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TENEMENT HOLDER: Poseidon Limited.

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Poseidon Limited

Incorporated in South Australia

106 Hutt Street,
Adelaide, 5000,
South Australia.
Phone (08) 223 7438
Telex 82486

Telegraphic and
Cable Address
Poseidon, Adelaide
South Australia.

EXPLORATION LICENCE 1110
ARDROSSAN, SOUTH AUSTRALIA

HELD BY POSEIDON LIMITED
QUARTERLY REPORT FOR
THE PERIOD ENDED 15TH MAY, 1983.

R.G. BLUCK
JULY, 1983.

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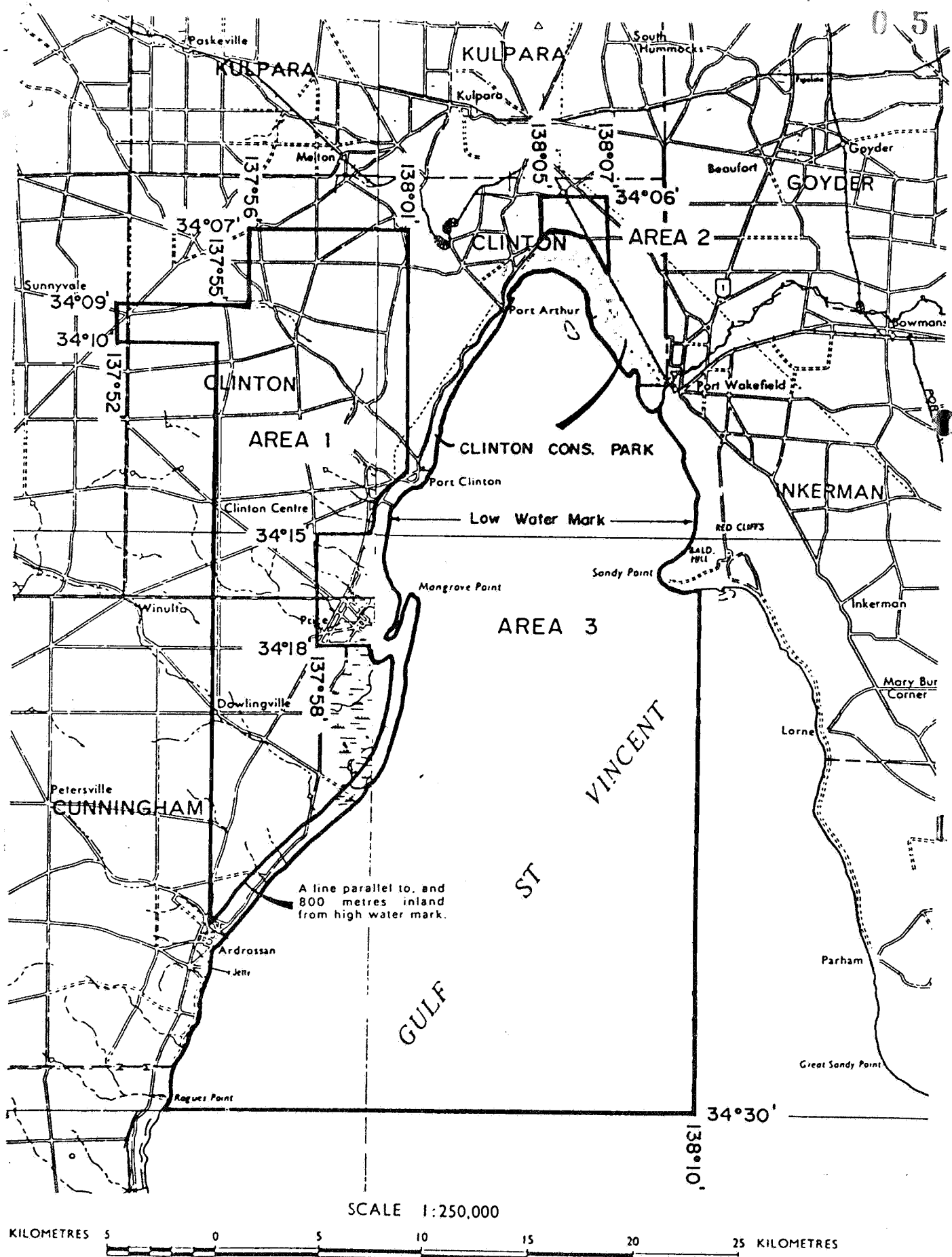


Figure 1
Locality Map
EL 1110, Ardrossan,
South Australia.

NOTE: There is no warranty that the boundary of this Exploration Licence is correct in relation to other features on the map. The boundary is to be ascertained by reference to the Australian Geodetic Datum.

1, SUMMARY

1.1 Tenure

Exploration Licence No. 923 was granted to Poseidon Limited on 16th November, 1981 for a period of one year. This title has been succeeded by Exploration Licence No. 1110 granted on 15th February, 1983, also for a period of one year. Both titles cover essentially the same area of some 875 square kilometres located at the northern end of the Gulf of St. Vincent and the immediately adjacent shores (Figure 1).

1.2 Exploration Objectives

The area is considered prospective for sedimentary deposits of copper/uranium hosted in cover rocks of Late Proterozoic to Tertiary age overlying a basement known to contain widespread copper and uranium mineralization.

1.3 Methodology

All the available geological data was reviewed and a geological synthesis prepared (Thomson, 1982); the available geophysical data was then re-examined in the context of the interpreted geology and a number of targets identified (Anderson, 1982).

Surface radiometric and magnetic surveys were carried out to define the more prospective targets, which were then tested by open hole drilling (a total of 11 holes).

1.4 Results

The results of the exploration of the pre Cainozoic sequences were not encouraging and no further work can be recommended (Giles, 1982). Significant anomalous radiometric responses were obtained in the drilling of the Cainozoic sequence and more work is warranted (reported herein). The karst topography developed in the Cambrian limestones has some potential for Mississippi Valley type lead-zinc deposits. This report summarises the work completed to date and identifies those areas where additional work is warranted.

2. GEOLOGY

2.1 Stratigraphy

2.1.1 General

Within the area of the Exploration Licence the sequence consists of a non-outcropping Pre-Adelaidean basement complex, succeeded by Adelaidean to Cambrian clastic sediments and limestones, with a Cainozoic cover of lacustrine to fluvial sediments and palaeosurfaces.

2.1.2 Basement complex

The geology of the basement complex within the area of the Exploration Licence has been discussed by Thomson (1982) and Giles (1982), while Edgecombe (1982) reviewed the geology of the Bute area located immediately to the north.

The two components of the basement are a western assemblage of schistose to gneissic and granitic rocks (Moonta Porphyry equivalents and Arthurton Granite) which have a characteristic, relatively complex, aeromagnetic signature, and an eastern suprabasement assemblage of metasiltstones, calc-silicates and dolomites with a predominantly flat aeromagnetic signature, but containing localised anomalies related to late amphibolitic intrusives. The suprabasement rocks represent a variably metamorphosed and metasomatised marine assemblage of fine grained sedimentary rocks, with no indication that coarse clastic facies equivalent to those developed at Olympic Dam are present.

2.1.3 Adelaidean to Cambrian sediments

Unconformably overlying the basement complex is an Adelaidean sequence of fluviatile conglomerates, grits, sandstones, dolomites and dolomitic siltstones succeeded by a Cambrian sequence of shallow water shelf facies limestones.

While the Adelaidean units appear to be laterally uniform, the detailed work necessary to confirm this has not been done. Sufficient work has been done within the Cambrian succession to confirm the laterally persistent, grossly bedded, character of the limestones, and the absence of major reef structures.

2.1.4 Cainozoic sequence

2.1.4(a) Introduction

The most complete Cainozoic section was obtained in drill hole AP-8 drilled immediately east of the Ardrossan Thrust zone: the upper portions of this section can be readily correlated with the coastal marginal marine stratigraphy presented by Stuart (1970). However, the lower portion represents an apparently new, prograding, mature, fluviatile sequence.

The section and proposed correlations from AP-8 are:

<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Description</u>	<u>Formation</u>
0.0	3.5	3.5 m	Sandy soils, calcrete nodules and pink to red-brown clay	Sub-recent soil and weathering profile
3.5	22.0	18.5 m	Red-brown to buff claystones, siltstones, and clayey fine grained sands; minor silicified fossiliferous (Turritella) sandstones and some glauconitic bands	Rogue Formation
22.0	28.0	6.0 m	Pale khaki claystones (kaolinite?) with minor fine siltstone.	Throoka Silts
28.0	53.0	25.0 m	Red to grey to khaki claystone, siltstone, and clayey fine to medium grained sandstone, minor medium to coarse grained well sorted sands.	Muloowartie Formation
53.0	61.0	8.0 m	White, cream and buff massive to variegated clay with minor to accessory silt	Cream Clay Unit (informal name)
61.0	63.0	2.0 m	Cream to light grey clay, silt and fine sand	
63.0	113.0	50.0 m	Grey to brown, occasionally buff, fine grained to granular sands, accessory silty phases towards top and numerous pebble bands towards base; clasts predominantly well rounded quartzose and tough lithic materials. Individual bands mature and commonly fining up. Carbonaceous wisps and lignitic fragments or thin bands commonly present in the grey, unoxidised phases.	Mature Sand Unit (informal name)
113.0	118.0	5.0 m	Grey to brown fine grained to granular sands with prominent pebble bands, intercalated claystone and lignite.	Basal Sand Unit (informal name)

This section, and in particular, the three informal units, can be recognised in all of the holes drilled to the west of the Ardrossan Thrust zone in the area outlined by the +20 m Cainozoic isopach (Plate 1). The individual units, their local facies variations, and the basis for their correlation from hole to hole, are discussed below.

2.1.4(b) Basal Sand Unit

This unit, which was intersected in all of the holes drilled, varies from 1.5 metres of soft brown lignite with a thin basal proximal conglomerate (AP-4), to 4.5 metres of cream and brown clays with minor granular sands (AP-9), to 5 metres of grey to dark grey coarse grained to pebbly silty sands with included basement boulders overlying 2 metres of black silt and clays (AP-6). Despite this variance the unit is readily differentiated from the overlying Mature Sand Unit by:

- a predominance of silty and clayey phases, these are often variegated in colour, or black grading to carbonaceous muds and poor lignites
- dirty, immature, pebble to boulder bands
- frequently a proximal conglomerate is developed at the basal unconformity, and isolated basement boulders often occur higher up in the unit
- the unit has an anomalous radiometric response, and the clay or lignite units which are invariably present produce a pronounced neutron low.

Though relatively thin, the unit is laterally persistent: the depositional environment varies from active, high energy, fluvial channels to over bank settings. On the available data it appears a lacustrine environment may develop west and south-west of hole AP-4.

2.1.4(c) Mature Sand Unit

This unit was intersected in all of the holes drilled; while thickness varies markedly (4.5 m in AP-10 to 33.5 m in AP-7, both west of the Ardrossan Thrust, to 50.00 m in AP-8 east of the Ardrossan Thrust) the unit is characterised by mature sands with minor silt and clay components. The unit displays a gross grain size variation with pebble bands being relatively common towards the base, while finer sand and silt units become more common towards the top. Additionally, individual sand units could be observed during drilling to vary from silty fine sands, through medium coarse grained or granular sands over distances of 1 to 4 metres. Clasts are invariably well rounded, with a high sphericity, and consist predominantly of clear and milky quartz (predominantly in the sand sizes) and accessory various light and dark coloured fine grained to aphyric intrusive and metamorphic rocks (predominantly in the granule to pebble sizes).

To the west of the Ardrossan Thrust the unit is commonly light grey to grey with traces of lignite fragments and dispersed wispy carbonaceous material, or a pale yellow brown with limonitic or jarosite films on the constituent grains. To the east of the Ardrossan Thrust, in hole AP-8, general colourations are very similar but lignitic fragments and carbonaceous wisps are far more common and some discrete lignitic bands are developed.

The unit is readily characterised by:

- the preponderance of clean, mature sands
- a gross grain size gradation through the unit with pebble bands concentrated towards the base and silts towards the top
- upward fining in individual sand horizons
- a general paucity of clays, and an absence of the red clays and silty clays characteristic of the Muloowurtie and Rogue Formations
- a restricted range of lithologies in the clasts; they are invariably composed of physically tough and chemically stable rock types and no ironstone, calcrete? or limestone fragments were observed in the unit
- the geophysical response is not particularly characteristic with both the gamma and neutron profiles being relatively flat.

The unit represents an active fluvial valley system opening to a deltaic front system to the east of the Ardrossan Thrust. No information is available on source areas or transport direction, though the maturity of the clastic components indicates fluvial transport over a substantial distance. It is probable that the principle channel flowed from the north-north-east to south-south-west through Clinton Centre, turning south-east to debouch over the Ardrossan Thrust zone west of Price into a marginal marine environment. The area north-west of Dowlingville may contain a tributary running back south-west to the Ardrossan basement high, or a flood plain and over bank facies.

2.1.4(d) Cream Clay Unit

All of the holes intersected this quite distinct unit which, where best developed in hole AP-8, consists of a basal 2.0 metres of cream to light grey to buff or brown, clayey silt and fine sand which graded up into 8.0 metres of cream and buff, massive to variegated clay with minor silty clay. To the west of the Ardrossan Thrust the unit is generally thinner (4.4 m in AP-7 to 2.4 m in AP-2) but consists of the same elements of an upper clay and intercalated silts with underlying silty clays to fine sands.

None of the drill intersections provided any coherent samples, however, a water sump excavation in the bottom of Crowell's sand quarry has exposed a pale grey, massive, claystone with fine silt bands which correlates with the cream clay unit in hole AP-9. A sample of the quarry material was collected for petrographic examination: the report is attached as Appendix III. The material is a silty argillite consisting

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predominantly of kaolinite-illite with small dispersed splinters of quartz and muscovite, occasional thin silty laminae and a few heavy mineral grains. A feature of the rock is that it displays simultaneous extinction due to lithification recrystallisation, suggesting that the unit was originally overlain by a reasonably substantial sedimentary section.

The principle features of the unit are:

- its lateral persistence and relatively uniform thickness over the area investigated
- its consistent composition and gross upward fining from fine sandy-silt to silty-clay
- its apparently consistent stratigraphic position
- pervasive pale colouration and general absence of organic material.

Because of the active fluvial character of the underlying Mature Sand Unit it is possible that the Cream Clay Unit is a complex composite of flood plain and over bank deposits. However, the unit has the characteristics of a prodelta assemblage, and is more likely to have formed as a single event throughout the channel system during a rise in the depositional base level.

2.1.4(e) Muloowurtie Formation

This unit was intersected in all of the holes except possibly AP-3. It is best developed east of the Ardrossan Thrust Zone in hole AP-8 which intersected 25 metres of red to grey to khaki claystone, siltstone and clayey fine to medium grained sandstone, with subordinate medium to coarse grained, and rarely granular, sands.

To the west of the Ardrossan Thrust complete but much thinner sections were obtained in most holes. Thickness decreases from west (14.5 m AP-5) to east (7.5 m AP-7), and possibly from south (14.5 m AP-5) to north (6.0 m AP-4 and 11.5 m AP-10), though the data is too scattered to be certain in the latter cases.

The sections exposed in Crowell's sand quarry, 4.5 kilometres west-south-west of Price, were assigned to the Basal Fluvatile Sediments by Stuart (1970). However, they overlie the informally named Cream Clay Unit, are themselves overlain by equivalents of the Throoka Silt, and can be traced laterally for some kilometres. It therefore seems more reasonable to place these rocks into the Muloowurtie Formation, rather than group them with the Basal Fluvatile Sediments, which are usually localised developments of conglomerate and fluvatile sands on, or immediately adjacent to basement.

The characteristic features of the unit are:

- it is predominantly immature with a high proportion of siltstone and claystone horizons throughout
- sand beds are generally poorly sorted with a high silt-clay matrix component
- sands are fine to medium grained with only minor granular phases
- the clastic material is rounded to well rounded but sphericity is quite variable
- clasts are predominantly composed of tough lithic materials, but ironstone and calcrete fragments are relatively common
- the radiometric response is invariably flat.

In the quarry area the depositional environment was obviously fluviatile with some 11 metres of laminated to thinly bedded sands exhibiting abundant small to medium scale cross-stratifications, and common coarse channel lag deposits. Stuart (1970) measured channel and cross-strata directions in the quarry and determined a sediment transport direction towards the south-east (132° Grid).

2.1.4(f) Throoka Silts

This unit was defined by Stuart (1970) as consisting "of laminated to very thinly bedded quartz sands and subordinate silty and arenaceous clays. No overall vertical or lateral textural trends are apparent. Muscovite is a common accessory mineral and kaolinite is the dominant clay mineral. There are also traces of illite and chlorite." The unit was previously referred to as "unfossiliferous ochreous clays" by Tapper (1897). The name is tentatively assigned to the 6.0 metre section of pale khaki claystone (kaolinite) with minor fine siltstones obtained in hole AP-8 east of the Ardrossan Thrust. An equivalent section of red-brown to khaki clays with minor silts was intersected immediately below the soil profile in the majority of the holes drilled west of the Ardrossan Thrust. The unit subcrops over substantial portions of the inferred channel area, and is probably responsible for the U and Th channel spectrometer anomalies obtained in these areas.

The principle features of the unit are:

- a predominance of red to khaki clays, probably predominantly kaolinitic
- accessory thin intercalations of fine sand and silt
- reasonable lateral persistence; thickness variations cannot be assessed as the section is generally incomplete
- typically the down hole geophysical log shows an elevated, spiky, radiometric response with a coincident neutron low.

The unit is interpreted as a lagoonal assemblage by Stuart (1970). The apparent lateral persistence and consistent stratigraphic position suggest the environment was quite extensive, and a similar mechanism to that proposed for the Cream Clay Unit may have operated.

2.1.4(g) Rogue Formation

The unit is "a mainly marine sequence consisting of quartz sands, sandstones and siliceous sandstones, siliceous and arenaceous limestones, mudstones and clays. Sands and siltstones are more common than other rock types" (Stuart, 1970). The unit is characterised by a carbonate-siliceous facies rich in *Turritella* underlain in places by glauconitic quartz sand.

Hole AP-8, collared immediately east of the Ardrossan Thrust, intersected a sequence of red-brown to buff, fine grained to granular sands with a predominantly clayey to silty matrix and occasional pebble bands, between surface and 22.0 metres. Siliceous fine quartz sandstones with abundant *Turritella* fragments were intersected between 6.0 and 11.0 metres, and were underlain by 5.2 metres of intermittently glauconitic khaki clayey sands. Equivalent sediments were not recognised in the holes drilled west of the Ardrossan Thrust, though the extensive areas of sandy clays and calcrete incorporated in the recent soil profile may represent a laterally equivalent facies.

The unit was deposited in a marginal marine environment and may indicate a major marine transgression terminating the previously dominant fluvial regime.

2.1.4(h) Conclusion

The fluviatile sequence formed by the Basal Sand Unit, the Mature Sand Unit, and the Cream Clay Unit represents a major palaeodrainage system. Flow appears to have been from the north of the Licence area, along the present valley floor through the Clinton Centre, thence turning south-east to debouch over the Ardrossan Thrust forming a major delta immediately south of Price. The system is informally referred to as the Clinton palaeochannel.

2.1.5 Geomorphology

The principle geomorphic elements in the Licence area are, from east to west:

- lobate mangrove and salt-flat terrains at Port Clinton and south of Price. These are anomalous in the context of the otherwise linear eastern coast of Yorke Peninsula, and are thought to reflect areas of Cainozoic deltaic sedimentation.
- a north-east to south-west linear coastal zone of rolling downs country developed on the upper portions of the Cainozoic sedimentary sequence between the sea and the Ardrossan Thrust.
- a linear north-east to south-west escarpment generally coincident with the Ardrossan Thrust zone. Adelaidean to Cambrian sediments are present in outcrop and subcrop along the crest which marks the eastern edge of a tilt block containing the Clinton palaeochannel.
- a broad north-east to south-west zone of low downs and valley country with a general westerly and southerly fall. The surface carries abundant nodular calcreta with broad interspersed zones of red clay developed on Throoka Silts overlying the Clinton Palaeochannel. Negative, internally draining,

topographic features are developed in the central northern portions of the geomorphic element, and reflect the presence of a karst system in the underlying Cambrian limestones.

- a low curvilinear escarpment extends from Winulta in the south to Cocoanut in the north and appears to form a limit to the fluvial sediments of the Clinton Palaeochannel (hereafter the Winulta Cocoanut Feature).

2.2

Structure

A major part of the Aquitaine Australia Minerals programme was directed towards examining the transitional Torrens Hinge Zone between the Gawler Platform to the west and the Adelaide Geosyncline to the east. Airborne magnetometer and Geometrics "CompuDepth" studies located the Ardrossan Thrust and Yararoo Fault zones, and identified a number of possible "basement highs" which could correlate with pinch outs in the Adelaidean-Cambrian sedimentary cover.

The major structural feature is the Ardrossan Thrust which is reflected in the geophysical data, in outcrop and drill hole data (refer cross-sections, Thomson, 1982), and in the present topography. Secondary interpreted structural features predominantly follow north-north-east to north-east trends and are not readily apparent in geology or topography. The geophysical data does not identify structures in the younger cover rocks.

In the north and west of the Licence area, north-west trending features influence the distribution of basement and cover rocks. The most prominent of these is the north-west trending linear element south of Kainton, formed by the edge of the Cambrian carbonate sequence, extending to the east to include the Yararoo phosphate occurrences, and generally marking the southern extent of Adelaidean outcrop. This feature hereafter referred to as the Kainton Feature, also appears to have controlled the development of the linear karst topography located immediately north of the Kainton-Port Clinton Road. see 5091-11

A pronounced, curvilinear, generally north-east trending escarpment is traceable some 24 kilometres from Winulta in the south to Cocoanut in the north, and appears to mark the western margin of the Clinton Palaeochannel. The Cainozoic sequence thickens in this direction, and it appears that the fluvial sediments accumulated in a north-east to south-west elongate tilt block, elevated to the east along the Ardrossan Thrust and downstream to the west along the Winulta-Cocoanut Feature.

3.0 GEOPHYSICS

3.1 General

The available geophysical data was reviewed by Mr C. Anderson (Anderson, 1982a).

In the period mid-1976 to 1978 Aquitaine Australia Minerals flew a detailed aeromagnetic survey in the area and followed this by some localised gravity surveys. Regional magnetic and gravity data were available from S.A.D.M.E. and B.M.R. surveys.

Targets identified by Anderson were:

<u>Designation</u>	<u>Description</u>	<u>Action</u>
Area M1	Local magnetic high in profiles, near surface source.	Wirrahill Anomaly. Ground survey and drilling.
Area M2	Feature within magnetic zone near Yararoo Fault/Ardrossan Thrust intersection.	No follow up.
Areas G1, G2	Local gravity highs in areas of Cambrian Carbonate cover.	No follow up.
Tertiary Palaeochannel	Two station gravity low.	Reconnaissance drilling.
Kimberlite Target	Low amplitude near surface anomaly.	Correlates with steel power pylon.

3.2 Ground Magnetics

Wirrahill Anomaly

The area M1 was considered a priority target area as the localised magnetic anomaly was consistent with a narrow concentration of magnetic material. Accordingly, a systematic ground survey was carried out and the data assessed (Anderson, 1982b). A source located some 30 to 50 metres below surface with a finite depth of 200 metres, and strike extent of several hundred metres, was modelled. The anomaly was considered to be a legitimate massive sulphide (pyrrhotite) target in a favourable stratigraphic setting at the basal Adelaidean unconformity, and was tested by drill hole PW-1. An amphibolite containing trace to 5% magnetite was intersected and is considered to account for the observed magnetic response (Bluck, 1983).

3.3 Spectrometry

Tertiary Palaeochannel

The potential Tertiary Palaeochannel was first identified by Thomson (1982) with supporting gravity data reported by Anderson (1982a). A broad spaced ground spectrometer survey was carried out to indicate the extent of the Tertiary Channel sequence and to check for anomalous responses within its confines. The results are presented and discussed in Bluck (1982); principle features of the survey were:

- high uranium channel count rates were recorded over the areas of Wandearah Metasiltstone and phosphatic Cambrian Limestones in the north of the area: these are possible source areas for mobile uranium.
- anomalous uranium channel count rates were obtained near Glengyle within the channel area; drilling results suggest that these related to a veneer of Throoka Silts.
- distinctly anomalous potassium and thorium channel count rates were obtained in the Dowlingville area; Aquitaine Australia Minerals investigated lead anomalies in the same area. The responses still have not been adequately explained.

3.4 Down Hole Logging

All the holes drilled were logged by Geoscience. Holes PW-1 and PA-1A were open hole gamma logged with a conventional probe (Bluck, 1982), while holes PA-2 to AP 2-10 PA-10 were logged inside double walled reverse circulation drill pipes with a purpose made slim probe. The open hole logging presented no operational or interpretive problems; the use of the slim probe is discussed below.

The slim probe was a conventional gamma-neutron array ($\frac{1}{2}$ " x $\frac{1}{2}$ " Na I crystal) but was turned down to an outside diameter of 40 mm to fit inside the double walled reverse circulation drill pipe (inside diameter 49 mm). During the logging runs the drill stem was left on bottom, and the log run up from the bit.

In the profiles drill pipe couplings show up every 6 metres up from bottom as symetrical -125 K cps signatures in the neutron log; the gamma response to the couplings is not discernable. Below the water table the total neutron log is attenuated, and the typical neutron drop over a pipe coupling is reduced to -20 K cps.

A gamma attenuation factor for logging inside the drill stem was calculated from a dual run of the upper portions of drill hole AP-9. A near surface anomalous zone was logged with the probe in the drill stem and again in open hole after the stem was drawn: results were digitised and a correction factor calculated.

	<u>Inside Stem</u>	<u>Open Hole</u>
Peak value	12 cps	20 cps
Mean over 4.5 metres	4.97	11.39
Ratio		2.29
Pipe factor (with free air connection)		2.44

The only drill hole to obtain a potentially significant radiometric response was AP-8: where a bilobe anomaly was present between 63 and 72 metres in the water saturated Mature Sand Unit. Considerable difficulty was encountered in drilling the hole, and the stem was tripped in and out past the intersection point approximately eight times - on each trip the hole was circulated for extended periods at each rod join to clear free running sands. The neutron

log shows several broad zones of depressed signal in this portion of hole which, as the original cuttings samples were of uniform fine to medium sand, almost certainly reflect attenuation of the neutron response by water filled washouts. The magnitude of the attenuation in an apparently lithologically uniform section indicates major changes in hole geometry at these points. Accordingly, the gamma responses obtained through this interval must be regarded as indicative only, and cannot reflect the in-situ grade of the material which must be considerably in excess of the indicated maximum 67 ppm eU_3O_8 .

4.0

DRILLING

Two drilling campaigns were mounted.

The first campaign using a conventional rotary-percussion Schramm 64 series supplied by Northbridge Drilling, drilled a single angled open hole into the Wirranill Magnetic anomaly, and attempted to drill the Tertiary sequence at site PA-1. Two holes were attempted at the PA-1 site (tricone roller and blade bits, water injection) but both tend to be abandoned at 15 to 17 metres in running sands of upper portions of the Mature Sand Unit.

The second campaign was directed solely at drilling the Tertiary sequence and employed a reverse circulation system matched to a Schramm 64 series rig supplied by Northbridge Drilling. Holes AP-2 to AP-10 were all successfully drilled to basement, though the advance rate was very low. Problems were invariably encountered in the upper portions of the Mature Sand Unit where free flowing sands tended to bind the drill stem, and to flow back up both tubes during rod changes. The problem was partly overcome in hole AP-8 by using a tricone roller bit which slowed the backflow of sand during rod changes, with only a marginally slower advance rate in the sand-silt sequence.

The drill hole data are summarised below:

<u>Hole No.</u>	<u>Commenced</u>	<u>Completed</u>	<u>Total Depth</u>
PW-1	19/10/82	19/10/82	84 m
wb PA-1	20/10/82	20/10/82	abandoned 15 m
AP- PA-1A	20/10/82	20/10/82	abandoned 17 m
in logs PA-2	27/1/83	27/1/83	30 m
PA-3	27/1/83	28/1/83	35.5 m
PA-4	28/1/83	29/1/83	34.5 m
PA-5	29/1/83	29/1/83	59.5 m
PA-6	1/2/83	1/2/83	63 m
PA-7	2/2/83	2/2/83	58.5 m
PA-8	2/2/83	4/2/83	119.5 m
PA-9	5/2/83	5/2/83	50.5 m
PA-10	5/2/83	5/2/83	27.5 m

5.0 MINERALIZATION

5.1 Basement Complex

Basement in the Licence area is predominantly a suprabasement succession of fine grained marine metasediments: areas of Wandearah Metasiltstone and associated Willamulka Volcanics are present in the extreme west. Neither the gross structural features nor the coarse clastic rocks associated with the Olympic Dam deposit could be inferred within the area from the available geological or geophysical data. Drilling of a discrete intrabasement magnetic anomaly intersected a magnetite bearing amphibolite (hole PW-1).

5.2 Adelaidean to Cambrian Sediments

"On Yorke Peninsula, Departmental and company drilling has shown that faulting, or wedging out to the west, of Sturt tillite against basement, with relatively impermeable overlying Tapley Hill Formation, can be associated with narrow zones of 0.5% Cu (chalcopyrite) mineralization in the tillite. Low grade sulphide mineralization also occurs at the base of the Tapley Hill Formation, with basal Backy Point or Burra Group sediments, and at the base of the Wilpena Group (Thomson, 19)."

No significant mineralization was located at these stratigraphic levels by the Aquitaine Australia Minerals drilling. Sturt Tillite was intersected in holes SYM 600/102 and 101 but contained only traces of pyrite-chalcopyrite. Surface reconnaissance in the north-eastern portion of the Licence area by Poseidon did not locate any mineralized, or significantly altered, subcrop or scree.

