

**Environmental Impact Classification
Pursuant to Section 98 of the *Petroleum Act 2000***

**Exploration Coal Seam Drilling within PEL 120 – Northern Yorke Peninsula, Northern
Adelaide Plains and Mid-North, South Australia**

10 July 2008

INTRODUCTION

Pursuant to section 98 of the *Petroleum Act 2000* (the Act) the Minister must classify the regulated activities covered by a prepared Environmental Impact Report (EIR) as either of low, medium or high environmental impact.

The classification must be made on the basis of:

- The prepared EIR;
- Criteria established for classifying the level of environmental impact of regulated activities, a copy of which is found on the PIRSA Petroleum and Geothermal Group (PIRSA) web page:
http://www.pir.sa.gov.au/data/assets/pdf_file/0008/27728/sigactv6.pdf; and
- Comment received from relevant Government departments in accordance with established administrative arrangements between these departments and PIRSA.

This document summarises the classification made by PIRSA on the proposed exploratory drilling activities (coal seam gas) within PEL 120 within northern Yorke Peninsula, northern Adelaide Plains and mid-north of the State. This classification is based on information provided in the original EIR prepared by RPS Ecos (April 2008).

SUMMARY OF CLASSIFICATION

- 1) From an analysis of the environmental significance of the events and potential impacts associated with the proposed activities against the classification criteria referred to above (assessment provided as Attachment 1), these regulated activities have been classified as **medium environmental impact**.
- 2) The majority of events associated with the proposed drilling and initial production testing activities were assessed to be of low environmental significance. This is due to the temporary duration of the proposed activities, and the fact that appropriate management measures will be implemented by SAPEX to avoid or mitigate any potential environmental consequences. However, PIRSA has classified these activities to be of medium environmental impact due to the large number of stakeholders covered by this proposal.
- 3) For a medium environmental impact classification, PIRSA is required to consult with Planning SA in accordance with the administrative arrangement dated 7 November 2000. Comments received from Planning SA on 23 April 2008 agreed with the medium environmental impact classification.

Pursuant to delegated powers, I hereby classify this regulated activity as **medium environmental impact**.



Barry Goldstein
Director Petroleum & Geothermal
Delegate of the Minister for Mineral Resources Development

