

**ENVIRONMENTAL IMPACT REPORT
GRAVESTOCK-1
Drilling, Completion and Initial Production Testing
PEL 73
STANSBURY BASIN
YORKE PENINSULA, SOUTH AUSTRALIA**

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1 PROPOSED ACTIVITIES

1.1 INTRODUCTION

David M Schuette / DMS Partners LP is the Operator of PEL73 in southern Yorke Peninsula. As part of the Year 5 licence requirements, David M Schuette proposes to drill petroleum exploration well Gravestock 1 at a location 10km southwest of Yorketown. The well will test the oil and gas potential of a broad anticlinal structure interpreted from earlier seismic surveys. The primary target is the Kulpara Formation at an expected depth of approximately 1340 metres. The proposed maximum total depth for the well is 1875 metres.

Should the well be successful production casing will be run and cemented and the well completed for future production.

In the event of the well failing to discover economic hydrocarbons, it will be plugged with cement plugs to isolate any permeable zones and abandoned. The wellsite will then be rehabilitated.

It is intended to spud the well in December, 2006. The actual timing of operations will depend on the availability of a suitable drilling rig. Drilling related activities will be continuous over a 3 to 4 week period.

During the drilling related activities David M Schuette will control environmental impact at the site to acceptable levels and will minimise risk and inconvenience to the landholder, the local community, all personnel and third parties.

The nominated Liaison Person for all PEL 73 environmental and drilling related activities will be Griff Weste.

All activities will be carried out according to best industry practice and will conform to the relevant State and Federal Government regulations.

1.2 SCOPE

The scope of this Environmental Impact Report is to address the various risks associated with the drilling of the proposed well and in the case the well is successful, the completion and production testing of the well.

1.3 LOCATION AND ACCESS

David M Schuette proposes to drill petroleum well Gravestock-1 at Longitude 137.53 deg, Latitude 35.091 deg S (GDA94 coordinates 731090mE, 611390mN). This location is within Section 47 Hundred of Melville and is 3 km north of Port Moorowie and 10 km southwest of Yorketown on the southern Yorke Peninsula (see figure 1). The land is Freehold, is totally cleared of native vegetation, is under crop and fenced. The titleholders of the land are E J Story and J G Story of Yorketown. As required under the Petroleum Act 2000 and its Regulations and following PIRSA guidelines, a Notice of Entry has been presented to the land titleholders and a compensation agreement signed. The landholders will be given notice in accordance with Part 10 of the *Petroleum Act*

2000 of the timing of wellsite operations. Access is via sealed roads and formed wide gravel roads to within 100m of the well site. The Narungga People with traditional responsibility for the area have yet to carry out an inspection. The Native Title Unit has been informed of the proposed operations and a heritage clearance will be completed before works start.

1.4 WELLSITE REQUIREMENTS

1.4.1 Drill Pad

A drill pad area 120m X 80m will be roughly levelled and paved for the drill rig and associated equipment. Within that area a portion 40m X 20m will be accurately levelled for the rig base. It may be necessary to remove some topsoil from the pad area. Any topsoil removed will be stockpiled adjacent to the pad for replacement when the site is rehabilitated. If the grass is dry or operations are within the fire season, the pad will be surrounded by a 10 metre wide ploughed firebreak. The pad site is on almost level ground (see figure 2) and only very minor levelling will be required. The pad will be paved with gravel to a depth of 30cm. Thicker paving (50cm) may be required for the 40m X 20m rig base. Small drains sufficient to control surface runoff from the drill pad will be constructed around the pad margins. The pad will be constructed so that any runoff upslope from the pad will be directed away from the pad.

1.4.2 Sump and Flare Pit

A shallow sump 25m X 30m will be constructed to hold drill cuttings and waste drilling fluids. Drilling fluids used will be non-toxic polymers. A small shallow flare pit will be constructed adjacent to the drill pad. A firebreak will be ploughed around the flare pit.

1.4.3 Access Track

A short access track of length not greater than 100m will be constructed from the public roadway to the drill pad. The track will be approximately 6m wide and will be formed then paved with gravel. The track will not cross drainage lines. If grass is drying a 10m wide ploughed firebreak along each side of the access track will be constructed.

1.4.4 Water

Approximately 1 ML of water will be used to drill the well. Drilling water will be trucked 10km from Yorketown.

1.4.5 Camp Site

A crew camp may be required. A 50m X 50m area adjacent to the drill pad will be used for a self-contained 30 person relocatable camp equipped with septic tanks. Disturbance to the soil surface will be kept to a minimum. It will be necessary to lightly pave the camp area with gravel.

1.4.6 Toilet Facilities

Toilet facilities with septic tank will be provided at the site and at the camp. Small pits will be constructed to house the tanks which will be removed after drilling operations are completed.

1.4.7 Fencing and Fire Break

A fence will be constructed to enclose the wellsite area of approximately 2 hectares and the 100m long access track. Lockable gates will be placed across the start of the access track. All activities will be confined to within the fenced area. A 10m wide firebreak will be ploughed along the outside of the fence.

1.5 DRILLING

1.5.1 Drilling Period

It is proposed to drill the well during December 2006. The drill pad may be constructed up to three weeks prior to the commencement of drilling operations. Actual drilling operations will take between 21 and 28 days and will be on a 24 hour 7 day week basis. If the well is successful, testing may be carried out for a period of up to 1 week. The drill rig will be demobilised within one week of the completion of drilling/testing. The site will be rehabilitated on a timetable suitable to the landholder and the paving material removed. The sump will be allowed to dry before infilling.

1.5.2 Well Prognosis

GRAVESTOCK 1 PROGNOSIS					
AGE	FORMATION	LITHOLOGY	TOPS (m GL)	CASING	TARGETS
Quaternary		kunkar on sand	0		
Permian		glacial till claystones boulder beds clayey sandstones	4	20" conductor to 10m 17 1/2" hole 13 3/8" casing to 430m	set BOPs
Cambrian	Yuruga Fm	sandstone	450	12 1/4" hole 9 5/8" casing to 765m	secondary
	Coobowie Lst	limestone	690		
	Ramsay Lst	limestone	850	8 1/2" hole to TD	secondary primary secondary
	Minlaton Fm	siltstone	900		
	Parara Lst	dolomite limestone	970		
	Kulpara Fm	dolomite chert	1340		
	Winulta Fm	dolomitic sandstone	1700 1750		
Proterozoic		quartzite	1850	maximum TD 1875m	

TABLE 1 WELL GEOLOGICAL PROGNOSIS

1.5.3 Proposed Operations Program Outline

Install 20" conductor to 10m in Permian glacials and cement to isolate surficial sediments.

Drill 17 1/2" hole to 430m in lower Permian glacials.

Run 13 3/8" casing and cement to surface.