The Cambrian Limestone sequence was systematically explored for stratabound lead-zinc mineralization by Aquitaine Australia Minerals. While the model employed is not fully discussed, the emphasis appears to have been placed on structural flexures and pinchouts of the carbonates against basement highs: in the context of the models presented by Callahan (1974) the targets were Type 'A' or Type 'C' deposits at the base of the sequence.

The possibility of Mississippi Valley style lead-zinc deposits within the karstified limestone sequences was not examined by Aquitaine Australia Minerals. However, the best geochemical results for the carbonate sequences were obtained in hole SYM 600, drilled between two karst features (2 m grey to dark grey carbonaceous dolosparite at 84 m, Cu 1600 ppm, Pb 400 ppm, Zn 550 ppm, Co 45 ppm). While not conclusive this suggests that the event responsible for the Yararoo phosphate deposits was reasonably extensive, and a capable of mobilising

base metals. Further investigation of the karst topography to the north-west of the Yararoo deposits along the trend of the Kainton linear feature is warranted if lead-zinc deposits of the Mississippi style are considered worthwhile exploration targets.

The Yararoo phosphate deposits, while hosted by the Cambrian Limestones, are related to Cainozoic to recent karstification. This mode of genesis virtually precludes the possibility of developing an adequate tonnage of commercially acceptable phosphate rock.

5.3

Cainozoic Sequence

The Cainozoic sequence was investigated by drill holes AP-1 to AP-10. A major fluvial unit, the informally named Clinton Palaeochannel, was located below the surface veneer of Throoka Silts and younger sediments. The palaeochannel debouched over the Ardrossan Thrust Zone between Price and Dowlingville to form a major deltaic feature which is preserved as the salt flat-mangrove-sand dune complex between Price and Ardrossan. Syndepositional subsidence along the thrust resulted in the deposition of a markedly thicker clastic sequence in the marginal marine environment. The Clinton Palaeochannel event was terminated by a major change in base level, and the resultant widespread deposition of the Cream Clay Unit as a pro-deltaic facies. This unit is essentially impervious and its contact with the underlying Mature Sands Unit is a major locus for uranium mineralization in the area.

The facies control models for sedimentary uranium accumulations emphasise, in addition to the traditional requirements of porous sedimentary sections, abundant carbonaceous trash, etc., the juxtaposition of "slope" and "base level" facies, and the importance of basement structures in producing these.

In the context of the above model the bilobe anomaly located in hole AP-8 is significant as:

- the hole is located on the marine side of the transition from terrestrial (slope) to deltaic (base level) facies, and
- is adjacent to a major basement flexure, the Ardrossan Thrust Zone.
- the anomaly is located at the top of a highly porous, water saturated, carbonaceous, sand sequence immediately below an impervious clay unit.
- because of problems involved in drilling the hole, and uncertainties concerning the resulting hole geochemistry, the response is certainly anomalous and may represent ore grade in-situ.

The prospective zone between the fluvial and deltaic facies extends some 5 kilometres either side of hole AP-8 along and across the Ardrossan Thrust Zone. Additional potentially prospective zones will occur across the deltaic sequence, and particularly at the interface between the marginal marine deltaic and marine facies.

5.4

Conclusion

The fluvial-deltaic facies transition tested by hole AP-8 has a significant potential for the development of deposits of sediment hosted uranium. Other facies transitions exist in the area and may offer similar opportunities.

The development of a karst topography in the northern portions of the Licence area has been accompanied by the accumulation of significant, though non-commercial phosphate deposits and minor base metal mobilisation. Potential exists for the development of Mississippi Valley type lead-zinc deposits in the structurally controlled karsts along the Kainton feature, and in the broader collapse karsts to the north.

6.0

RECOMMENDATIONS

Additional drilling is required to assess the potential of the anomalous uranium intersection obtained in hole AP-8: work should be concentrated on the eastern side of the Ardrossan Thrust Zone.

An assessment of the base metal potential of the karst system is required and will involve:

- re-assaying of material from the Yarraroo phosphatic karsts for base metals
- petrographic examination of the metal anomalous zone in hole SYP 600-102 to determine the setting of the sulphides
- examination, assaying and petrology, of the core from hole SYM 101
- re-interpretation of the available gravity data in the vicinity of holes SYP 600-102 and SYM 101.

7.0

EXPENDITURE

Expenditure on the Exploration Licence for the period ended 16th May, 1983 was as follows.

Geology	2,412
Geophysics	3,340
Geochemistry	573
Drilling	10,495
Motor Vehicle Expenses	68
Travel and Accommodation	284
Field Supplies	14
Printing and Maps	<u>8</u>
Sub-Total	<u>\$17,204</u>
Administrative Overheads	860
Tenure	<u>1,366</u>
Total	<u><u>\$19,430</u></u>

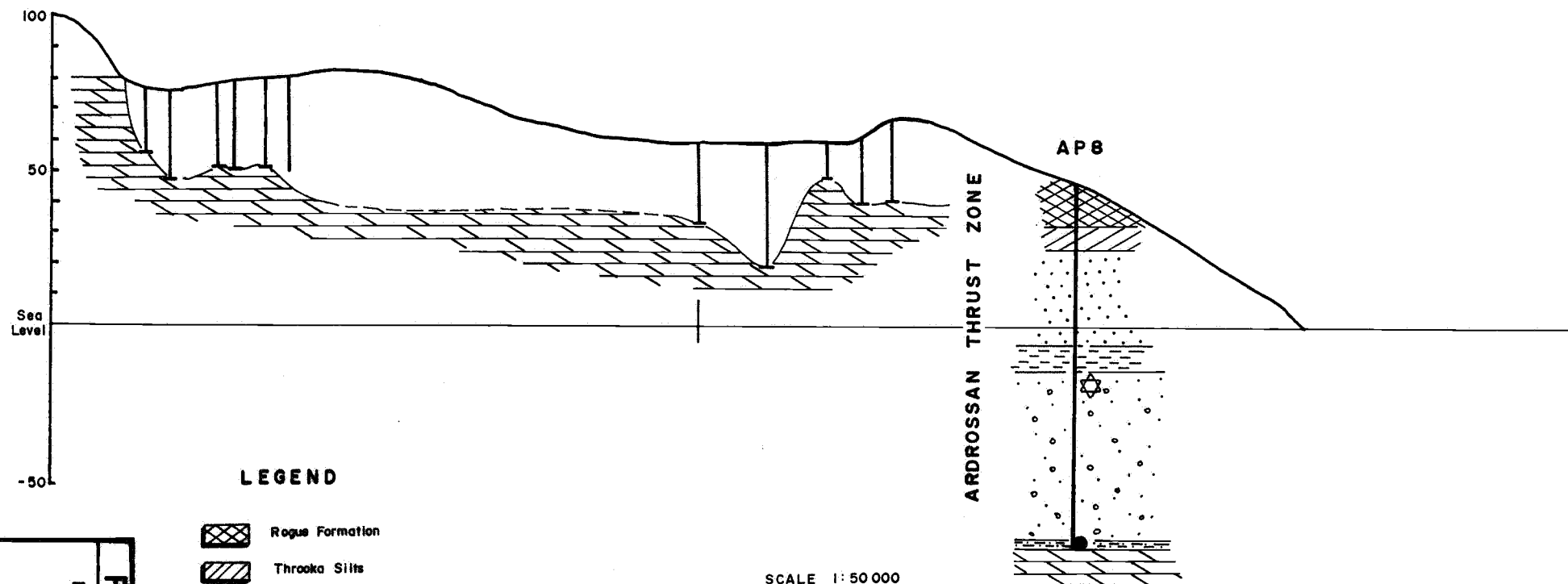


R.G. Bluck
July, 1983

8.0

REFERENCES

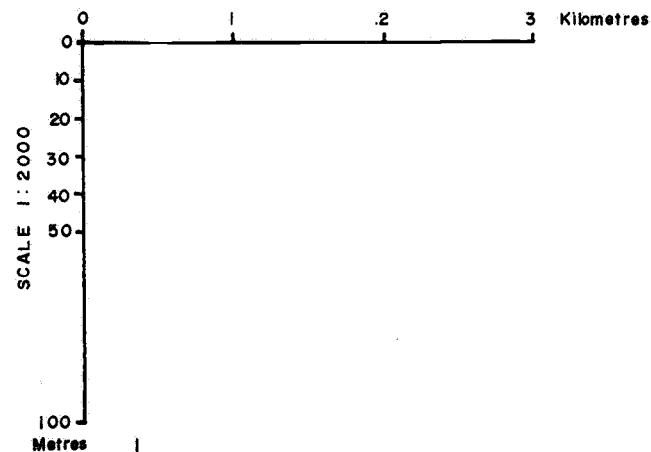
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LEGEND

-  Rogue Formation
-  Throoka Silts
-  Mulgoortie Formation
-  Cream Clay Unit
-  Mature Sands Unit
-  Basal Sand Unit
-  Cambrian basement
-  Anomalous radiometric response
-  Significant radiometric response

SCALE 1:50 000

Poseidon Limited
Drillhole

Aquitaine R.A.B. Holes - Abandoned

Aquitaine R.A.B. Holes - Completed in
Basement

POSEIDON LIMITED

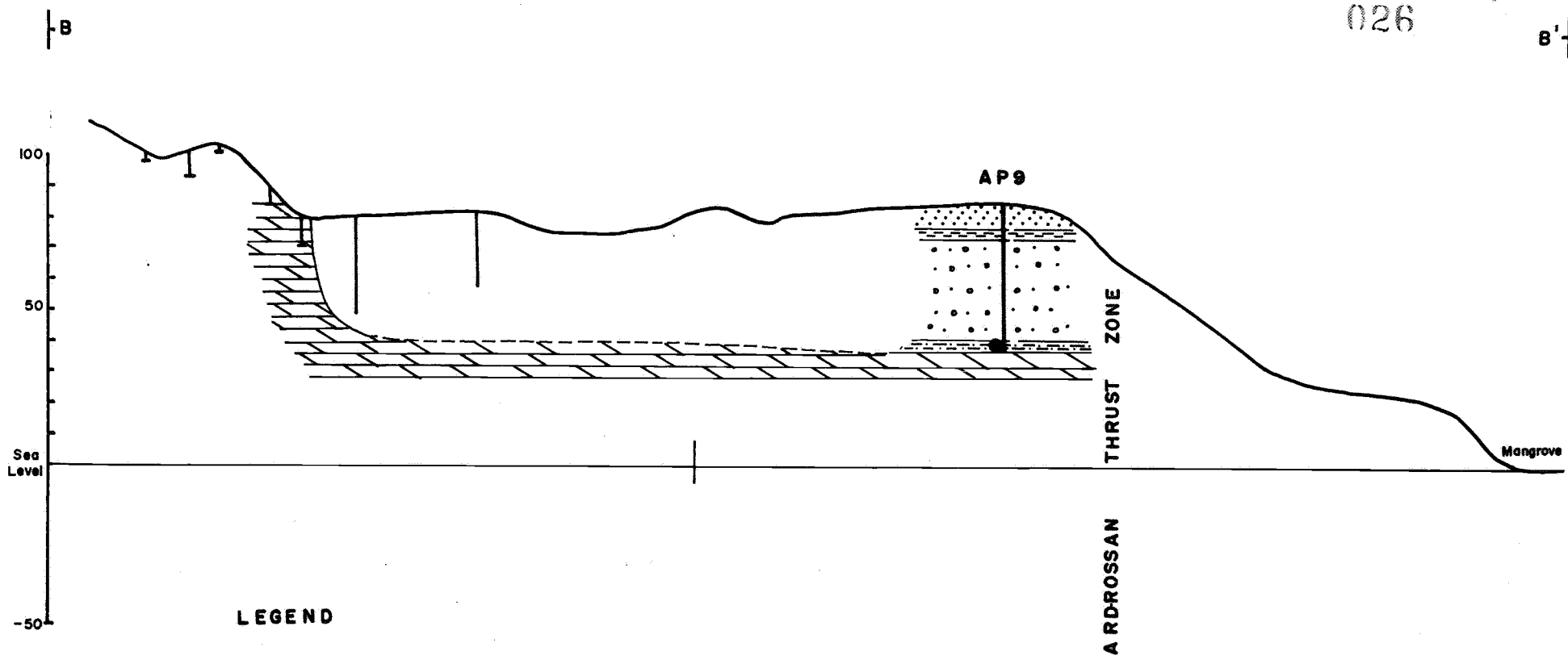
E.L. 1110 ARDROSSAN, South Australia

CROSS-SECTION A

Geologist: R. BLUCK	Scale: As shown	Fig. N°
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Sheet Index: 1-53-12	Dwg. N°007/24/83	
Revision:		2

026

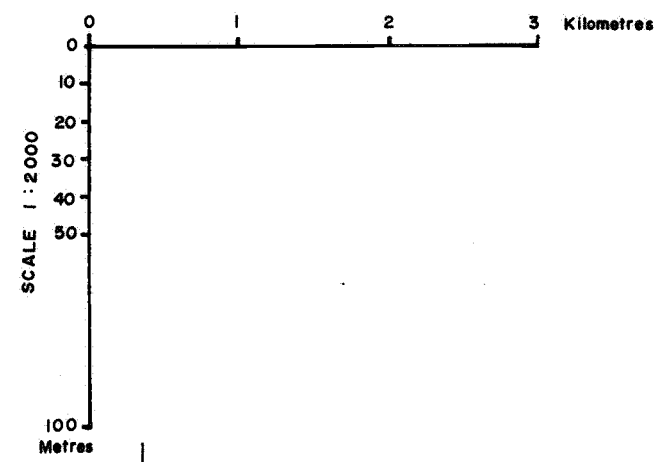
B'



LEGEND

- Rogue Formation
- Throoka Silts
- Muloowartie Formation
- Cream Clay Unit
- Mature Sands Unit
- Basal Sand Unit
- Cambrian basement
- Anomalous radiometric response
- Significant radiometric response

SCALE 1:50 000



- Poseidon Limited Drillhole
- Aquitaine R.A.B. Holes - Abandoned
- Aquitaine R.A.B. Holes - Completed in Basement

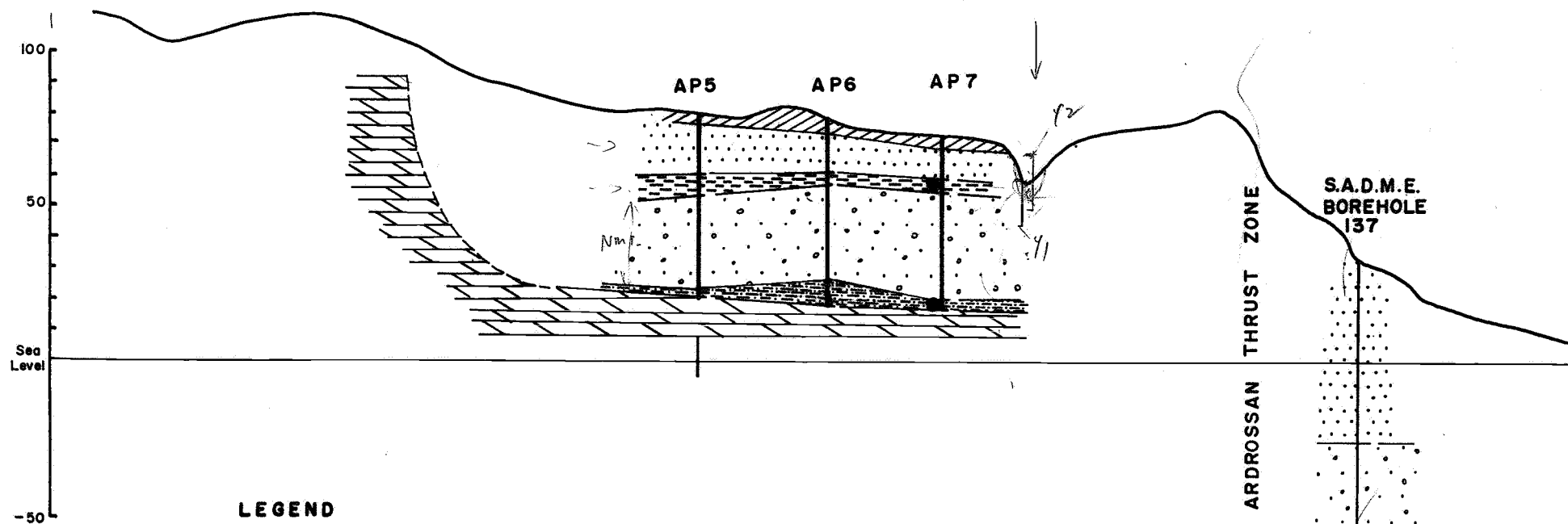
POSEIDON LIMITED

E.L. 1110 ARDROSSAN, South Australia

CROSS-SECTION B

Geologist : R. BLUCK	Scale : As shown	Fig. N°
Drawn : N. Bowden	Date March '83	3
Sheet Index : 1-53-12	Dwg. N° 007/25/83	
Revision:		

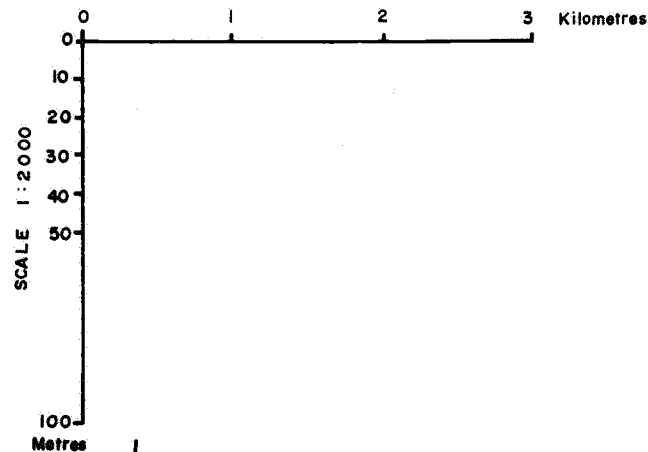
027 c-



LEGEND

-  Rogue Formation
-  Throoka Silts
-  Muloowartle Formation
-  Cream Clay Unit
-  Mature Sands Unit
-  Basal Sand Unit
-  Cambrian basement
-  Anomalous radiometric response
-  Significant radiometric response

SCALE 1:50 000



Poseidon Limited
Drillhole

Aquitaine R.A.B. Holes - Abandoned

Aquitaine R.A.B. Holes - Completed in
Basement

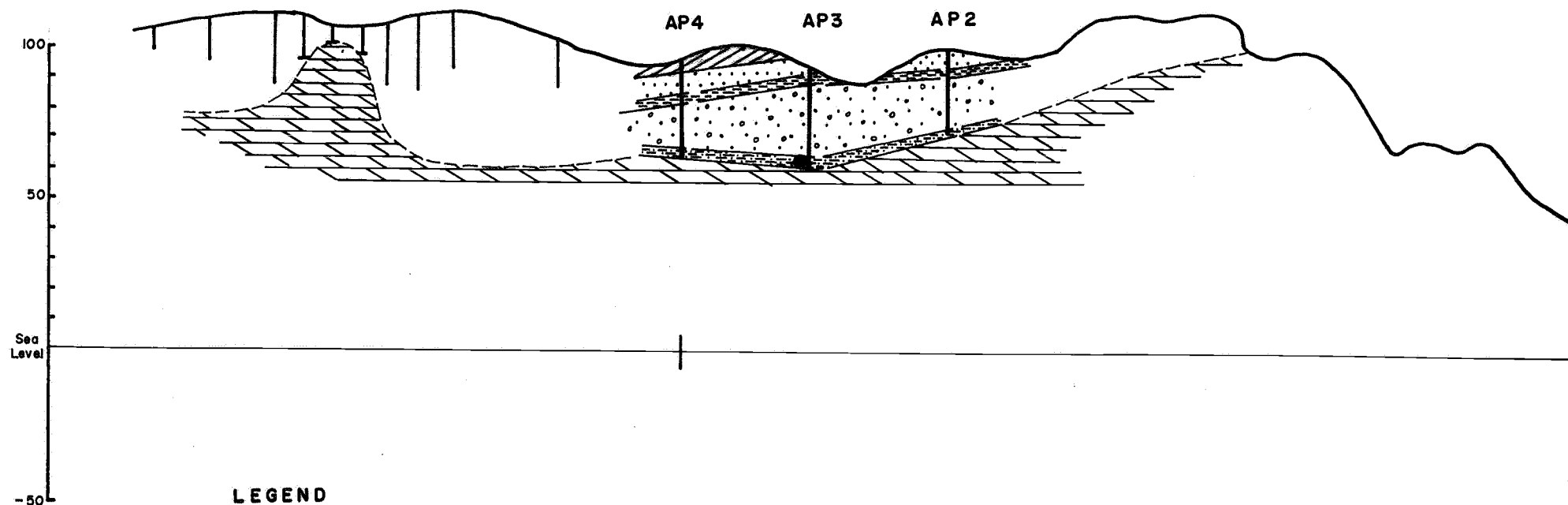
CROSS-SECTION C

POSEIDON LIMITED
E.L. 1110 ARDROSSAN, South Australia

Geologist: R. BLUCK	Scale: As shown	Fig. N°:
Drawn: N. Bowden	Date: March '83	4
Sheet Index: 1-53-12	Dr. N. 007/26/83	
Revision:		

028

D



LEGEND

-  Rogue Formation
-  Throoka Silts
-  Mulgoonartie Formation
-  Cream Clay Unit
-  Mature Sands Unit
-  Basal Sand Unit
-  Cambrian basement
-  Anomalous radiometric response
-  Significant radiometric response

SCALE 1:50 000

0 1 2 3 Kilometres

0
10
20
30
40
50
100
Metres

SCALE 1:2000

Poseidon Limited
Drillhole

Aquitaine R.A.B. Holes - Abandoned

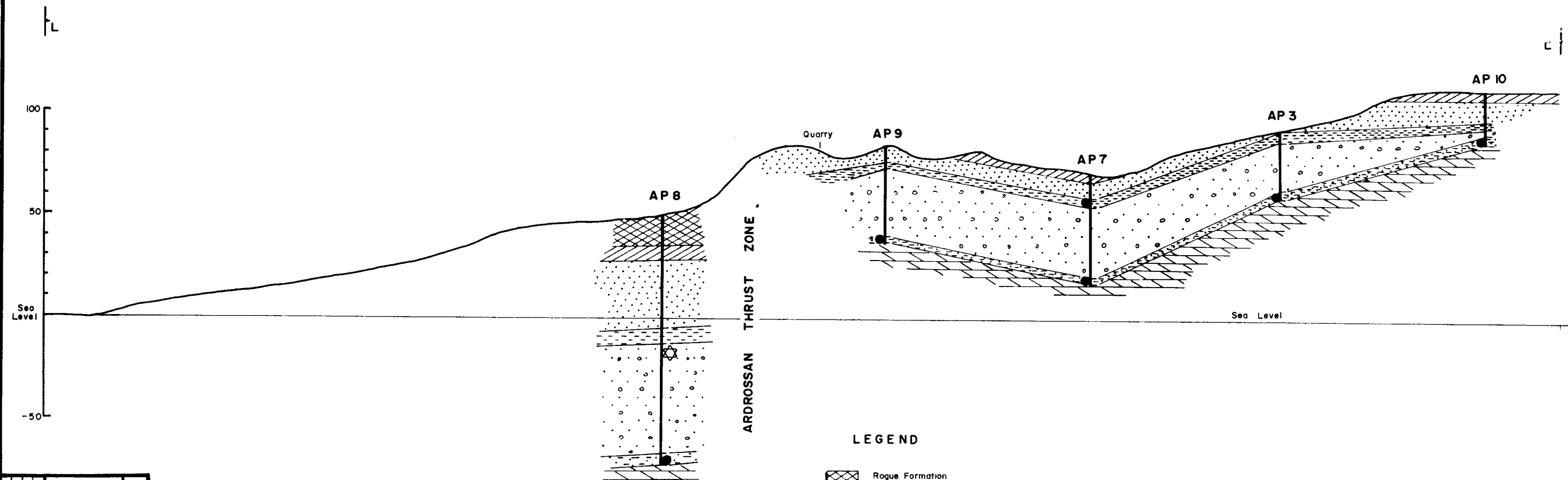
Aquitaine R.A.B. Holes - Completed in
Basement

POSEIDON LIMITED

E.L. 1110 ARDROSSAN, South Australia

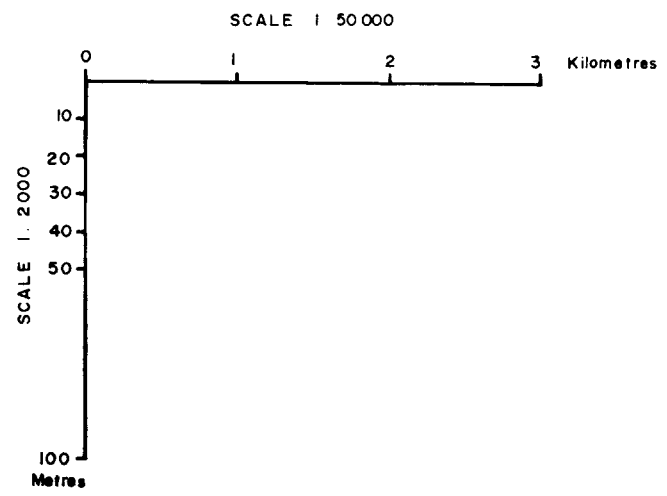
CROSS-SECTION D

Geologist: R. Bluck	Scale: As shown	Fig. No. 5
Drawn: N. Bowden	Date: March '83	
Sheet Index: 1-53-12	Dr. No. 007/27/83	
Revision:		



LEGEND

- Rogue Formation
- Throoka Silts
- Muloowartie Formation
- Cream Clay Unit
- Mature Sands Unit
- Basal Sand Unit
- Cambrian basement
- Anomalous radiometric response
- Significant radiometric response



POSEIDON LIMITED	
E.L. 1110 ARDROSSAN, South Australia	
LONGITUDINAL SECTION	
L-L₁ view west	
Geologist: R. BLUCK	Scale: As shown
Drawn: N. Bowden	Date: March 83
Sheet Index: 1-53-12	Drig No: 007/28/83
Revision:	Fig. No: 6

APPENDIX I

031

DRILL HOLE NO.: AP-2

OPEN HOLE DRILLING
Field Log

Lat. S : Long. E :
Azimuth : Dip : 90°
Commenced : 27/1/83 Completed: 27/1/83
Total Depth : 30 metres
Geologist : RGB
Operator : Northbridge
Schram 64 series, reverse circulation

Comments : Logged by Geoscience; slim probe, dual neutron, gamma

[illegible]

OPEN HOLE DRILLING
Field Log

Lat. S	:	Long. E	:
Azimuth	:	Dip	: 90°
Commenced	:	Completed:	28/1/83
Total Depth	:		
Geologist	:		
Operator	:		
		Schram 64 series	

Hole size: 3 7/8" nominal OD; inner tube ID 41 mm.

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

[illegible]

OPEN HOLE DRILLING
Field Log

Lat. S	:	Long. E	:
Azimuth	:	Dip	: 90°
Commenced	:	28/1/83	Completed: 29/1/83
Total Depth	:	34.5 metres	
Geologist	:	RGB	
Operator	:	Northbridge	
		Schram 64 series	

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

[illegible]

PROPERTY NAME : Ardrossan'

DRILL HOLE NO.: AP-5

Poseidon LimitedOPEN HOLE DRILLING
Field Log

Lat. S : Long. E :
 Azimuth : Dip : 90°
 Commenced : 29/1/83 Completed: 29/1/83
 Total Depth : 59.5 metres
 Geologist : RGB
 Operator : Northbridge
 Schram 64 series

Hole size: 3 7/8" nominal OD; inner tube ID 41 mm.

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

From	To	Sample No.	Lithology and comments
0.0	1.5	1	Kunkar clay and soil
	3.5	2	Red brown clay, some silt to fine sand
	5.5	3	Red brown clay and fine to med. grd. sand
	7.5	4	Red brown clay and fine to med. grd. sand; minor granular sand
	9.5	5	Co-dominant granular to fine grd. sand and brown clay
	11.5	6	Brown clayey fine to med. grd. sand
	13.5	7	Brown clayey fine to med. grd. sand
	15.5	8	Brown clayey fine to med. grd. sand
	17.5	9	Brown clayey fine to med. grd. sand
	19.5	10	Cream to khaki silts and clay, minor sands as above
	21.5	11	Off-white to pale grey silts and clay
	23.5	12	Off-white to pale grey silts and clay
	25.5	13	Khaki to cream silts and clays, some fine sand
	27.5	14	Khaki co-dominant fine grd. sand and clay
	29.5	15	Grey-pale brown fine to med. grd. sand
	31.5	16	Grey-pale brown med. grd. to granular sand
	33.5	17	Grey-pale brown medium grd. sands
	35.5	18	Grey-pale brown med. grd. to granular sand
	37.5	19	Grey to yellowish brown fine grd. to granular sands
	39.5	20	Greenish grey fine grd. to granular sands
	41.5	21	Green-grey fine grd. to granular sands
	43.5	22	Grey coarse grd. to granular sand, minor red clay
	45.5	23	Grey to grey-brown fine to coarse grd. sands
	47.5	24	Grey fine to med. grd. sands
	49.5	25	Grey med. to coarse grd. sands
	51.5	26	Grey med. grd. to granular sands
	53.5	27	Grey to grey-brown med. grd. to granular sands
	55.5	28	Grey med. to coarse grd. sands
	57.5	29	Grey coarse grd. to pebbly sands - all well rounded
	59.5	30	Light to dark grey limestone and calcareous siltstone
			END OF HOLE

PROPERTY NAME : Ardrossan'
 DRILL HOLE NO.: AP-6

Poseidon Limited

OPEN HOLE DRILLING
 Field Log

Lat. S : Long. E :
 Azimuth : Dip : 90°
 Commenced : 1/2/83 Completed: 1/2/83
 Total Depth : 63 metres
 Geologist : RGB
 Operator : Northbridge
 Schram 64 series

Hole size: 3 7/8" nominal OD; inner tube ID 41 mm.

