DECLARATION OF ENVIRONMENTAL FACTORS & ENVIRONMENTAL IMPACT REPORT

PROPOSED PETROLEUM EXPLORATION DRILLING BY STUART PETROLEUM NL AT ACRASIA 1 (27° 14' 3.94" S 140° 59' 43.21" E)

Prepared for

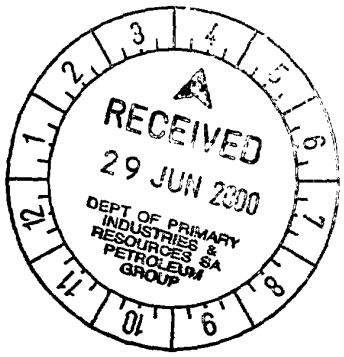
Stuart Petroleum NL

by

Fatchen Environmental Pty Ltd

Adelaide, June 2000

SP-00-01



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1. PROPOSED ACTIVITIES

1.1 Location and access

Stuart Petroleum NL proposes drilling within the Cooper Basin at Acrasia 1 (27° 14' 3.94" S 140° 59' 43.21" E), approximately 3.8 km ENE of the suspended Reg Sprigg 1 well, at the intersection of REG880 and cross-line 1360 of the Reg Sprigg 3D seismic survey.

It is further proposed to utilise the existing Reg Sprigg rig access track, of some 10 km from the Innamincka-Cordillo public road to Reg Sprigg 1 well, and to construct a further 4 to 4.5 km of rig access track from the Reg Sprigg 1 pad to the proposed Acrasia 1 site.

1.2 Wellsite requirements

1.2.1 Pad and sump

The wellsite will require a level and firm pad for the rig and camp, with a combined total area of about 1 ha. The camp does not necessarily have to share the same pad as the rig.

The site is conducive to providing a level and firm pad for much of the intended use by simply rolling the gibber pavement. However, at least part of the pad will require a consolidated clayed surface to support intensive and heavy use. Options for this are use of imported material, or use of borrow from the drilling sump.

A single large drilling sump, of some 28m by 31m, will be required to confine cuttings and drilling muds. Minor earthworks will be needed to provide for loading bays and septic pits. No sump or pit will be in a location subject to major overland flows, and sump and pits may be provided with small encircling bunds to divert minor run-on.

1.2.2 Water supply

Water supply has not yet been determined. It may be possible to utilise shallow-aquifer bores by arrangement with Innamincka Station. Alternatively, the Reg Sprigg 1 water bore may be relocated.

1.3 Drilling

1.3.1 Responsibilities

Stuart Petroleum's nominated representative will be responsible for supervision of the initial site preparation, enforcement of vehicle movement limitations, tidiness and cleanliness of the site and access, and supervision and documentation of remediation works. The drilling contractor will have responsibility for the actual drilling operation.

1.3.2 Drilling period and parameters

Drilling is proposed for August 2000. The general drilling parameters are:

Total depth	2530 m
Hole size	12¼ in and 8½ in
Casing size	9⅝ in and 7 in
Shoe depths	861 - 2530 m
Well duration	19 days
Total project duration (mobilisation to demobilisation)	23 days

1.4 Access

1.4.1 Access construction

The existing Reg Sprigg 1 rig road appears to have been largely rolled, with a minimum of cutting other than at some minor stream crossings (Section 2). With the exception of the minor stream crossings, the road has had little permanent impact and, especially, is not eroding. Only minor cleanup and possibly re-rolling will be necessary for the road to be useable. The additional use is not likely to accelerate the minor existing erosion nor add significantly to long-term residual impacts of the original road construction.

The required rig road extension to Acrasia 1 can be prepared by rolling, with no cut and fill required on the gibber surface. It is possible to get to Acrasia 1 without crossing drainage lines by following close to the crests of the gibber downs. Actual crests have very large stone which may not respond to rolling, and should be avoided. Some removal of individual larger stones may be necessary.

1.4.2 Vehicle movements

Vehicular movements will use defined access. For the initial drilling, the rig and camp will require some 40 trailer loads, with a further 10 trailer loads of operator equipment (increasing to 15-18 trailer loads if the well is successful). A cementing and logging truck will be stationed at the wellsite for the duration of the drilling.

During the drilling, vehicular movement will be minimised. The following is indicative, based on an anticipated mobilisation, drilling, and demobilisation time of 23 days.

Daily:	Water truck (15t tanker) plus one contractor vehicle (min. 2 round trips)
Weekly:	Crew change: 1 x crew cab vehicle, 3 round trips?
	Supply run: 1 x 15 t truck, 5 round trips?

2. SUMMARY OF LOCAL ENVIRONMENT

2.1 Regional context

2.1.1 Land use

The proposed wellsite and access all lie within the Innamincka Regional Reserve, in an area used for extensive livestock (cattle) grazing. Tourism use of the particular area is limited to transit along the Innamincka-Cordillo Downs public road (Figure 1).