Environmental Significance Assessment																		
ACTIVITY:	Exploratory Coal Seam Gas Drilling																	
PROJECT:	SAPEX Ltd																	
ASSESSOR:	Tim Flowers																	
DATE:	11/04/2008																	
ABBREVIATIONS: H = High certainty; M = Medium certainty; L = Low certainty																		
EIR REF	TYPE OF IMPACT	EVENT(S)	POTENTIAL CONSEQUENCES	PREDICTABILITY					MANAGEABILITY					Environmental significance				
				SIZE	SCOPE	DURATION	FREQUENCY	STAKEHOLDERS	SIGNIFICANCE	AVOIDANCE	PROBABILITY	DURATION	SIZE AND SCOPE		CUMULATIVE EFFECTS	STAKEHOLDERS	SIGNIFICANCE	COMMENTS
Natural Environment Impacts																		
Soil Impacts																		
3.2, 5.3.1, 6.2, 6.3, 6.4, 6.7	Earthmoving activities during preparation of drill pad, mud sump, flare pit, water sump, access tracks, camp sites and borrow pits	Soil erosion; Soil inversion; Soil compaction; Disturbance to soil structure		M	H	M	M	L	4	No	Med	Confined				3	Well sites will be constructed to the minimum size required for the safe operation of the drill rig. Track width will be restricted to the minimum necessary. Locations requiring steep cuts or fills will be avoided. Cleared topsoil and vegetation will be stock piled adjacent to the well/camp site/borrow pit and separately from fill removed from sumps and pits. Borrow material if required will be sourced locally, preferably from existing borrow pits. Upon well reinstatement, stock piled topsoil and vegetation will be spread over disturbed areas. Access roads, borrow pits, well leases and campsites are to be restored and rehabilitated to attain the highest achievable Coal Attainment Scaling rating as per PIRSA's field guide for abandoned wellsites.	MED
4.0, 5.3.3, 6.2, 6.3, 6.4	Vegetation clearance for well sites and access tracks	Soil erosion; Reduction in available farming area		M	M	M	M	L	4	No	Med	Confined				3	80 % of PEL 120 is devoted to agricultural production and as a result almost 70 % of the region has been cleared of remnant vegetation to support crops and livestock grazing. Clearance of native vegetation, especially the removal of trees and larger shrubs will be avoided wherever possible and minimised where unavoidable. Significant vegetation will be avoided.	MED
6.2, 6.5	Vehicle movement during construction, drilling and monitoring activities	Soil erosion; Soil compaction; Wheel tracks		M	H	M	M	L	4	No	Med	Confined				3	Existing roads and tracks will be utilised as far as is practicable to avoid the creation of parallel and multiple access tracks. Where practicable, materials will be transported to and from well sites in bulk.	MED
5.3.4, 6.5, Table 5	Blowout or kick during drilling; Equipment or tubular failure	Soil contamination		M	H	M	H	L	4	No	Low					1	A blowout could result in loss of containment of gas, produced water and drilling fluids. Blowouts are not common. There are considerable safety measures to avoid a drilling blowout including: guidelines, procedures, safety practices, design considerations, well control equipment and certification of trained individuals in drilling. The chance of a blowout in completion activities is considerably less because the well is cased. Therefore, the well bore is in stable condition and down hole pressures are fairly well known.	LOW
3.6.1, 3.7.2, 6.4, 6.5, 6.8	Disposal of drilling and completion fluids to flare pits during well testing and clean-up; Disposal of drill cuttings and muds	Soil contamination		M	H	M	H	L	4	No	Low					1	All drill cuttings, muds and drill fluids will be contained within designated mud sumps with adequate freeboard at the completion of operations to allow for a 0.5m cover of clean fill. This is the standard industry practice for drilling mud disposal, however, in some circumstances (eg shallow groundwater or intensive/sensitive land use) it may be appropriate to remove drilling muds for disposal off site.	LOW
3.4, 5.3.6, 6.4	Explosion or fire during drilling	Soil contamination		M	M	H	M	L	4	No	Low					1	The loss and subsequent ignition of some hazardous substances may also lead to an explosion or fire. Where they are required, flare pits will have a suitable fire break around the perimeter.	LOW
3.7.2, 3.7.3, Table 1, 5.3.6, 6.6, 6.8	Spills and leaks associated with drilling operations, storage or transport of oil, fuels and chemicals, storage of drilling and completion fluids, refuelling operations and use of high pressure hydraulic systems.	Soil contamination		M	H	H	H	L	4	No	Low					1	All fuel, oil and chemicals will be stored in banded areas in accordance with appropriate standards, including AS 1940 and EPA guidelines. Hazardous materials will be transported and disposed of in accordance with appropriate standards and legislative requirements, including Australian Dangerous Goods Code and EPA guidelines and licensing requirements. Appropriate spill response equipment will be available on site. Fuel and oil spills will be reported, and treated accordingly in consultation with the landholder (eg chemically treated or bio-remediated, ground ripped, or contaminated material removed)	LOW