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

From	To	Sample No.	Lithology and comments
0.0	1.5	1	Clay and soil
	3.5	2	Red clay, minor silt
	5.5	3	Red clay, minor silt
	7.5	4	Red clay, minor fine sand
	9.5	5	Red clay, accessory fine to med. sand
	11.5	6	Red clay, accessory fine to med. sand
	13.5	7	Red brown clay, accessory fine to med. grd. clay
	15.5	8	Red brown clay, accessory fine to med. grd. clay
	17.5	9	Red brown to khaki clays with accessory fine to med. grd. sand
	19.5	10	Cream and buff clays
	21.5	11	Pale grey clay and tr fine sand
	23.5	12	Pale yellow brown sand, med. grd. (possibly jarosite stained)
	25.5	13	Grey fine to med. grd. sand
	27.5	14	Light grey to grey fine to med. grd. sand
	29.5	15	Light grey fine to med. grd. sand
	31.5	16	Light grey fine grd. to coarse sand
	33.5	17	Light grey fine grd. to coarse sand
	35.5	18	Light grey to pale brown silty claystone and fine sand
	37.5	19	Grey to yellow brown coarse grd. to pebbly sand
	39.5	20	Yellow brown coarse grd. to pebbly sand
	41.5	21	Light grey fine grd. sand
	43.5	22	Light to dark grey fine to med. grd. sand
	45.5	23	Grey to light grey fine to med. grd. sand
	47.5	24	Grey to light grey fine to med. grd. sand
	49.5	25	Grey to light grey med. grd. to granular sand, minor pebble
	51.5	26	Grey to light grey coarse grd. to granular, minor pebbles
	53.5	27	Grey to light grey coarse grd. to granular, minor pebbles
	55.5	28	Dark grey to faint browns med. grd. to pebbly sand, rare angular limestone fragments
	57.5	29	Grey to dark grey med. grd. sand, pebble bands; some black silty sands
	59.5	30	Grey to light grey fine to med. grd. sands, some black silty sand

[illegible]

PROPERTY NAME : Ardrossan
 DRILL HOLE NO.: AP-7

Poseidon Limited

OPEN HOLE DRILLING
 Field Log

Lat. S : Long. E :
 Azimuth : Dip : 90°
 Commenced : 2/2/83 Completed: 2/2/83
 Total Depth : 58.5 metres
 Geologist : RGB
 Operator : Northbridge
 Schram 64 series

Hole size: 3 7/8" nominal OD; inner tube ID 41 mm.

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

From	To	Sample No.	Lithology and comments
0.0	1.5	1	Soil and red clay
	3.5	2	Red to red-brown clay
	5.5	3	Red to grey clay with fine to med. sand
	7.5	4	Red to cream clay with fine to med. sand
	9.5	5	Red to cream clay with fine to med. sand
	11.5	6	Red to cream clay with fine to med. sand
	13.5	7	As above, co-dominant red-brown med. grd. sand (clean)
	15.5	8	Off-white to cream silt and clay
	17.5	9	Off-white to grey silt and clay
	19.5	10	Light grey-brown clayey silt and fine sand
	21.5	11	Similar to above
	23.5	12	Pale light grey fine to med. grd. sand (clean)
	25.5	13	Similar to above
	27.5	14	Similar to above
	29.5	15	Similar to above, minor pale brown coarse grd. material
	31.5	16	Pale brown med. grd. to granular sand
	33.5	17	Grey fine grd. sand and pale brown med. to coarse grd. sand
	35.5	18	Grey to pale yellow-brown fine grd. to granular sand
	37.5	19	Light to dark grey fine to med. grd. sand, tr silt
	39.5	20	Light grey med. grd. to granular and pebbly sand, some silty bands
	41.5	21	Light grey granular to pebbly sand
	43.5	22	Grey to pale yellow-brown fine to med. grd. sand, some silt
	45.5	23	Light grey med. grd. sand
	47.5	24	Light grey to pale yellow-brown med. grd. sand, pebble bands
	49.5	25	Grey brown fine grd. to granular sands
	51.5	26	Grey to light grey fine grd. pebbly sands
	53.5	27	Light grey to pale khaki clayey fine grd. pebbly sands
	55.5	28	Light grey to pale khaki clay and siltstone; minor pebbly sand
	57.5	29	Dark grey to black siltstone and calcareous siltstone
	58.5	30	Dark grey to black siltstone and calcareous siltstone
			END OF HOLE

PROPERTY NAME : Ardrossan'
 DRILL HOLE NO.: AP-8

Poseidon Limited

OPEN HOLE DRILLING
 Field Log

Lat. S : Long. E :
 Azimuth : Dip : 90°
 Commenced : 2/2/83 Completed: 4/2/83
 Total Depth : 119.5 metres
 Geologist : RGB
 Operator : Northbridge
 Schram 64 series

Hole size: Ream to 6.5 metres, hammer 6.5 to 9.5 metres; reverse circulation to total depth, nominal OD 3 7/8", inner tube ID 41 mm.

Comments :

From	To	Sample No.	Lithology and comments
0.0	1.5	1	Light pink-brown clay, sand, soil
	3.5	2	Light pink-brown sand, calcrete nodules, clay
	5.5	3	Red brown clay and sand
	7.5	4	Intercollated red-brown sandy clay and silicified limestone (fossiliferous)
	9.5	5	As above
	11.5	6	Predominantly red clay, minor thin silicified limestones
	13.5	7	Red-brown clay, silty in part; minor glauconitic sands
	15.5	8	Yellow-brown to khaki clay, minor fine sand, minor glauconitic sands
	17.5	9	Yellow-brown to pink clay, minor fine sand (fossiliferous)
	19.5	10	Pink to pale red-brown clay, minor sand; minor lithified sandstone bands (fossiliferous)
	21.5	11	Cream to pink clay, fine sand
	23.5	12	Pale khaki clay, lithified sandstone horizons
	25.5	13	Pale khaki and pink clay, minor siltstone (bentonitic?)
	27.5	14	Pale grey-khaki clay (bentonitic)
	29.5	15	Pale grey-khaki clay (bentonitic)
	31.5	16	Pale grey to cream clay and co-dominant fine sand
	33.5	17	Pale grey to khaki fine sand and co-dominant clay matrix and bands
	35.5	18	Khaki fine sand and co-dominant clay matrix and bands
	37.5	19	Khaki fine to med. sand and co-dominant clay matrix and bands
	39.5	20	Khaki fine grd sand and co-dominant clay matrix and bands
	41.5	21	Khaki-grey fine to med. sand and co-dominant clay matrix and bands
	43.5	22	50% grey med. to coarse grd. sand, red clay
	45.5	23	Red to grey clay with dispersed fine sand
	47.5	24	Red to grey clay with dispersed fine sand
	49.5	25	Red to minor grey clay with dispersed fine sand
	51.5	26	Khaki-yellow to cream clay with dispersed silt
	53.5	27	As above with off-white clay and fine sand
	55.5	28	Cream to red clays with some silt

[illegible]

PROPERTY NAME : Ardrossan
DRILL HOLE NO.: AP-9

Poseidon Limited

OPEN HOLE DRILLING
Field Log

Lat. S	:	Long. E	:
Azimuth	:	Dip	: 90°
Commenced	:	Completed:	5/2/83
Total Depth	:		50.5 metres
Geologist	:		RGB
Operator	:		Northbridge
			Schram 64 series

Hole size: 3 7/8" nominal OD; inner tube ID 41 mm.

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

[illegible]

PROPERTY NAME : Ardrossan'
DRILL HOLE NO.: AP-10

Poseidon Limited

OPEN HOLE DRILLING
Field Log

Lat. S	:	Long. E	:
Azimuth	:	Dip	: 90°
Commenced	:	Completed:	5/2/83
Total Depth	:		
Geologist	:		
Operator	:		
		Schram 64 series	

Hole size: 3 7/8" nominal OD; inner tube ID 41 mm.

Comments : Logged by Geoscience; slim probe, dual neutron, gamma.

[illegible]

APPENDIX II



GEOSCIENCE
ASSOCIATES (AUSTRALIA) Pty. LTD.
P.O. Box 239
Kilkenny, S.A. 5009
Phone: 268 2898

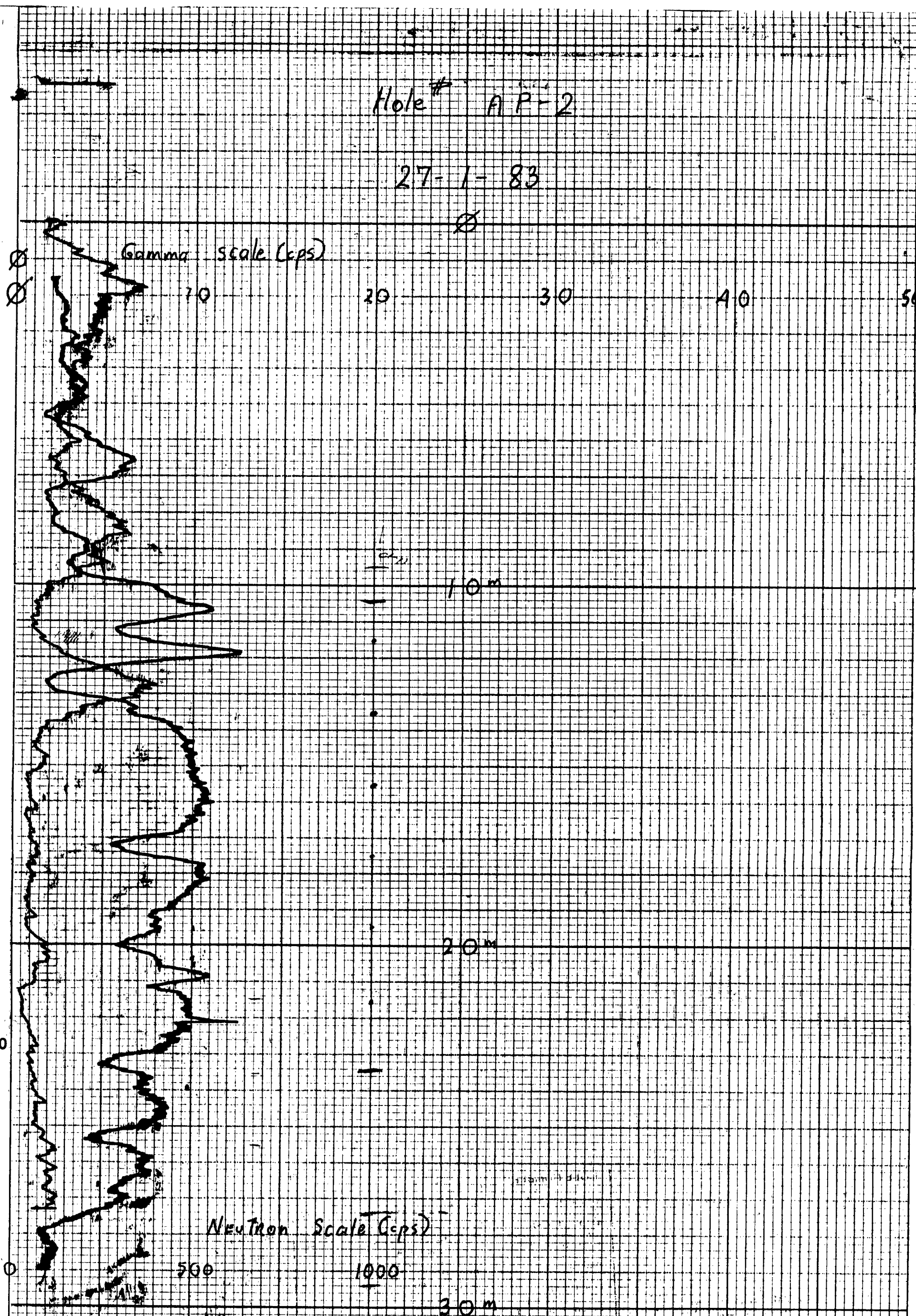
HOLE AP-2

5091-1

LOGGING DATA

DATE 27-1-83

LOCATION		HOLE NUMBER: AP-2		CLIENT: Pasiedon	
State: South Australia		Collar elev. metres		Claim:	
Area: York Peninsular		Depth drilled: 30 m metres		Owned by:	
Project:		CASING DATA		HOLE DATA	
Prospect:		Well size in. Dia. from to		Operated by:	
Lat: ° ' " Long ° ' "		Dia. (inside) in. Dia. from to		Unit Operator: HART	
GAMMA RAY		NEUTRON		Unit No. AL 8 Office: ADELAIDE	
INITIAL RUN		2 3 4		ELECTRIC	
Logged depth (M)		27.3 29.2		1 2 3 4	
Range (Full scale)		50 2.5K		Logged depth	
Time constant (sec.)		47.5 Dev 17.5 Dev		Resist. scale $\frac{\Omega}{\text{div}}$	
Paper speed cm/m		1 1		S.P. scale m.v.	
Logging speed m/min		6 6		Paper speed $\frac{\text{cm}}{\text{min}}$	
Bgnd count (cps)		4		Logging speed $\frac{\text{m}}{\text{min}}$	
Probe No.		62 62		Probe size	
Size (dia.) mm		35 35		Bias	
Crystal		5x5 NaI		REMARKS	
Standard (cps)				CALIPER	
Dead time		6 usec 4 sec.		Fluid Level logged inside drill metres	
Amp. Gain (disc)		180 170		pipe. No electric log.	
Ratemeter No.				Logged depth	
Bore hole medium				Scale $\frac{\text{in.}}{\text{in. def.}}$	
Mud density				Paper Speed	
Digital readout m.		NIL NIL		Logging speed	
Time base (sec)				Arm Length in.	
Upper Disc.				Max. Def. in.	
Lower Disc.					



GEOSCIENCE ASSOCIATES (AUSTRALIA) Pty. LTD.	
LOGGING DATA	
CORRECTION	S.P.
RANGE 50 cps	ATTEN.
47.5 Dev	LOGSPEED
PROB. 62	BIAS
SIZE 35	BENI
KFACTOR 1.35E-5	LOGSPEED
UNIT No. AL 8	
HOLE No. AP-2	DATE 27-1-83



GEOSCIENCE
ASSOCIATES (AUSTRALIA) Pty. Ltd.
P.O. Box 239
Kilkenny, S.A. 5008
Phone: 268 2898

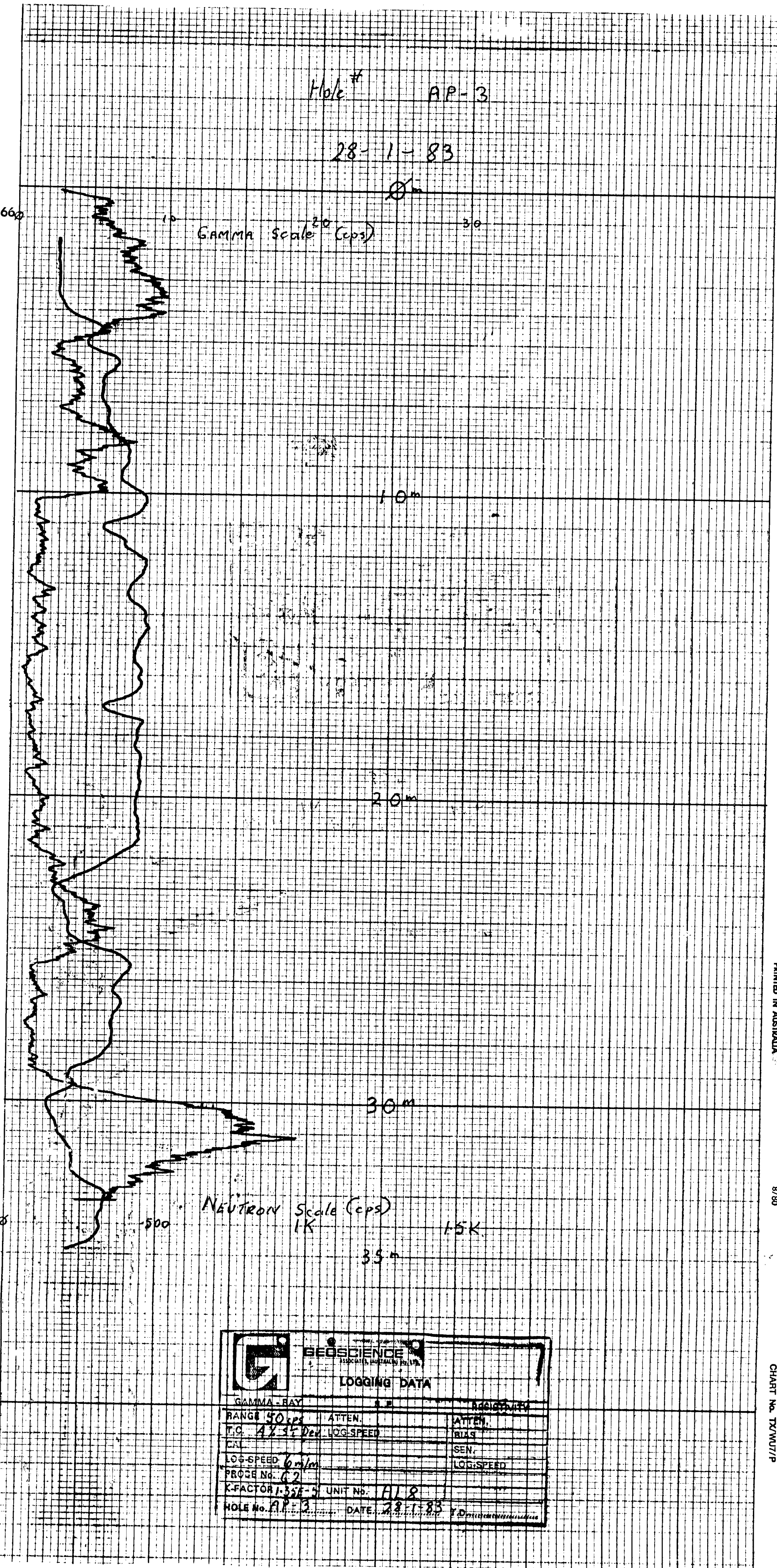
HOLE# AP-3

5091-2

LOGGING DATA

DATE 28-1-83

LOCATION				HOLE NUMBER: AP-3				CLIENT: POSIEDON			
State: South Australia				Collar elev. metres				Claim:			
Area: Ardrossan				Depth drilled: 35.5 metres				Owned by:			
Project:				CASING DATA				HOLE DATA			
Prospect:				Wall size in.				Dia. from to			
Lat: 0 " Long 0 "				Dia. (inside) in.				Dia. from to			
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN				Cased from to mtrs				Dia. from to			
2				Cored hole ☐				Non-cored hole ☒			
3				Sampled Interval				Type			
4				2m				Flowline			
Logged depth (ft.) m				33.2				34.9			
Range (Full scale) cps				50				2.5K			
Time constant (sec.)				4% ST dev				5% ST Dev			
Paper speed cm/m				1				1			
Logging speed m/min				6				6			
Bgnd count (cps)				4				4			
Probe No.				G2				G2			
Size (dia.) (in.)				35mm				35mm			
Type				4x2 No. 1				4x2 No. 1			
Standard (cps)				4 sec.				4 sec.			
Dead time				6 uses				6 uses			
Amp. Gain				180				170			
Ratemeter No.											
Bore hole medium											
Mud density											
Digital readout				NIL				NIL			
Time base											
Upper Disc.											
Lower Disc.											



5091-3



GEOSCIENCE
ASSOCIATES (AUSTRALIA) Pty. Ltd

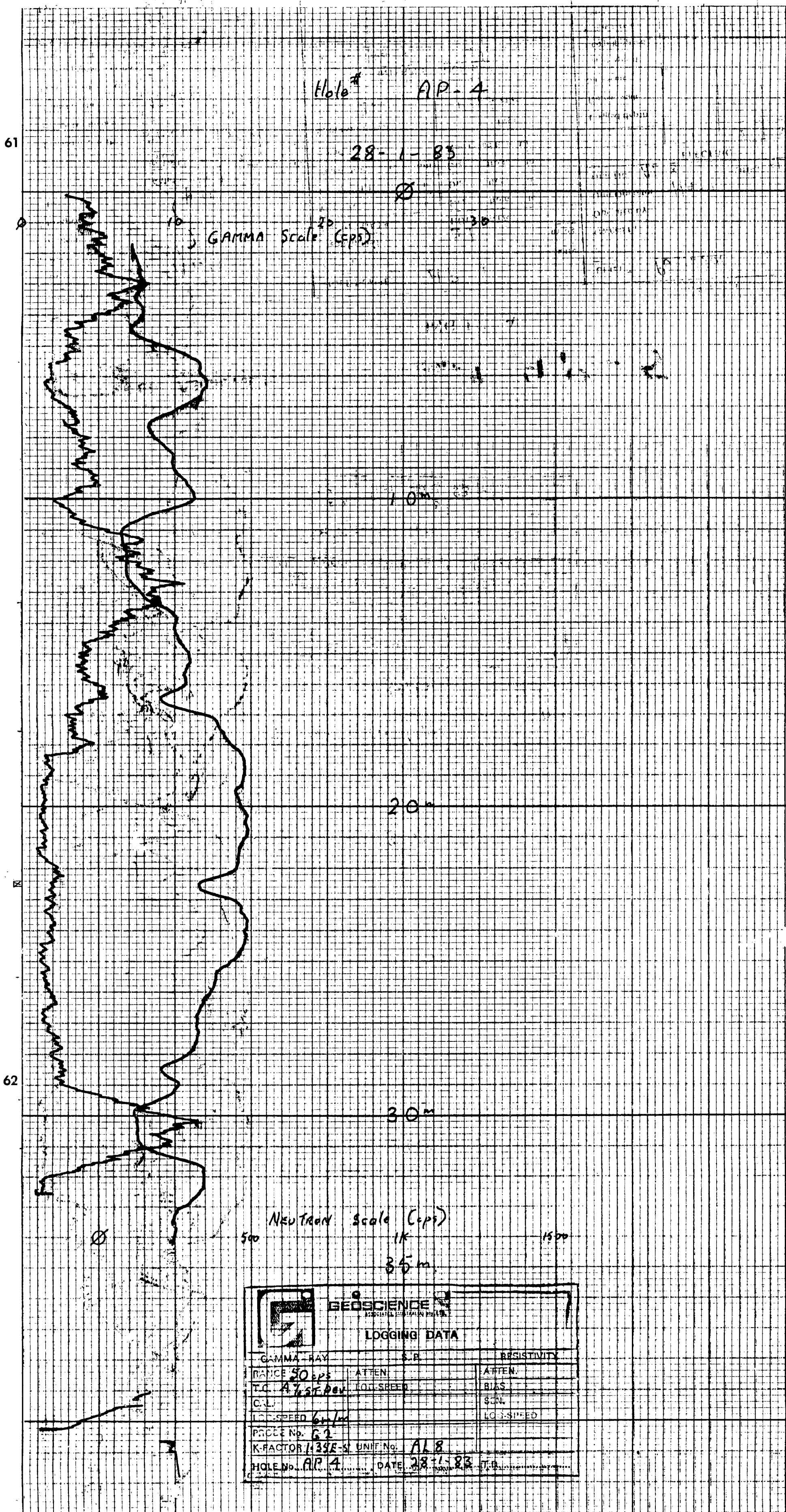
P.O. Box 239
Kilkenny, S.A. 5009
Phone: 268 2898

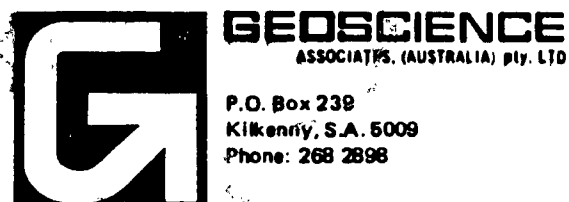
HOLE # AP-4

LOGGING DATA

DATE 28-1-83

LOCATION				HOLE NUMBER: AP-4				CLIENT: PosiEDon			
State: South Australia				Collar elev. metres				Claim:			
Area: Ardresan				Depth drilled: 34.5 metres				Owned by:			
Project:				CASING DATA				HOLE DATA			
Prospect:				Wall size in.				Dia. from to			
Lat: 0 0 0				Dia. (inside) in.				Dia. from to			
Long: 0 0 0				Cased from to mtrs				Dia. from to			
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN				2				3			
3				4				5			
Logged depth (ft.) m				32.5				34.2			
Range (Full scale) cps				50				2.5K			
Time constant (sec.)				4% STD Dev				5% STD Dev			
Paper speed cm/min				1				1			
Logging speed m/min				6				6			
Bkgnd count (cps)				4				4			
Probe No.				G2				G2			
Size (dia.) (in.)				3/8				3/8			
Type				1/2 x 1/2 NaI				1/2 x 1/2 NaI			
Standard (cps)				170				170			
Dead time (sec.)				6 usec				4 sec.			
Amp. Gain				180				170			
Ratemeter No.											
Bore hole medium											
Mud density				NIL				NIL			
Digital readout											
Time base											
Upper Disc.											
Lower Disc.											
Cored hole ☐				Non-cored hole ☒							
Sampled Interval				2m				Type			
Type				Fluorine				Logged depth			
Resist. scale								S.P. scale			
Paper speed								Logging speed			
Probe size				in				Type			
Bias								Max. Def.			
REMARKS				Fluid Level metres				Scale			
Lagged inside drill pipe.								Paper Speed			
No electric Logs.								Logging speed			
								Arm Length			
								Max. Def.			



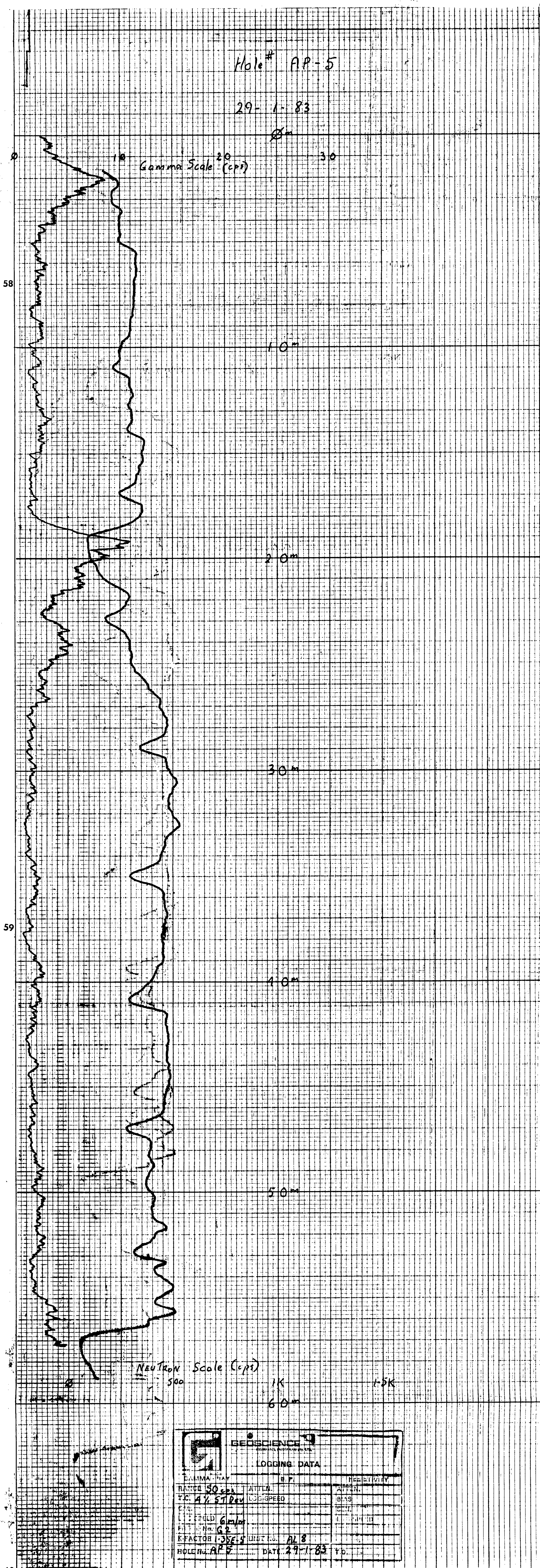


HOLE# AP-5

LOGGING DATA

DATE 29-1-83

LOCATION		HOLE NUMBER: AP-5		CLIENT: POSIEDON	
State: South Australia		Collar elev. metres		Claim:	
Area: Ararasan		Depth drilled: 59 metres		Owned by:	
Project:		CASING DATA		HOLE DATA	
Prospect:		Wall size in.		Dia. from to	
Lat: 0 0 0		Dia. (inside) in.		Dia. from to	
GAMMA RAY		NEUTRON		ELECTRIC	
INITIAL RUN		2 3 4		1 2 3 4	
Logged depth (ft.): 57.2		58.8		Logged depth	
Range (Full scale) cps 50		2.5K		Resist. scale	
Time constant (sec.) 4% 5% dev		5% 5% Dev		S.P. scale	
Paper speed cm/min 1		1		Paper speed	
Logging speed m/min 6		6		Logging speed	
Bkgnd count (cps) 4				Probe size in	
Probe No. 62		62		Type	
Size (dia.) mm (in.) 35 (1.375)		35 (1.375)		Bias	
Type 3x1/2 No 1					
Standard (cps)				Fluid Level metres	
Dead time 6usec		4 sec.		Logged depth	
Amp. Gain				Scale 1/16 in. def.	
Rate meter No.				Paper Speed	
Bore hole medium				Logging speed	
Mud density				Arm Length in.	
Digital readout NIL		NIL		Max. Def. in.	
Time base					
Upper Disc.					
Lower Disc.					