The wellsite and all local access lie outside the boundaries defining the areas of the Coongie Lakes Wetlands of International Importance under the 1971 Ramsar Convention. Parts of regional access lie within this area, in particular the Cooper Creek crossing, Innamincka township and part of the Innamincka-Cordillo Downs road (Figure 1).

2.1.2 Landform and soils

The Acrasia 1 wellsite and its access lie within the Merninie Land System (Marree Soil Conservation Board 1997). This is a gibber land system, of some 2100 km^2, comprising long gradual and relatively gentle gibber slopes, occasional mesas, alluvial plains, and drainage lines with small clayey floodouts. No mesas are present in the district about Acrasia 1.

Soils of the gibber slopes are a duplex shallow loam over light clay of moderate dispersibility. There is a dense gibber pavement, with stone also in the soil profile. Slopes of greater than 1° (>2%) are likely to erode irreversibly if the gibber pavement is disturbed. On the summits of the gentle gibber crests, the pavement may be complete (100% cover), and partially exfoliated silcrete

outcrops may be present. Gibber surfaces usually have some to major gilgai patterning, with relatively gibber-free areas of heaving clay carrying dense low vegetation.

The drainage systems about Acrasia 1 feed into Dripie Creek and Candradecka Creek (Figure 2). The former ends in diffuse floodouts with no connection to the Cooper Creek system to the south or Coongie Lakes to the west. Candradecka Creek has only a tenuous connection at best to the Coongie Lakes system. There is thus either no or, at worst, minimal possibility for operations to impinge on the area defined as the Coongie Lakes Wetlands of International Importance through drainage.

2.1.3 Vegetation and habitat

The primary vegetation cover on gibber is open perennial grassland of Mitchell grass with *Sclerolaena* spp. (bassias) and other grasses. Poorly defined drainage lines on crest areas have a denser cover of similar composition to surrounding gibber surfaces. Once drainage lines become incised, or otherwise well defined, a low tree cover may appear, with red mulga (*Acacia cyperophylla*) and gidgea (*Acacia georginae*) as main species. River red gum (*Eucalyptus camaldulensis*) appears only on major lines. Mitchell grassland is also the primary cover on the alluvial plains.

DEHAA database has one record of a rare, vulnerable or endangered plant species collected in the district. This is the bluebell *Wahlenbergia aridicola* PJ Smith, with the indicated locality on the Innamincka-Cordillo public road, south of Candradecka Creek.

Fauna of the area can be expected to be typical of the Merninie Land System, as outlined in Marree Soil Conservation Board (1997), as there are no unusual habitat characteristics in the area.

2.2 Wellsite characteristics

2.2.1 Terrain and soils

The designated well point is almost at the highest point for several kilometres around, on the apex of a broad, low gibber dome. A field slope sketch is given in Figure 3. Immediately to the northwest and northeast of the grid reference for the proposed hole, there is a slight rise to a very stony crest, with large silcrete exfoliating rocks protruding, then a relatively steep drop-off (slopes to 10%) to drainage (Figure 4). To the south and east, the surface is flat, with slopes less than 1% for 80-200m. Apart from the small rise, this area receives no run-on (Figure 5). To the southwest, slopes are some 2% increasing to 6% on edges of drainage depressions (Figure 6).

The gibber pavement is dense, with gibber cover at about 90% and stone dimensions up to 40 cm. Gilgai formation is limited, with individual gilgai areas smaller than 2-3 sq m.

2.2.2 Vegetation

The area is vegetated by a mixed perennial grassland/shrubland of mitchell grass (*Astrebla pectinata* and the normally uncommon caustic bush *Sarcostemma australe*, the latter abundant westward from Reg Sprigg 1. Cover at the time of inspection (May 2000) was in the order 25-40%, as a result of a major growth burst. This could be expected to drop below 10% in most seasons.

The bulk of the cover is provided by a multitude of ephemeral herbs and short-lived perennial species, particularly Aristida spp, Sporobolus actinocladus, Portulaca oleracea, Trigonella suavissima, Sclerolaena divaricata, S. lanicuspis, S. brachyptera, Psoralea australasica, Salsola kali and Erodium spp. There is little difference in this locality between vegetation of the level gibber and that of drainage depressions.

2.2.3 Biophysical significance and sensitivity

The wellsite and its surrounds possess no characteristics indicating particular conservation significance, or the possibility of particular significance. The wellsite is a small area within an

extensive land unit (upper gibber surfaces and rolling gibber downs), itself within an extensive land system, and with the exception of the local concentration of *Sarcostemma* about the wellsite and westward into Queensland, vegetation and habitat is typical of the Merninie land system gibber areas. Impact significance and mitigation therefore becomes a matter of "good housekeeping" and conformity with licence requirements, not to do with any single aspect of the biophysical environment in particular.

2.2.4 *Groundwater*

The well itself will intersect the shallow aquifers of the Winton Formation (App.1), and aquifers of the Cadna-Owie, Namur, Adori, Hutton, Poolowanna, Tinchoo and Wimma Formations.