Install BOPs and test.
Drill 12 ¼” hole to 765m.
Run 9 5/8” casing and cement back into surface casing.
Drill 8 ½” hole to total depth at 1875m +/- 30m proposed maximum.
Conduct drill stem tests if warranted.
Run wireline logs.

Run 7” production casing and completion if warranted.
Conduct limited production testing.

or plug and abandon if dry hole.

Total time rig arrival to rig departure 21 – 28 days.

1.6 ACCESS AND VEHICLE MOVEMENTS

Access will be via existing wide, well formed, sealed and gravel roads to within 100m of the site and then by the yet to be constructed 100m long paved access track. A locked gate will be installed in the fenceline at the start of the access track. Vehicle movements will be mobilisation and demobilisation of the drill rig, crew change vehicle, water truck. Vehicle noise will be monitored and movements restricted to daylight hours as far practicable.

1.7 INITIAL PRODUCTION TESTING

In the event of gas or oil discovery, the well will be completed and an initial production test undertaken. This limited testing is not expected to take more than 3 days (oil) or 6 days(gas).

1.7.1 Initial Production Testing - Gas

In the case of a potentially producing gas discovery, a single / multirate flow and buildup operation would be undertaken, with produced gas flared off. Details will necessarily depend on the outcome of drilling, but an initial production test for gas, while “producing” under the meaning of the Petroleum Act, will not require additional surface infrastructure or result in transportation or other removal of gas and liquids. If initial production testing were successful, approvals would be sought for upgrading to production rather than exploration facilities.

1.7.2 Initial Production Testing - Oil

If warranted by oil shows, a drill stem test(s) would run with open/shut-in times based on hole and drilling conditions. Any zones would be progressively tested, based upon quality of oil shows. Total oil volume produced from such drill stem tests is low, from nil to 50 barrels maximum. Further initial oil production testing may be performed to provide increased confidence in the commercial possibilities of the discovery. This testing would be conducted over a 24 to 72 hour period following completion of the well. Produced oil will be stored in a special purpose tank for later transport to a processing facility.

2 SUMMARY OF LOCAL ENVIRONMENT

2.1 CLIMATE

The wellsite area receives an average annual rainfall of 420mm and it rains an average of 106 days per year, mainly in the winter months. The area is adjacent to the ocean and is characterised by common moderately strong winds. A number of wind farms are recently completed or planned.

2.2 REGIONAL LAND USE

The original Mallee native vegetation of the lower eastern portion of Yorke Peninsula has been cleared for the growing of wheat and barley and for sheep grazing. Native sedges and grasses remain in some swampy areas. The coastal fringe is also used for recreational fishing and there are isolated small townships and settlements. A few rows of occupied dwellings, holiday houses and shacks occupy the land at Port Moorowie, 3 km south of the wellsite. Most are occupied for recreational purposes during summer weekends and holidays. The wellsite is distant from the remaining mallee tracts of the lower western portion of the Peninsula, including Innes National Park.

2.3 LANDFORM AND SOILS

The landform is gently undulating and low relief, steadily rising for about 2km from the coast and then remaining fairly level. To the east of the wellsite there are ephemeral swamps partially vegetated with sedges and grasses and grazed. The region is characterised by common salt lakes in deeper depressions flanked by stabilised gypsiferous dunes.

Soils are thin sandy calcareous loams overlying abundant kunkar limestone developed on discontinuous thin tertiary gravels overlying thick Permian glacial sandy claystones. The soils are stable with little erosion evident. The Recent to Present windy, low rainfall climate following a Pleistocene glacial climate has produced evaporite influenced subsoils.

2.4 HYDROLOGY AND HYDROGEOLOGY

Near-surface impermeable Permian claystones, low rainfall, and an absence of a distinct drainage system have resulted in numerous shallow perched isolated saline water tables throughout the lower Yorke Peninsula. They are exposed as common scattered ablated salt lakes. Low lying areas where the soils are clayey are swampy after rain.

2.5 NATIVE VEGETATION AND WILDLIFE

Intensive wheat and barley cropping has left only very small patches of native vegetation which occur as scattered remnants in the region, mostly on road reserves and coastlines. They consist of Mallee scrub or as isolated Acacia. Wildlife remaining in the immediate area of the wellsite is mainly occasional visiting native bird species, with raptors evident (nankeen kestrels and small hawks). Regular ploughing and spraying has removed most food sources and habitat. Native sedges and reeds survive in the ephemeral unploughed swamps in spite of grazing. The site is located away from swamps and away from Mallee hedgerows (see photographs figures 4 and 5).

2.6 WELLSITE

2.6.1 Topography

The wellsite is located on almost level ground (see figures 4 and 5). Elevation at the wellsite is 14m ASL. The ground slopes gently away from the wellsite. The wellsite area is dry and is approximately 3m above the level of ephemeral swamps in the area. The nearest ephemeral swampy ground is 400m east of the wellsite at the head of a poorly developed broad drainage feature. The nearest saltpan is 1.0km from the wellsite. The site is not flood prone. The landholder advises that the site has not been flooded in the 26 years he has worked the land.

2.6.2 Soil and Surficial Geology

The wellsite soil is a thin sandy calcareous loam 0.3m to 0.6m thick overlying a 1m to 2m thick very hard bouldery kunkar limestone developed in thin Tertiary gravel and clay on Permian sandy claystone. The soil is porous and stable. There are no steep slopes in the vicinity of the wellsite and heavy rain will not cause erosion.

2.6.3 Aboriginal Heritage

Representatives of the Narungga people will carry out a site inspection prior to earthmoving operations starting. The Department of State Aboriginal Affairs and Department for Environment and Heritage will be consulted.

2.6.4 European Heritage

There are no sites of European heritage at or near the wellsite.

2.6.5 Local Community

The wellsite is located adjacent to a gravel road 10km from the regional centre Yorketown and 3km from the small coastal community of Port Moorowie. The road is not a major thoroughfare. There will be moderate road use by large trucks over very short periods during pad construction and drill rig mobilisation and demobilisation. The roads are wide, well paved with limestone and are of low dust nuisance. There will be minor vehicle movements on the local roads during and after daylight hours. The wellsite is not visible from Yorketown or Port Moorowie and will not impact on these communities. The nearest occupied dwelling is 900 metres from the wellsite and is not visible from the wellsite. The drilling rig will be visible from local roads. This impact will be transient.

3 ENVIRONMENTAL RISKS ARISING FROM PROPOSED ACTIVITIES

Possible risks, their avoidance or amelioration, and environmental objectives to be pursued during operations are summarised for risk level in Table 2 and for management in Table 3. The objectives and risk management procedures listed in Table 3 form the basis of the SEO.