GEO SCIENCE	
LOGGING DATA	
GAMMA RAY	NEUTRON
RANGE 50 cps	ATTEN.
TC 4% 5% Dev	BIAS
EXP.	CLIM.
LOG SPEED 6 m/min	LOG SPEED
PROB. No. 62	PROB. No.
K FACTOR 1.35E-5	UNIT NO. AL 8
HOLE NO. AP-5	DATE 29-1-83

5091-5

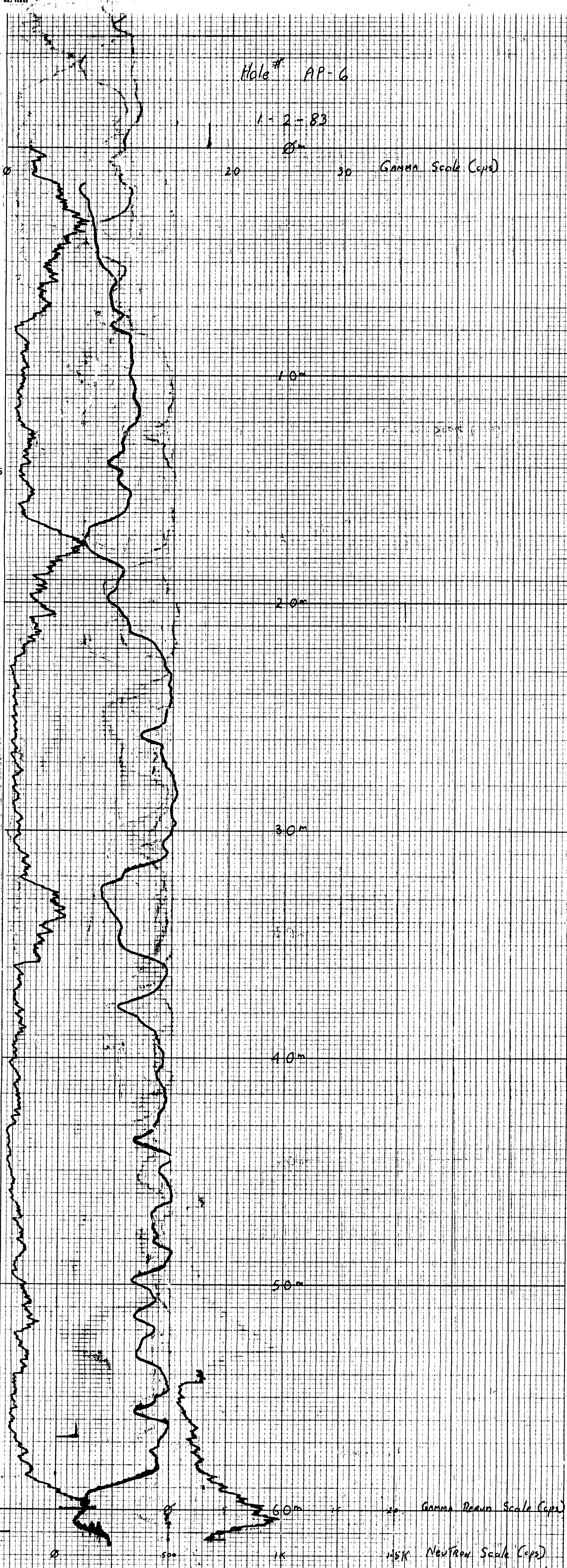


HOLE # AP-6

LOGGING DATA

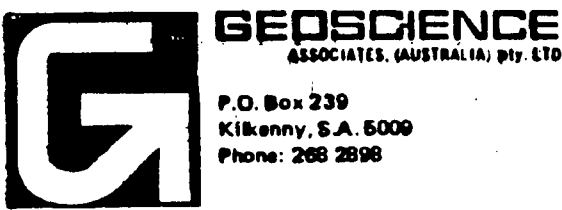
DATE 1-2-83

LOCATION				HOLE NUMBER: AP-6				CLIENT: POSIEDON			
State: South Australia				Collar elev. metres				Claim:			
Area: Androsan				Depth drilled: 62.5 metres				Owned by:			
Project:				CASING DATA				HOLE DATA			
Prospect:				Wall size in. Dia. from to				Operated by:			
Lat: 0 0 0				Dia. (inside) in. Dia. from to				Unit Operator: HART			
Long: 0 0 0				Cased from to mtrs Dia. from to				Unit No. AL8 Office: Adelaide			
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN				Cored hole ☐ Non-cored hole ☒							
Logged depth (ft.) m				Sampled Interval				Type			
Range (Full scale) cps				2m				Flowline			
Time constant (sec.)								Resist. scale			
Paper speed cm/m								S.P. scale			
Logging speed m/min								Paper speed			
Bkgnd count (cps)				Probe No. Standard (cps) K factor				Logging speed			
Probe No. 62				G2				1.35E-5			
Size (dia.) (mm.)								Probe size in			
Type								Type			
Standard (cps)				REMARKS				CALIPER			
Dead time				Fluid Level metres				Logged depth			
Amp. Gain				Logged inside drill pipe				Scale in/in. def.			
Rate meter No.				No electric logs				Paper Speed			
Bore hole medium								Logging speed			
Mud density								Arm Length in.			
Digital readout								Max. Def. in.			
Time base											
Upper Disc											
Lower Disc											



GEO SCIENCE			
LOGGING DATA			
GAMMA RAY		S.P.	
RANGE 50 cps	ATTEN.	RESISTIVITY	
TC 4% 1st Dev	LOG SPEED	BIAS	
CAL		SEN	
LOG SPEED 6m/min		LOG SPEED	
PROB NO.			
K FACTOR 62	UNIT NO. AL8		
HOLE NO. AP 6	DATE 1-2-83	TP	

5091-6

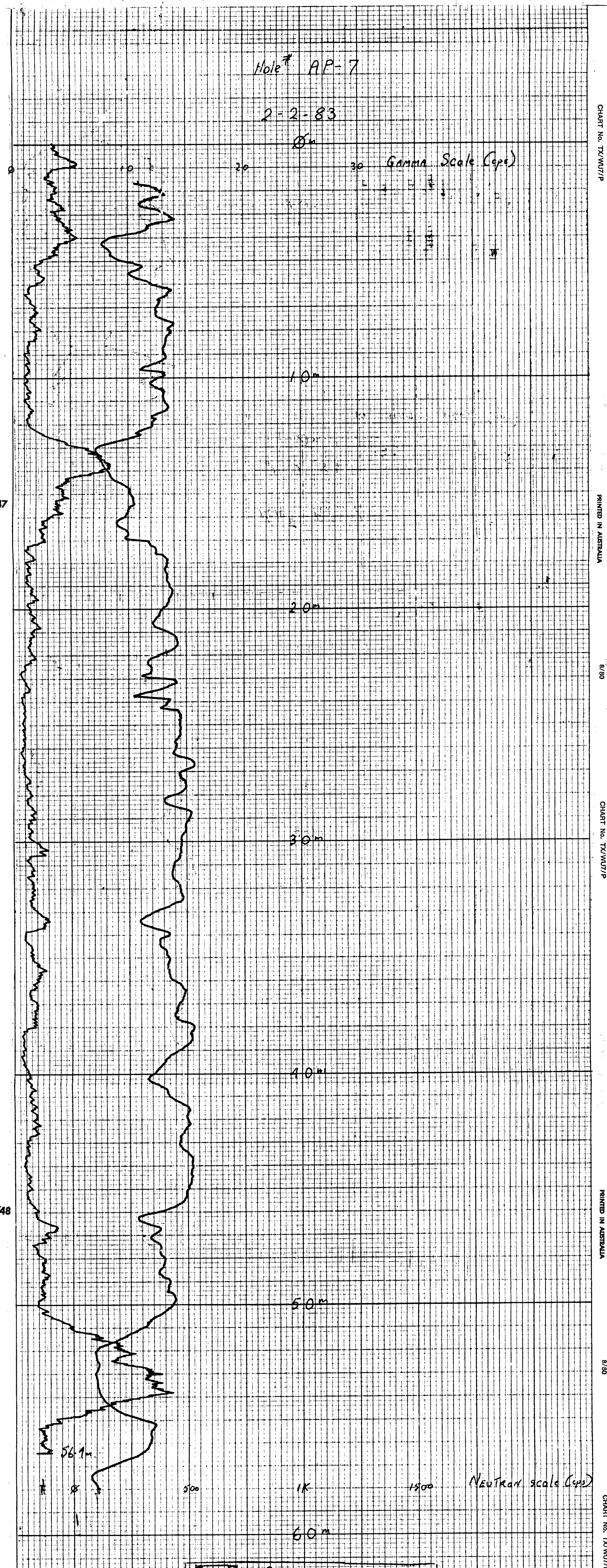


HOLE # AP-7

LOGGING DATA

DATE 2-2-83

LOCATION				HOLE NUMBER: AP-7				CLIENT: POSIEDON			
State: South Australia				Collar elev. metres				Claim:			
Area: Ardrossan				Depth drilled: 58.5 metres				Owned by:			
Project:				CASING DATA				HOLE DATA			
Prospect:				Well size in. Dia. from to				Unit Operator: HART			
Lat: 0 0 0 Long 0 0 0				Dis. (inside) in. Dia. from to				Unit No. ALB Office: Adelaide			
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN				Cased from to mtrs				Non-cased hole			
Logged depth (m) 56.4				Sampled interval 2m				Type Floline			
Range (Full scale) 50				Cored hole				Logged depth			
Time constant (sec) 1% std dev				Probe No. G2				Resist. scale			
Paper speed cm/m 1				Standard				S.P. scale m.v.			
Logging speed m/min 6				K factor 1.35E-5				Paper speed			
Bkgnd count (cps) 4				Probe size				Logging speed			
Probe No. G2				Bias				Probe size			
Size (dia.) mm 35				REMARKS				CALIPER			
Crystal 2x1/2 No 1				Fluid Level				Logged depth			
Standard (cps)				metres				Scale			
Dead time 60sec				Logged inside drill pipe				Paper Speed			
Amp. Gain (disc) 180				No electric logs				Logging speed			
Rate meter No.				Arm Length				Max. Def.			
Bore hole medium											
Mud density											
Digital readout m. NIL											
Time base (sec)											
Upper Disc.											
Lower Disc.											



GEO SCIENCE ASSOCIATES (AUSTRALIA) Pty. Ltd.			
LOGGING DATA			
GAMMA RAY		S.P.	
RANGE 50 cps		RESISTIVITY	
T.C. 1% std dev		BIAS	
LOG SPEED 6m/min		LOG SPEED	
PROBE NO. G2			
K-FACTOR 1.35E-5		UNIT NO. 2-2-83	
HOLE NO. AP-7		DATE	

CHART No. TX/WUT/P

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8/80

CHART No. TX/WUT/P

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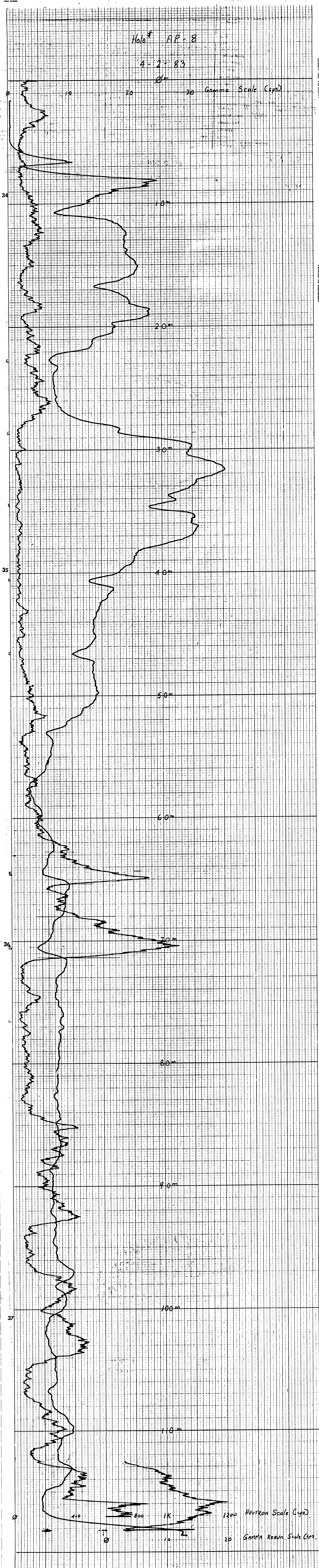
8/80

CHART No. TX/WUT/P

LOGGING DATA

DATE **4-2-83**

LOCATION				HOLE NUMBER: AP-8				CLIENT: POSIEDON			
State: South Australia				Collar elev. _____ metres				Claim: _____			
Area: Arckara				Depth drilled: 119.5' metres				Owned by: _____			
Project: _____				CASING DATA				HOLE DATA			
Prospect: _____				Well size in. Dia. from to				Unit Operator: HART			
Lat. 0 " Long 0 "				Dia. (inside) in. Dia. from to				Unit No. AK 8 Office: Adelaide			
GAMMA RAY Neutron				Cased from to mtrs				ELECTRIC			
INITIAL RUN 2 3 4				Cored hole ☐ Non-cored hole ☒				1 2 3 4			
Logged depth (ft.) 118.7				Sampled Interval _____ Type _____				Logged depth _____			
Range (Full scale) cps 50				2m Flowline				Resist. scale _____			
Time constant (sec.) 1.9% st dev				INTERPRETATION DATA				S.P. scale _____			
Paper speed cm/min 6				Probe No. Standard (cps) K factor				Paper speed _____			
Bgnd count (cps) 4				62 1.35E-5				Logging speed _____			
Probe No. 62				Type _____				Probe size in _____			
Size (dia.) mm 35				Bias _____				Type _____			
Type 3x1 No 1				REMARKS				CALIPER			
Standard (cps) _____				Fluid Level _____ metres				Logged depth _____			
Dead time 6 usec				Logged inside drill pipe				Scale in. det. _____			
Amp. Gain _____				No electric logs.				Paper Speed _____			
Rate meter No. _____				_____				Logging speed _____			
Bore hole medium _____				_____				Arm Length in. _____			
Mud density _____				_____				Max. Def. in. _____			
Digital readout Nil				_____				_____			
Time base _____				_____				_____			
Upper Disc _____				_____				_____			
Lower Disc _____				_____				_____			



GEOSCIENCE ASSOCIATES (AUSTRALIA) PTY LTD

LOGGING DATA

GAMMA RAY	NEUTRON	RESISTIVITY
PROBE NO. 62	PROBE NO. 62	PROBE NO. 62
LOG SPEED 6 cm/min	LOG SPEED 6 cm/min	LOG SPEED 6 cm/min
K-FACTOR 1.35E-5	UNIT ID. AK 8	UNIT ID. AK 8
HOLE NO. AP-8	DATE 4-2-83	DATE 4-2-83

5091-8



HOLE # **AP-9**

LOGGING DATA

DATE **5-2-83**

LOCATION				HOLE NUMBER: 50.5m AP-9				CLIENT: POSIEDON			
State: South Australia				Collar elev. _____ metres				Claim: _____			
Area: Ardrosan				Depth drilled: 50.5m metres				Owned by: _____			
Project: _____				CASING DATA				HOLE DATA			
Prospect: _____				Wall size _____ in.				Dia. from to _____			
Lat: 0° _____ Long 0° _____				Dia. (inside) _____ in.				Dia. from to _____			
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN				2				3			
2				3				4			
Logged depth (ft.) 20				21.8				Sampled Interval			
Range (Full scale) 50				2.5K				Type Flowline			
Time constant 4% stdev				5% stdev				Logged depth			
Paper speed 1 cm/m				1				Resist. scale			
Logging speed 6 m/min				6				S.P. scale			
Bkgnd count 4 (cps)				G2				Paper speed			
Probe No. G2				G2				Logging speed			
Size (dia.) 35 mm				35				Probe size _____ in.			
Type 4x3 NaI				REMARKS				Type _____			
Standard (cps)				Fluid Level _____ metres				Bias			
Dead time 6 usec				4 sec.				Logged depth			
Amp. Gain				Logged open Hole.				Scale _____ in. def.			
Ratemeter No.				Dry Hole.				Paper Speed			
Bore hole medium								Logging speed			
Mud density								Arm Length _____ in.			
Digital readout 0.1 m				NIL				Max. Def. _____ in.			
Time base 1 sec											
Upper Disc.											
Lower Disc.											

28

Hole # **AP-9**

5-2-83

8m

20

30 Gamma Scale (cps)

10m

20m

5m

1000 NEUTRON Scale Cps

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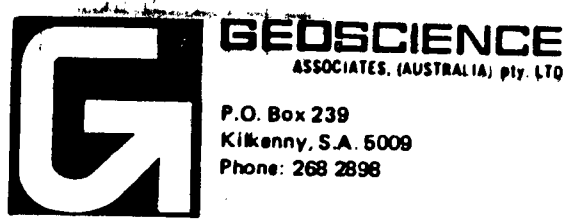
8/80

CHART No. JX4W07/P

29

GEOSCIENCE ASSOCIATES (AUSTRALIA) PTY. LTD.			
LOGGING DATA			
GAMMA-RAY		S.P.	
RANGE 50 cps		ATTEN.	
T.C. 4% stdev		LOG SPEED	
CAL.		SEN.	
LOG SPEED 6 m/min		LOG SPEED	
PROBE No. G2		UNIT No.	
K-FACTOR 1.35E-5		HOLE No. AP-9	
DATE		T.D.	

5091-9



HOLE# AP-9

LOGGING DATA

DATE 5-2-83

LOCATION				HOLE NUMBER: AP-9				CLIENT: POSIEDON			
State: South Australia				Collar elev. metres				Claim:			
Area: Arcdrosan				Depth drilled: 50.5 metres				Owned by:			
Project:				CASING DATA				HOLE DATA			
Prospect:				Wall size in. Dia. from to				Unit Operator: HART			
Lat: 0 Long 0				Dia. (inside) in. Dia. from to				Unit No. AL 8 Office: Adelaide			
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN				Cased from to mtrs				Dia. from to			
Logged depth (ft.) m				Cored hole ☐ Non-cored hole ☒							
Range (Full scale) cps				Sampled Interval				Type			
Time constant (Sec.)				2m				Fluorine			
Paper speed cm/m				INTERPRETATION DATA				Logged depth			
Logging speed m/min				Probe No. Standard (cps) K factor				Resist. scale			
Bkgnd count (cps)				G2				S.P. scale			
Probe No. G2				1.35E-5				Paper speed			
Size (dia.) mm (in.)								Logging speed			
Type 4x1/4								Probe size in			
Standard (cps)				REMARKS				Type w/d			
Dead time 6 usec				Fluid Level metres				Bias			
Amp. Gain				Logged inside drill pipe				CALIPER			
Ratemeter No.				No electric logs				Logged depth			
Bore hole medium								Scale in. def.			
Mud density								Paper Speed			
Digital readout .1								Logging speed			
Time base 1								Arm Length in.			
Upper Disc.								Max. Def. in.			
Lower Disc.											

Hole# AP-9

5-2-83

8m

Gamma Scale (cps)

10m

20m

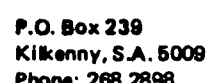
30m

40m

Gamma Beam Scale

Neutron Scale Cps

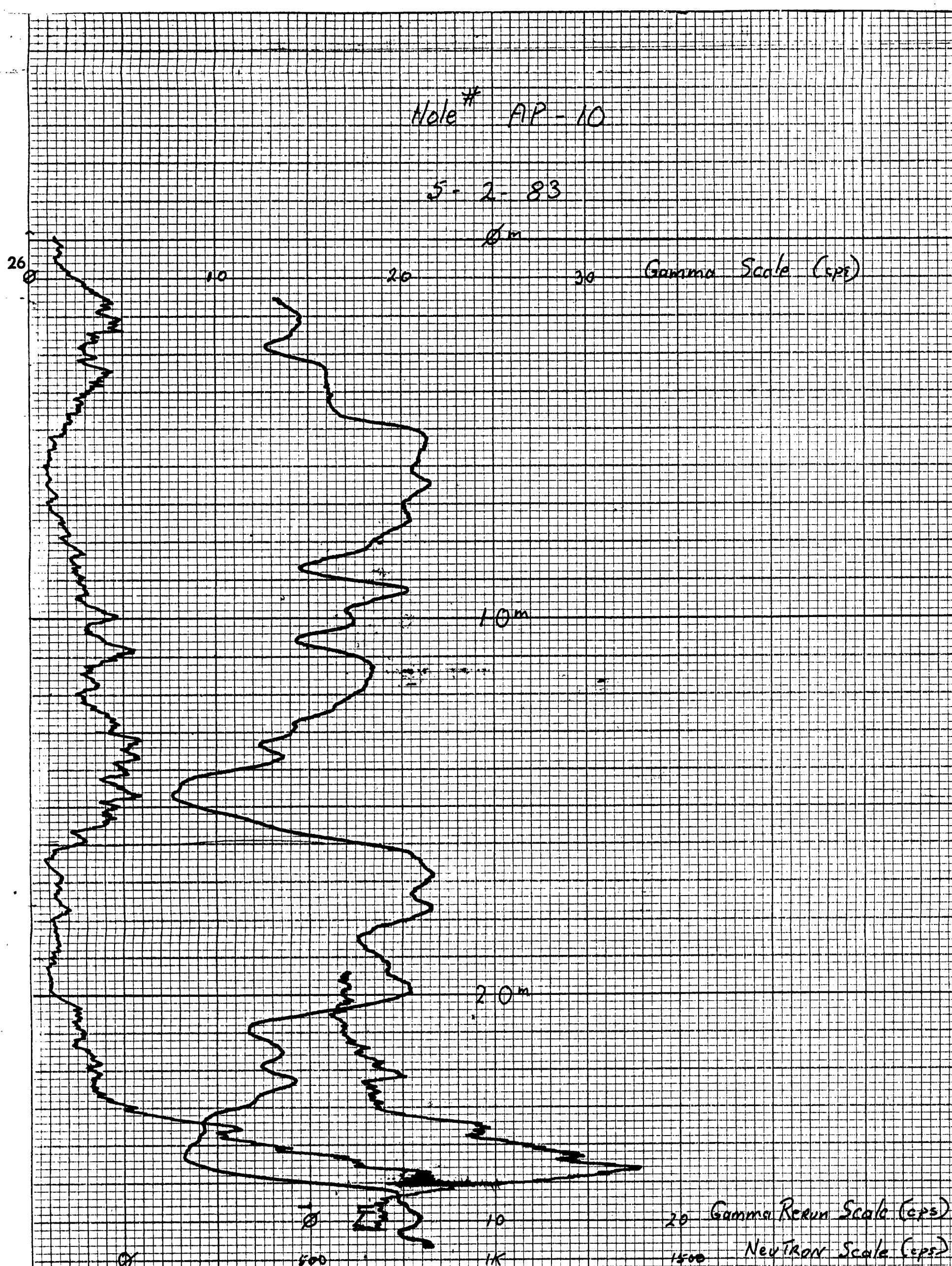
GEDSCIENCE			
LOGGING DATA			
GAMMA-RAY		S.P.	
RANGE 50 cps		ATTEN.	
T.C. 4% st dev		LOG SPEED	
CAL.		BIAS	
LOG SPEED 6m/min		SEN.	
PROBING G2		LOG SPEED	
KFACTOR 1.35E-5		UNIT NO. AL 8	
HOLE No. AP-9		DATE 5-2-83	



LOGGING DATA

DATE 5-2-83

LOCATION				HOLE NUMBER: AP-10				CLIENT: Posidon			
State: South Australia				Collar elev. metres				Claim:			
Area: Ardrosan				Depth drilled: 27.5 metres				Owned by:			
Project:				CASING DATA				HOLE DATA			
Prospect:				Wall size in.		Dia. from to		Unit Operator: HART			
Lat: 0 0 0 0				Dia. (inside) in.		Dia. from to		Unit No. AL 8		Office: Adelaide	
GAMMA RAY				NEUTRON				ELECTRIC			
INITIAL RUN		2		3		4		Cored hole ☐		Non-cored hole ☒	
Logged depth (ft.)		26.2		26.8		Sampled Interval		Type		Logged depth	
Range (Full scale)		50		2.5K		2m		Flowline		Resist. scale	
Time constant (sec.)		4% st dev		.5% st dev						S.P. scale	
Paper speed cm/m		1		1				INTERPRETATION DATA		Paper speed	
Logging speed m/min		6		6		Probe No.		Standard (cps) K factor		Logging speed	
Bkgnd count (cps)		4				G2		1.35E-5		Probe size in	
Probe No.		G2								Type $\frac{w}{d}$	
Size (dia.) mm (in.)		35		35						Bias	
Type		2 1/2 NaI						REMARKS		CALIPER	
Standard (cps)						Fluid Level metres		Logged depth			
Dead time		6 usec		4 sec.		Logged inside drill pipe		Scale $\frac{in}{in. def.}$			
Amp. Gain						No electric logs.		Paper Speed			
Ratemeter No.								Logging speed			
Bore hole medium								Arm Length in.			
Mud density								Max. Def. in.			
Digital readout m		0.1		NIL							
Time base sec		1									
Upper Disc.											
Lower Disc.											



		GEO SCIENCE AUSTRALIA	
LOGGING DATA			
BAMMA-RAY		S.P.	
RANGE 50.0m		ATTEN.	
TC 4% ST dev		LOG SPEED	
CAL		BIAS	
LOG-TEMP 6m/hr		GEN	
PROJ No. 62		LOG-SPEED	
KI FACTOR 1/35.5		UNIT NO. 018	
FORM NO. AP-10		DATE 5-2-88	
		TO	

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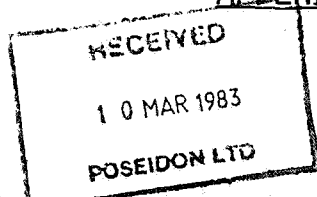
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CHART No. TX/WU//H

PRIN

APPENDIX III

APPENDIX III



Central Mineralogical Services



39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

Mr. R. Bluck
Chief Geologist
Poseidon Ltd.
106, Hutt Street
ADELAIDE / S.A. 5000

9th March, 1983

REPORT CMS 83/3/2

YOUR REFERENCE:	Verbal request
DATE RECEIVED:	1st March, 1983
SAMPLE NOS.:	9 Samples
SUBMITTED BY:	R. Bluck
WORK REQUESTED:	Petrology/Mineralogy


H.W. Fander, M. Sc.

Nine samples were received for petrological-mineralogical examination; eight were drill-hole sludges and one was a hand specimen from a quarry.

The sludges were washed and de-slimed and the coarser (silt-sand) material was examined under the stereobinocular microscope to note the presence of any unusual features; the hand specimen was thin-sectioned and was petrologically examined in the usual way.

Samples 31 - 38

The bulk colour of the samples is determined by the presence and amount of organic matter; this appears to be carbonised vegetable material which acts as a pigment in the clay fraction and also occurs in coarser detrital fragments. The organic matter imparts a very intense colour, and little is needed to produce a very dark sediment.

All the samples contain dominant quartz, generally as irregular, angular fragments showing relatively little abrasion; smoky, milky and clear varieties occur. Muscovite is present in most samples, and there are occasional grains of dark tourmaline (schorl). The assemblage indicates a granitoid provenance.

Several samples contain varying amounts of organic matter (Nos. 33, 36, 37, 38) in dispersed form and as friable pellets of silty material; these pellets may be very weakly radioactive.

The clay fractions themselves are believed to be kaolinite-illite, but this identification was not verified by XRD at this stage.

Basal Clay from Quarry (T.S. 45408)

This is an indurated silty argillite; no pyroclastic components were identified.

The rock consists dominantly of kaolinite-illite, as a compact mass showing simultaneous extinction due to lithification-recrystallization; small splinters of quartz, and muscovite flakes are dispersed through the rock, showing good parallel orientation due to bedding, and there are occasional thin silty laminae. A few heavy mineral grains occur and include zircon and leucoxene.

The rock clearly formed under quiet conditions of sedimentation and may have been a fresh-water sediment.

H.W. Fander, M. Sc.

APPENDIX IV

INVESTIGATION OF
POSEIDON LIMITED EL 923
NEAR ARDROSSAN,
SOUTH AUSTRALIA.

CHRIS GILES
FEBRUARY, 1983.

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SUMMARY

A brief field investigation of several aspects of Poseidon Limited EL 923 near Ardrossan was undertaken.

The Dowlingville potassium channel radiometric anomaly is coincident with a broad, probable Tertiary valley that has been incised into Cambrian limestones. A modern stream channel follows this valley for part of its length. Only two outcrops of Cambrian Kulpara Limestone were found and neither appeared particularly altered or fractured. Gold, silver and arsenic values were low in these rocks. The soil in the Dowlingville valley is notably clayey, lime deficient and enriched in feldspar (as angular sand-sized grains) compared with the soils covering adjacent upland areas. The possibility that the potassium and thorium radiometric anomalies owe their existence to surficial features such as soil type rather than local basement lithology should be carefully checked with further measurements before follow up work such as drilling, is undertaken.

No outcrops of Pre-Adelaidean basement rocks were found in the vicinity of the drilled Wirrahill magnetic anomaly. The most effective way of checking for basement rocks in this area of very subdued outcrop is to examine the heaps of stones systematically gathered from the surrounding paddocks by mechanical stone pickers. The percussion chips indicate that an ophitic-textured, intrusive dolerite, probably related to the pre-Wandearah Metasiltstone basement, was the chief lithology drilled. A few percent coarse grained magnetite accounts for the magnetic expression.

An unfriendly landholder permitted only limited observation of the Yararoo phosphate occurrences. The host rock is grey, nodular variety of the Cambrian Kulpara Limestone, which has a dip of 20 to 25 degrees East and rests unconformably on the adjacent near vertical Adelaidean quartzites, dolomites and dolomitic siltstones. The phosphate occurs as small secondary pods and seams in faulted and disrupted zones of the limestone, which have been exploited by weathering. Of the areas examined, this offers the most obvious potential for gold mineralization associated with faulting and carbonaceous units in the sedimentary sequence. However, it remains to be demonstrated that an auriferous hydrothermal system was active in the region.