2.3 Access

2.3.1 *Anticipated route and use of existing rig road*

The existing Reg Sprigg 1 rig road is proposed for use, with an extension from the Reg Sprigg 1 pad to Acrasia 1. Landsat coverage of the general area from the Innamincka-Cordillo Downs road to Acrasia 1, supplied by PIRSA, is shown in Figure 7.

2.3.2 *Terrain and vegetation on proposed new trackage*

Between Acrasia 1 and Reg Sprigg 1, the gibber surface is generally very gently sloping to level, with occasional drainage lines present. Cover is largely as already indicated for the Acrasia 1 wellsite, although the *Sarcostemma* stands do not extend as far as Reg Sprigg 1. However, where drainage becomes incised, with relatively steep slopes immediately along lines, a low woodland of *Acacia cyperophylla* (red mulga) with some gidgea is present (Figure 8). Such lines show on Landsat as pronounced dark stream patterns. It is possible to pick a route between Reg Sprigg 1 and Acrasia 1 which avoids all steeper slopes and wooded streams (Figure 9).

2.3.3 *Terrain and vegetation on existing trackage*

From Reg Sprigg 1 to the public road, the former rig road largely follows a 1995 seismic line, with one major diversion to avoid steeper slopes on the edge of the main area of gibber downs. The road appears to have been established primarily by rolling, with very little grading or cutting and no importation of materials. (Figure 10, 11). The road surface on the gibber areas is stable, other than two instances of minor gullying on steeper slopes (Figure 12), particularly on the descent to the watercourse/floodplain area highlighted in Figure 7.

From the edge of the main gibber slopes westward, the rig road crosses a variety of floodout, drainage and creek lines. Crossings of floodouts were rolled or lightly smoothed at grade, with no obstruction to water flow resulting (Figure 13). Vegetation on floodouts is ephemeral grassland, interspersed with areas of low open woodland or low woodland: red mulga is most common, but dead finish *Acacia tetragonophylla,* straggly corkbark *Hakea eyreana* and bloodwood *Eucalyptus terminalis* are also present. In one small area of sandplain, the rig road was cut, with a local diversion of a waterway resulting (Figure 14).

Floodouts and waterways are interspersed with residual rises: these have a level surface, with an armour of small gibbers. The upper surfaces are treeless, with an *Aristida contorta*-dominated ephemeral grassland cover, but with tall shrubs and trees present on short, steep slopes leading to incised watercourses: *Eremophila freelingii, E. longifolia, Acacia aneura, Eucalyptus terminalis,* and beefwood *Grevillea striata* (Figure 14).

2.3.4 *Biophysical significance and sensitivity*

As with the wellsite and its surrounds, the access possesses no characteristics indicating particular conservation significance, or the possibility of particular significance. There are existing disruptions to the surface hydrology, through local watercourse diversions, but even these do not extend particularly far. The access traverses land units which are extensive, with vegetation and habitat common throughout the Merninie land system gibber areas and minor drainage. As with the

wellsite, Impact significance and mitigation are a matter of "good housekeeping" and conformity with licence requirements, rather than special protection needs.

2.4 Aboriginal heritage

Neither the well site nor the access route extensions beyond Reg Sprigg 1 have yet been examined. Agreements are under negotiation.

2.5 European heritage

No sites or items of European heritage were observed during inspection in May 2000.

3. RISKS ARISING FROM PROPOSED ACTIVITIES

3.1 Risks to the natural environment

3.1.1 Processes creating risks

The primary risks to the natural environment arise from:

- drilling resulting in groundwater impacts
- possibilities of spills during drilling
- construction of new access and the actual well pad, in particular their specific locations on the gibber surfaces in relation to level of soil and vegetation disturbance and drainage patterns
- further use of existing access in regard to existing problems of watercourse crossings and local hydrological disturbance
- limitations on rehabilitation imposed particularly by the gibber landscapes.

Other risks to the natural environment appear to be low.

Table 1 summarises possible risks, their avoidance or amelioration, and suggested environmental objectives to be pursued during operations.

3.1.2 Possible impacts on groundwater

Actual drilling through Winton Formation aquifers and Jurassic aquifers could result in contamination of aquifers with drilling muds. There is also the possibility of crossflow between aquifers, and between hydrocarbon zones if well cementing is poor.

Cuttings and drilling mud disposal in drill sumps, and rubbish disposal in on-site pits, could result in contamination of unconfined aquifers through percolation.

3.1.3 Possible impacts on soils

Disturbance of soil surfaces, particularly the removal of gibber pavement, during access and pad construction may lead to accelerated erosion. In the case of gibber slopes >2%, this may be irreversible.

3.1.4 Possible impact on vegetation and habitat

Access track and wellsite construction will result in at least temporary local destruction of vegetation and faunal habitat on the access and wellsite.

Spills, particularly refuelling spills, can contaminate soil and in the medium-term prevent the re-establishment of vegetation on the spill area.

