landowner and two next nearest sensitive receivers will be carried out in accordance with section 2.3.1 of the REF. Background noise monitoring will be conducted at the site prior to the commencement of works to confirm the rating background level and noise affected level recommended standard hours and outside of standard hours. Prior to arriving on site, source noise levels of the drilling rig will be confirmed to verify noise impacts and confirm the management approach. Noise monitoring will be carried out at the commencement of drilling and cementing activities to confirm noise levels at the nearest sensitive receiver. Where noise levels exceed the noise affected level, all feasible and reasonable mitigation measures will be implemented to achieve the noise affected level. Further noise monitoring will be carried out to determine the effectiveness of mitigation measures. In the event of a noise complaint, the effectiveness of noise mitigation measures will be assessed and additional feasible and reasonable measures will be implemented, where necessary.
Waste	<ul style="list-style-type: none"> Management of waste, including its transport, will comply with the POEO Act and POEO (Waste) Regulation. Appropriate waste receptacles will be provided on site including covered rubbish bins for disposal of domestic wastes. Waste materials will be separated, classified and managed in accordance with the <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (DECCW 2009). Drilling mud will be managed according to the process described in section 2.7.2. All wastes will be removed from the site at the completion of drilling for recycling or disposal at an appropriately licensed facility. The type and volume of all waste removed from the site will be recorded. Portable toilets will be provided on site and will be regularly serviced by a licensed contractor. All staff and contractors will be made aware of waste management procedures during the site induction and through toolbox talks. Chemical, fuel and oil containers will be managed according to the MSDS or manufacturers' directions to avoid potential impacts to the environment or human health.
Flora and fauna	<ul style="list-style-type: none"> The site boundary will be clearly demarcated to ensure that plant and vehicles keep within the approved area of disturbance. Plant and machinery will be cleaned of any soil, seed and vegetation prior to being transported to the site in accordance with legislative requirements. Prior to earthworks, noxious weeds present on the site will be removed or treated with herbicide to help prevent or reduce their spread. Clearing will commence in areas of low weed infestation and move towards area of high weed infestation where practicable. Weed monitoring will occur throughout site preparation, drilling, completion and rehabilitation.

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Review of Environmental Factors
Kiandool 1 core hole – PEL 238, Gunnedah Basin, NSW

Item	Commitment
	<ul style="list-style-type: none"> activities. Weed removal will be carried out as necessary. Cleared weed species will be stockpiled separately and removed off site. Weed material will not be re-used during site rehabilitation. The site will be rehabilitated in accordance with section 2.6.9 of the REF. In the event that the proposed activity needs to extend outside the site, a qualified ecologist will undertake further inspection.
Community services, infrastructure and sites of importance	<ul style="list-style-type: none"> No specific mitigation measures for potential impacts on community services, infrastructure or sites of importance are proposed.
Economic issues	<ul style="list-style-type: none"> A land access and compensation agreement will be negotiated with the landowner prior to construction commencing. Any upgrades to the access track will be kept for the ongoing use of the landowner.
Amenity and public safety	<ul style="list-style-type: none"> The lease area will be fenced for safety reasons. Site safety protocols, incident management and emergency procedures will be implemented during the works. The site will be kept in a clean and tidy manner during site preparation, drilling activities and operation of the core hole.
Agricultural land	<ul style="list-style-type: none"> Delivery of plant, equipment and materials to the site will be scheduled to avoid impacts on the Walgett Branch rail line operations. Where necessary, this will include consultation with the NSW Rail Corporation. Construction personnel will be trained in pest control and hygiene procedures. All plant and machinery delivered to the site will be cleaned of foreign soil and propagative matter prior to arrival on site.
Other natural resources	<ul style="list-style-type: none"> Fuel will be used as efficiently as possible through appropriate work behavior (e.g. switching off equipment when not in use). The well will be designed and constructed in accordance with the <i>NSW Coal Seam Gas Code of Practice Well Integrity</i>.
Aboriginal cultural heritage	<ul style="list-style-type: none"> Project staff and contractors will be made aware of their statutory obligations to protect under the NPW Act and the Heritage Act, through the site induction and toolbox talks. Where practicable, vegetation will be cut rather than bulldozed to reduce disturbance to the ground surface. If any previously unidentified Aboriginal sites are identified during works, then works in the immediate area will cease, the area will be cordoned off and the OEH Enviroline 131 555 will be contacted. A suitably qualified archaeologist will be contacted so that the site can be assessed and managed. In the event that skeletal remains are uncovered, then works in the immediate area will cease, the area will be cordoned off and the NSW Police Coroner will be contacted to determine if the material is of Aboriginal origin. If determined to be Aboriginal, the OEH Enviroline 131 555 and relevant Aboriginal stakeholders will be contacted to determine an action plan for the management of the skeletal remains prior to works re-commencing. In the event that the proposed activity needs to extend outside the site, a qualified archaeologist will undertake further inspection.
European cultural heritage	<ul style="list-style-type: none"> If any previously unidentified potential European cultural heritage material is identified during works, then works in the immediate area will cease, the area will be cordoned off and the OEH Heritage Branch will be contacted. A suitably qualified archaeologist will be contacted so that the site can be assessed and managed.
Cumulative	<ul style="list-style-type: none"> Santos will work with relevant local governments, including Narrabri Shire Council for this activity, to ensure issues relating to increased pressure on labour resources, temporary and permanent accommodation, road infrastructure and telecommunications are addressed appropriately at a strategic level.