INTRODUCTION

In December, 1982, the writer was employed by Poseidon for a four day period to investigate several aspects of their EL 923 near Ardrossan. As communicated by R. Bluck (3rd December, 1982), the objects were:

1. Map and sample the area in the vicinity of the Dowlingville potassium channel anomaly.
2. Map the area of the "basement window" specifically looking for signs of mineralization associated with the basal Adelaidean unconformity.
3. Map and sample the area of phosphate occurrences in Cambrian limestones north-west of Port Clinton.
4. Assess the data and suggest exploration opportunities, if any.

The results of the investigation are recorded herein.

REGIONAL GEOLOGY

Critical to any successful exploration programme on Yorke Peninsula is a sound knowledge of the stratigraphic sequence, which to date has not appeared on any of the published maps of the area. Serious limitations are placed on any interpretations by the paucity of outcrop in the region, and the following is based on the writer's observations of both outcrop and drill core, discussions with other geologists and geochemical considerations.

High grade paragneiss and orthogneiss, intruded by syn- and late-tectonic granite, amphibolite and pegmatite, crop out extensively around the south-western coast of Yorke Peninsula from Meteor Bay to Carny Point. There is little doubt that these rocks correlate with the early Proterozoic Lincoln Complex of southern Eyre Peninsula.

Some highly significant exposures of acid volcanics mostly rhyolitic to dacitic ash-flow tuffs, and intercalated greywackes and shales occur on the foreshore at Port Victoria and on nearby Wardang Island. These rocks show a markedly lower degree of metamorphism and deformation than the basement rocks of southern Yorke Peninsula (e.g. lack migmatitic segregation and are thus interpreted to form a younger suite of probable early Middle Proterozoic age (1600 - 1700 M.Y.). Parker (1980) believes this sequence correlates with the relatively low grade Broadview Schist of eastern Eyre Peninsula (including the Myola Volcanics) that developed during the latter phases of the Kimban Orogeny and consequently escaped the full intensity of metamorphism and deformation. In the writer's opinion, the volcano-sedimentary sequence at Port Victoria correlates with the so-called Moonta Porphyry (actually a composite body comprised largely of rhyolitic to dacitic ash-flow tuffs, Lemar, 1975) and other metasedimentary rocks poorly exposed in central Yorke Peninsula (e.g. near Arthurton and the Parara Mine). The layered sequence is locally invaded by amphibolite (ex-dolerite and gabbro) and extensive, coarse grained, often pegmatitic, granite (e.g. at Harts Mine; near Arthurton - the Arthurton Granite; and at Moonta, both in the mines and on the foreshore of Moonta Bay). The granite is usually undeformed, or at most, mildly foliated, and is probably cogenetic with the acid volcanic rocks in the layered sequence. All rocks of this age on Yorke Peninsula are informally referred to as the Moonta Complex in this report.

Parker (1980) recognises a younger, presumably unconformably overlying, gently dipping and mildly metamorphosed unit of hematitic siltstone and minor calc-silicates, termed the Wandearah Metasiltstone, which may correlate with the base of the Moonachie Formation on Eyre Peninsula. This unit is intercalated with minor basic volcanics of the Willamulka Volcanics. It should be noted that J. Lynch (formerly North Broken Hill Limited district geologist at Moonta) maintains that the basement succession of north-central Yorke Peninsula contains all elements of Hutchinson Group stratigraphy (as exposed in eastern Eyre Peninsula), but of a generally lower grade. He believes that Parker's (1980) Wandearah Metasiltstone is part of the basement sequence and, importantly, that the

RESULTS OF INVESTIGATIONS

1. Harts Mine Area

Harts Mine is situated in the coastal cliffs 12.5 kilometres south of Ardrossan and had been noted by the writer on a previous occasion to hold some interest for Cu, Au and/or U mineralization. Consequently, while in the area the writer re-examined and sampled the outcrops on behalf of Poseidon Limited.

The main basement rock type is brecciated, altered, quartz-hematite veined, coarse grained to pegmatitic granite (Plate 1B). The granite is composed almost exclusively of quartz and coarse, platy pink K-feldspar identical to phases of the Arthurton Granite, to which it is correlated by the writer. At least some of the brecciation is caused by post-Cambrian, pre-Tertiary faulting that is aligned in a north-south direction, roughly coincident with the present coastline. This is deduced from the gritty fluviatile Cambrian sediments on the foreshore, which have been affected by fault movements (Plate 1A). Pendants of banded iron-formation (Plate 1C) and calc-silicate rocks (including impure marbles) occur in the granite. The banded iron-formation consists of thin alternating laminae of finely divided hematite and metamorphically recrystallised aggregates of quartz, microcline and plagioclase.

The copper mineralization, on which the original workings were sunk in 1847, is confined to supergene-enriched, oxidised, limonite-filled fractures and joints in the granite and metasediments. Finely disseminated malachite was also observed in impure marbles on one of the mine dumps. Ten samples, collected from a representative selection of potentially mineralized lithologies, including the brecciated granite, banded iron-formation and calc-silicate rocks, yield negligible gold, silver and arsenic values, thus down-grading the gold potential of the area (Table 1). The basemetal and uranium potential would also appear to be limited.

2. Dowlingville Potassium Channel Anomaly Area

Coincident K and Th channel radiometric anomalies were identified in the Dowlingville area by a broadly spaced ground spectrometer survey (Bluck, 1982). The K and Th anomalies trend roughly north-west to south-east and coincide with a broad, shallow valley that runs through Dowlingville (Plate 2). The highest readings were obtained from measurements taken along the road that runs roughly up the centre of the valley (see Plans 4 and 5, Bluck, 1982).

Curiously, the valley is occupied by a modern stream channel for only part of its length. It was probably carved into the Cambrian limestone bedrock during wetter climatic conditions that prevailed during the late Tertiary or early Quaternary (evidenced by Pleistocene fluviatile gravels in the Ardrossan cliffs). The valley originates in the rolling hills near Arthurton on central

Yorke Peninsula, and can be traced for roughly 15 kilometres to the south-east before meeting the coastal lowlands north of Ardrossan.

Only two outcrops of Cambrian limestone were found along the valley. One occurs in a road cutting 5.5 kilometres north-west of the Dowlingville Hall, on a prominent ridge of Cambrian limestone that is truncated by the valley. The dominant lithology is a grey, recrystallised limestone that is vuggy and ferruginous-stained in part. The limestone is not obviously hydrothermally altered, but is fractured and jointed in places. Three samples of Cambrian limestone from this locality (A1, 2 and 3, Table 1) yielded insignificant levels of Au, Ag and As, as did a sample of Tertiary gravelly clay (A4, Table 1).

The other outcrop is composed of massive, bedded, nodular limestone located in a creek bed opposite the Dowlingville Uniting Church (Plate 3A and B). This limestone is also not obviously altered, but minor malachite was observed in the more recrystallised zones. Notably, it was at this locality that Aquitaine Australia Minerals found a 240 ppm lead anomaly (four times background) which they followed up with a bedrock drilling programme on a 250 x 250 m grid, without success (Lee, 1977). They did locate a further lead anomaly 16 kilometres up the valley to the north-west, but failed to adequately define its limits owing to prohibitive overburden thickness. A 104 metre percussion drill hole (SYD 600) was sited in the valley floor approximately between the two anomalies and intersected unmineralized limestone and some weakly pyritic, carbonaceous, dolomitic siltstone, which may have been the source of the metals (Lee, 1977). Negligible Au, Ag and As contents were obtained in five samples of limestone from this locality (A5, 6, 7, 8 and 9, Table 1; see Plate 3C).

In connection with the K and Th radiometric anomalies, it is interesting to note that Lee (1977) postulated a "fault or fracture zone along the valley axis which drains the Dowlingville area" and observed that "the lead geochemical response parallels this trend, apparently oblique to the geological trend." It is tempting to suggest that the radiometric anomalies owe their existence to the same feature, although in view of the paucity of bedrock outcrop, there is no proof that such a feature does in fact exist.

In view of the fact that the Dowlingville valley drains from the Artherton area, which is largely underlain by K-rich granitoid rocks, the alternative possibility that the K and Th channel anomalies are related to surficial features, should also be considered. For example, the soil in the Dowlingville valley (and hence along the road where the measurements were taken) is a reddish-brown, friable clay with abundant sand-sized K-feldspar grains, and lacks calcrete nodules. It greatly resembles the heavier red-brown sandy, calcareous loessal soils that cover adjacent rising ground immediately north and south of the valley. Sheet and nodular calcrete is ubiquitous

in the latter areas and often the soil along the roads has a marked drift component, with a low clay content and negligible feldspar. It is of particular note that the lowest spectrometer readings were obtained in areas where there was sheet calcrete and/or drift sand.

3. Wirrahill Magnetic Anomaly Area

The Wirrahill magnetic anomaly was identified from Aquitaine Australia Minerals aeromagnetic data by Anderson (1982 a) and further defined by ground magnetic traverses (Bluck, 1982). Detailed interpretation of the ground magnetic data favoured a near vertical linear body 30 to 35 metres below the surface, with a depth : extent of about 200 metres (Anderson, 1982 b).

Subsequent percussion drilling of this anomaly intersected a mafic igneous rock and associated green, chloritic schist and coarse carbonate-pyrite zones. Examination of several thin sections cut from the drill chips indicates that the dominant lithology is an ophitic-textured dolerite composed of an interlocking aggregate of tabular, twinned, plagioclase laths, pale green amphibole (ex clinopyroxene) and lesser biotite, chlorite and magnetite (2 to 3%). One sample contains appreciable coarse orthopyroxene, while other more altered samples contain variable amounts of carbonate (up to 15%) and quartz, sometimes occurring together in minor cross-cutting veinlets. The relatively coarse ophitic texture and presence of orthopyroxene and coarse magnetite grains all suggest that the rock is an intrusive dolerite rather than an extrusive basalt. Its affinities lie with like bodies seen within the Moonta complex at several localities (e.g. at the Parara Mine, Arthurton and Port Victoria areas). Relationship with the younger, mafic members of the Willamulka Volcanics intersected in SYM 101 and 102 several kilometres to the north, seems unlikely. The presence of magnetite in the rock accounts for its magnetic response.

One of the drill chips sectioned, identified as chloritic schist in hand specimen, is a foliated aggregate of plagioclase, green amphibole, chlorite and limonite (ex magnetite). It is interpreted as a chilled, marginal phase of the dolerite body that has taken on a deformation related foliation.

The writer's brief was to map the area of the "basement window", but unfortunately no sign of basement rocks were seen at the surface in spite of intensive search. This was confirmed by examination of all stone heaps in the area. The stones have been systematically gathered from the paddocks by mechanical stone pickers, which have dumped them into the scattered heaps. It can be safely assumed that if a given lithology is absent from a stone heap, then it does not outcrop or even subcrop (because it would be brought to the surface by cultivation implements). The only stone heap which contained any schistose, probable basement rock fragments, was the one adjacent to the drill hole: even then, only two rather doubtful samples were found in a heap containing several

tonnes of rock (almost exclusively nodular calcrete). A survey of about fifty stone heaps within a 12 square kilometre area failed to locate any further fragments of basement rocks. Apart from the ubiquitous, white nodular calcrete, samples of Adelaidean sandstone and dolomite and Cambrian limestone were frequently encountered in the heaps - consistent with their known exposure in the region.

In conclusion, there is no positive evidence at the surface for the underlying basement rocks. The only possible clue is the combination of a general topographic high with adjacent Adelaidean sediments. In the Artherton region such features generally indicate basement (usually granite) at shallow depth, since the Adelaidean sediments usually form a thin, gently dipping veneer.

4. Yararoo Phosphate Occurrences

Three separate phosphate quarries occur on the large property known as "Yararoo" several kilometres north-west of Port Clinton. Unfortunately, the owner of the property is unfriendly towards mineral exploration companies, and it was only after considerable persuasion that he allowed the writer to briefly examine the phosphate occurrences. He was unwilling to let the writer go elsewhere on his property, and consequently no mapping was possible.

The host rock is a grey, nodular variety of the Cambrian Kulpara Limestone, which dips at 20 to 25 degrees east. Although the actual contact is not seen, the Cambrian rocks are interpreted to unconformably overlie the steeper dipping (60 to 80 degrees east) Adelaidean sandstones, quartzites, dolomites and dolomitic siltstones, which crop out several hundred metres to the west. The Cambrian limestones at this locality, (i.e. to the east of the Adelaidean) are not recorded on Thomson's (1982) map, but are shown in the subsurface on his sections 5 and 6.

The Kulpara Limestone in the vicinity of the phosphate quarries has been disrupted by jointing and faulting, and associated shearing and drag folding (Plate 4). This, combined with the porous, nodular nature of the limestone, has facilitated permeation of ground water with consequent solution and deep weathering. During the intense weathering it appears that the limestone was converted to, or replaced by clay, since the original nodular texture is often still recognisable in the secondary clay (Plate 5). Abundant pods and veins of concretionary mangiferous ironstone are distributed throughout the weathered zones (Plate 5) while the phosphate generally occurs as localised seams and nodules in the clay and ironstone. In these zones it is not uncommon to find remnants of massive, well bedded, nodular limestone that have apparently escaped weathering.

A prominent solution cavity infilled with clay and blocks

of massive limestone occurs in the eastern wall of the northernmost quarry (identified as Quarry No. 1). Jack (1919), who gave the first detailed descriptions of the phosphate deposits in this area, considered that they were the product of residual concentration of phosphate (and clay) in solution cavities. He raises the intriguing possibility that the contorted (in the writer's opinion, sheared) clay is the result of "the settling of the residual material into the cavities produced by solution!"

The secondary nature of the phosphate and the importance of weathering processes in producing concentrations of it, is beyond doubt. Therefore, the possibility of a large tonnage phosphate deposit seems remote (see also Forbes, 1981). The environment is ideal for accumulation of Mississippi Valley type lead deposits, an avenue apparently tested by AAM without success. Eleven samples representative of a variety of lithologies exposed in the three quarries gave negligible Au and Ag values, but some of the ferruginous rocks do contain anomalous As contents, possibly because of scavenging (A26 - 37, excluding A36, Table 1).

CONCLUSIONS AND RECOMMENDATIONS

The current field investigations and sampling programme gave little encouragement to the prospect of locating an appreciable, near surface gold reserve on the EL. Any obvious targets, whether geophysical or geochemical, have probably been tested. To achieve success, future exploration in the area will require a committed deep percussion and diamond drilling programme with the object of furthering the present scant knowledge of the basement rocks. A management decision needs to be taken as to whether the low prospectivity of the region justifies the expense involved. Whereas exploration for mineralization of the type known from Yorke Peninsula (e.g. vein and stockwork copper as at Moonta-Wallaroo) or weak stratabound basemetal mineralization seems unjustified in the present economic climate, other, more original conceptual exploration models for gold may be worth pursuing. The following recommendations are directed towards this end:

1. A detailed analysis of all lineaments (whether structural, magnetic, gravity or other) in the region. Drilling should be focused on or near the linear features identified.
2. A detailed appraisal of all other exploration results available on open file for central and northern Yorke Peninsula (including J. Lynch's M.Sc. thesis).
3. Drilling to test for carbonaceous units within the Cambrian, Adelaidean or Wandearah Metasiltstone. Where these are intersected by faults (e.g. of the type seen at Harts Mine) prime U and Au exploration targets may occur. In this connection, the evidence for faulting, and its distribution, in the Cambrian limestones hosting the Yararoo phosphate occurrences should be investigated. Past basemetal exploration in this area should also be assessed.

TABLE I

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ASSAY RESULTS

<u>Sample</u>	<u>Au</u>	<u>Ag</u>	<u>As</u>	<u>Description</u>
1.	<u>Harts Mine area:</u>			
A11	<0.05	<1	18	Hematite - rich portion of BIF
A12	<0.05	<1	14	Brecciated BIF
A13	<0.05	<1	8	Typical BIF
A14	<0.05	<1	6	Malachite - stained, impure marble
A15	<0.05	<1	<2	Typical brecciated, veined, altered granite
A16	<0.05	<1	2	Epidotised, brecciated granite
A17	<0.05	<1	3	Brecciated, altered, veined granite
A18	<0.05	<1	4	Altered, chloritised granite
A19	<0.05	<1	7	Banded calc-silicate rock
A20	<0.05	<1	4	Brownish-green calc-silicate rock
2.	<u>Dowlingville potassium channel anomaly area:</u> (5.5 kilometres north-west of Dowlingville Hall)			
A1	<0.05	<1	<10	Grey, vughy, slightly ferruginous Cambrian L.S.
A2	<0.05	<1	14	As above, but more ferruginous
A3	<0.05	<1	4	As above, but strongly jointed
A4	<0.05	<1	34	Tertiary, clay-concretionary ironstone in a shallow depression in Cambrian L.S. (adjacent to Dowlingville Church)
A5	<0.05	<1	2	Massive, grey Cambrian L.S.
A6	<0.05	1	4	Nodular, grey Cambrian L.S.
A7	<0.05	<1	4	Nodular, slightly ferruginous, Cambrian L.S.
A8	<0.05	1	<2	Recrystallised, grey Cambrian L.S.
A9	<0.05	<1	6	Grey, jointed Cambrian L.S.
A10	<0.05	<1	3	Recent gravel from creek bed
3.	<u>Yararoo phosphate occurrences:</u>			
A23	<0.05	<1	26	Vughy, ferruginous Cambrian L.S.
A24	<0.05	2	330	Tertiary ferricrete? (from stone pile) (Quarry 1)
A26	<0.05	2	4	Deeply weathered nodular Cambrian L.S.
A27	<0.05	1	2	Sheared "green shale"
A28	<0.05	1	48	Ferruginous band in L.S.
A29	<0.05	1	60	As for A28

<u>Sample</u>	<u>Au</u>	<u>Ag</u>	<u>As</u>	<u>Description</u>
A30	<0.05	1	9	Clay, weathered from nodular L.S.
A31	<0.05	1	5	As for A28
				(Quarry 2)
A37	<0.05	1	6	As for A28
				(Quarry 3)
A32	<0.05	<1	<2	Nodular grey Cambrian L.S.
A33	<0.05	<1	2	Clay, weathered from Cambrian L.S.
A34	<0.05	1	32	As for A28, from fault zone
A35	<0.05	1	135	As for A34, concretionary in part

Note: 1. All samples contain 4 ppm Bi and 0.05 ppm or less Hg.
 2. All samples are accurately located on air photographs.

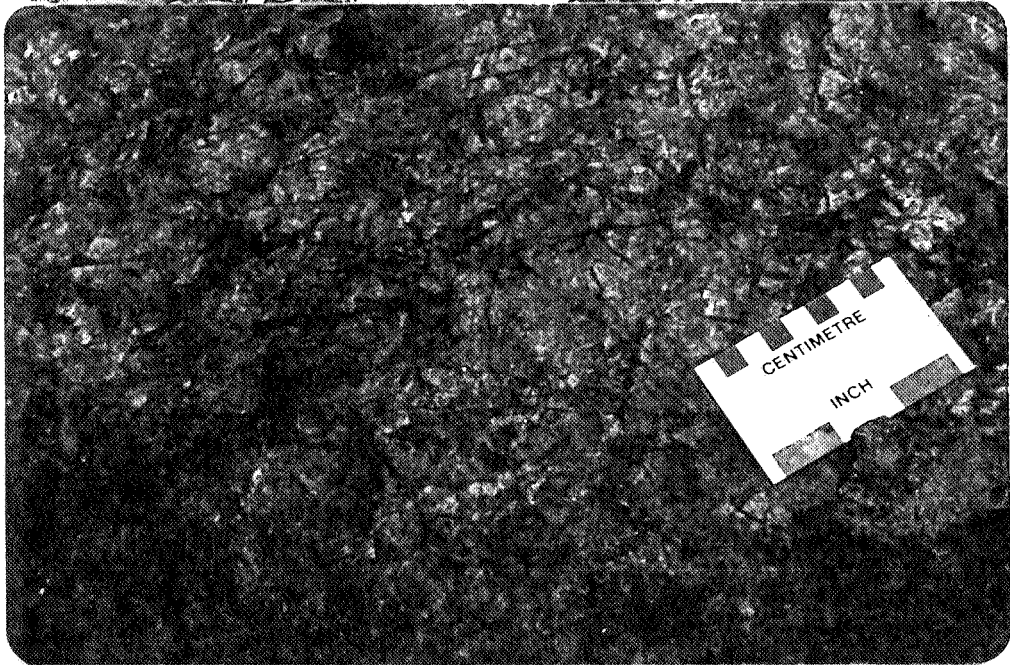
PLATE 1

Lithologies in the vicinity of Harts Mine:

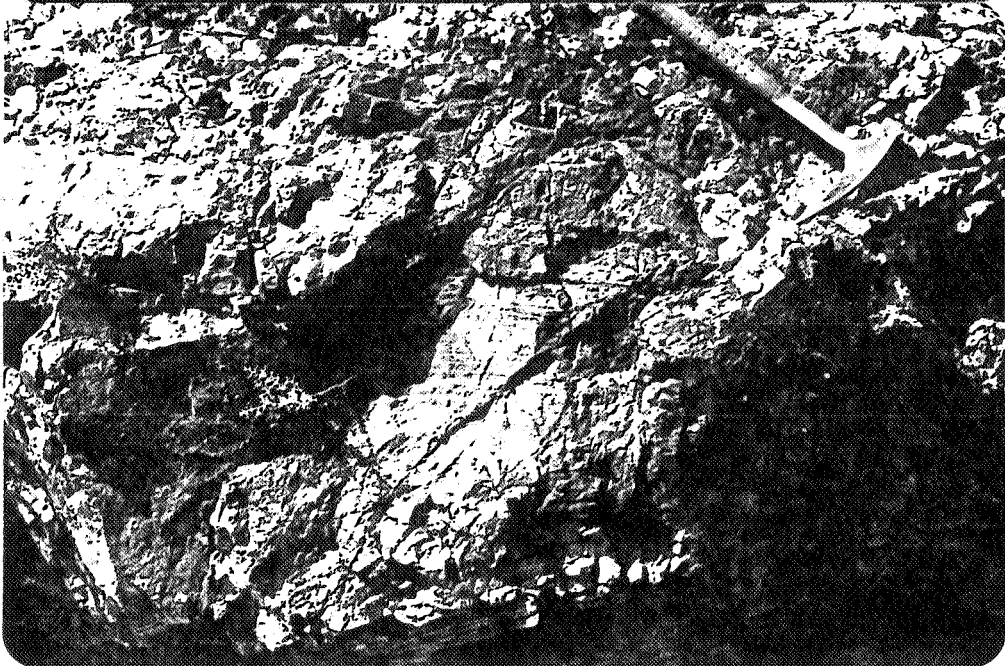
- A. Cambrian fluviatile sandstones and grits exposed on the shore platform at Harts Mine, 12.5 kilometres south of Ardrossan. These rocks unconformably overlie brecciated Proterozoic granite, which can be seen forming an orange-coloured outcrop with irregular surface, immediately beyond (and towards the left). Kaolinised granite (white) and overlying Tertiary sediments (orange-brown) are exposed in the cliffs.
- B. Detail of the brecciated, altered granite at this locality, showing micro-veinlets infilled with hematite and quartz. The granite, which is composed largely of pink feldspar and quartz, is correlated with the Arthurton Granite of central Yorke Peninsula.
- C. Banded iron-formation, occurring as a roof pendant in the granite. In thin section the banded iron-formation consists of alternating laminae enriched in hematite and quartz-microcline-plagioclase.



1a



1b



1c

PLATE 2

Views of the Dowlingville valley (which is coincident with the Dowlingville potassium channel radiometric anomaly).

- A. View to the north-east across the valley towards the Dowlingville Uniting Church (with red roof). A prominent outcrop of Cambrian Kulpara Limestone (see Plate 3A) occurs in a small creek immediately south of the church.
- B. View to the north-west across the shallow valley, with sheet calcrete in the foreground.
- C. View to the south-east down the valley, with St. Vincents Gulf visible on the horizon. The valley originates in the rolling hills near Arthurton and can be traced for roughly 15 kilometres to the south-east before meeting the coastal lowlands north of Ardrossan.

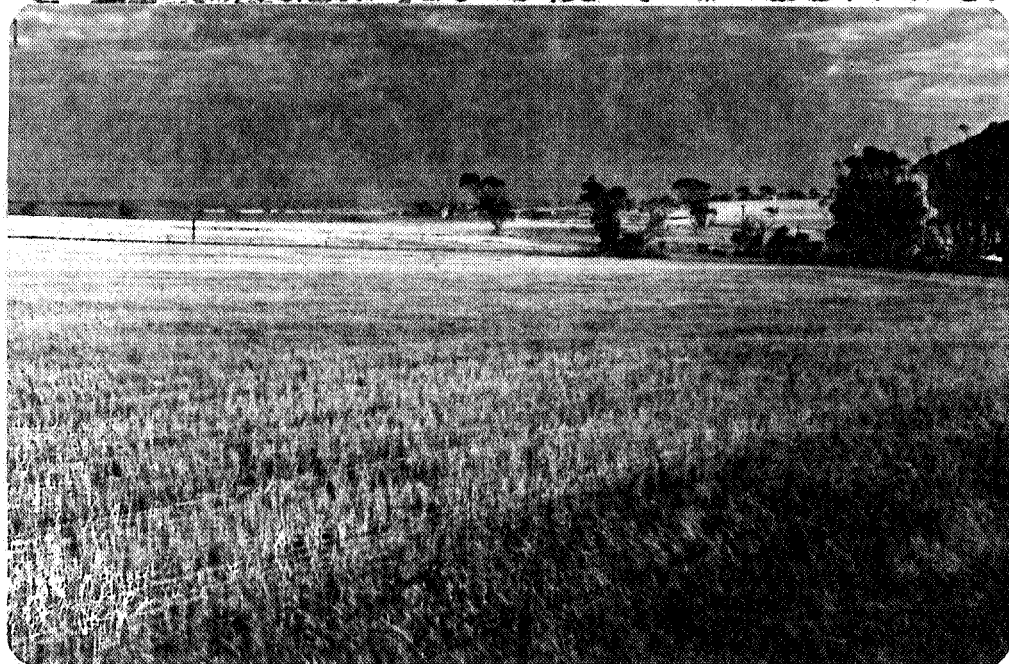


PLATE 3

Lithologies in the Dowlingville valley as exposed in a creek bed opposite the Dowlingville Uniting Church.

- A. Outcrop of gently easterly dipping, massive Cambrian Kulpara Limestone. This unit, although situated on the Dowlingville potassium channel anomaly, and near a Pb anomaly, does not show abnormal alteration, jointing or recrystallisation.
- B. Detail of the above outcrop, showing the characteristic nodular nature of the limestone.
- C. Recent fluviatile sediments exposed in the bank of the modern drainage channel occupying portion of the Dowlingville valley. The detritus, which includes abundant K-feldspar grains, has been largely derived from granitic basement rocks in the Arthurton area; this contrasts with the calcareous loessal soils which veneer much of the calcrete in adjacent areas and may explain in part the K and Th radiometric anomalies.