3.7.2, 5.3.5, 5.3.6, 6.7, 6.8	Disposal of domestic and chemical waste; Sewage treatment	Soil contamination		H	H	H	H	L	4	No	Low					1	Putrescible domestic wastes created at campsites will be stored on site prior to transportation to a licensed waste disposal facility. Rubbish will be recycled where possible or transported to a licensed waste disposal facility. Campsite wastewater will either be collected on-site or disposed of off-site by a licensed waste contractor or receive onsite treatment for disposal onto land (well away from watercourses or infrastructure). This disposal method for wastewater will be undertaken in compliance with the Standard for the Construction, Installation and Operation of Septic Tank Systems in SA or be to the satisfaction of the Department of Health. Markers and litter will not be left in the work area after completion.	LOW
Groundwater Impacts																		
5.3.4, Table 5	Blowout or kick during drilling; Equipment or tubular failure; Down hole problems; Casing or cement failure	Crossflow; Aquifer contamination; Reduction in aquifer pressure		M	M	H	H	L	4	No	Low					1	A blowout could result in loss of containment of gas, produced water and drilling fluids. Blowouts are not common. There are considerable safety measures to avoid a drilling blowout including: guidelines, procedures, safety practices, design considerations, well control equipment and certification of trained individuals in drilling. The chance of a blowout in completion activities is considerably less because the well is cased. Therefore, the well bore is in stable condition and down hole pressures are fairly well known.	LOW
5.3.5, 6.5	Disposal of drilling and completion fluids to flare pits during well testing and clean-up; Disposal of drill cuttings and muds	Shallow groundwater contamination		H	H	H	H	L	4	No	Low					1	The risk of shallow groundwater contamination associated with the disposal of drilling fluids, cuttings and other fluids associated with completion activities (eg frac gels) to an unlined earthen drilling sump is considered low. This is due to the low toxicity associated with additives and the presence of fine bentonite clays which form relatively impervious mud cake in the base of drilling sumps. These techniques are generally industry standard practice for disposal of non-oil based drilling mud systems cuttings. Sumps will be of sufficient depth to have adequate freeboard at the completion of operations to allow for at least 0.5m cover of clean fill.	LOW
Table 5, 5.3.4	Loss of radioactive source down hole	Groundwater contamination		H	M	H	H	L	4	No	Low					1	After drilling, wells are open hole logged using a neutron and gamma ray emitting tool. If the tool is lost down hole, it is retrieved immediately in most cases. However, if it is not possible to retrieve the tool it is cemented in the hole to isolate it from adjacent formations.	LOW
5.3.4, 6.5	Drilling fluids in down hole environment	Groundwater contamination of freshwater aquifers		H	M	H	H	L	4	No	Low					1	Constituents of drilling muds are generally non-toxic or have low effective chronic toxicity at the concentrations present in the drilling mud. Detailed study has shown that although this is an area of concern, drilling fluid impact is not a major component of potential down hole problems, and that the main consequence of drilling fluid loss is reservoir formation damage rather than an irreversible contamination of the aquifer (Mavroudis 2001, cited in Santos 2003).	LOW
3.7.2, 3.7.3, Table 1, 5.3.6, 6.6, 6.8	Spills and leaks associated with drilling operations, storage or transport of oil, fuels and chemicals, storage of drilling and completion fluids, refuelling operations and use of high pressure hydraulic systems.	Groundwater contamination		M	H	H	H	L	4	No	Low					1	All fuel, oil and chemicals will be stored in banded areas in accordance with appropriate standards, including AS 1940 and EPA guidelines. Hazardous materials will be transported and disposed of in accordance with appropriate standards and legislative requirements, including Australian Dangerous Goods Code and EPA guidelines and licensing requirements. Appropriate spill response equipment will be available on site. Fuel and oil spills will be reported, and treated accordingly in consultation with the landholder (eg chemically treated or bio-remediated, ground ripped, or contaminated material removed)	LOW
5.3.4, 6.5	Insufficient plugging between aquifers	Uncontrolled release of water hydrocarbon to surface; Crossflow between aquifers		H	M	H	H	L	4	Yes						1	Plugs will be installed between aquifers to prevent mixing and uncontrolled flow to the surface.	LOW
5.3.4, 6.5	Insufficient isolation barriers set in place	Crossflow of aquifers; Aquifer contamination		H	M	H	H	L	4	Yes						1	Isolation barriers will be set in place to ensure that crossflow, contamination or pressure reduction does not occur. There will be no provision for cross-flow behind casing between aquifers, and between aquifers and hydrocarbon reservoirs unless approved by DWLBC.	LOW