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REF example: Approval



Trade &
Investment
Resources & Energy

Our Ref: MCV12/285
Sent by email: 11/1/2013

Manager, Environment and Water, Energy NSW
Santos Limited
Level 16
40 Creek Street
Brisbane QLD 4000

Attention: Sofia Oliver – Regulatory Approvals Co-ordinator

Dear Sir,

RE: PEL238 Approval to undertake Kiandool 1 core hole.

In accordance with the Conditions of PEL238 granted under the provisions of the *Petroleum (onshore) Act 1991*, the licence holder is hereby granted approval to conduct Kiandool 1 core hole drilling, subject to the conditions set out below. These conditions relate specifically to this approval. The conditions are in addition to those previously attached to PEL238. The Division of Resources & Energy (DRE) acknowledges that PEL238 is pending assessment of renewal and that new, contemporary conditions will apply to this drilling activity upon that imminent renewal. A breach of these conditions is an offence under the *Petroleum (Onshore) Act 1991*.

CONDITIONS.

Environmental Management Conditions.

- The works must be carried out at the location(s) and in accordance with the methods contained in:
 - Review of Environmental Factors "Kiandool 1 Core hole – PEL238, Gunnedah Basin, NSW" submitted by Santo on 08/11/2012.
 - Kiandool 1 Core hole, PEL 238, Review of Environmental Factors supplementary information – December 2012 submitted by Santos on 11 December 2012.
- All works must be completed and the site fully rehabilitated within three years of the date of this approval.

Except as amended by the following conditions.

Codes of Practice

- Unless otherwise approved by the Minister, the licence holder must comply with the requirements set out in the following Codes, as amended or replaced from time to time:
 - the *NSW Code of Practice for Coal Seam Gas Exploration* (NSW Trade & Investment, 2012);
 - the *NSW Code of Practice for Coal Seam Gas Well Integrity* (NSW Trade & Investment, 2012).

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Fracture stimulation

- Fracture stimulation, the process by which a well is "stimulated" when fluids are forced at high pressure into hydrocarbon-bearing formations to create a conductive flow path into the target formation resulting in enhanced flow of hydrocarbons to the wellhead, is not approved for the Kiandool 1 corehole.

Drill Pad and Access Road Construction

- Construction activity within 40m of any watercourse, including construction of the drill pad, upgrades to access roads and any watercourse crossing, should be designed by a suitably qualified person, consistent with the NSW Guidelines for Controlled Activities (July 2012).

Beneficial reuse of Drill Cuttings

- Any drill cuttings used for on site rehabilitation must comply with the requirements of the *Protection of the Environment Operations (waste) Regulations 2005 – The excavated natural material exemption 2012* and must only be used as engineering fill or applied in earth works. Drill cuttings used that do not meet the *excavated natural material exemption 2012* must be classified in accordance with the New South Wales EPA's Waste Classification guidelines and disposed of in accordance with New South Wales waste legislation

Waste Management

- Prior to the commencement of the activity, a waste management plan must be developed, detailing:
 - containment methods for drilling by products, spoil and produced water
 - mitigation and contingency measures for preventing accidental spill
 - remediation actions to be undertaken in the event of accidental spill
 - removal and rehabilitation actions to be undertaken on completion.

Water Act 1912 Licensing Requirements

- Licenses under Part 5 of the *Water Act 1912* are to be obtained from the NSW Office of Water (NOW) and detailed bore design is to be submitted to the NOW for approval prior to the commencement of drilling.
- In order to provide protection to the Great Artesian Basin sequences the core hole should be cased at least to the base of the Napperby Formation and the core hole should be completed and converted to a monitoring bore within 3 months of commencement of construction.

Should you wish to discuss any details of this approval please contact the Environmental Sustainability Unit on 02 4931 6605

Yours Sincerely,

Greg Summerhayes
Acting Manager Environmental Operations.

Date: 11 January 2013

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