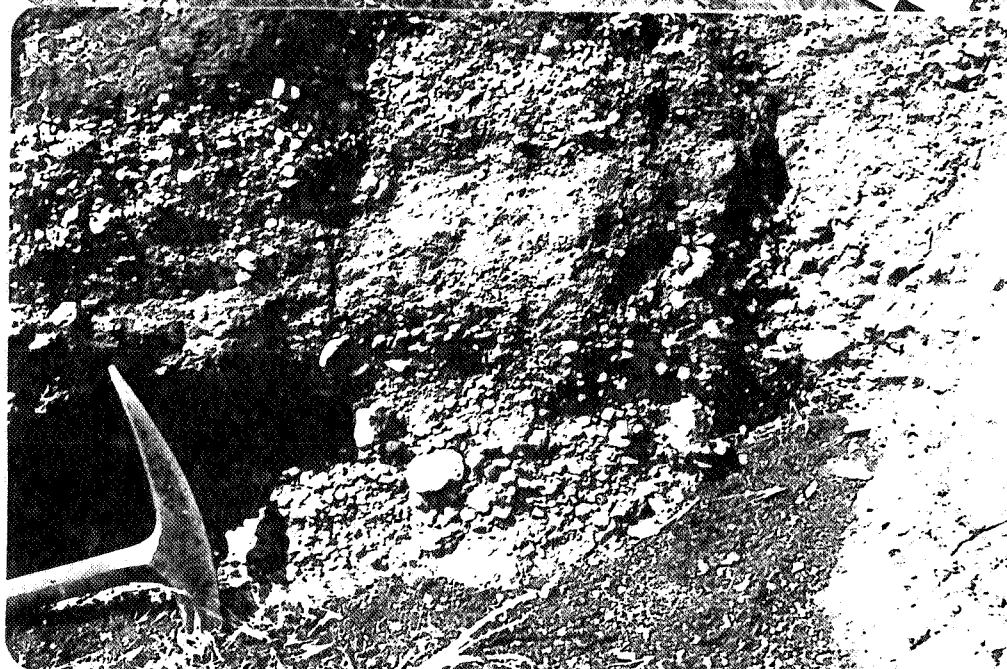
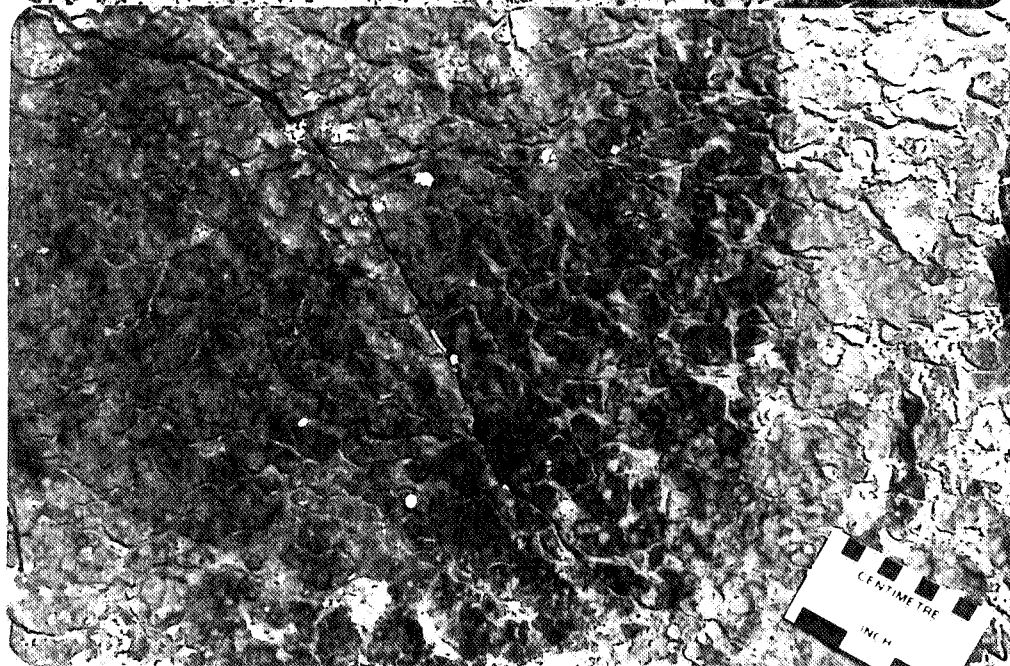
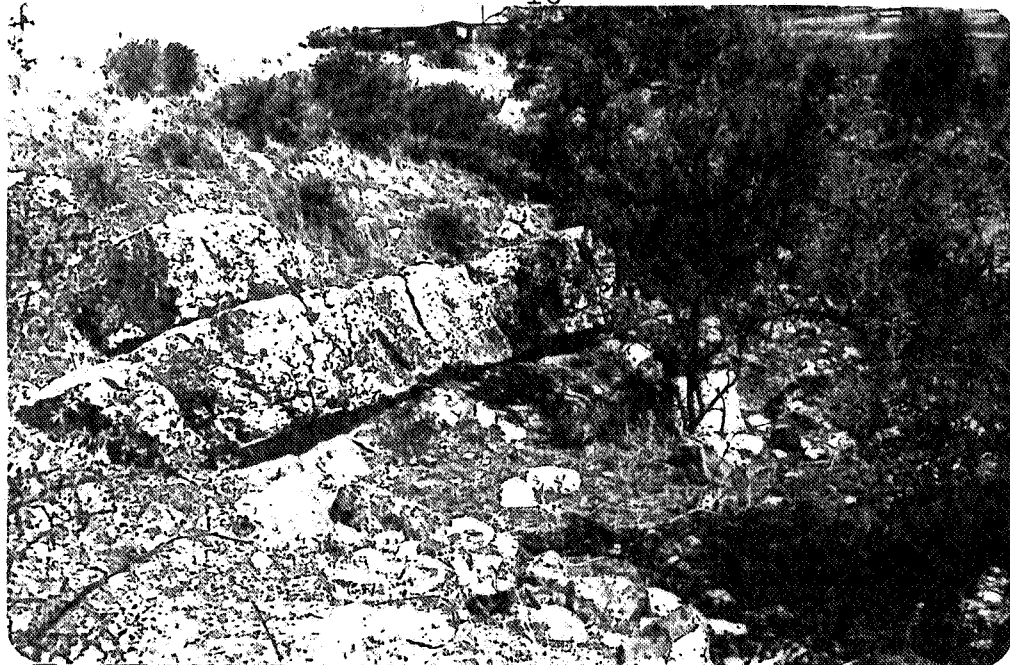


PLATE 4

Geological features of the northernmost (No. 1) phosphate quarry on Yararoo.

- A. Portion of the western and southern walls, showing massive, well bedded Kulpara Limestone (left of centre) cut by a vertical fault now occupied by ferruginous (and manganiferous?) weathering products. Gently warped, weathered limestone occurs to the right.
- B. Detail of the western wall showing weathered limestone (partially converted to clay) cut by several faults and joints.
- C. The eastern wall composed of blocks of massive limestone and enclosing weathered limestone, cut by limonite-filled joints and fractures. The joints, fractures and faults, being zones of enhanced permeability, have been preferentially exploited by weathering.

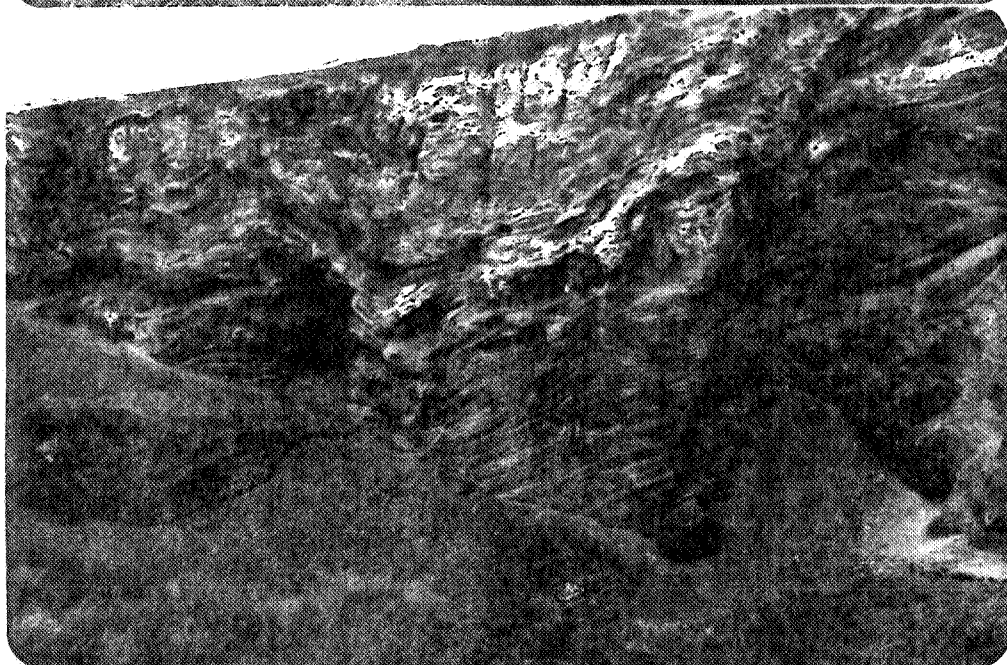
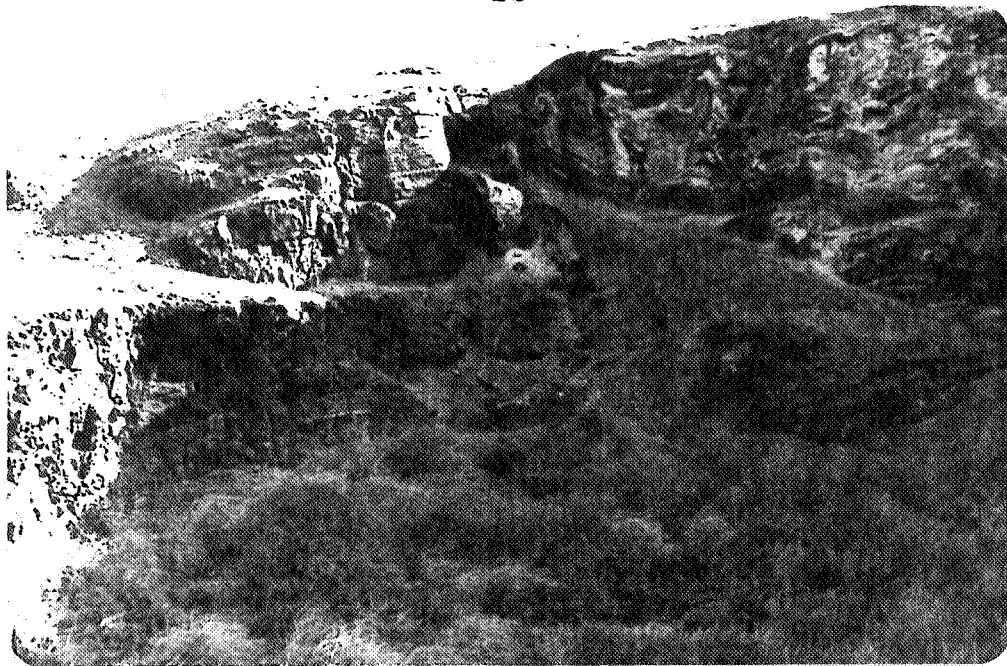
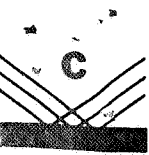


PLATE 5

Weathered limestone largely converted to clay, but still preserving relic nodular texture, adjacent to a fracture zone or fault now filled with secondary limonite and probable manganese oxides (dark material, lower part of photograph). The relic nodular texture favours in-situ weathering processes rather than infilling of solution cavities with detritus, although the latter is evident in some places.



APPENDIX V



APPENDIX V
COMLABS Pty. Ltd.
COMPUTERISED ANALYTICAL LABORATORIES

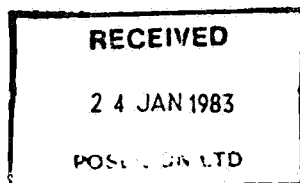
072

Head Office and
Central Laboratory
305 SOUTH ROAD,
MILE END SOUTH
STH. AUST. 5031
TEL.: (08) 43 5722
TELEX: AA89323



NATA REGISTERED No. 1526

OUR REF.: COM 830021
YOUR REF.:



Action	RGB
Information	
File	Anderson - Gen.

Mr. R. Bluck,
Poseidon Ltd,
106 Hutt Street
ADELAIDE. S.A. 5000

21.1.83

Dear Sir

RE: JOB COM 830021

Enclosed are the assays for the samples delivered to our laboratory on the 7th January, 1983.

Yours sincerely,
COMLABS PTY LTD

per : 

C.C: Mr. C. Giles



ANALYTICAL REPORT

073

JOB COM830021

O/N : SA 82/1

Results in ppm

SAMPLE	Au	Ag	Bi	Hg	As
A 23	<0.05	<1	<4	<0.05	26
A 28	<0.05	1	<4	0.05	48
A 26	<0.05	2	<4	0.05	4
A 3	<0.05	<1	<4	<0.05	4
A 34	<0.05	1	<4	<0.05	32
A 2	<0.05	<1	<4	<0.05	14
A 33	<0.05	<1	<4	<0.05	2
A 30	<0.05	1	<4	<0.05	9
A 37	<0.05	<1	<4	<0.05	6
A 31	<0.05	1	<4	<0.05	5
A 32	<0.05	<1	<4	<0.05	<2
A 29	<0.05	1	<4	<0.05	60
A 27	<0.05	<1	<4	<0.05	2
A 17	<0.05	<1	<4	<0.05	3
A 10	<0.05	<1	<4	<0.05	3
A 11	<0.05	<1	<4	<0.05	18
A 35	<0.05	1	<4	<0.05	135
A 24	<0.05	2	<4	<0.05	330
A 6	<0.05	1	<4	<0.05	4
A 8	<0.05	1	<4	<0.05	<2
A 12	<0.05	<1	<4	<0.05	14
A 7	<0.05	<1	<4	<0.05	4
A 14	<0.05	<1	<4	<0.05	6
A 20	<0.05	<1	<4	<0.05	4
A 19	<0.05	<1	<4	<0.05	7



ANALYTICAL REPORT

JOB COM830021

O/N : SA 82/1

Results in ppm

SAMPLE	Au	Ag	Bi	Hg	As
A 18	<0.05	<1	<4	<0.05	4
A 16	<0.05	<1	<4	<0.05	2
A 9	<0.05	<1	<4	<0.05	6
A 13	<0.05	<1	<4	<0.05	8
A 5	<0.05	<1	<4	<0.05	2
A 1	<0.05	<1	<4	<0.05	10
A 15	<0.05	<1	<4	<0.05	<2
A 4	<0.05	<1	<4	<0.05	34

Method of Analysis :

Bi	:	AAS1
Ag	:	AAS3
Au	:	AAS5A
Hg	:	AAS7
As	:	XRF1

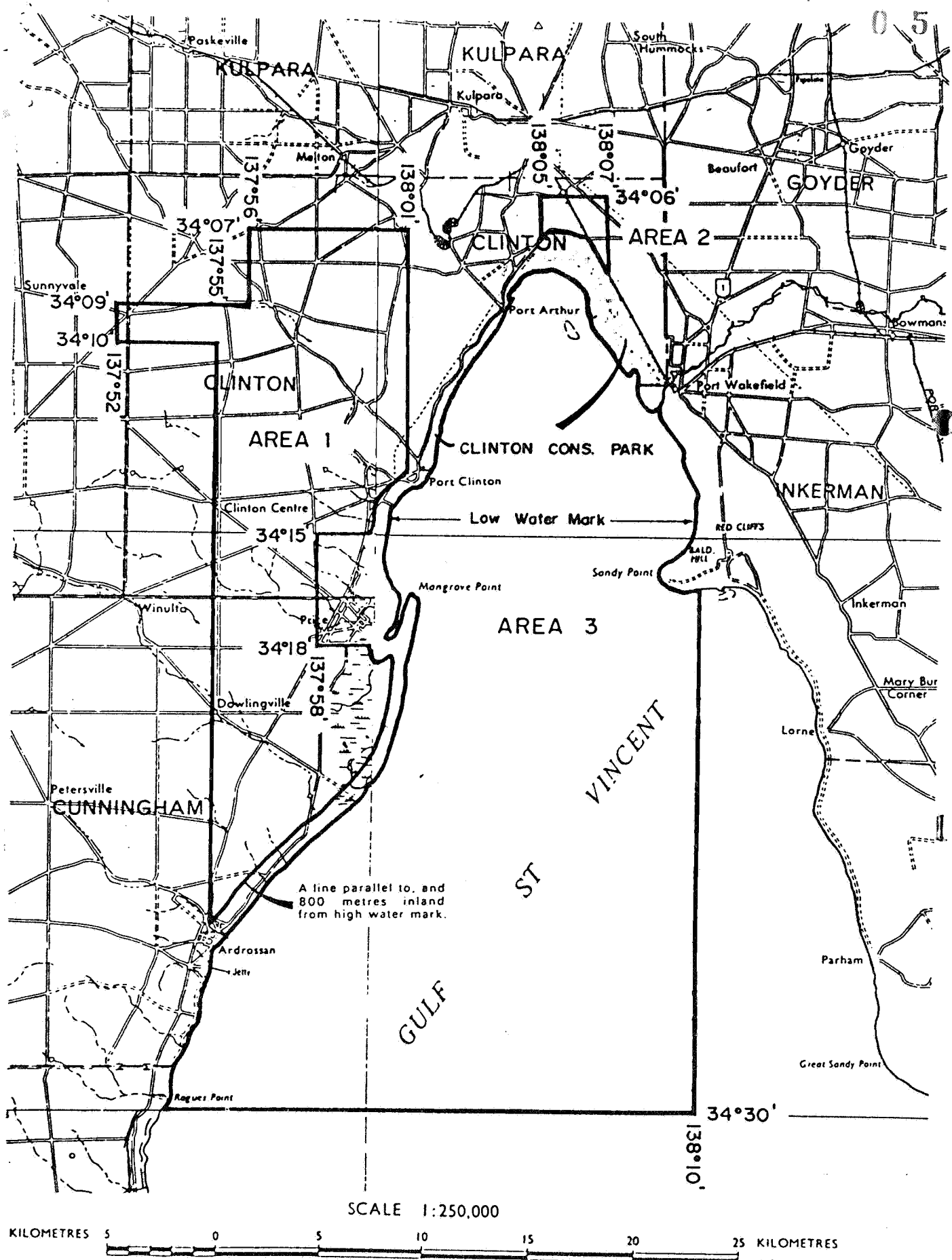
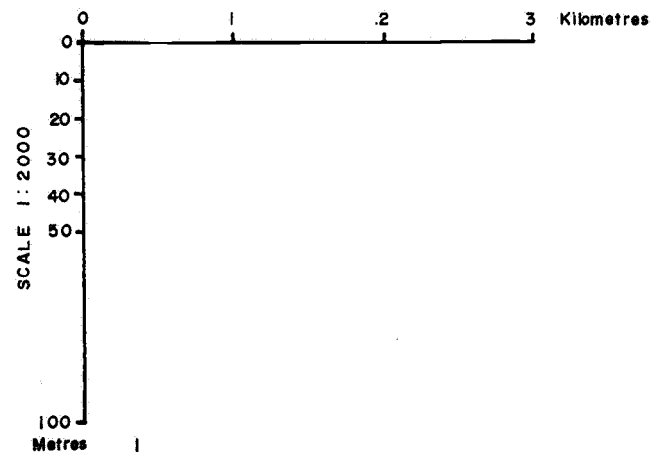
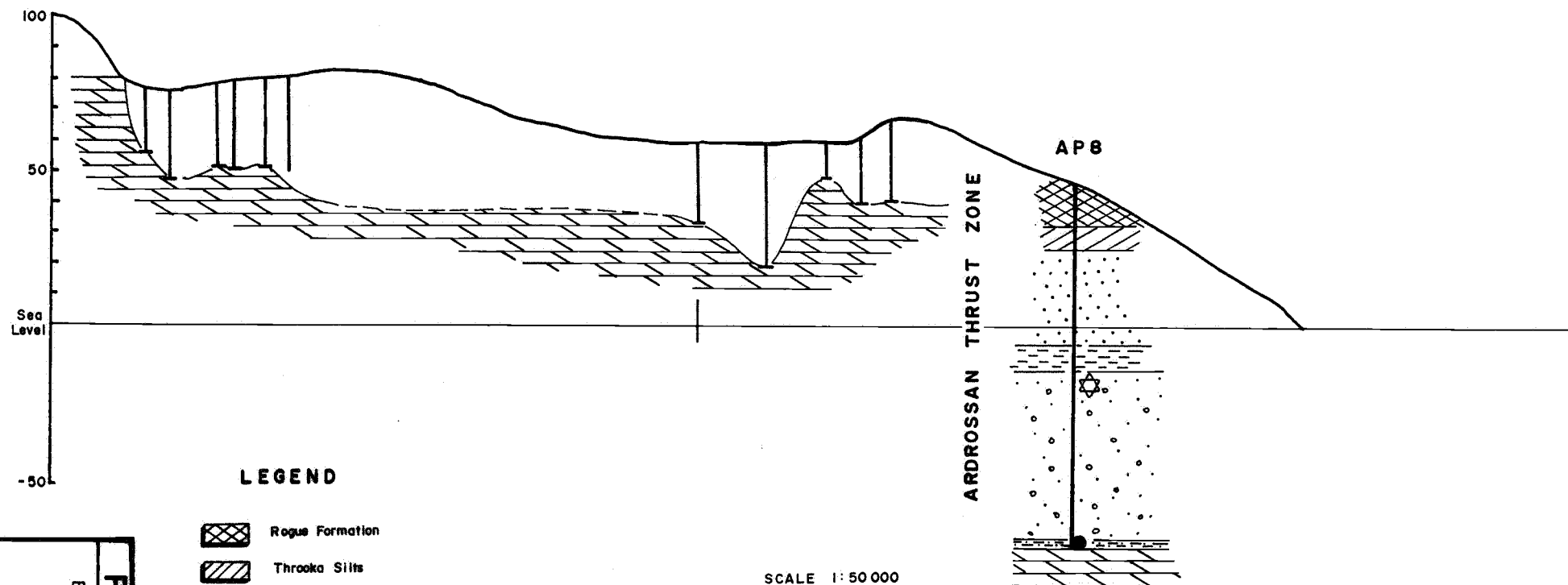


Figure 1
Locality Map
EL 1110, Ardrossan,
South Australia.



Poseidon Limited
Drillhole

Aquitaine R.A.B. Holes— Abandoned

Aquitaine R.A.B. Holes— Completed in
Basement

POSEIDON LIMITED

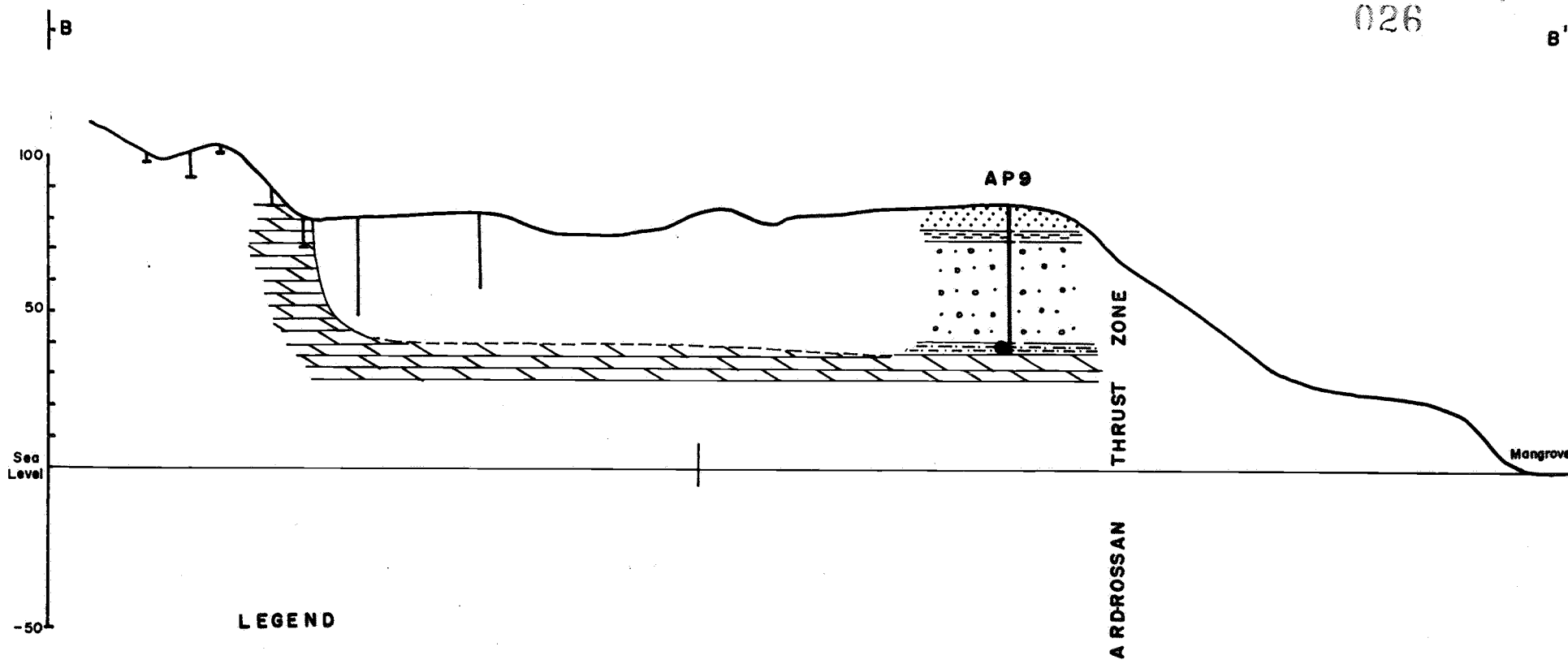
E.L. 1110 ARROSSAN, South Australia

CROSS-SECTION A

Geologist: R. BLICK	Scale: As shown	Fig. N°
Drawn: N. Bowden	Date: March '83	2
Sheet Index: 1-53-12	Dwg. N°007/24/83	
Revision:		

026

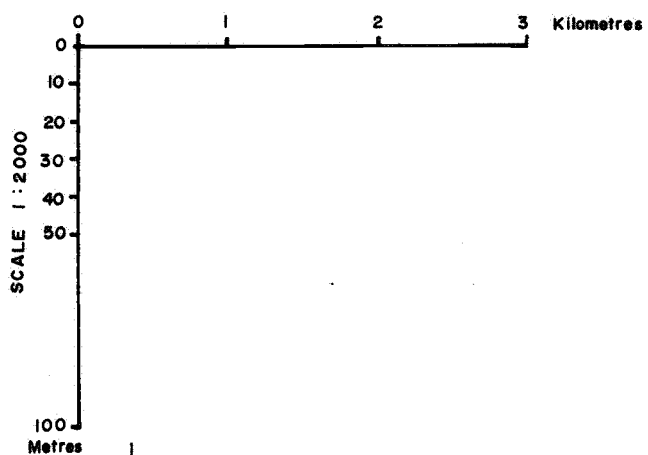
B'



LEGEND

-  Rogue Formation
-  Throoka Silts
-  Muloowartie Formation
-  Cream Clay Unit
-  Mature Sands Unit
-  Basal Sand Unit
-  Cambrian basement
-  Anomalous radiometric response
-  Significant radiometric response

SCALE 1:50 000



-  Poseidon Limited Drillhole
-  Aquitaine R.A.B. Holes - Abandoned
-  Aquitaine R.A.B. Holes - Completed in Basement

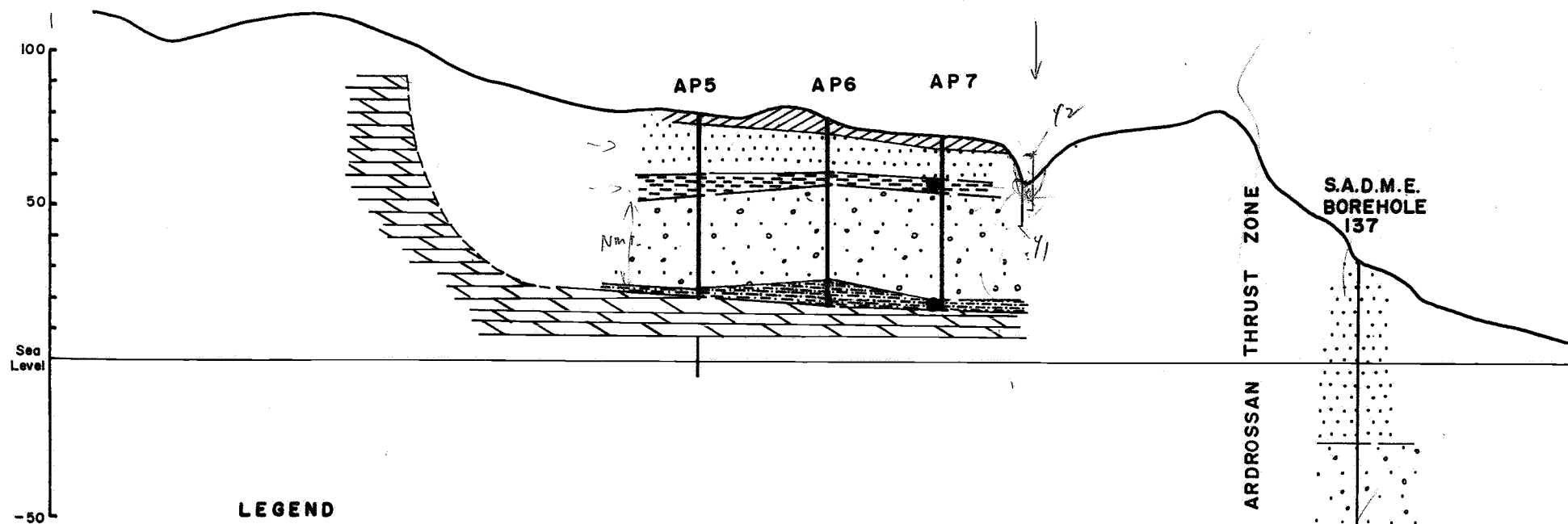
POSEIDON LIMITED

E.L. 1110 ARDROSSAN, South Australia

CROSS-SECTION B

Geologist : R. BLUCK	Scale : As shown	Fig. N°
Drawn : N. Bowden	Date March '83	3
Sheet Index : 1-53-12	Dwg. N° 007/25/83	
Revision:		

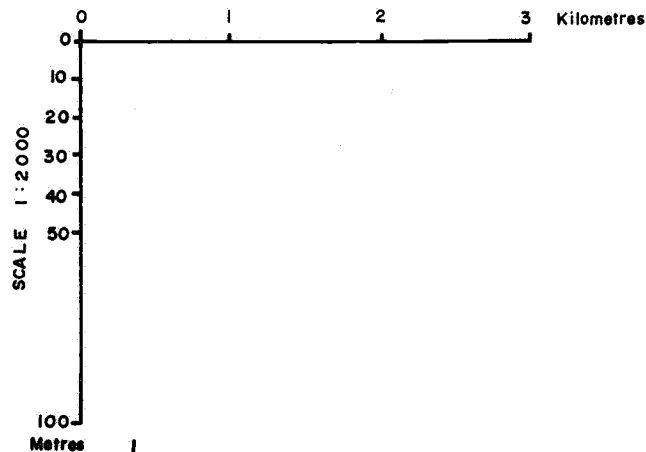
027 c-



LEGEND

-  Rogue Formation
-  Throoka Silts
-  Muloowartle Formation
-  Cream Clay Unit
-  Mature Sands Unit
-  Basal Sand Unit
-  Cambrian basement
-  Anomalous radiometric response
-  Significant radiometric response