There are no unusual characteristics of landform, soil or surficial geology, or habitat which might suggest an increased likelihood for the presence of rare, threatened or vulnerable plant or animal species, and the one known record is both some kilometres south, and near a main road (implying a locally widespread distribution).

3.1.5 *Possible impact on surface hydrology*

The main risks to surface hydrology arise from construction of access tracks redirecting stream flows.

3.2 Risks to the social and economic environment

3.2.1 *Impacts on community resources and safety*

There is likely to be a short-term degradation of the Innamincka-Cordillo Downs road through the passage of heavy vehicles for rig establishment and removal. The current condition of the road is such that a major rainfall is likely to obliterate any long-term effect of the temporary use of the road.

There will be only minor visual impacts, due to the screening of the rig road from the main road.

There exists a risk of visitors following the rig road rather than the public road and becoming lost or exposed to dangers associated with drilling operations.

3.2.2 *Impacts on Aboriginal heritage*

Risks to Aboriginal cultural heritage cannot be determined until the area is examined.

3.2.3 *Impacts on European heritage*

In the absence of any particular European heritage items or relationships, the activities pose no risk to European cultural aspects.

3.2.4 *Impacts on existing land uses*

Risks to pastoral activity should be minor: sources and location of water supplies have yet to be determined. Preliminary contact with pastoral leaseholders has been made, but closer contact will be undertaken prior to any construction activity starting.

4. MINIMISING IMPACTS AND IMPACT RISKS

4.1 In development of new access

It should be possible to extend access from Reg Sprigg 1 to Acrasia 1 without encountering slopes more than 2% (Figure 9), without interfering to any significant extent to local drainage, and without major disturbance or removal of the gibber surface.

If a path approximately as shown in Figure 7 is used, access will follow close to crests, where dense natural pavements of gibber can be rolled to form a temporary access road, with a minimum of blading. The crests themselves cannot be followed, since outcrops of large stones would prevent development of a rolled track without extensive grading. Some minor blading prior to rolling may still be needed in places to dislodge large stones.

Such a path, via crests and saddles, also avoids the depressions and waterways of the gibber slopes. As well as avoiding direct impact, this further minimises the impact of any spill or accident along the access, itself a low risk. The curved path is less visually obtrusive than a straight one.

Slopes of less than 2%, even where some disturbance of the gibber surface has been necessary, or results from subsequent use, are unlikely to erode significantly in the future. The risk of erosion is less still, given that the new access is on or very close to high points, with little run-on as a result.

Impact to vegetation and habitat on such a path, will be slightly greater in the immediate term than were a shorter route to be followed, but longer term impacts should be less, due to reduced risks of accelerated erosion, and the likelihood of successful rehabilitation will be high.

Detail of final selection of the access should be undertaken actually on the ground. We would recommend that, as well as the contractor and Stuart Petroleum supervisor being present, a PIRSA inspector or other suitably experienced person assist in the selection.

4.2 In using existing access

4.2.1 On gibber land units

As already indicated, the Reg Sprigg 1 rig road requires little re-development to be serviceable in gibber areas. Minor gullying requiring repair is present at two general localities (Figure 7). On the gibber areas, the re-use of the road will not itself result in increased immediate or residual impacts. In this respect, it differs from much older, bladed rig roads in the area, such as to Paning 1, where the extent of gullying and erosion is such that that major earthworks would be needed for re-use. On the Paning 1 rig road, the necessary roadworks would themselves result in increased immediate and long-term, continuing impacts.

The existing road is generally straight, however its visual obtrusiveness is lessened in distant views by the diagonal climbing section moving from the lower to upper gibber surfaces (Figure 7).

Vegetation and habitat will be unaffected .

4.2.2 Crossings of minor floodplain and watercourse

None of the flood- and watercourses crossed by the access have catchments larger than 2-3 km^2. Flows therefore are short duration and of limited volume and velocity.

The main existing problem appears to be two incised creek crossings, where the rig road has obstructed channels and diverted flows along the road (Figures 6, 13), with consequent gullying and erosion. It is intended to re-open the access through these watercourses using crossings at grade, with the present flow obstruction removed. This should immediately remediate existing local hydrological impacts, even though the road will again be in use, through free flow being returned to the diverted watercourse. There may be local change in vegetation, as the original watercourse again takes stream flow.

Some gravel may be needed in both creek crossings, to avoid unnecessary churning. Gravel would be surface gibber obtained from flat ground at existing surface scrapes near the main road, believed to be Transport SA scrapes.

Crossing of the broad wash and floodout (Figures 6, 12) is intended to be minimally altered. Some skimming and rolling may be required to smooth present ruts and consolidate the surface. There has already been some stone imported: more may be taken from Transport SA stone scrapes near the main road if necessary for vehicle movement. Any grading will be light, and rill-kill or similar utilised to prevent formation of windrows across the wash, particularly since any form of even small damming on this wash will result in redirection and concentration of otherwise shallow, slow-moving overland flow, with both operational and environmental risks. There should be no more than very minor impact on vegetation and habitat on the actual crossing.