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3.7.1, 4.4.2		Aquifer use for water supply during drilling	Depletion of local shallow and deep aquifers	H	M	H	M	L	4	No	Low				1	The amount of water required for drilling operations depends principally upon the depth of the well that is being drilled. Water for drilling operations may be sourced from town water supplies, farm dams and/or licensed water bores, with the agreement of the landowner or supplier.	LOW
	Surface Water Impacts																
6.2, 6.4		Earthmoving activities during preparation of drill pad, mud sump, flare pit, water sump, access tracks, camp sites and borrow pits	Disturbance to natural drainage lines	M	H	M	H	L	4	No	Low				1	Well sites will be located and orientated to account for natural drainage patterns (ie. creeks, flood plains and salt lakes). Surface levelling shall be avoided wherever possible or minimised.	LOW
6.3		Vegetation clearance for well sites and access tracks	Siltation of natural drainage lines, dams and watercourses; Destabilisation of creek crossings or watercourses	M	M	M	H	L	4	No	Low				1	Proposed well sites will be inspected to determine the best location and orientation of the well site and access tracks, campsite (if required).	LOW
6.2		Earthmoving and construction of access roads across watercourses or flood plain crossings.	Interruption to surface water flows	M	H	M	H	L	4	No	Low				1	Watercourse crossings will be constructed so as to maintain water flows (eg culverts may be installed).	LOW
5.3.5, 6.5		Disposal of drilling and completion fluids to flare pits during well testing and clean-up; Disposal of drill cuttings and muds	Surface water contamination	M	M	M	H	L	4	No	Low				1	The risk of shallow groundwater contamination associated with the disposal of drilling fluids, cuttings and other fluids associated with completion activities (eg frac gels) to an unlined earthen drilling sump is considered low. This is due to the low toxicity associated with additives and the presence of fine bentonite clays which form relatively impervious mud cake in the base of drilling sumps. These techniques are generally industry standard practice for disposal of non-oil based drilling mud systems cuttings. Sumps will be of sufficient size to contain mud discharges. Sumps will also be of sufficient depth to have adequate freeboard at the completion of operations to allow for at least 0.5m cover of clean fill.	LOW
5.3.6, 6.4		Spills and leaks associated with drilling operations, storage or transport of oil, fuels and chemicals, storage of drilling and completion fluids, refueling operations and use of high pressure hydraulic systems.	Surface water contamination	M	M	M	H	L	4	No	Low				1	Spills or leaks may occur as a result of equipment failure or human error. All fuel, oil and chemicals will be stored in bunded areas in accordance with appropriate standards, including AS 1940 and EPA guidelines. Hazardous materials will be transported and disposed of in accordance with appropriate standards and legislative requirements, including Australian Dangerous Goods Code and EPA guidelines and licensing requirements. Appropriate spill response equipment will be available on site. Fuel and oil spills will be reported, and treated accordingly in consultation with the landholder (eg chemically treated or bio-remediated, ground ripped, or contaminated material removed). Emergency response plans will be reviewed and updated on a regular basis, including emergency response simulation training sessions.	LOW
3.7.2, 5.3.5, 5.3.6, 6.7, 6.8		Disposal of domestic and chemical waste; Sewage treatment	Surface water contamination	M	H	H	H	M	4	No	Low				1	Putrescible domestic wastes created at campsites will be stored on site prior to transportation to a licensed waste disposal facility. Rubbish will be recycled where possible or transported to a licensed waste disposal facility. Campsite wastewater will either be collected on-site or disposed of off-site by a licensed waste contractor or receive onsite treatment for disposal onto land (well away from watercourses or infrastructure). This disposal method for wastewater will be undertaken in compliance with the Standard for the Construction, Installation and Operation of Septic Tank Systems in SA or be to the satisfaction of the Department of Health. Markers and litter will not be left in the work area after completion.	LOW