Because the wellsite is on regularly ploughed and cropped flat farmland, the risk to the natural environment is very low. Also, the ploughed site makes it most unlikely that cultural materials are still present intact. There are no dams or bores in, or adjacent to, the wellsite. There are no known aquifers. Principal risks are vehicle accidents and minor oil spills. The degrees of risks from the proposed operations are summarised in Table 1 below. The absence of any native vegetation at the annually ploughed wellsite location minimises the likelihood of any endangered or threatened species of flora or fauna.

**TABLE 2.
ENVIRONMENTAL RISK LEVEL**

Potential Risks relating to:	Specific Aspect	High Concern	Low Concern	No Risk
1. Cultural heritage	Cultural Heritage		*	
2. Flora and fauna	Native vegetation			*
2. Flora and fauna	Native fauna			*
3. Weeds	Weed/disease introduction		*	
4. Soil impacts	Topsoil	*		
5. Erosion	Wind erosion			*
6. Aquifer pressures	Aquifer isolation		*	
7. water and groundwater impacts	Confined aquifer contamination		*	
	Groundwater or unconfined surface aquifer pollution and contamination		*	
	Surface water pollution	*		
	Natural drainage	*		
	Flooding			*
8. Land access, landholders	Land use impairment	*		
9. Public risks	Spills, safety, dust, traffic dealt with under other objectives, below			
9. Public risks	Visual impact		*	
10. Waste control 12, 13. Oil spills	Waste/minor oil spills	*		
11. Livestock	Farm stock		*	
14. Dust	Road safety/dust	*		
15. Noise	Noise		*	
16. Vehicle movement	Vehicle movement	*		
17, 18. Fire	Fire		*	

3.1 RISKS FROM WELLSITE CONSTRUCTION

3.1.1 Vehicle Movement

Trucks carrying paving material from the source stockpile to the wellsite and trucks carrying water to the wellsite have the potential to cause a dust hazard and to damage road pavement. The trucks also have the potential to cause a hazard to other road users. Trucks and tractors constructing the wellsite also have the potential to cause local excessive noise and dust, and to compact soils immediately adjacent to the drill pad area. Vehicles which have moved through areas of seeding weeds have the potential to introduce these to the wellsite area. The heavy vehicles may also damage pasture in the vicinity of the wellsite. Although at the time of this documents compilation there were no stock in the vicinity of the wellsite, there is the possibility of stock (sheep) disturbance. Refuelling of equipment has the potential for minor fuel spills to contaminate the soil. Malfunctioning exhaust systems and discarded cigarette butts have the potential to cause grass and crop fires which are a hazard to human life, stock and crops.

3.1.2 Introduced Materials

Significant volumes of crushed limestone will be laid on the site and compacted as paving. This has the potential to prevent rainfall from penetrating the underlying soil and of causing erosion on runoff. On abandonment of the site, limestone paving material left behind may impede future crop growth. There is the potential for the introduction of weeds if the paving material source is contaminated. Rehabilitation of the sump has the potential to distribute used drilling fluids over and away from the site, and although non-toxic in this instance, may affect the pH of the soil.

3.1.3 Interference to Topsoil and Natural Drainage

At the wellsite a thin sandy calcareous loam overlies bouldery kunkar limestone. There is a risk of dragging boulders to the surface which if left there will cause damage to farming equipment during future ploughing and sowing. The wellsite has a very minor slope from a low relief high point 200m to the east across a roadway. Without minor culvert construction it is remotely possible that very heavy rains could cause some flooding as surface runoff water flows across the site. Rainwater runoff could accumulate beside the paved area. Site construction vehicle wheel tracks in soft recently ploughed soils could form poorly directed drainage channels.

3.1.4 Risk to Natural Vegetation and Native Fauna

The wellsite is located in a crop rotation paddock which is regularly ploughed. All natural vegetation has been removed from the vicinity of the wellsite (see figures 4 and 5). No native fauna have been seen in the area. The risk to natural vegetation or native fauna is accordingly minimal.

3.2 RISKS ARISING FROM DRILLING OPERATIONS

3.2.1 Risk to Aquifers and Groundwater

Aquifer and cross-aquifer contamination can occur in a bore hole. The drilling fluids used will be non-toxic. There are no known shallow artesian or fresh water aquifers in the area. A 10m deep well was dug 150m from the wellsite but was abandoned for lack of pumpable water volume and high water salinity. Previous drilling in the Stansbury Basin has not incurred significant circulation losses in upper portion of holes where

utilisable aquifers may occur. Incompletely cemented casing risks cross-aquifer contamination and possible flow to surface of artesian aquifers. There is a risk that spillages of chemicals, fuel, lubricants, etc. may contaminate any surface and near surface groundwater and aquifers.

3.2.2 Risk to Community

The wellsite is located 100m from a public road and will be clearly visible to the public. Unauthorised non-inducted people may attempt to access the wellsite. There will be 2 short periods of high road use as large trucks mobilise and demobilise the drill rig and other equipment through the region. The drilling contractor will be required to comply with all District Council, traffic authority and police permitting requirements. Continued local vehicle movement on roads, such as water truck, can create a safety hazard and a dust nuisance. Drill rig and water truck engine noise may be discernable to any nearby residents and their animals. The only nearby occupied dwelling is 900m from the wellsite, well within hearing distance for heavy diesel engines. Lighting at the site has the potential to disturb nearby residents. A treed area adjacent to the only nearby occupied dwelling forms an effective screen. Flaring may cause a grass fire and thus be a threat. Grinding and welding equipment can cause fire. If there is dry grass then there is the potential that sparks from faulty equipment and cigarette butts may start a grass fire.

3.2.3 Waste Risks

Improper management of human waste and rubbish can result in a health risk and soil contamination. Spillage can occur during transfer of septic waste from septic tanks. Improperly contained food waste will pose a health risk. Improperly secured empty containers and drilling fluid bags can be blown around and off the wellsite area.

3.2.4 Risks From Fuel, Oils, Drilling Fluids, Chemicals, Radioactive Sources, Sump

Any poorly maintained leaking fuel and lubricant hoses and containers will contaminate the site. Damaged drilling fluid containers/bags are also a risk. The delivery and associated unloading/transfer of fuels, lubricants, chemicals and drilling fluids presents a risk of spillage. Heavy rain or flooding can flood the sump and result in the contents flowing out of the sump. Radioactive sources pose a contamination threat if not properly stored and handled. Radioactive sources lost in hole can contaminate the hole.

3.2.5 Drilling Operations Risks

Unplanned emissions of hydrocarbons, hydrogen sulphide, overpressured fluids, from the well, including blow out, can cause significant environmental damage by fire and by contamination. Oils recovered by drill stem testing and flaring have the potential to contaminate the local environment if not correctly handled and disposed of. In the event of any well testing and flaring during the fire season the presence of a CFS unit will be requested. If the well is plugged and abandoned, a failure to isolate any aquifers or permeable zones in the well can lead to contamination or flow from the well.