4.2.3 Connection to public road

Most of the existing rig road is masked from public view (along the Innamincka-Cordillo Downs road) by a combination of low gibber rises, trees, and a dogleg in the track near the main road. Visual impacts will be minor.

To minimise public entry and risk, signs will be placed near the rig road/public road intersection prohibiting entry, warning against trespassing, and warning of danger associated with drilling and truck movements. Tourists found on the rig road by drilling and/or supervisory staff will be requested to leave.

4.2.4 Borrow

At present, there appears to be little need for borrow materials. Some however may be required for stabilising the few areas of gully erosion and possibly for stabilising stream crossings. Transport SA is understood to be considering borrow materials for maintenance of the Innamincka-Cordillo road in this area, and it may be possible where necessary to also utilise their sources.

4.2.5 Dust

All access surfaces will generate some dust, the worst being the clay floodout (above) which is likely to generate some bulldust. The risk and hazard of dust generation, however, has to be accepted as a trade-off for limiting importation of new material. Dusting will be of relatively short-term duration.

4.3 In pad construction

Drilling and camp pads generally will be rolled gibber, with irregular or curved outlines to minimise later visual contrasts. Part of the drill pad will required a clayed surface free of stone: it is proposed to use clay from the sump for constructing such surfaces, as well as for minor earthworks such as ramps and bunds. The following procedures are proposed to minimise impact and assist subsequent remediation.

- The drill and camp pad areas will be rolled. There is no vegetation on the site requiring more active clearing than rolling. The vegetation cover and associated animal habitat will be heavily impacted on the actual pad..
- For the sump area and load bearing surfaces which must be stone free, the gibber mantle will be scraped and stockpiled, with associated surface soil and plant debris, on the pad edge for later rehabilitation. Minor pits such as septic and putrescible waste will be constructed similarly.
- Clay from the sump will be used for additional levelling on load-bearing surfaces.

Clay from the sump will also be used for subsidiary earthworks such as loading bays and bunds. In these cases, the clay will be placed on the rolled gibber surface, leaving the gibber mantle in place.

4.4 During drilling

4.4.1 Drilling operation

Drilling will follow industry-accepted codes of practice for drilling and workover. Muds used will be non-toxic, and will comply with standards for offshore drilling operations: accordingly, sumps will not be lined.

Casing design and cementing will be engineered to prevent blowout and petroleum spillage, as well as aquifer protection (Appendix 1). Surface casing will isolate shallow aquifers in the Winton Formation. Formation damage in the main hole will be minimised by drilling using a controlled water loss/low solids mud. Both surface casing, and production casing, if run, will be externally protected

from corrosion by cement. Internal protection from corrosion will be provided by either treated drilling mud (surface casing) or other corrosion inhibitor (production casing). Detail will be provided in Stuart Petroleum's Drilling Plan.

The drilling contractor will be required, in the normal course of drilling operations, to regularly test casings integrity and blowout prevention equipment.

4.4.2 Rubbish

Non-putrescible rubbish will be held on site for later removal to a disposal facility. Putrescible wastes will be disposed on site in pits.

4.4.3 Refuelling spills

Refuel areas will be HDPE or clay floored and locally bunded. Flooring and bunding clay would be sourced from the sump and laid on the uncut gibber surface.

The drill sump and any subsidiary sump will be bunded. The level drill site, with no run-on, itself limits the extent to which spills of any sort can escape.

In the event of spills on gibber surfaces, the spills can be left to self-clean rather than risk disturbance of gibbers.