5.3.4, Table 5		Blowout or kick during drilling; Equipment or tubular failure; Down hole problems; Casing or cement failure	Surface water contamination	M	H	H	H	L	4	No	Low				1	A blowout could result in loss of containment of gas, produced water and drilling fluids. Blowouts are not common. There are considerable safety measures to avoid a drilling blowout including: guidelines, procedures, safety practices, design considerations, well control equipment and certification of trained individuals in drilling. The chance of a blowout in completion activities is considerably less because the well is cased. Therefore, the well bore is in stable condition and down hole pressures are fairly well known.	LOW
	Vegetation Impacts																
5.3.3, 6.4		Vegetation clearance for well sites and access tracks	Loss of vegetation; Loss of biodiversity	M	M	M	M	L	4	No	Med	Med	Confined		3	Well sites will be located and orientated so as to take into account vegetation. Clearance of native vegetation, especially the removal of trees and larger shrubs will be avoided wherever possible and minimised where unavoidable. In some areas (eg grazing lands in the far north of PEL 120) the vegetation consists predominantly of degraded native vegetation and it may not be possible to completely avoid clearing native vegetation. However, sites would be selected to avoid removal of significant vegetation if cleared areas are not present.	MED
5.3.3		Vegetation clearance for well sites and access tracks	Weed invasion	M	H	M	H	L	4	No	Low				1	Vegetation clearance will be minimised to prevent weed invasion.	LOW
5.3.8		Use of borrow material	Introduction and spread of weeds	M	M	H	H	L	4	No	Low				1	Where possible borrow material will be sourced from existing quarries or borrow pits in the region to minimise impacts on the region. Borrow material is generally not moved over large distances. However, there is the potential for weed species to be moved along with the construction material from the borrow site to the well site.	LOW
5.3.6, 6.4		Spills and leaks associated with drilling operations, storage or transport of oil, fuels and chemicals, storage of drilling and completion fluids, refueling operations and use of high pressure hydraulic systems.	Loss of vegetation; Loss of biodiversity	M	H	H	H	L	4	No	Low				1	Spills or leaks may occur as a result of equipment failure or human error. All fuel, oil and chemicals will be stored in bunded areas in accordance with appropriate standards, including AS 1940 and EPA guidelines. Hazardous materials will be transported and disposed of in accordance with appropriate standards and legislative requirements, including Australian Dangerous Goods Code and EPA guidelines and licensing requirements. Appropriate spill response equipment will be available on site. Fuel and oil spills will be reported, and treated accordingly in consultation with the landholder (eg chemically treated or bio-remediated, ground ripped, or contaminated material removed). Emergency response plans will be reviewed and updated on a regular basis, including emergency response simulation training sessions.	LOW
6.4, 6.5		Vehicle movement during construction, drilling and monitoring activities	Introduction and spread of weeds	M	H	H	H	L	4	No	Low				1	Vehicles and equipment involved in drilling operations must be clean when entering the region. Vehicles or equipment will be washed down if they pose a significant risk of weed introduction. Earthmoving equipment that is not free of potential weed sources will be cleaned before starting work at the site. Any weed outbreaks at the well site or access track will be controlled, in consultation with appropriate personnel (eg landholder, NRM Board officers).	LOW
6.4, 6.5		Vehicle movement during construction, drilling and monitoring activities	Damage to vegetation	M	H	M	H	L	4	No	Low				1	All vehicles will be required to remain on designated roads and access tracks or parking areas. Campsites, if required, will be located adjacent to existing access tracks or roads, utilising areas with sparse vegetation.	LOW
3.4, 5.3.6, 6.4		Explosion or fire during drilling	Soil contamination	H	H	H	H	L	4	No	Low				1	The loss and subsequent ignition of some hazardous substances may also lead to an explosion or fire. Where they are required, flare pits will have a suitable fire break around the perimeter.	LOW
	Fauna Impacts																
3.2.3, 5.3.8, 6.4		Development of borrow pits	Hazard to stock and wildlife	M	H	M	H	L	4	No	Low				1	Where possible, borrow material will be sourced from existing quarries or borrow pits in the region to minimise impacts on the region.	LOW