3.2.6 Risks Arising From Initial Production Testing

The primary risks to the natural environment from production testing relate to oil production, not gas. Gas production, with gas flared off, poses little risk provided flare and flare pit are constructed appropriately and surrounded by a suitable fire break. Initial production tests will use the same pads and access as for drilling, with the same

construction risks. Oil produced on initial production testing will be conducted to a special tank or road tanker via production line. The primary risks are:

- Spills resulting from leaks in production line and valves,
- Catastrophic failure of storage tank, including fire
- Spills due to overflow of storage tank
- Spills during loading and road transportation of storage tanker
- Impacts of spills extending downslope beyond the initially affected area
- Hydrocarbon pollution of soil or natural waters.

3.4 RISKS ARISING FROM SITE REHABILITATION

3.4.1 Risk to Soil Quality and Original Drainage

Paving material left at the site has the potential to reduce the soil quality for crop production and to reduce the penetration of rain. Boulders of kunkar limestone left at the surface may damage farming implements. A failure to restore the original topography and drainage can result in erosion of the site and surrounding area. Used drilling fluids and drill cuttings have the potential to degrade the soil quality. Untreated oil and fuel spillages, if left in contact with the soil can contaminate the soil and reduce crop production. Distribution of subsoil over topsoil will result in a deteriorated soil quality.

3.4.2 Risk of Rubbish Contamination

Any rubbish, including plastic bags and cigarette butts left at the site create visual pollution and are a threat to stock.

3.4.3 Other Risks

Site rehabilitation vehicular movements pose the same risks as those described in 3.1.1. above. Fire risks are similar. Casing, wellhead equipment, etc., left on the well can pose a risk to stock or to unauthorised persons interfering with the well.

3.5 RISKS TO ABORIGINAL AND EUROPEAN CULTURAL HERITAGE

There is a risk of damage or interference to any nearby sites of significance to Aboriginal Peoples. Damage can occur to items of European cultural significance such as buildings, monuments or significant trees.

4 MANAGEMENT OF ENVIRONMENTAL RISKS

Possible risks to the environment are described in section 3 above. Section 4 outlines how these possible risks will be managed to prevent their occurrence or minimise their impact. Table 3 Risk Management and Procedures, details potential impact, risk source, risk management procedures and environmental objectives.

4.1 WELLSITE CONSTRUCTION

4.1.1 Vehicle Movement

Warning signs will be positioned on the public road 200m on either side of the entry to the wellsite. District Council requests regarding signage will be followed. The few local resident farmers will be individually notified in advance when truck movements are to commence. Notices will be placed in the local newspaper and the topic will be covered in a meeting with the local community.

The last four kilometres of the road from Yorketown is paved but unsealed. The road is wide and paved with crushed kunkar which forms a very hard surface yielding very limited dust. Paving material will be sourced from a nearby commercial quarry. In the interests of public safety, trucks carrying paving material from a quarry to the wellsite and possible water trucks will be instructed to drive at a maximum speed of 50kph on the unsealed section of road. This will also minimise pavement damage and risk of vehicular damage. If road dust becomes a concern then a water truck will be used to settle the dust. All necessary permits will be obtained for trucks transporting construction equipment and paving materials.

If the paving being laid on the drill pad is very dry and dusty a water truck will be used to reduce dust and assist compaction.

Excessively noisy construction equipment will not be used. Trucking and wellsite construction will only be carried out during daylight hours.

A specially constructed perimeter fence will prevent trucks and tractors constructing the wellsite from moving onto and compacting soils or damaging crops adjacent to the area.

Construction vehicles will be inspected for signs of weeds and seeds and cleaned if found. Any vehicles showing any dirt on wheels or suspension will be washed with a disinfectant to kill any Phytophthora.

The wellsite perimeter fence will protect stock (sheep) from serious disturbance. Although at the time of this document's compilation there were no stock in the vicinity of the wellsite, there is the possibility of stock disturbance.

Refuelling equipment will be regularly checked to ensure that there are no leaks. Spill cleanup materials will be onsite so that any minor spills can be immediately treated.

Grass fire risk will be minimised by the construction of a 10m wide ploughed fire break around the wellsite and access track perimeters. Vehicles will not be permitted to drive over dry grass. Vehicles and equipment with malfunctioning exhaust systems will not be allowed onsite. Smoking will not be allowed removing the possibility that discarded cigarette butts could cause fire.

Secure gates will be positioned on the roadside fence across the wellsite access and will be kept locked when there is no construction activity.

4.1.2 Introduced Materials

Rainfall runoff from the paved drill pad will be carefully directed off the wellsite area so as to prevent the development of erosional channelling down slope. On abandonment of the site, the limestone paving material will be removed and returned to the source stockpile, except where it is required for further development/production or needed by the landholder. The paving material source stockpile consists of clean weed free limestone material and clean equipment will be used to load, transport and lay the material.

4.1.3 Interference to Natural Drainage and Soil Profile

There are no creeks or natural drainage channels in the immediate vicinity of the wellsite. The wellsite will be constructed to minimise interference with natural surface runoff. Culverts and other drains will be constructed to divert any surface runoff after heavy rains around the site area. Site construction vehicle wheel tracks in soft recently ploughed soils will be removed to avoid the development of poorly directed drainage channels.

Care will be taken to minimise bringing boulders of the subsoil kunkar limestone to the surface. Any boulders will be stockpiled for return to the subsoil during site rehabilitation or they will be removed from the site. Soil moved for sump and other construction will be carefully stockpiled for redistribution during rehabilitation.

4.2 DRILLING OPERATIONS

4.2.1 Aquifers and Groundwater

Although no utilisable aquifers are known in the immediate area, care will be taken to ensure that the conductor and 13 3/8" surface casing are cemented to surface. The 9 5/8" casing string will be cemented back into the 13 3/8" casing. Any aquifers/permeable zones identified during drilling of the 8 1/2" hole will be isolated by cement plugs on abandonment of the well or by casing cemented for production.

Chemicals, fuel, lubricants, etc., which may contaminate any surface and near surface groundwater and aquifers, will be stored in their product drums within a suitable container located in a bunded area. A spill clean-up kit will be located in this area. Transfer/unloading of potential contaminants will be carried out according to industry accepted procedures to minimise risk of spillage. All runoff from the drill pad will be directed into the sump.

4.2.2 Community Risk Management

Because the wellsite is located 100m from a public road and will be clearly visible to the public, access to the wellsite will be strictly controlled. Signs prohibiting unauthorised entry will be erected at the public road fenceline at the start of the wellsite access track. The wellsite office and car park will be located beside the access track on the road side of the drill pad. Gates at the start of the access track will be kept locked during any periods of low activity. The wellsite will not be left unattended when plant is on site. Unauthorised non-inducted persons will be refused entry.