Table 1: Risks, impacts and management in relation to environmental objectives

Possible impact	Main sources of risk	Avoidance, management, mitigation	Environmental objective
Intrusion or physical site damage to areas of Aboriginal and European heritage significance	Access and pad construction, vehicle and people movement	No European sites known. Aboriginal sites to be scouted: sites to be physically avoided where necessary. Use of existing access limits scope for impact	Avoid disturbance to sites of Aboriginal and European heritage significance
Crossflow between aquifers, and/or between hydrocarbon zones	Drilling through Winton Formation aquifers and Jurassic aquifers	Use of non-toxic drilling muds. Winton Fm aquifers protected by casing. Corrosion protection for casings. Controlled water loss/low solids mud use to limit formation damage.	Minimise or eliminate aquifer contamination and crossflow.
Contamination of unconfined aquifers through percolation	Cuttings and drilling mud disposal in drill sumps; on-site rubbish disposal ; sewerage, litter, overflow and spillage	Non-toxic drilling muds. Sewage disposed locally via short-term septic pits. Wastes on site confined by bins/skips. Disposal eventually to EPA-licenced waste disposal facility: minor non-toxic wastes, muds disposed in drill sump. Litter cleanup during and post-drilling.	Minimise waste handling and disposal impact
Pollution through local oil spills, sump overflows	Vehicle and plant refuelling, drilling operations	Refuel areas HDPE/clay floored and locally bunded (flooring and bunding clay sourced from sump and laid on uncut gibber surface). Sump(s) bunded. Level site with no run-on limits extent to which spills may escape. In the event of spills on gibber surfaces, spill can be left to self-clean rather than risk disturbance of gibbers. Refuel areas' contaminated soil to be disposed in sump, with drilling muds, at end of drilling.	Avoid spills; rapid cleanup and impact minimisation following spills
Physical damage to soils, vegetation and habitat	Access and pad construction; natural limits on rehabilitation	Use of existing access; rolled new access and pad development on gibber surfaces	Minimise disturbance to vegetation and habitat
Accelerated soil erosion.	Access and pad construction	Construction of pad on level ground without run-on. Rolling of most of pad area rather than scraping, cut or fill. Gibber and surface loam held for later respreading where scraped gibber surfaces are created (eg for sump). Access rolled with minimal scraping, following on or near gibber crests to minimise access slopes and overland water interception. Access between main road and gibber areas reshaped, watercourse crossings at grade, minimal borrow requirements. Stone (creek crossings) sourced from Transport SA local scrapes.	Minimise soil impacts
Potential start-up of long term irreversible erosion on gibber slopes >2%			Minimise disturbance to gibber surfaces
Disturbance to rare, endangered, vulnerable species	Access and pad construction	No such species known to be present; if present, then can be expected to be widespread in district	Avoid disturbance to rare, endangered, vulnerable species
Establishment of further alien species in the locality	Importation on vehicles	Requirement for contractor/other vehicles to be clean prior to entering district. (This incremental risk is very low, given other vehicular use, uncleaned, on the Innamincka-Cordillo Downs road).	Prevent introduction of pest plants

(Table 1 cont...)

Possible impact	Main sources of risk	Avoidance, management, mitigation	Environmental objective
Development impacting high biological or wilderness value areas	Access and pad construction	Area does not possess special biological/wilderness value	Avoid impacts on high biological value or wilderness value areas
Visual impacts through obtrusive access and pad development and/or visible long-term persistence of pad and access.	Access and pad construction	Curves rather than straight lines in new access development. Pad flush with land surface. Rolled surfaces on pad and new access promoting reasonable rehabilitation. Existing access will still be obtrusive over long, straight sections, but is masked from the Innamincka-Cordillo Downs road.	Minimise visual impacts
Creation of new public risks: public using rig road; well blowouts; post-drilling.	Access risks, wellsite risks	For drilling period -- signage on rig road/public road intersection prohibiting entry, warning against trespassing, and warning of danger associated with drilling and truck movements. At wellsite, regular integrity testing	Minimise public and third party risks
Intrusion or physical site damage to areas of Aboriginal and European heritage significance	Access and pad construction, vehicle and people movement	No European sites known. Aboriginal sites to be scouted: sites to be physically avoided where necessary. Use of existing access limits scope for impact	Avoid disturbance to sites of Aboriginal and European heritage significance
Interference with stock	No risk anticipated	Site is distant from areas of stock concentration and handling, from watering points, and clear of fences.	Minimise adverse impact on livestock

5. SITE REMEDIATION

Completion proposals here assume that the well is unsuccessful, and that a total withdrawal, remediation and completion takes place. In the case of a potentially producing well, new approvals would be sought for upgrading to production rather than exploration facilities. For a suspended well, remediation would proceed to pad cleanup but not beyond.

5.1 Well abandonment

Should the well be plugged and abandoned, it is intended to isolate and protect formations with cement plugs as follows. Detail of plug size and extent will be provided in Stuart Petroleum's Drilling Plan.

Plug 1	Isolate the Pre-Permian Merrimelia Formation from higher Triassic formations
Plug 2	Isolate both the Tinchoo and Poolowanna from the Hutton formations
Plug 3	Isolate both the Hutton and Birkhead from the Adori, Westboume and Namur aquifers
Plug 4	Isolate the Cadna-Owie formation from the underlying Adori, Westbourne and Namur aquifers, and the overlying Wallumbilla aquifer
Plug 5	Shoe plug, sealing the surface casing from the open Allaru to Wallumbilla formations
Plug 6	Surface isolation

5.2 Wellsite

Site cleanup and remediation will follow as soon as possible after completion of drilling.

Putrescible waste and septic pits will be backfilled to the original ground level, with stockpiled gibber and surface earth and debris spread. For earthworks such as loading ramps and bunds, most of the clay will be lifted and returned, together with minor spill-contaminated soils, to the drilling sump, leaving the intact gibber surface with some remnant clay on it. The remnant can be expected to eventually slump and wash off, preferable to further disrupting the gibber surface.

Refuelling areas' contaminated soil will be disposed in the sump, along with the drilling muds and cuttings. Clay originally from the sump will also be used as sump backfill, with backfilling to slightly above the original ground level, to allow for slumping. Stockpiled gibbers will be spread on the sump. Final backfilling will be delayed until the sump has largely dried.

Excess clay left from the sump will be loosely spread, to allow for natural slumping and spreading.