SCALE 1:50 000



Poseidon Limited
Drillhole

Aquitaine R.A.B. Holes - Abandoned

Aquitaine R.A.B. Holes - Completed in
Basement

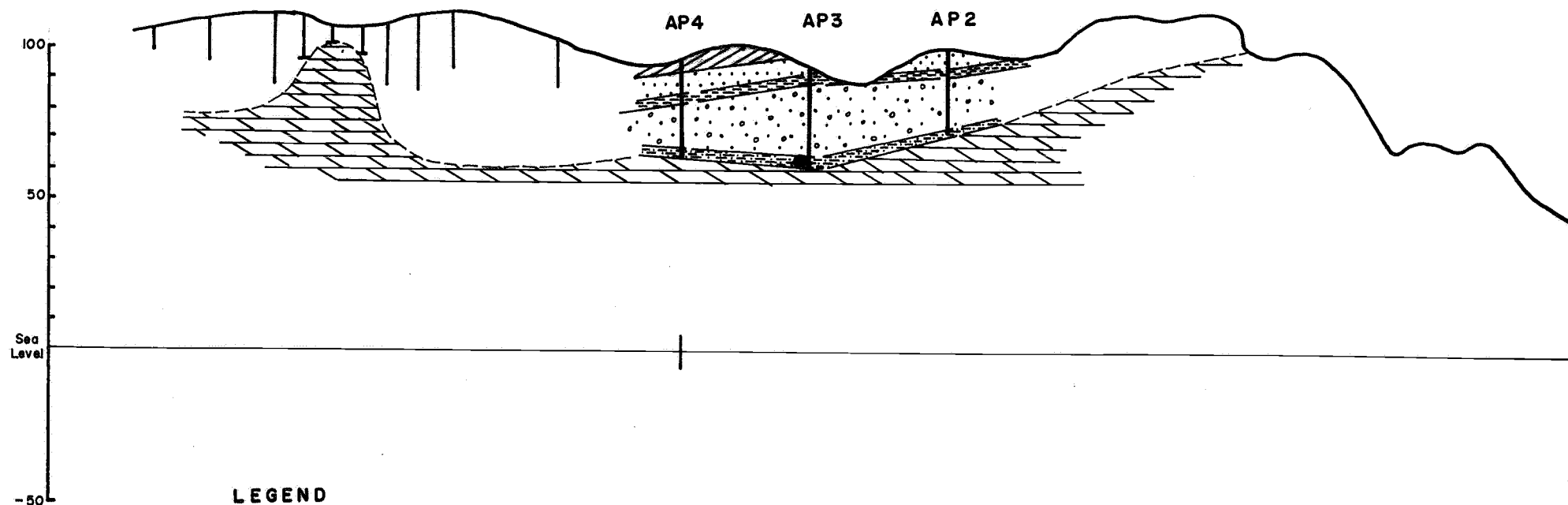
CROSS-SECTION C

POSEIDON LIMITED

E.L. 1110 ARDROSSAN, South Australia

Geologist: R. BLUCK	Scale: As shown	Fig. N°:
Drawn: N. Bowden	Date: March '83	4
Sheet Index: 1-53-12	Dr. N. 007/26/83	
Revision:		

028



LEGEND

- Rogue Formation
- Throoka Silts
- Mulgoowartie Formation
- Cream Clay Unit
- Mature Sands Unit
- Basal Sand Unit
- Cambrian basement
- Anomalous radiometric response
- Significant radiometric response

SCALE 1:50 000

0 1 2 3 Kilometres

0 10 20 30 40 50 100 Metres

Poseidon Limited
Drillhole

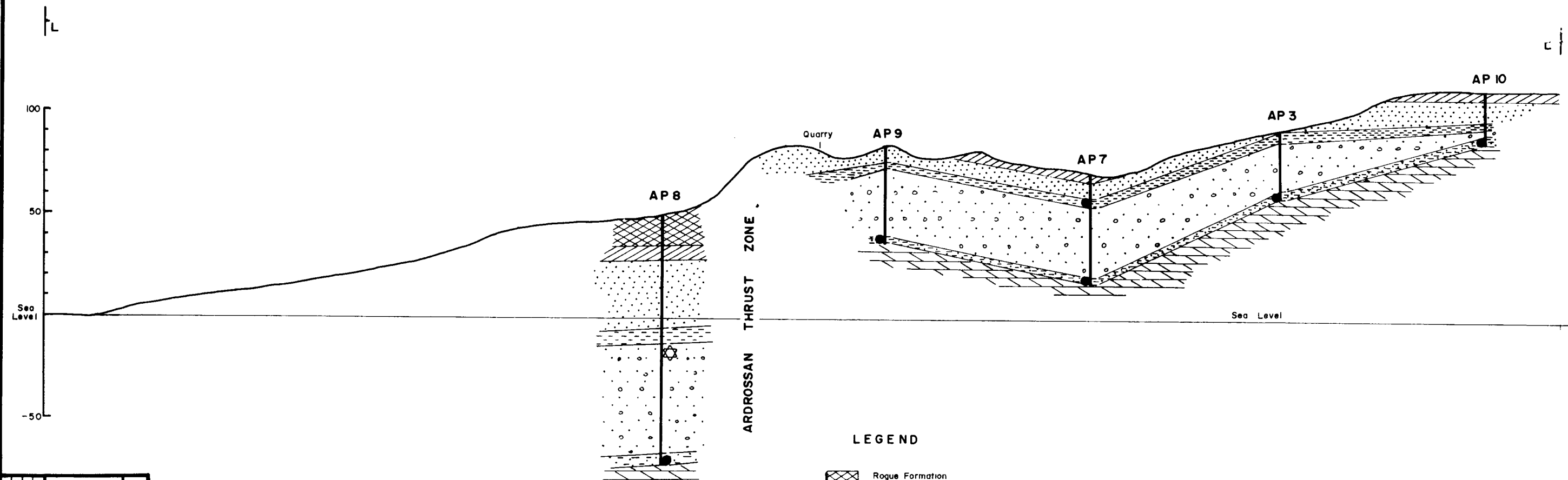
Aquitaine R.A.B. Holes - Abandoned

Aquitaine R.A.B. Holes - Completed in
Basement**POSEIDON LIMITED**

E.L. 1110 ARDROSSAN, South Australia

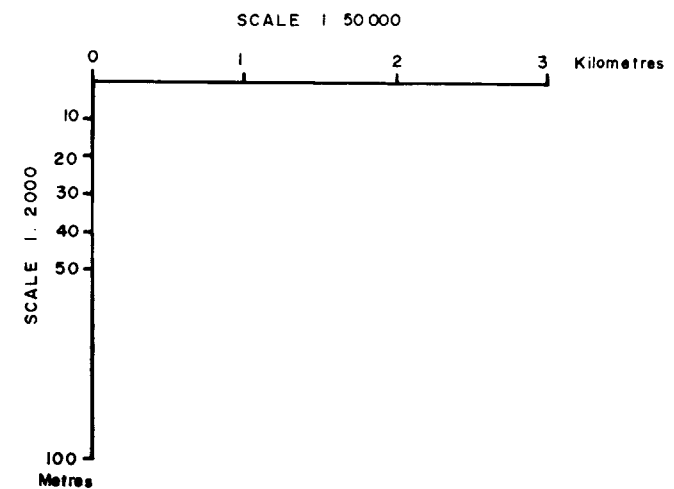
CROSS-SECTION D

Geologist: R. Bluck	Scale: As shown	Fig. No. 5
Drawn: N. Bowden	Date: March '83	
Sheet Index: 1-53-12	Dr. No. 007/27/83	
Revision:		



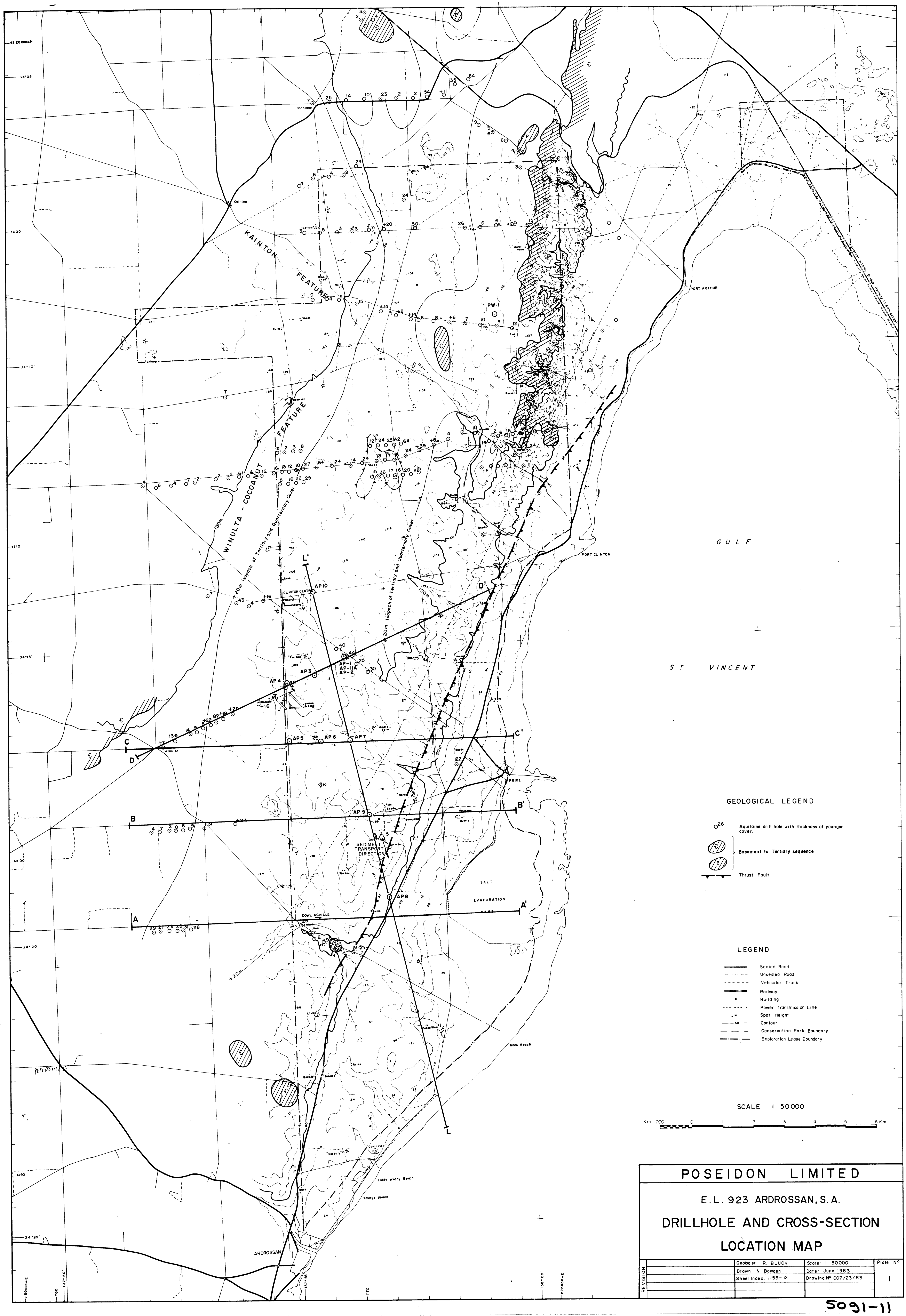
LEGEND

- Rogue Formation
- Throoka Silts
- Muloowartie Formation
- Cream Clay Unit
- Mature Sands Unit
- Basal Sand Unit
- Cambrian basement
- Anomalous radiometric response
- Significant radiometric response



AP 8
Poseidon Limited
Drillhole

POSEIDON LIMITED	
E.L. 1110 ARDROSSAN, South Australia	
LONGITUDINAL SECTION	
L-L₁ view west	
Geologist: R. BLUCK	Scale: As shown
Drawn: N. Bowden	Date: March 83
Sheet Index: 1-53-12	Drig No: 007/28/83
Revision:	Fig. No: 6



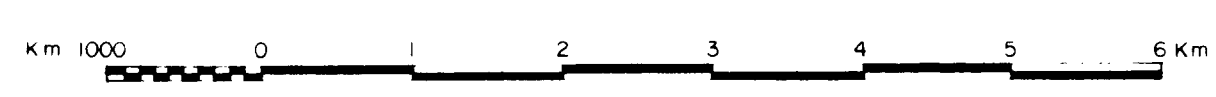
GEOLOGICAL LEGEND

- 26 Aquitaine drill hole with thickness of younger cover.
- Basement to Tertiary sequence
- Thrust Fault

LEGEND

- Sealed Road
- Unsealed Road
- Vehicular Track
- Railway
- Building
- Power Transmission Line
- Spot Height
- Contour
- Conservation Park Boundary
- Exploration Lease Boundary

SCALE 1:50 000



POSEIDON LIMITED

E.L. 923 ARDROSSAN, S.A.

DRILLHOLE AND CROSS-SECTION LOCATION MAP

Geologist: R. BLUCK	Scale: 1:50 000	Plate No.
Drawn: N. Bowden	Date: June 1983	
Sheet Index: 1-53-12	Drawing No: 007/23/83	

Poseidon Limited

Incorporated in South Australia

106 Hutt Street,
Adelaide, 5000,
South Australia.
Phone (08) 223 7438

Telegraphic and
Cable Address
Poseidon, Adelaide
South Australia.

Telex 82486

KRY:hjd.

21st October, 1983.

The Director-General,
Department of Mines & Energy,
P.O. Box 151,
EASTWOOD, S.A. 5063.

Dear Sir,

Quarterly Report on E.L. 1110
for the Period ended 15th August, 1983

In the comprehensive report prepared for the period ended 15th May, 1983 it was concluded that there was potential for sedimentary uranium deposits in a Tertiary stream channel and for lead and zinc in Cambrian Limestone in the Kainton/Port Clinton area.

In view of existing Government policies relating to the mining of uranium in South Australia, it was decided to forego further exploration of the Tertiary stream channel, but to consider further the Cambrian Limestone lead/zinc concept. In this latter context, during the reporting period, the geology of this area was carefully reviewed including discussions with Dr. J. Parker of your Department, with the aim of formulating an exploration programme.

Following this review, discussions were held with a major Australian company with a view to a joint venture approach to testing this concept. Agreement has been reached in principle and a joint venture agreement is currently being drafted.

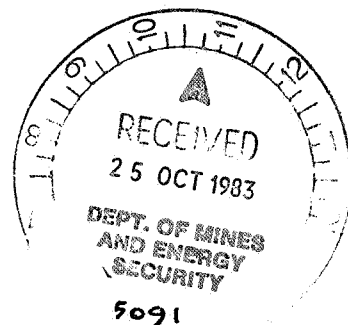
It is intended to undertake an exploration programme involving a small airborne input electro-magnetic programme followed by a ground induced-polarization survey. Anomalies generated by this geophysical programme will be tested by percussion drilling. Given that there are sufficient tangible geophysical anomalies to test by drilling, expenditure on this programme will amount to approximately \$60,000. This work will commence as soon as the joint venture agreement is signed.

Expenditure during the quarter is set out on the attached sheet.

Yours faithfully,
POSEIDON LIMITED

K. R. Yates

K. R. YATES,
Manager.



EXPLORATION LICENCE 1110Ardrossan, South AustraliaExpenditure for the Period Ended 15th August, 1983

Expenditure for the Period ended 15th August, 1983 was as follows:

Geology	\$ 1,837
Geophysics	800
Geochemistry	125
	\$ 2,762
5% Administrative Overheads	138
	\$ 2,900

Progressive expenditure on the Exploration Licence has been:

1st Quarter to 15th May	\$19,430
2nd Quarter to 15th August	2,900
Progressive Total	\$22,330

hjd:21/10/83

Poseidon Limited

Incorporated in South Australia

106 Hutt Street,
Adelaide, 5000,
South Australia.
Phone (08) 223 7438

077
Telegraphic and
Cable Address
Poseidon, Adelaide
South Australia.
Telex AA 82486

EXPLORATION LICENCE NUMBER 1110

ARDROSSAN, SOUTH AUSTRALIA

HELD BY POSEIDON LIMITED

QUARTERLY REPORT

FOR THE PERIOD ENDED

14TH. FEBRUARY, 1984.

D.L. ANDREWS
MARCH, 1984.

C O N T E N T S

1. SUMMARY
2. CONCLUSIONS AND RECOMMENDATIONS
3. INTRODUCTION
4. WORK DONE
 - 4.1 Data Review
 - 4.2 Field Inspections
 - 4.3 Rock Chip Sampling
 - 4.4 Image Processing
 - 4.5 E.M. Survey
5. EXPENDITURE
6. REFERENCES
7. LOCATION
8. KEYWORDS
9. LIST OF PLANS
10. LIST OF APPENDICES

1. SUMMARY

A review of all work undertaken by Poseidon Limited was completed by C.R.A Exploration Pty. Ltd. during the quarter and highlighted the potential of the Cambrian carbonate sequence to host lead-zinc mineralisation. A contract to complete ground E.M. traverses over five topographical anomalies has been let.

2. CONCLUSIONS AND RECOMMENDATIONS

- 2.1 Ardrossan E.L. 1110 has limited potential to host carbonate lead zinc deposits.
- 2.2 Due to the low topographical relief within the E.L. and the extensive thin transported cover it is recommended that ground E.M. surveys be conducted over selected topographical anomalies within the E.L. which may represent palaeo karst features in the Cambrian carbonates.
- 2.3 When results from the E.M. surveys are available, a diamond drilling programme will be formulated.

3. INTRODUCTION

Ardrossan E.L. 1110 covers an area of approximately 875 square kilometres on the northeastern end of the Yorke Peninsula. The area covered was originally granted to Poseidon Limited as E.L. 923 on the 16th. November, 1981, for a period of one year (Plan SAa 2345). This title has been succeeded by E.L. 1110 which was granted on the 15th. February, for a period of twelve months. An extension of a further twenty four months was granted on the 10th. January, 1984. A transfer from Poseidon Limited to Poseidon Minerals Limited was lodged with the Minister of Mines and Energy on 10th. November, 1983.

A joint venture agreement between Poseidon Minerals Limited and C.R.A. Exploration Pty. Limited was signed on the 18th. January, 1984.

4. WORK DONE

4.1 Data Review

A review of all available exploration data completed by the previous title holders, North Broken Hill Pty. Ltd. and Aquitaine, was undertaken during the quarter. Similarly a review of Poseidon's work programme was completed.

The review highlighted areas where basement faults and/or ridges may have influenced the development of karsts in the Cambrian carbonates. Due to the generally flat lying character it is believed that such karsts may be reflected by topographic lows in the present topography.

The potential of the E.L. to host significant deposits of Cu-U is believed to be low in the areas of shallow subcrop and essentially unknown in areas of deeper cover. No outstanding magnetic or gravity anomalies remain untested.

4.2 Field Inspections

All the topographic features selected during the data review were inspected during the quarter and of these further work was recommended on five. Notices of Entry have been served to all landowners holding title over the topographic anomalies selected for further work.

4.3 Rock Chip Sampling

Rock chip samples were collected from previously untested Cambrian Limestone outcrops or subcrop and from limestone which had previously returned weakly anomalous values.

The rock chip samples and locations are shown in Appendix I and Plan SAa 2651.

The sampling confirmed the anomalous character of the Kulpara (?) limestone outcropping at Dowlingville.

4.4 Image Processing

Located magnetic data tapes from a 1974 aeromagnetic survey flown over part of the area now covered by E.L. 1110 have been obtained and are being gridded prior to image processing. Similarly, B.M.R. gravity and the associated topographic data, is being image processed.

4.5 E.M. Survey

Due to the presence of minor pyritic and graphitic material within the Cambrian carbonates and the presences of fences across most of the topographic anomalies it has been decided to undertake SIROTEM ground surveys over each of the topographical anomalies (Plan SAa 2651).

A contract has been let to McSkimming Geophysics to commence in late February a ground SIROTEM survey over the topographic anomalies.

D.L. ANDREWS

of C.R.A. Exploration Pty. Limited.

Endorsed by:



K.R. YATES

for Manager, Poseidon Minerals Limited.

5. EXPENDITURE

Expenditure for the period ended 31st. January, 1984, the nearest accounting period was \$3,949.00, as listed below.

	\$
Payroll	1,006
Property	793
Contractors	1,410
Overheads	515
Transfer fee for E.L.	125
	\$3,949

6. REFERENCES

- Anderson, C.G. Interpretation of Geophysical Data
1982 (a) from E.L. 923, S.A.; Memorandum to
Poseidon Limited.
- Anderson, C.G. Drill testing of Wirrahill Magnetic
1982 (b) Anomaly, E.L. 932, S.A.; Memorandum
to Poseidon Limited.
- Bluck, R.G. E.L. 923, Quarterly Report for the
1982 Period ended 16/8/82.
- Bluck, R.G. E.L. 923, Quarterly Report for the
1983 Period ended 16/11/82.
- 1983 (b) E.L. 1110 Quarterly Report for the
Period ended 15/5/83.
- Callahan Syngensis versus Epigenesis of
1974 Mississippi Valley - Appalachian Type
Base Metal Mineral Deposits. Economic
Geology V69 pp. 123-124.
- Giles, C. Investigation of Poseidon Limited E.L.
1982 923 near Ardrossan, S.A.
- Lee, R.J. E.L. 180 (Price). Reconnaissance bedrock
1975 drilling programme. Quarterly Report,
Period ending 24/11/76. MG: 627.
Aquitaine Australia Minerals Ltd. (SADME,
Open File 2550/2).
- Lee, R.J. Quarterly Report Period ending 24/11/76.
1976 MG: 735. E.L. 180 (Price). Aquitaine
Australia Minerals Pty. Ltd. (SADME, Open
File 2550/2).

- Lee, R.J.
1977 Quarterly Report Period ending 26/7/77.
MG: 834. E.L. 314 (Price), Aquitaine
Australia Minerals Pty. Ltd. (SADME,
Open File 3040).
- Lee, R.J.
1978 (a) Quarterly Report for Period ending
26/4/78. MG: 929. E.L. 314 (Price),
Aquitaine Australia Minerals Pty. Ltd.
(SADME, Open File 3040/2).
- Lee, R.J.
1978 (b) Final Report. MG: 614. E.L. 314 (Price),
Yorke Peninsula, South Australia.
Aquitaine Australia Minerals Pty. Ltd.
(SADME, Open File 3040/2).
- Yates, K.R.
1983 Quarterly Report on E.L. 1110 for the
Period ended 15/8/83.

7. LOCATION

Maitland	SI53-12	1:250 000 sheet
Adelaide	SI54- 9	1:250 000 sheet

8. KEYWORDS

Geochem-rock chip
Cambrian
Carbonate

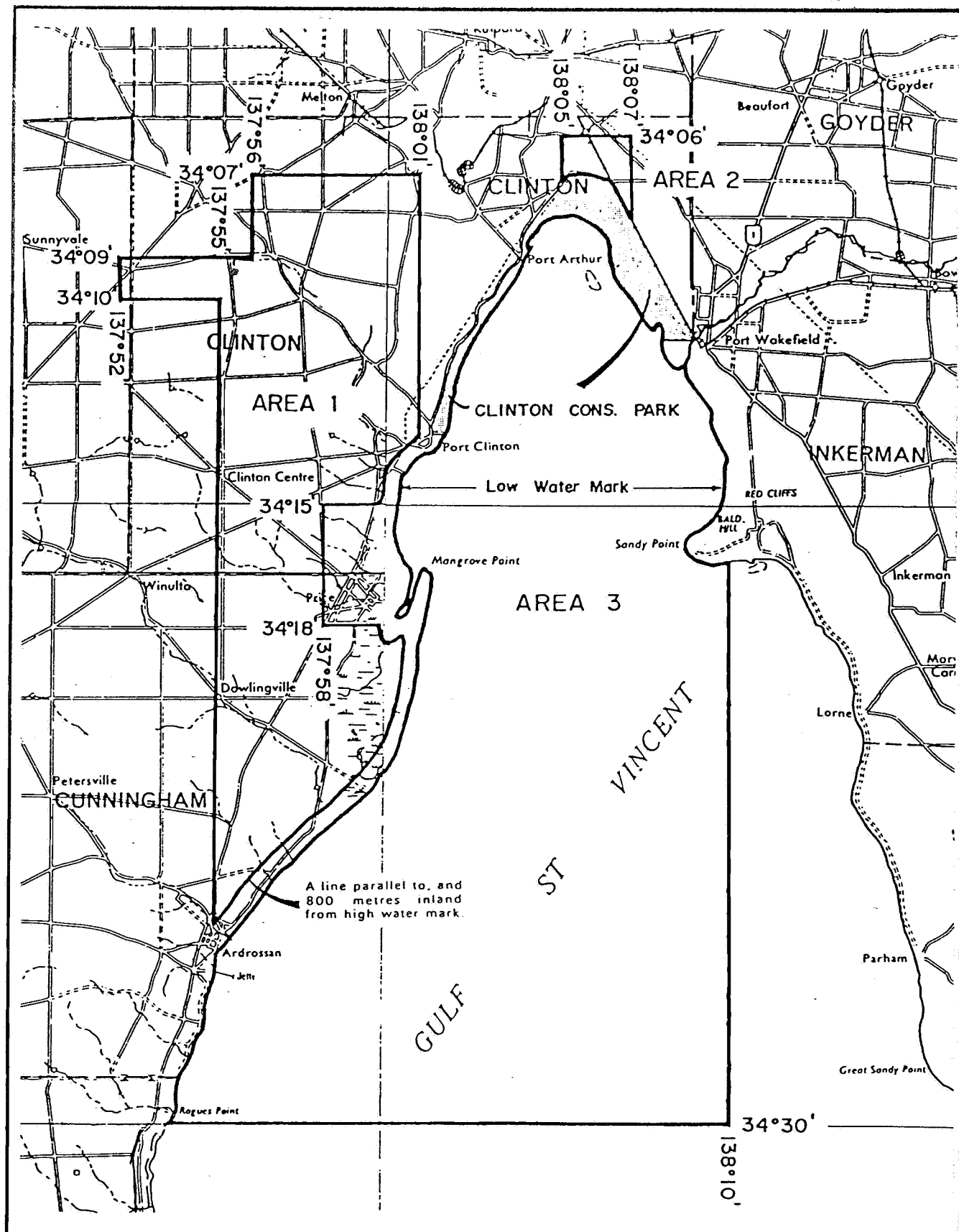
9. LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
SAa 2345	Ardrossan Area, S.A. First schedule Farm-in and J.V. Between Poseidon and CRAE	1:250 000
SAa 2651	Ardrossan E.L. 1110, S.A. Proposed SIROTEM Survey.	1:100 000

10. LIST OF APPENDICES

Appendix 1

APPENDIX 1ROCK CHIP SAMPLE RESULTS



SCALE 1:250 000



CRA EXPLORATION PTY LIMITED

FIRST SCHEDULE
'ARDROSSAN' AREA, S.A.
FARM-IN AND JOINT VENTURE BETWEEN
POSEIDON LIMITED
AND CRA EXPLORATION PTY LIMITED
Area: 875 km² Approximately

REF. MAITLAND SI 53-12, ADELAIDE SI 54-9

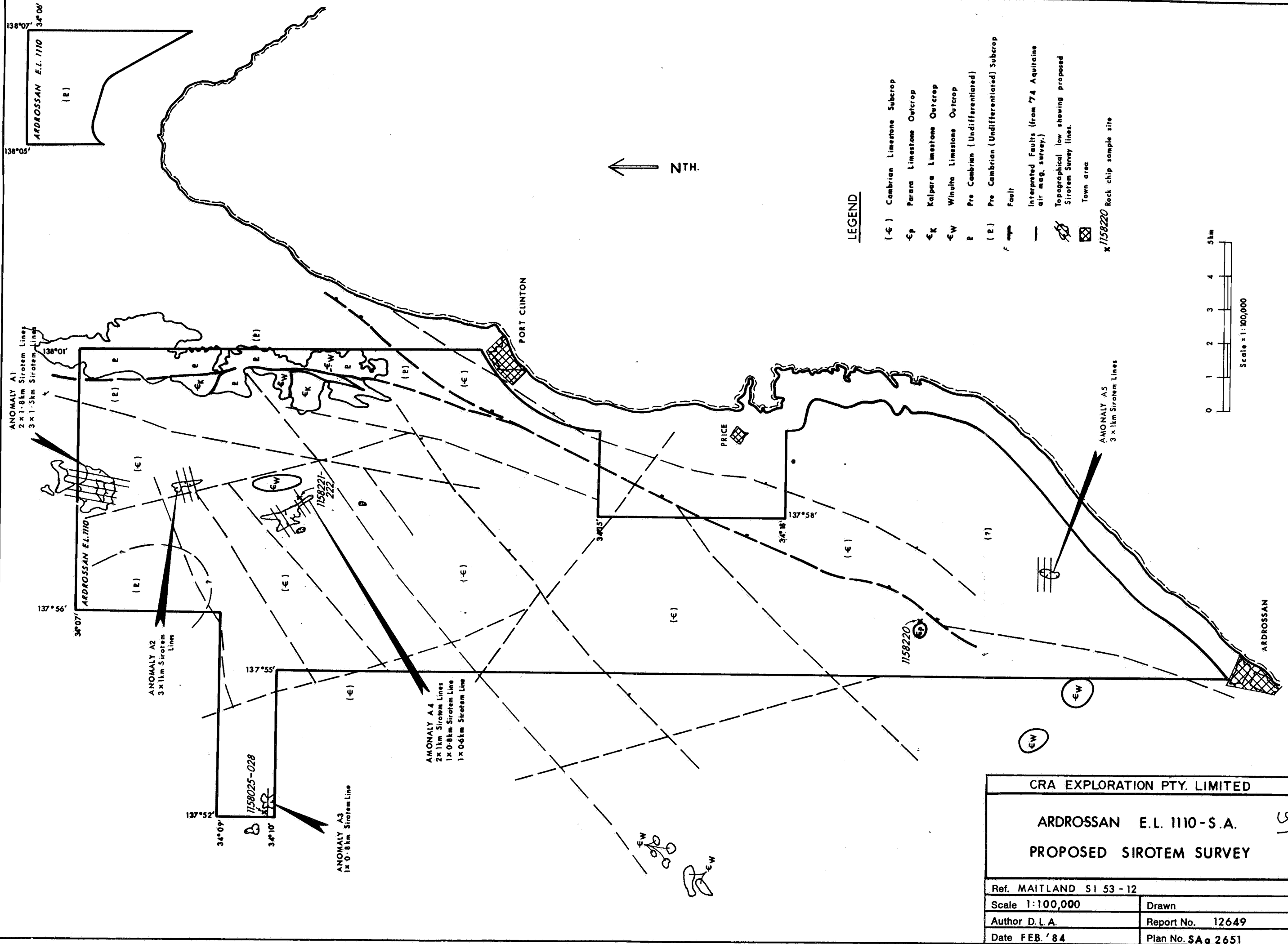
SCALE 1:250 000

AUTHOR D.K.R.