Local farmers/residents, the Shire Council and police will be warned immediately prior to the movement of large trucks during rig mobilisation and demobilisation. Notices will be placed in the local newspaper and the topic will be covered in a meeting with the local community to be arranged by the Liaison Person. Heavy vehicles will be diverted around

town centres wherever feasible. Road signage as in 4.1.1 above will be maintained. A 50kph speed limit will be imposed on unsealed roads. All necessary permits will be obtained for trucks transporting drilling and other equipment. Local people and the Shire council will also be notified of regular truck movement on roads, such as a water truck.

Contractors will be instructed that all vehicles, large and small will be restricted to 50kph within a 3km radius of the wellsite. These precautions will significantly reduce dust hazard and general safety.

The nearest farmhouse is 900m from the wellsite and drill rig noise will be partially shielded by a stand of trees near the farmhouse. Where possible transportables needed at the wellsite will be placed between the drill rig and the farmhouse as a noise barrier. The treed area adjacent to the only nearby occupied dwelling will form an effective screen from rig lighting.

Grass fire hazard will be controlled by a 10m wide firebreak constructed around the flare pit, the entire wellsite and the access road. Mechanical equipment and all vehicles will be carefully checked for fire hazard resulting from faults including faulty exhaust systems. Vehicles will not be permitted to drive over dry grass. If drilling operations are conducted during a high fire danger period, a fire unit consisting of a trailer with water tank, pump and hoses, will be on standby at the wellsite. Use of grinding and welding equipment will not be permitted off the paved lease pad area. A CFS fire station is located at Yorketown, 10km from the wellsite. The local CFS will be fully briefed on the operations. Smoking will be banned at all times. Contractors housed off site will be briefed on pro-community behaviour.

4.2.3 Waste Management

Septic tanks will be pumped by an accredited waste management contractor to avoid any spillage. General non-toxic waste will be placed in proper waste skips for collection by a waste contractor. Any toxic wastes will be stored in the correct clearly marked sealed containers and disposed of according to State government and District Council regulations. A clean completely rubbish free policy will be implemented. Wellsite cleanliness and waste disposal will be included in Induction procedures.

4.2.4 Fuel, Oils, Drilling Fluids, Chemicals, Radioactive Sources, Sump

Fuel and lubricant hoses and containers will be regularly checked for signs of wear. A designated Hazchem chemicals banded storage area will be clearly identified. Where feasible containers will be kept on polythene liners to prevent any minor spills from contaminating the soil and to allow for proper cleanup. A quantity of suitable absorbent materials will be kept on site for cleanup of any spills. Contaminated soil and cleanup materials will be placed in approved clearly marked containers for proper disposal. Drainage from storage areas will be directed to the lined sump. Drilling fluid containers/bags will be stored away from risk of damage. Radioactive sources will be stored and handled strictly in accordance with the Regulations. Any tools containing radioactive sources lost in the hole will be secured by a cement plug. Rig and campsite generators will have collection trays or liners for collection of any leaks. Care will be taken to avoid damage to the sump liner that may allow the contents to contaminate the area. Some of the earth removed during construction of the sump will be used to form a raised berm around the sump to prevent runoff following heavy rain from flooding the sump.

4.2.5 Drilling Operations

All drilling related operations will be carried out according to Regulations and to approved procedures designed to protect personnel at the site and the general public. Drilling operations will be conducted according to an approved Drilling Operations Manual. The rig will be equipped with fully functional and regularly tested blow out preventers. Unplanned emissions of hydrocarbons, hydrogen sulphide, overpressured fluids, from the well, including blow out, which can cause significant environmental damage by fire and by contamination, are covered by Emergency Response Plan and other procedures. The local CFS and Emergency Services will be involved to an extent which will be detailed in the Emergency Response Plan. If the well is plugged and abandoned, any aquifers or permeable zones in the well will be isolated by cement plugs to prevent contamination or flow from the well.

4.2.6 Well Testing

Testing of hydrocarbons may be carried out during drilling operations. Up to three drill stem tests may be conducted. A drill stem test may produce up to 50 barrels of oil which will be transferred to a special storage tank. Depending on the volumes involved, any oil recovered will either be burnt or be trucked to a oil refining facility. Drill stem tests may recover formation waters and these would be disposed of into the sump. Minor oil produced during any flaring will be burnt.

4.2.7 Initial Production Testing

Initial production testing may produce up to 400 barrels of oil. This oil will be transferred from the well to a special storage tank or road tanker via a production line which will be tested for leaks prior to use. The storage tank will be inspected for structural integrity and potential leaks before transport to the site and at the site prior to use. Fire extinguishers will be located close to the tank during testing. Oil levels in the storage tank will be continually monitored during the production testing to avoid overfilling and spillage. The storage tank will be in a bunded area to contain any minor spillage from moving away from the area and polluting soil and natural drainage.

4.2.8 Serious and Reportable Incidents

Section 85(1) of the Petroleum Act defines a "serious incident" to mean:

"an incident arising from activities conducted under a licence in which-

- (a) a person is seriously injured or killed; or
- (b) an imminent risk to public health or safety arises; or
- (c) serious environmental damage occurs or an imminent risk of serious environmental damage arises; or
- (d) security of natural gas supply is prejudiced or an imminent risk of prejudice to security of natural gas supply arises."

Under Regulation 12(2) of the Petroleum Act, the events listed below are considered to be those which could arise and, if not properly managed or avoided, cause a serious incident:

- Explosion or fire at the well facility;
- Failure of containment systems resulting oil spillage beyond confines of well site or into ground water or surface water bodies;
- Transportation accident involving oil spillage;

- Transportation accident resulting in fire;
- Disturbance to sites of Aboriginal heritage significance;
- Removal of rare or endangered native vegetation.

Pursuant to Regulation 12(2) of the Act, the events listed below are considered to be reportable incidents under Section 85(1) of the Act:

- Non-compliance with procedures defined or developed to implement environmental objectives
- Spills of oil outside bunded and other defined areas intended to contain spillages
- Evidence of oil in disposed formation water
- Landowner complaints in regard to operations
- Other non-compliances with SEO objectives as indicated by assessment criteria.

4.3 SITE REHABILITATION

4.3.1 Soil Quality and Original Drainage

Should the landholder obtain the necessary local council approvals to use all or part of the paved area, then restoration will be completed to meet the landholders approved requirements, without interference to the natural drainage. Should the well be completed for production then the site will be restored so as to leave sufficient pad and access required for a production licence. If the well is plugged and abandoned as a dry well and the landholder does not seek to use the paved area, all paving material brought to the site will be removed. The sump will be rehabilitated by allowing the contents to dry, and then covering the sump material with a layer of kunkar limestone rubble subsoil. Previously stockpiled topsoil will then be carefully spread over the kunkar to reform the sump area to the original soil profile. The evaporative climate and the natural highly permeable structure of the soil and subsoil will facilitate in the rehabilitated sump area.