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														COMMENTS		
5.3.3, 6.4		Earthmoving activities during preparation of drill pad, mud sump, flare pit, water sump, access tracks, camp sites and borrow pits; Heavy vehicle trafficking	Loss of fauna habitat	L	M	M	H	L	4	No	Med	Med	Confined	3	Well sites will be located and orientated so as to take into account vegetation. Clearance of native vegetation, especially the removal of trees and larger scrubs will be avoided wherever possible and minimised where unavoidable. In some areas (eg grazing lands in the far north of PEL 120) the vegetation consists predominantly of degraded native vegetation and it may not be possible to completely avoid clearing native vegetation. However, sites would be selected to avoid removal of significant vegetation if cleared areas are not present.	MED
5.3.3, 6.4		Earthmoving activities during preparation of drill pad, mud sump, flare pit, water sump, access tracks, camp sites and borrow pits; Heavy vehicle trafficking	Impede movement of fauna (small mammals and reptiles)	M	H	M	H	L	4	No	Low			1	Clearance of introduced pasture or crops is unlikely to impact fauna movements.	LOW
5.3.2, 6.5		Vehicle collision with wildlife during movement to and from well site	Fauna mortality	M	H	M	H	L	4	No	Low			1	The major roads in the region carry a relatively high level of traffic including heavy vehicles associated with road freight and farming machinery. The additional traffic on major roads due to petroleum exploration is not likely to be significant. All vehicles will be required to remain on designated roads and access tracks or parking areas.	LOW
3.4, 5.3.6, 6.4		Explosion or fire during drilling	Loss of habitat; disturbance to native fauna	H	H	H	H	L	4	No	Low			1	The loss and subsequent ignition of some hazardous substances may also lead to an explosion or fire. Where they are required, flare pits will have a suitable fire break around the perimeter.	LOW
3.7.2, 5.3.5, 5.3.6, 6.7, 6.8		Disposal of domestic and chemical waste; Sewage treatment	Attraction of scavenging wildlife (native and pest species)	M	M	H	H	L	4	No	Low			1	Putrescible domestic wastes created at campsites will be stored on site prior to transportation to a licensed waste disposal facility. Rubbish will be recycled where possible or transported to a licensed waste disposal facility. Campsite wastewater will either be collected on-site or disposed of off-site by a licensed waste contractor or receive onsite treatment for disposal onto land (well away from watercourses or infrastructure). This disposal method for wastewater will be undertaken in compliance with the Standard for the Construction, Installation and Operation of Septic Tank Systems in SA or be to the satisfaction of the Department of Health. Markers and litter will not be left in the work area after completion.	LOW
5.3.6, 6.4		Spills and leaks associated with drilling operations, storage or transport of oil, fuels and chemicals, storage of drilling and completion fluids, refuelling operations and use of high pressure hydraulic systems.	Disturbance to native fauna	M	H	H	H	L	4	No	Low			1	Spills or leaks may occur as a result of equipment failure or human error. All fuel, oil and chemicals will be stored in bunded areas in accordance with appropriate standards, including AS 1940 and EPA guidelines. Hazardous materials will be transported and disposed of in accordance with appropriate standards and legislative requirements, including Australian Dangerous Goods Code and EPA guidelines and licensing requirements. Appropriate spill response equipment will be available on site. Fuel and oil spills will be reported, and treated accordingly in consultation with the landholder (eg chemically treated or bio-remediated, ground ripped, or contaminated material removed). Emergency response plans will be reviewed and updated on a regular basis, including emergency response simulation training sessions.	LOW
4.2.1.2	Sensitive Area Impacts	Damage to saltlakes	Loss of biological significance	H	H	H	M	L	4	Yes				1	The Bumbunga environmental association is comprised of a series of low-lying plains salt lakes and occasional dunes, and includes Lake Bumbunga salt lake near Lochiel. Remnant vegetation in the environmental association is limited to the margins of the salt lakes. Well sites will not be constructed on sensitive areas such as salt lakes.	LOW
3.4	Air Impacts	Flaring of gas during initial production testing	Atmospheric pollution	H	H	H	M	M	2	No	Low			1	Initial production testing is short term (< 10 days) and relatively small volumes of water and gas are produced. Gas is typically flared during initial production testing of gas wells.	LOW