The rolled surface over most of the pads combined with the re-spreading of gibber, debris and surface soil over bared areas, together with the absence of cut-and-fill benching, should promote relatively rapid vegetation regrowth and rehabilitation.

5.3 Access

It should be possible simply to leave the rolled new access road to rehabilitate unaided.

Remediation of the Reg Sprigg 1 rig road generally would be dependent on the intentions of Santos for Reg Sprigg 1. Specific remediation along this road by Stuart Petroleum would be undertaken to return stream crossings to wholly unobstructed flow, including re-instating banks if necessary to avoid stream diversion, and obscuring of the intersection between the rig road and public road.

6. REFERENCES

Marree Soil Conservation Board (1997) "Marree Soil Conservation Board District Plan" ISBN073084203 7

7. FIGURES

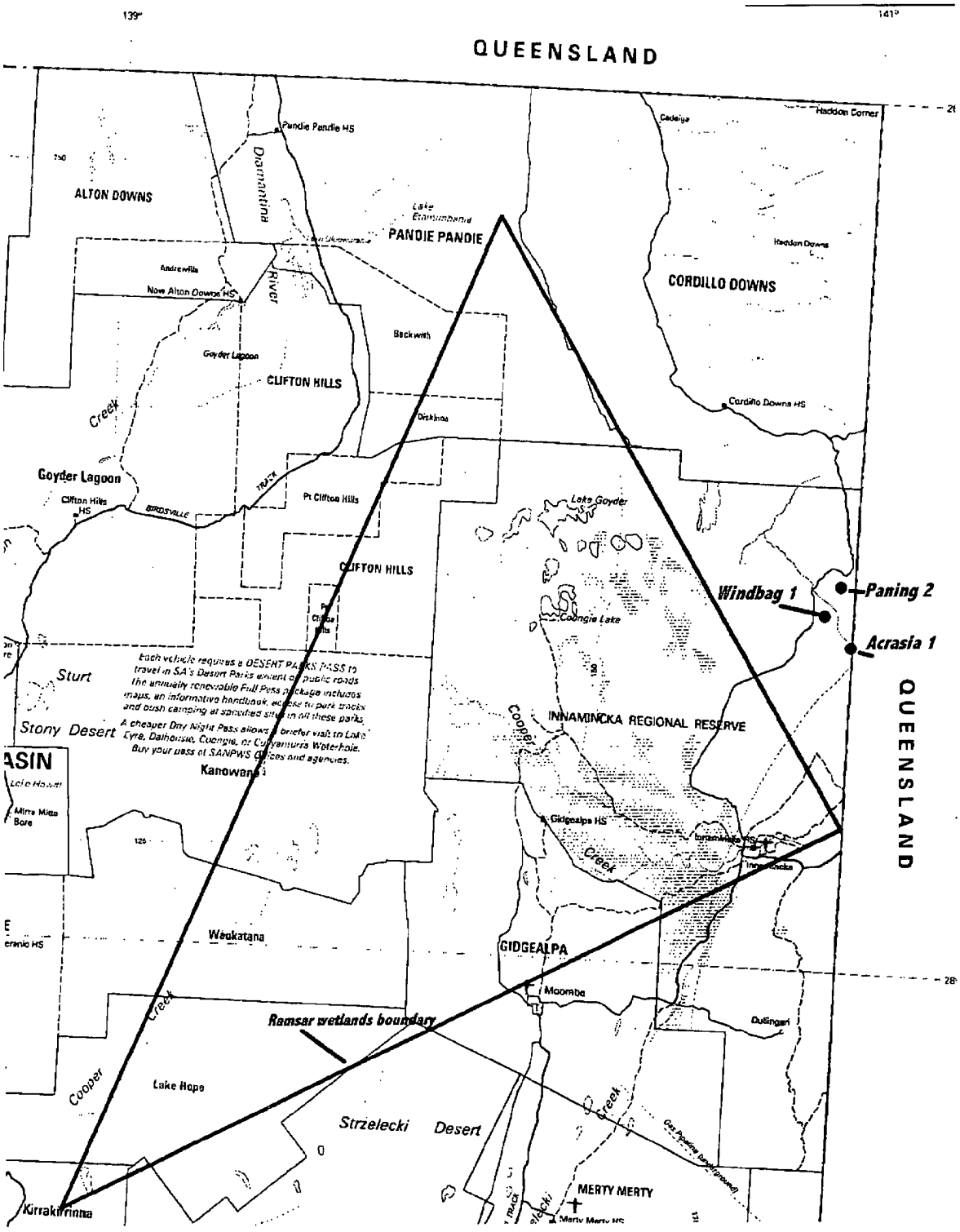

Figure 1. General location of Acrasia 1 wellsite in relation to Innamincka Regional Reserve, Ramsar Wetlands and local infrastructure. (Map base: DENR Pastoral areas 1:250000, 1993)