The original topography/slope of the wellsite will be restored and the topsoil evenly redistributed across the disturbed area to ensure that the original drainage and cropping potential are restored. Boulders of subsoil kunkar limestone will not be left at the surface. They will either be rolled into the soil as is common farming practice, or removed from the land for crushing as road paving. A final shallow ploughing will be carried out to ensure soil aeration and permeability. A crop will then be sowed for additional soil stabilisation.

4.3.2 Rubbish Contamination

A rubbish free wellsite policy should result in no rubbish to cleanup. A very thorough inspection will be carried out at the completion of each stage of rehabilitation to ensure that that no rubbish of any kind remains.

4.3.3 Other Risks

Rehabilitation vehicular tracks will be removed by ploughing the wellsite area. Grass fire precautions will be the same as for wellsite construction. Any casing cap or wellhead left on the well above ground level will be in accordance with the Regulations and be so

constructed as to present no safety hazard to farming machinery, livestock, or to unauthorised persons interfering with the well.

4.4 ABORIGINAL AND EUROPEAN CULTURAL HERITAGE

The Naïve Title Unit has been contacted and representatives of the Narungga people will carry out a site inspection prior to site preparation. No features of traditional significance will be interfered with. The relevant government department and Aboriginal Group will be immediately notified should any indications of possible items of traditional significance be discovered during operations. The Department of State Aboriginal Affairs and Department for Environment and Heritage will be consulted if cultural aspects of any area are in doubt. There are no features of European cultural significance in the vicinity of the wellsite.

4.5 MANAGEMENT AND TRAINING

4.5.1 Management

David M Schuette as PEL 73 licensee and Operator of PEL 73 and petroleum well Gravestock-1, carries overall responsibility for this Environmental Assessment Report and for the implementation of the Statement of Environmental Objectives. David M Schuette will appoint a Drilling Supervisor who will have onsite responsibility for the execution of the drilling plans and supervision of all onsite contractors. The Drilling Supervisor will be responsible for the implementation of management of environmental risks during drilling operations. The Drilling Supervisor will report to the Operations Engineer. The Operations Engineer will report to the Exploration Manager / Liaison Person. David M Schuette has appointed Mr. Griff Weste as his Exploration Manager / Liaison Person.

4.5.2 Training

The Drilling Supervisor will be responsible for the appropriate environmental and other induction of all personnel, contactors and all other persons who access the drilling operations. Environmental induction will be part of a general induction process also including safety procedures and which will include a record of induction to be signed by all inductees.

TABLE 3		RISK MANAGEMENT AND PROCEDURES	
ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACT	RISK SOURCE	RISK MANAGEMENT PROCEDURES
1. Avoid disturbances to known sites of Aboriginal and European heritage significance.	Disturbance to sites of Aboriginal significance	Wellsite construction	Liaise with relevant Aboriginal organisations. Site inspection by people with traditional responsibility. Avoid any identified areas of significance.
2. Avoid disturbance to rare, vulnerable and endangered flora and fauna species.	Loss of natural habitat	Wellsite construction Vehicle movements Fire	Locate wellsite where natural habitat already lost. Ensure that vehicles travelling to and from site do not damage any roadside vegetation. Adequate grass fire prevention.
3. Prevent the introduction and establishment of weed species.	Importation of weeds or soil pathogens on equipment	Wellsite construction, vehicle movement, earthmoving	Source paving materials from sites free of weeds. Perimeter fence to protect stock. Disinfect any dirty vehicles on arrival.
4. Minimise impacts to soil.	Physical damage to topsoil,	Wellsite construction	Minimise movement of soil during drill pad construction. Where possible lay paving on top of topsoil. Stockpile any topsoil moved, for later redistribution. Avoid disturbance of subsoil. Limit area of soil compaction by restricting vehicle movements off the drill pad area and access track. Plough wheel tracks and other off-pad topsoil disturbance at completion of construction phase. Site rehabilitated to original condition as required by landowner
	Loss of productivity of land	Area of land affected	Use only that area of land needed for safe and effective conduct of operations. Pave only that area needed for safe effective operations.

TABLE 3		RISK MANAGEMENT AND PROCEDURES	
ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACT	RISK SOURCE	RISK MANAGEMENT PROCEDURES
		Period of occupation Loss of fertility Inadequate rehabilitation	Rehabilitate site as soon as feasible after completion of operations. Careful preservation of soil structure. Careful stockpiling of any topsoil removed for excavations. Avoid soil compaction where possible. Avoid soil erosion. Avoid soil contamination. Removal of paving materials. Removal of any kunkar limestone brought to surface. Careful redistribution of any stockpiled topsoil. Aeration of soil by ploughing.
		Site rehabilitation	Careful removal of paving material. Careful backfilling of sump, septic tank pits, flare pit. Redistribution of any stockpiled topsoil. Restoration of original topographic profile. Restoration of original drainage pattern. Removal of any kunkar limestone boulders. Final light ploughing of site to aerate soil. Sow crop to stabilise soil.
5. Avoid initiating erosion on shallow limestone soil substrates	disruption to natural drainage, erosion	Wellsite construction	Locate wellsite on most level site possible. Locate wellsite away from swampy ground. Construct culverts to divert surface runoff from adjacent areas from entering the wellsite, but in such a manner so as not to induce the development of downslope erosion channels. Site rehabilitated to original condition as required by landowner
		Drilling operations	Restrict vehicle movement off pad area and access track by construction of a perimeter fence. Direct all drainage/runoff from paved area into lined sump.