3.4, Table 9		Emissions vented from drill stem testing and production testing	Atmospheric pollution	H	H	H	M	M	2	No	Low			1	Table 9 indicates that emissions are likely to occur during drill stem testing and production testing. However, is of negligible severity (ie short term) and not expected to have an effect on air quality.	LOW
3.4, 5.3.6		Spills and leaks; Fire or explosion during drilling operations	Atmospheric pollution	M	H	H	H	M	2	No	Low			1	Loss of containment and subsequent ignition of a hazardous substance may lead to an explosion or fire. Appropriate management measures can (and will) be implemented to ensure that these hazards do not result in significant environmental risks.	LOW
	Social Environment															
	Community Resource Impacts															
5.3.2, 6.5		Vehicle movement to and from well sites	Damage to community infrastructure	M	H	M	H	L	4	No	Low			1	The major roads in the region carry a relatively high level of traffic including heavy vehicles associated with road freight and farming machinery. The additional traffic on major roads due to petroleum exploration is not likely to be significant.	LOW
Table 5,		Change in visual appearance of area during well site and access track construction	Visual impact; Reduction in aesthetic value	H	H	H	H	L	4	No	Med	Short		2	Monitoring will be undertaken to assess the visual impact of the operations. Visual impact associated with drilling and access track preparation will be short term during the exploration phase.	MED
3.7.2, 5.3.5, 5.3.6, 6.7, 6.8		Disposal of domestic and chemical waste	Litter on well site and surrounding area	H	H	H	H	L	4	No	Med	Short		2	Putrescible domestic wastes created at campsites will be stored on site prior to transportation to a licensed waste disposal facility. Rubbish will be recycled where possible or transported to a licensed waste disposal facility. Campsite wastewater will either be collected on-site or disposed of off-site by a licensed waste contractor or receive onsite treatment for disposal onto land (well away from watercourses or infrastructure). This disposal method for wastewater will be undertaken in compliance with the Standard for the Construction, Installation and Operation of Septic Tank Systems in SA or be to the satisfaction of the Department of Health. Markers and litter will not be left in the work area after completion. Litter storage methods will address litter scattering and impacts on wildlife (eg, rubbish bins or skips will be covered).	MED
	Cultural & Heritage Impacts															
4.5, 4.6.1, 6.2, 6.3		Earthmoving activities during preparation of drill pad, mud sump, flare pit, water sump, access tracks, camp sites and borrow pits	Disturbance of Aboriginal, cultural or natural heritage sites; Loss of cultural affinity with the area.	M	H	M	H	L	4	No	Low			1	Cultural heritage surveys will be carried out with relevant Aboriginal groups where there is a likelihood of cultural heritage material occurring. Sites identified of known Aboriginal or non-Aboriginal heritage significance will be completely avoided where possible. In the event that drilling at a non-indigenous or natural heritage site or area is proposed, permission to do so will be obtained from the relevant authority.	LOW
4.5, 6.3, 6.5		Vehicle movement during construction, drilling and monitoring activities	Disturbance of Aboriginal, cultural or natural heritage sites; Loss of cultural affinity with the area.	M	H	M	H	L	4	No	Low			1	All vehicles will be required to remain on designated roads and access tracks or parking areas. Where practicable, materials will be transported to and from well sites in bulk. Cultural heritage surveys will be carried out with relevant Aboriginal groups where there is a likelihood of cultural heritage material occurring. In the event that drilling at a non-indigenous or natural heritage site or area is proposed, permission to do so will be obtained from the relevant authority.	LOW
	Community Health & Safety															
4.7.2, 5.3.2, 6.5		Increased vehicle traffic on public roads (trucks, bulldozers, drill rigs)	Vehicle accidents; Disturbance to local road users	M	H	M	H	L	4	No	Low			1	Where appropriate, temporary signage will be erected on access tracks at intersections with public roads. The major roads in the region carry a relatively high level of traffic including heavy vehicles associated with road freight and farming machinery. The additional traffic on major roads due to petroleum exploration is not likely to be significant.	LOW
4.7.2, 5.3.2, 6.5		Dust generation created from vehicle movement to and from well site (trucks, bulldozers, drill rigs)	Disturbance to local road users	M	H	M	H	L	4	No	Low			1	The major roads in the region carry a relatively high level of traffic including heavy vehicles associated with road freight and farming machinery. The use of minor roads and tracks will require careful management in order to minimise the risk and potential disturbance to other road users and landholders.	LOW