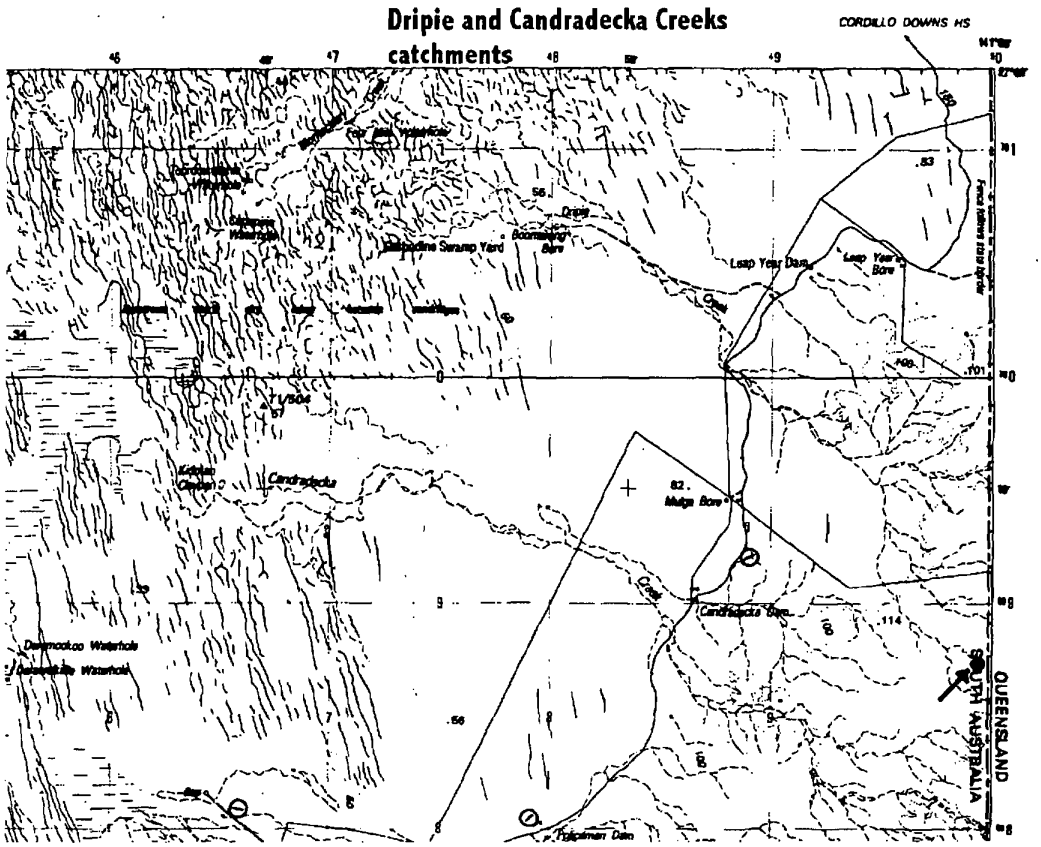

Figure 2. Dripie Creek and Candradecka Creek catchments ((Natmap SG 54-14)

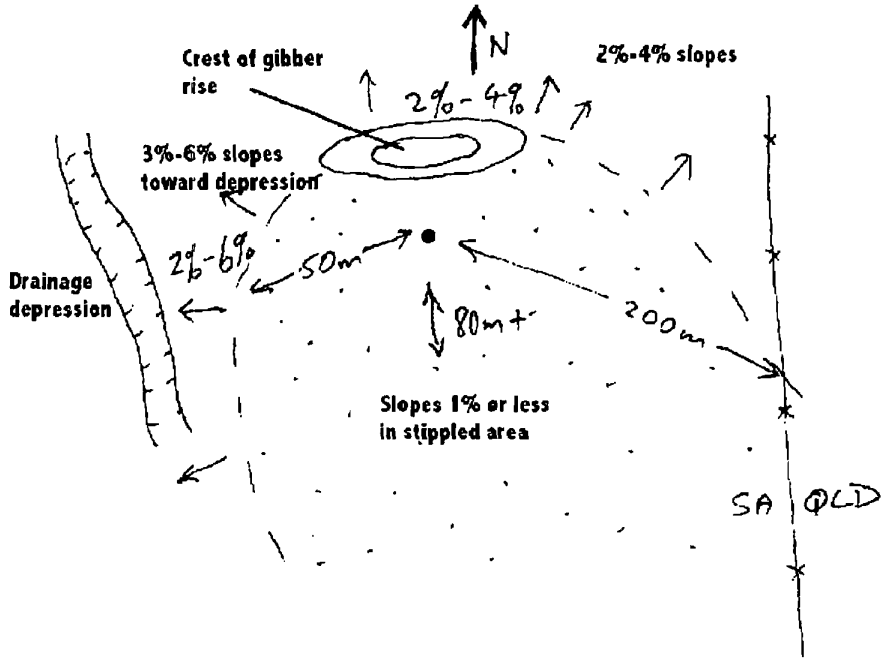

Figure 3. *Field sketch of wellsite.*