TABLE 3	RISK MANAGEMENT AND PROCEDURES		
ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACT	RISK SOURCE	RISK MANAGEMENT PROCEDURES
6. Minimise loss of reservoir and aquifer pressures.	Pressure loss	Drilling operations	Isolate and seal off potential aquifers behind casing cemented to surface or back into previous casing string. In open hole, isolate aquifers / permeable zones with cement plugs.
7. Avoid contamination of aquifers; minimise impacts on surface water.	Contamination of aquifers	Drilling, testing	Use environmentally friendly drilling fluids. Case off any aquifers with cemented casing. Isolate multiple aquifers with cement plugs.
8. Conduct all operations relating to land owners and access to land according to the Act.	General interference to Landholder	All operations.	Considerate attitude and consultation by Liaison Person. Ready availability of access Liaison Person. Open but non-intrusive communication. Follow PIRSA guidelines and Regulations under the Petroleum Act. Rapid settlement of compensation for losses. Advance notice of vehicle movements and wellsite operations. Landholder access to inspect operations.
	Interference to nearby residents	Vehicle movements	Consultation by Liaison Person. Advance notice of vehicle movements and wellsite operations. 50kph speed limit. Dust minimisation with road watering when necessary. Warning signs on roads. Avoid engine braking and excessively noisy vehicles.
9. Minimise public, employee and third party risk			Use nearby source of paving material. Cart paving material only during daylight hours. Lockable gates and signs prohibiting unauthorised entry at entrance to wellsite. Compulsory induction of all persons prior to entry to operations.
		Personnel housed off site.	Promote pro-community behaviour.
10. Minimise impact of waste handling and disposal.	Waste mismanagement	General rubbish Waste drilling	Site cleanliness as part of compulsory induction process. Adequate distribution of lidded properly labelled general waste containers. Rubbish skips with lids.

TABLE 3		RISK MANAGEMENT AND PROCEDURES	
ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACT	RISK SOURCE	RISK MANAGEMENT PROCEDURES
		fluids and cuttings Waste lubricants Human waste Waste left behind	Adequate sized properly constructed sump to hold waste from well. Allow sump to dry prior to rehabilitation. Waste lubricants to be stored in the correct properly labelled containers. Waste lubricant containers to be disposed of according to Sate and Local Government regulations. Septic tanks to be correctly emptied and cleaned and removed contents taken to disposal facility. Careful check of wellsite area for waste immediately prior to site rehabilitation. Careful inspection of area for missed waste post rehabilitation.
11. Avoid adverse impacts on livestock.	Stock disturbance	All activities	Perimeter fence to isolate sheep from wellsite
12. Avoid spills of oil or hazardous material outside areas designed to contain them;	Contamination of topsoil, surface water, groundwater	Wellsite construction Drilling and testing	Check all earth moving mechanical equipment for oil leaks. Check fuel and lubricant storage and delivery systems for potential leaks. Locate fuels and lubricants such that any leaks are most easily treated. Restrict movement of equipment to wellsite area. Have spill cleanup material onsite. Significant volumes of oil recovered by testing to be placed in suitable stock tanks.
13. In the event of a spill, minimise further impacts		Drilling and testing operations	Proper coverage of contamination in induction procedures. Store all fuel, lubricants, chemicals, radioactive sources appropriately in safe areas. Clearly identified Hazchem chemical storage area. Store potentially contaminating materials in bunded areas. Rig and camp generators to have spill trays or liners to contain leaks. Have spill cleanup material in clearly identified locations close to potential contaminants. Clearly marked approved containers for contaminated soils and cleanup materials.

TABLE 3		RISK MANAGEMENT AND PROCEDURES	
ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACT	RISK SOURCE	RISK MANAGEMENT PROCEDURES
			<p>Production testing tubing and storage tank to be inspected prior to use. Production testing oil tank underlain by polythene in separate bunded area. All drill pad runoff directed into sump. Sump protected from flooding by earth berm. Follow approved drilling operations and safety procedures to avoid/control unplanned emissions from the well. Use pressure control drilling including blow out preventers. Cement in hole any radioactive tools irretrievably lost in hole.</p>
		Site rehabilitation	<p>Fuel storage and refuelling checks as above. Thoroughly check pad for any contamination areas and remove before removal of paving. Restore original soil profile over dried out sump. Avoid spillage during pumping and removal of septic tanks.</p>
14. Control dust on roads and drilling lease areas	Vehicle generated dust	Construction and well operations	Unpaved roads are kunkar with minor dust generation capability: water truck used when necessary.
15. Control noise	Heavy vehicles, rig noise	Construction and well operations	Wellsite construction only during daylight hours.
16. minimise inconvenience to the local community from vehicular movements.	General interference to local community	<p>Drill rig moving through the local community.</p> <p>Wellsite operations.</p> <p>Water truck.</p> <p>Carting of paving material</p>	<p>Wellsite located away from and out of sight from community centres. Consultation with Yorke Peninsula District Council. Consultation / meeting with local community. Heavy vehicles to detour around town centre. Place notices in local newspaper advising of community meeting, heavy vehicle movements, commencement of drilling operations. Consultation with residents in the vicinity of the wellsite. Obtain all statutory approvals. Advise local police, CFS, ambulance, hospital of activities and their timing. Local community access to Environmental Impact Report and to Statement of Environmental Objectives.</p>

TABLE 3	RISK MANAGEMENT AND PROCEDURES		
ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACT	RISK SOURCE	RISK MANAGEMENT PROCEDURES
			<p>Ready availability of “Liaison Person”.</p> <p>Heavy vehicles avoid school bus route/times.</p> <p>50kph speed limit on unsealed roads.</p> <p>Warning signs on roads in immediate vicinity of wellsite.</p> <p>Careful briefing of drilling and transport contractors.</p> <p>Assist local community by use of local services, employment, etc. where feasible.</p>