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EIR REF	TYPE OF IMPACT	EVENT(S)	POTENTIAL CONSEQUENCES	PREDICTABILITY						MANAGEABILITY						Environmental significance	
				SIZE	SCOPE	DURATION	FREQUENCY	STAKEHOLDERS	SIGNIFICANCE	AVOIDANCE	PROBABILITY	DURATION	SIZE AND SCOPE	CUMULATIVE EFFECTS	STAKEHOLDERS		SIGNIFICANCE
4.7.2, 5.3.2, 6.5, 6.8		Noise associated with vehicle movement to and from well site (trucks, bulldozers, drill rigs)	Risk to human health; Disturbance to local community	M	H	M	H	L	4	No	Low				1	The major roads in the region carry a relatively high level of traffic including heavy vehicles associated with road freight and farming machinery. The use of minor roads and tracks will require careful management in order to minimise the risk and potential disturbance to other road users and landholders. Vehicles will travel at slow speed in the vicinity of dwellings.	LOW
3.7.2, 5.3.5, 5.3.6, 6.7, 6.8		Disposal of domestic and chemical waste	Risks to human health	H	H	H	H	M	2	No	Low				1	Putrescible domestic wastes created at campsites will be stored on site prior to transportation to a licensed waste disposal facility. Rubbish will be recycled where possible or transported to a licensed waste disposal facility. Campsite wastewater will either be collected on-site or disposed of off-site by a licensed waste contractor or receive onsite treatment for disposal onto land (well away from watercourses or infrastructure). This disposal method for wastewater will be undertaken in compliance with the Standard for the Construction, Installation and Operation of Septic Tank Systems in SA or to the satisfaction of the Department of Health. Markers and litter will not be left in the work area after completion.	LOW
	Economic Environment <i>Existing Land Use Impacts</i>																
5.3.7, 6.1, 6.2, 6.4, 6.5		Vehicle movement and earthworks during construction, drilling and monitoring activities	Disturbance to stock	M	H	M	H	L	4	No	Low				1	All vehicles will be required to remain on designated roads and access tracks or parking areas. Where practicable, materials will be transported to and from well sites in bulk. Well sites will be constructed to the minimum size required for the safe operation of the drill rig.	LOW
3.4, 5.3.6, 5.3.7, 6.1, 6.4		Explosion or fire during drilling	Disturbance to stock	H	H	H	H	L	4	No	Low				1	The loss and subsequent ignition of some hazardous substances may also lead to an explosion or fire. Where they are required, flare pits will have a suitable fire break around the perimeter.	LOW
3.7.2, 3.7.3, Table 1, 5.3.6, 6.1, 6.6, 6.8		Spills and leaks associated with drilling operations, storage or transport of oil, fuels and chemicals, storage of drilling and completion fluids, refuelling operations and use of high pressure hydraulic systems.	Disturbance to stock; Disruption to land use	M	H	H	H	L	4	No	Low				1	All fuel, oil and chemicals will be stored in banded areas in accordance with appropriate standards, including AS 1940 and EPA guidelines. Hazardous materials will be transported and disposed of in accordance with appropriate standards and legislative requirements, including Australian Dangerous Goods Code and EPA guidelines and licensing requirements. Appropriate spill response equipment will be available on site. Fuel and oil spills will be reported, and treated accordingly in consultation with the landholder (eg chemically treated or bio-remediated, ground ripped, or contaminated material removed)	LOW