5 REFERENCES

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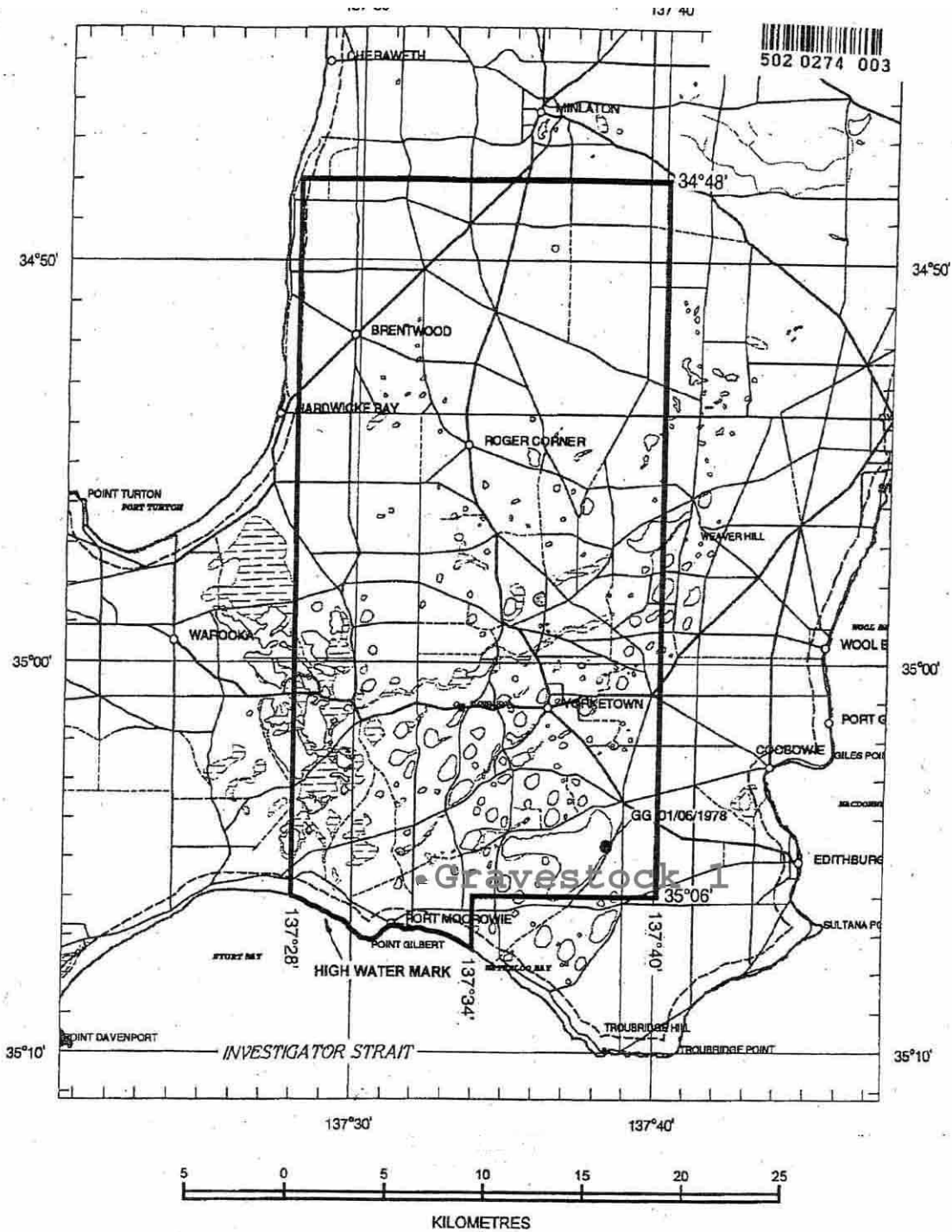
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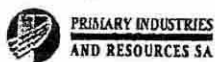
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NOTE: There is no warranty that the boundary of this licence is correct in relation to other features on the map. The boundary is to be ascertained by reference to the Australian Geodetic Datum (AGD66) and the Geocentric Datum of Australia (GDA94) and the schedule.

THE PLAN HEREINBEFORE REFERRED TO
DAVID M SCHUETTE
PETROLEUM EXPLORATION LICENCE NO. 73



SR 27/2/188

AREA: 625 sq km (approx)

FIGURE 1. PEL 73 AND GRAVESTOCK 1

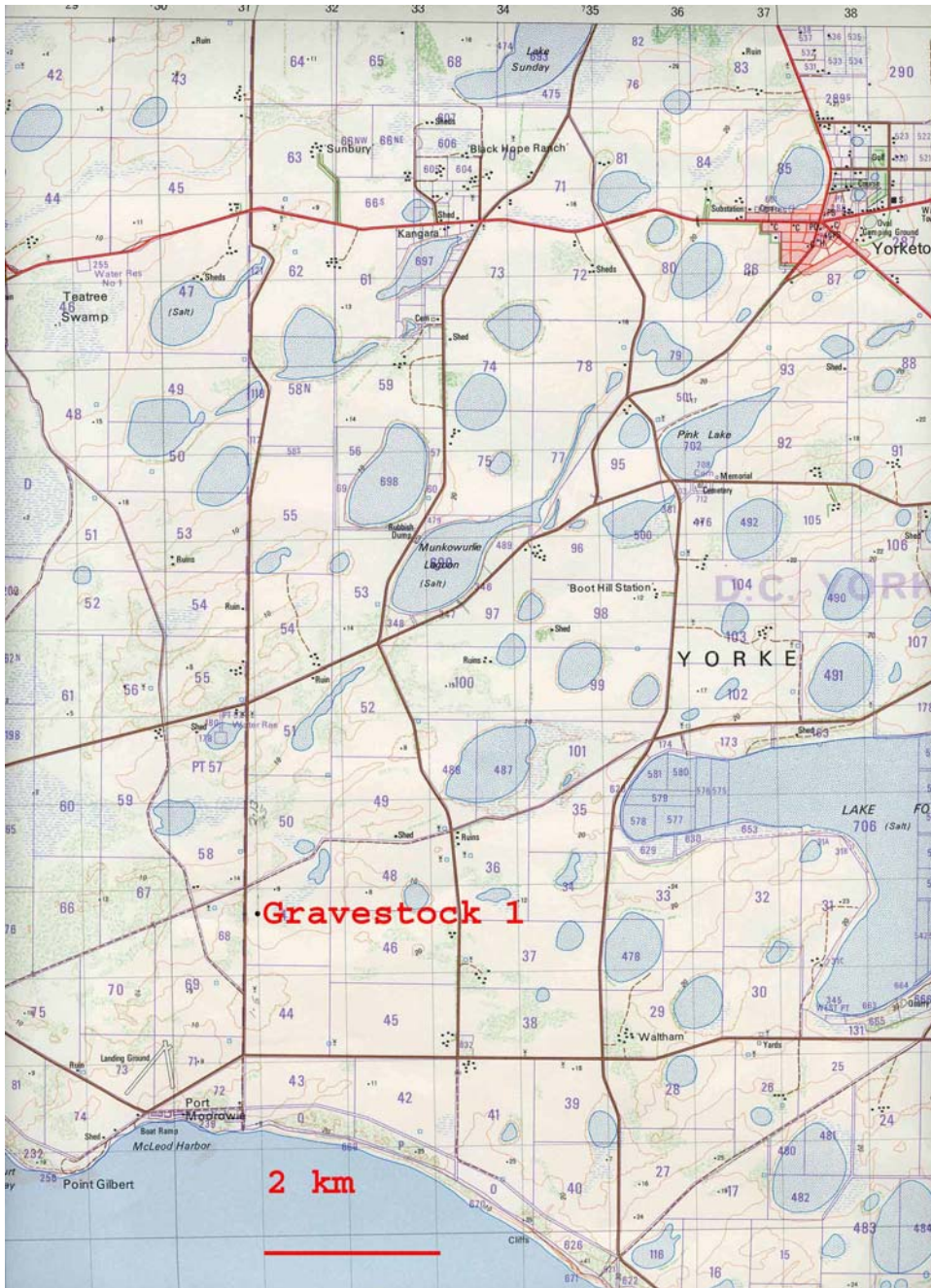


FIGURE 2. GRAVESTOCK 1 TOPOGRAPHIC MAP



FIGURE 3. GRAVESTOCK 1 AIR PHOTO



FIGURE 4. GRAVESTOCK 1 PANORAMA (180 degrees)



FIGURE 5. GRAVESTOCK 1 WELLSITE