DATE 4 OCTOBER, 1983

REPORT 12792

PLAN No S A a 2345



LEGEND

- (-E) Cambrian Limestone Subcrop
- (-P) Perera Limestone Outcrop
- (-K) Kalpara Limestone Outcrop
- (-W) Winulta Limestone Outcrop
- (-R) Pre Cambrian (Undifferentiated) Subcrop
- (-F) Fault
- Interpreted Faults (from '74 Aquitaine air mag. survey.)
- Topographical low showing proposed Sirotek Survey lines.
- Town area
- 1158220 Rock chip sample site

CRA EXPLORATION PTY. LIMITED	
ARDROSSAN E.L. 1110-S.A.	
PROPOSED SIROTEM SURVEY	
Ref. MAITLAND SI 53-12	
Scale 1:100,000	Drawn
Author D.L.A.	Report No. 12649
Date FEB. '84	Plan No. SA 2651

CRA EXPLORATION PTY. LIMITED

FIFTH QUARTERLY REPORT FOR ARDROSSAN E.L. 1110,
SOUTH AUSTRALIA, FOR THE PERIOD ENDING 14TH MAY, 1984

The contents of this report remain
the property of C.R.A. Exploration
Pty. Limited and may not be published
in whole or in part nor used in a
company prospectus without the
written consent of the Company.

AUTHOR: D.L. ANDREWS

COPIES TO: CRAE LIBRARY
SADME
POSEIDON MINERALS LTD

DATE: 23RD MAY, 1984

SUBMITTED BY: *D.L. Andrews*

ACCEPTED BY: *Neil D. Tuckwell*

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2. CONCLUSIONS AND RECOMMENDATIONS	1
3. INTRODUCTION	1
4. WORK DONE	2
4.1 Ground EM Survey	2
4.2. Aeromagnetic Data Processing	3
5. PROPOSED WORK	3
EXPENDITURE	4
REFERENCES	5
LOCATION	6
KEYWORDS	6
LIST OF PLANS	6

1. SUMMARY

Ground E.M. traverses were completed by McSkimming Geophysics over five topographic lows which were interpreted to represent possible Karst features. No major conductors were located during the survey. There is some indication that a weak conductor may be present to the east of anomaly designated A4.

A copy of the located magnetic data tape for the Price survey flown in 1978 for Aquitaine has been obtained and is being gridded prior to reprocessing.

2. CONCLUSIONS AND RECOMMENDATIONS

2.1 The potential of E.L. 1110 has been significantly downgraded by the absence of major conductors associated with topographic anomalies A1 - A5.

2.2 Further work will be dependent upon an interpretation of the results of processing Aquitaine's aeromagnetic data.

3. INTRODUCTION

Ardrossan E.L. 1110 covers an area of approximately 875 square kilometres on the north eastern end of the Yorke Peninsula. The area covered was originally granted to Poseidon Limited as E.L. 923 on the 16th. November, 1981, for a period of one year (Plan SAa 2345). This title has been succeeded by E.L. 1110 which was granted on the 15th. February, for a period of twelve months. An extension of a further twenty four months was granted on the 10th. January, 1984. A transfer from Poseidon Limited to Poseidon Minerals Limited was lodged with the Minister of Mines and Energy on 10th. November, 1983.

A joint venture agreement between Poseidon Minerals Limited and CRA Exploration Pty. Limited was signed on the 18th. January, 1984.

This report details all work carried out during the quarter ending 14th April, 1984.

4. WORK DONE

4.1 Ground EM Survey

A ground EM survey was carried out over five interpreted karst features within Ardrossan E.L. 1110 from 21/2/84 to 29/2/84 by McSkimming Geophysical Services. (Plan SAa 2651).

A low powered Sirotem MKII unit was used with 100m x 100m transmitten loops and a RVR (roving vector receiver) placed in the centre of the loop. Stations were read at 50m intervals on lines 200m apart over the following anomalies:

<u>Area</u>	<u>Line</u>	<u>Stations</u>
A1	10000E	8250N to 9950N
	9800E	8250N to 9950N
	9600E	8500N to 9950N
	9400E	8500N to 9950N
	9200E	8500N to 9950N
A2	9950N	9100E to 9950E
	9750N	9100E to 9950E
	9550N	9100E to 9950E
A3	9750E	9950N to 9700N
	9600N	9600E to 10350E
A4	9950N	9050E to 9950E
	9750N	9050E to 9950E
	9350N	9450E to 9950E
	9150N	9450E to 10150E
A5	9750N	9050E to 9950E
	9950N	9050E to 9950E
	10150N	9050E to 9950E

(Plan SAa 2651).

Assessment of the SIROTEM lines by R.J. Lane has yielded the following interpretation.

Areas A1, A2, A3

No major conductors were located during the Sirotem survey. Several shallow overburden patches could be interpreted from the early channels. The flexibility introduced into the Sirotem system by the use of the RVR receiver was clearly evident in these areas as the response from fences could be reduced to a minor level by careful placement of the receiver. Overhead power-lines remain as the major source of unwanted signal.

Area A4

No major conductors were interpreted from the profiles. Lines 9150N and 9350N both show an increase in mid-channel response to the east indicating an increase in the conductivity of the subsurface.

Although no discrete conductors were located, the possibility exists of a conductor a short distance to the east of these lines. This could be tested by carrying out a fixed loop Sirotem, EM37 or Utem survey covering an area 600m x 400m.

Area A5

No major conductors were interpreted from the profiles. The ground conductivity was very high in this region, hardly surprising when its proximity to both the coast and to sea level are considered. Penetration was probably limited to less than 50m. Small anomalies were obtained on line 9950N at 9575E and line 10150N at 9600E indicating minor variations in the geoelectric section. The source of the anomaly could be an area of more conductive pore fluid between lines 9950N and 10150N, or a basement feature striking N/S. The latter is the favoured interpretation since the narrow feature is observed on lines 200m apart.

Stacked transient EM profiles for anomalies A1 - A5 are presented in Plans SAa 2783 - 2798.

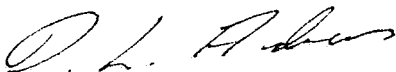
4.2. Aeromagnetic Data Reprocessing

Reprocessing of the 1978 Aquitane aeromagnetic survey, encompassing part of E.L. 1110, has been hampered by formatting problem.

The aeromagnetic data tape is currently being gridded by Technical Computer Services prior to reprocessing on the CRAE COMTAL image processor.

5. PROPOSED WORK

The program will be reassessed when the image processed aeromagnetic data is available.



D.L. ANDREWS

DLA/dkf

EXPENDITURE

Expenditure for the period ended 30th April 1984, the nearest accounting period was \$21,470.00, as listed below.

Payroll	\$ 7,303
Supplies	628
Vehicle	921
Travel	2,075
Property	558
Tenements	1,510
Contractors	5,647
Laboratory	186
Overheads	2,642
	\$ 21,470

REFERENCES

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- Lee R.J. Final Report. MG:614. E.L. 314 (Price),
1978 (b) Yorke Peninsula, South Australia. Aquitaine Australia Minerals Pty. Ltd. (SADME, Open File 3040/2).
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1983 period ended 15/8/83.

LOCATION

Maitland S153 - 12 1:250,000 sheet
Adelaide S154 - 9 1:250,000 sheet

KEYWORDS

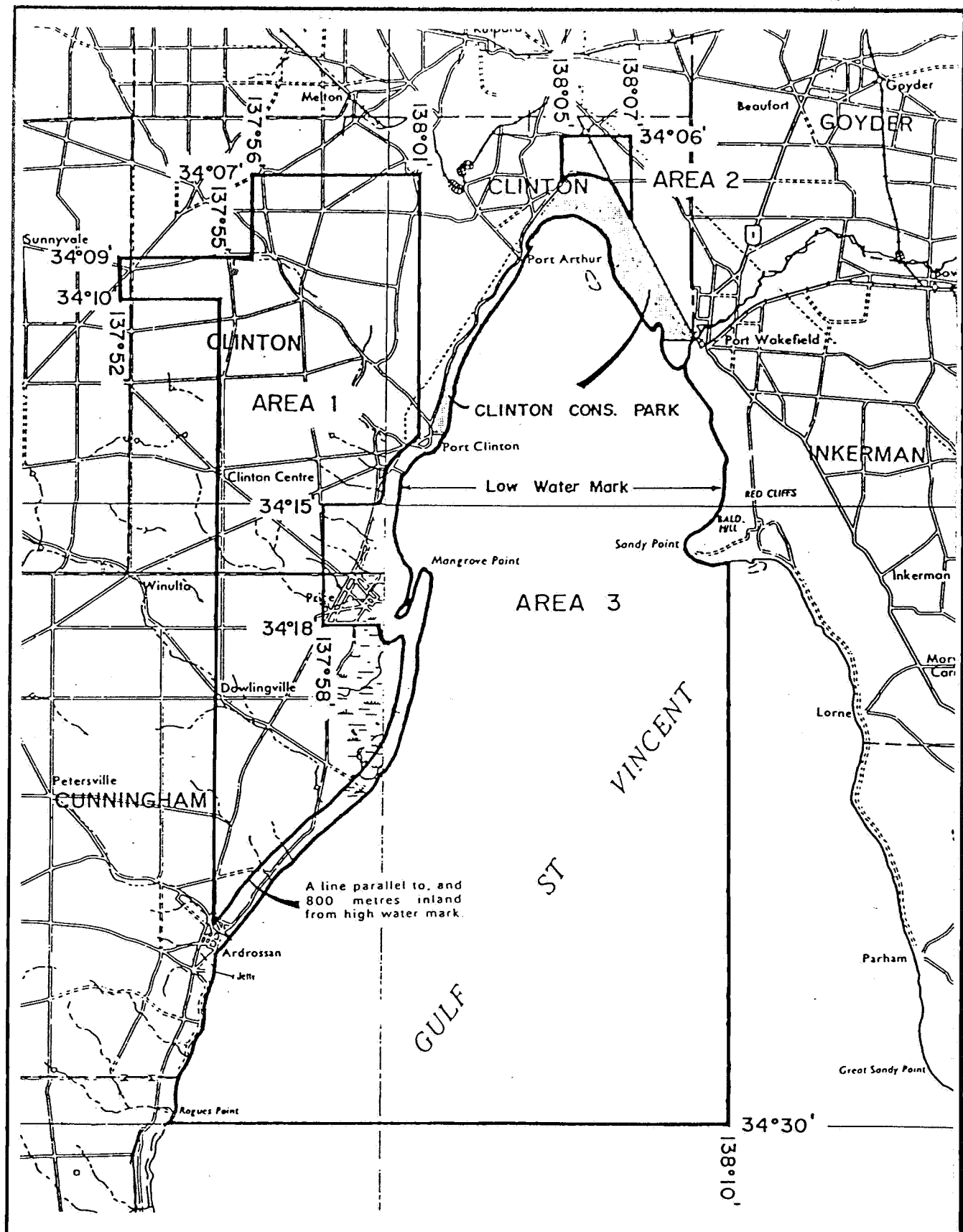
Geophys - Ground EM, Geophys - aeromag, Cambrian, Carbonate

LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
SAa 2345	Ardrossan Area, S.A. First schedule Farm-in and J.V. Between Poseidon and CRAE	1:250 000
SAa 2651	Ardrossan E.L. 1110, S.A. Proposed SIROTEM Survey.	1:100 000
SAa 2783	Ardrossan E.L. 1110 S.A., Anomaly A1, SIROTEM in-loop receiver profile line 10,000E	1:5 000
SAa 2784	Ardrossan E.L. 1110 S.A., Anomaly A1, SIROTEM in-loop receiver profile line 9800E	1:5 000
SAa 2785	Ardrossan E.L. 1110 S.A., Anomaly A1, SIROTEM in-loop receiver profile line 9600E	1:5 000
SAa 2786	Ardrossan E.L. 1110 S.A., Anomaly A1, SIROTEM in-loop receiver profile line 9400E	1:5 000
SAa 2787	Ardrossan E.L. 1110 S.A., Anomaly A1, SIROTEM in-loop receiver profile line 9200E	1:5000
SAa 2788	Ardrossan E.L. 1110 S.A., Anomaly A2, SIROTEM in-loop receiver profile line 9950N	1:5 000
SAa 2789	Ardrossan E.L. 1110 S.A., Anomaly A2, SIROTEM in-loop receiver profile line 9750N	1:5 000
SAa 2790	Ardrossan E.L. 1110 S.A., Anomaly A2, SIROTEM in-loop receiver profile line 9550N	1:5 000
SAa 2791	Ardrossan E.L. 1110 S.A., Anomaly A3, SIROTEM in-loop receiver profile line 9600N	1:5 000

LIST OF PLANS CONT....

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
SAa 2792	Ardrossan E.L. 1110 S.A., Anomaly A4, SIROTEM in-loop receiver profile line 9950N	1:5 000
SAa 2793	Ardrossan E.L. 1110 S.A., Anomaly A4, SIROTEM in-loop receiver profile line 9750N	1:5 000
SAa 2794	Ardrossan E.L. 1110 S.A., Anomaly A4, SIROTEM in-loop receiver profile line 9350N	1:5 000
SAa 2795	Ardrossan E.L. 1110 S.A., Anomaly A4, SIROTEM in-loop receiver profile line 9150E	1:5 000
SAa 2796	Ardrossan E.L. 1110 S.A., Anomaly A5, SIROTEM in-loop receiver profile line 10150N	1:5 000
SAa 2797	Ardrossan E.L. 1110 S.A., Anomaly A5, SIROTEM in-loop receiver profile line 9950N	1:5 000
SAa 2798	Ardrossan E.L. 1110 S.A., Anomaly A5, SIROTEM in-loop receiver profile line 9750N	1:5 000



SCALE 1:250 000

KM 5 0 5 10 KM.

CRA EXPLORATION PTY LIMITED

FIRST SCHEDULE
 'ARDROSSAN' AREA, S.A.
 FARM-IN AND JOINT VENTURE BETWEEN
 POSEIDON LIMITED
 AND CRA EXPLORATION PTY LIMITED
 Area: 875 km² Approximately

REF. MAITLAND SI 53-12, ADELAIDE SI 54-9

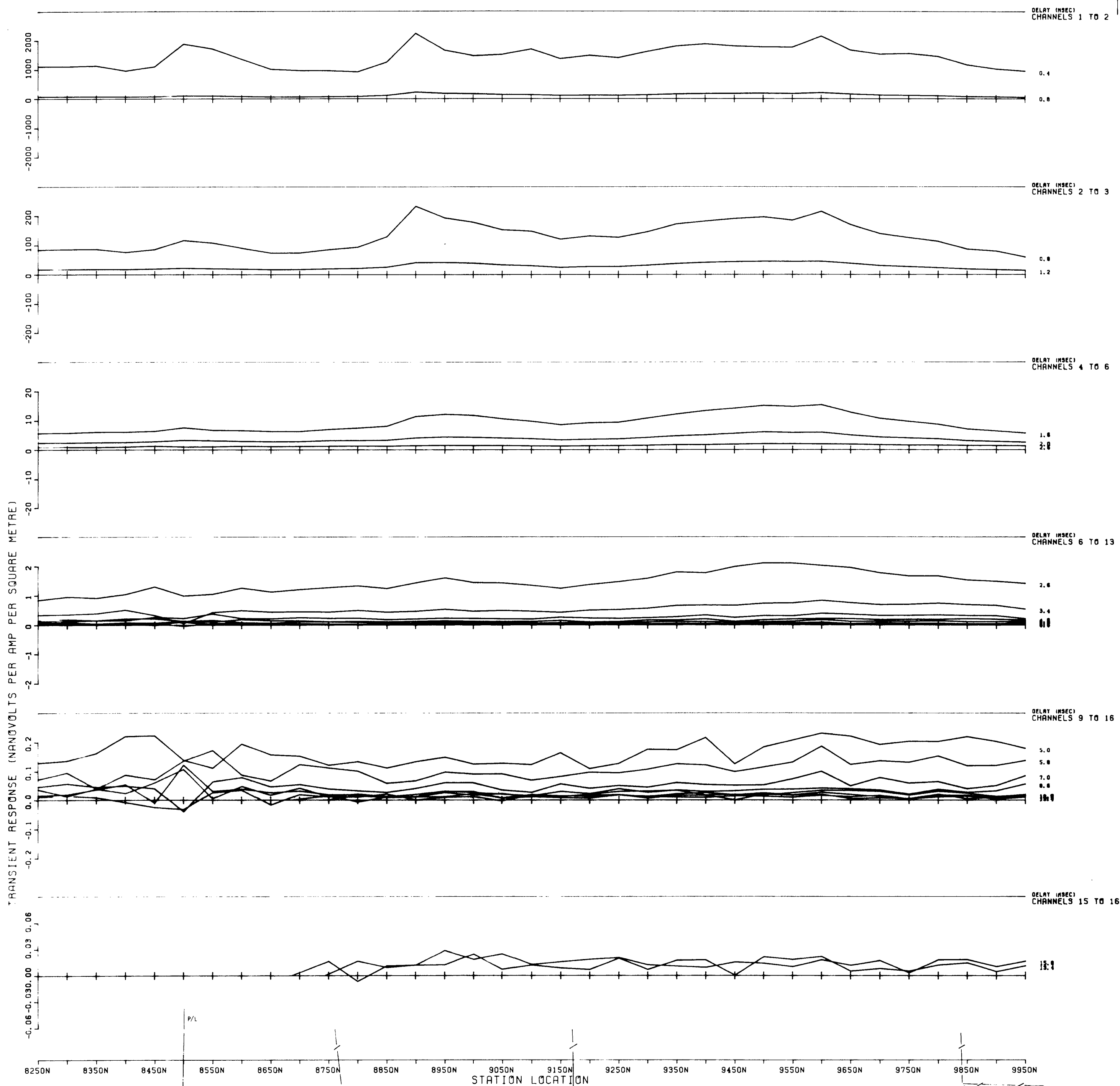
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AUTHOR D.K.R.

REPORT 12792

DATE 4 OCTOBER, 1983

PLAN No S A a 2345



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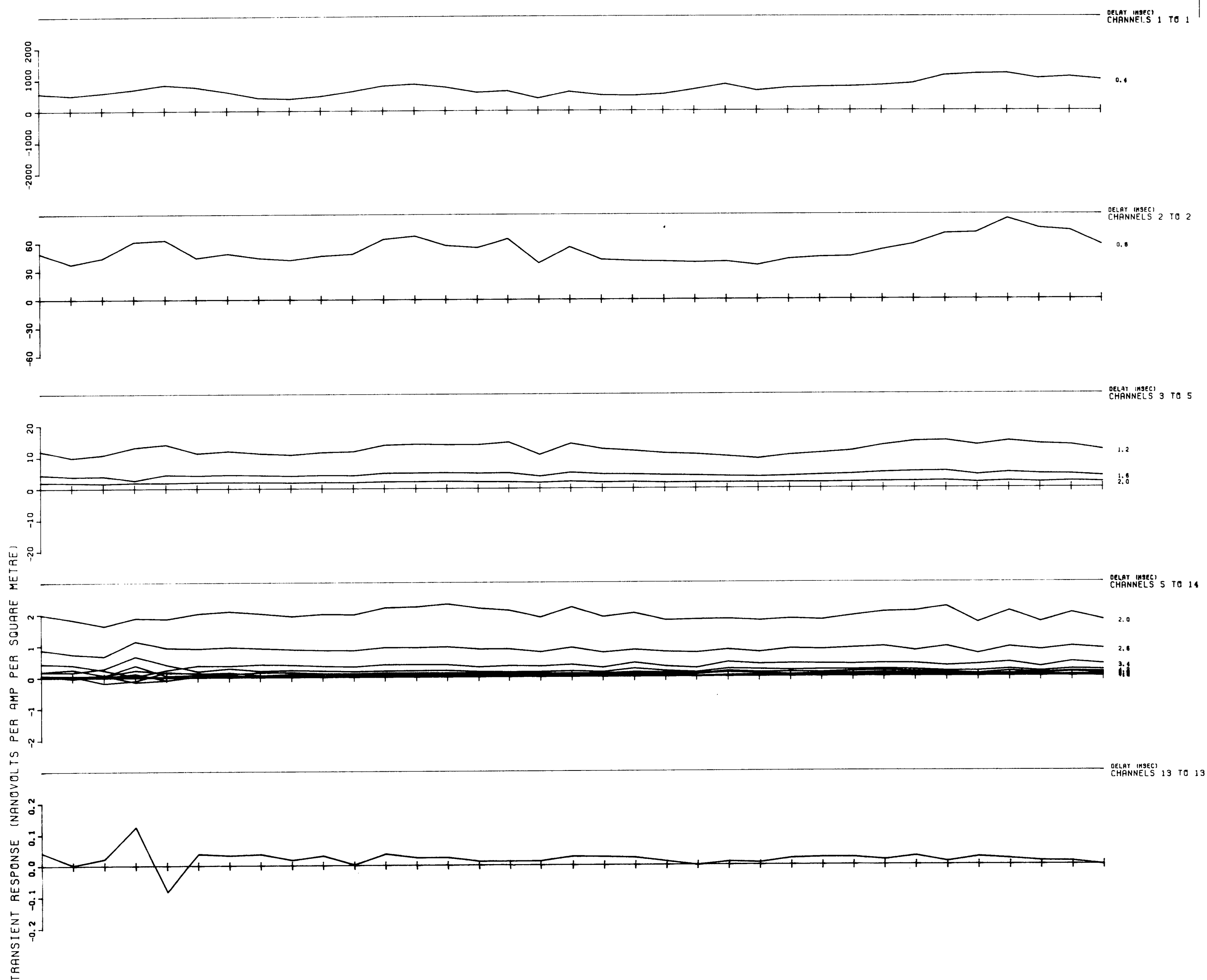
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 TRANSIENT E.M. PROFILE
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SCALE: 1:5000
 DATE : 21/02/84
 MAP : ARDROSSAN, S.A.



CRA EXPLORATION PTY LIMITED			
ARDROSSAN, EL 1110 — S.A.			
ANOMALY A1			
SIROTEM IN LOOP RECEIVER PROFILE			
LINE 10000E			
REF	MAITLAND S153-12		
SCALE	1:5000		
AUTHOR	RL	REPORT No.	12649
DATE	23-5-84	PLAN No.	SAa 2783

5091-12



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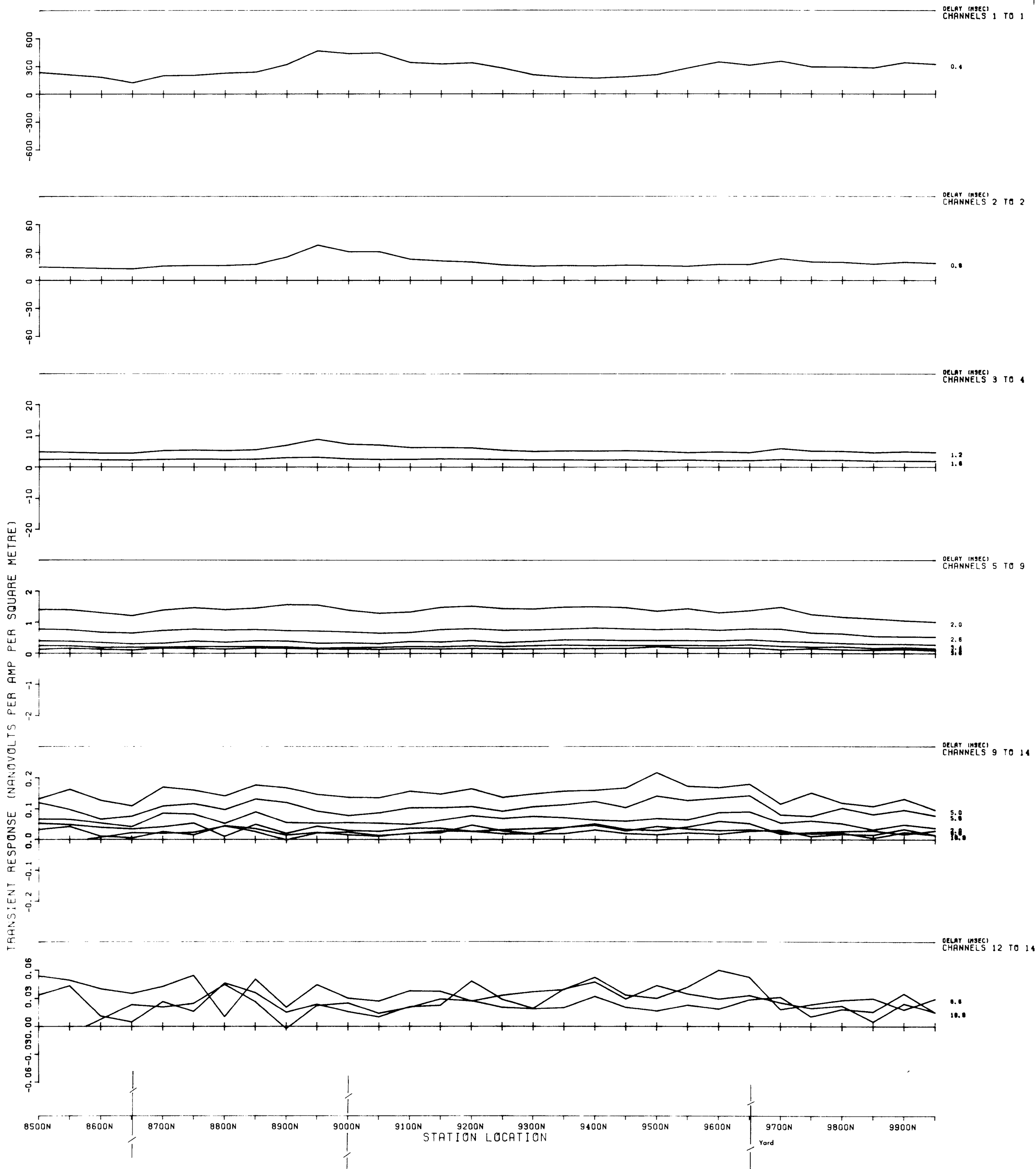
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SCALE: 1:5000
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 MAP : ARDROSSAN, S.A.



5091-13

REF	MAITLAND SI53-12
REPORT No.	12649
PLAN No.	SAa 2784



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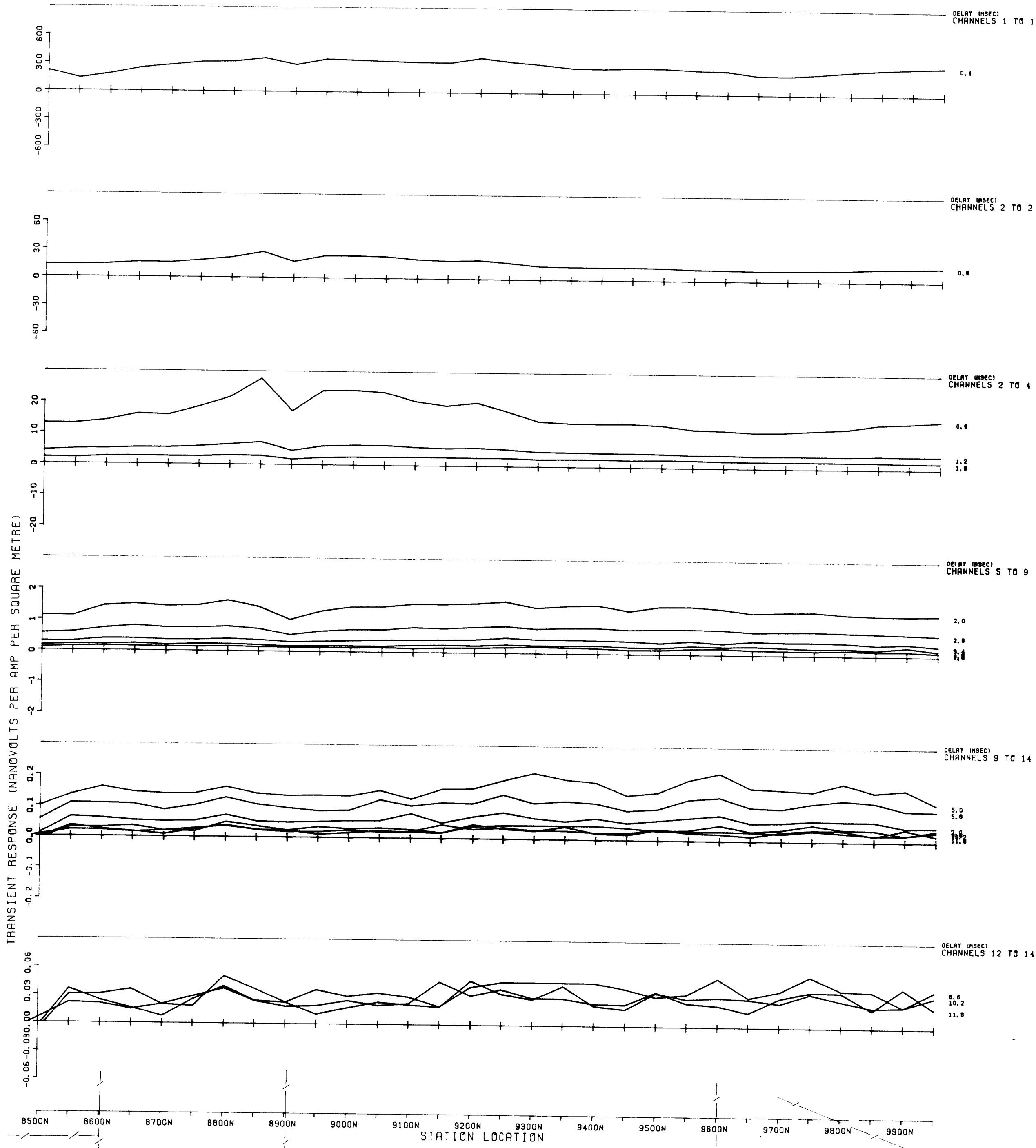
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SCALE: 1:5000
 DATE : 23/02/84
 MAP : ARDROSSAN, S.A.



5091-14

REF: MAITLAND SI53-12
 REPORT No. 12649
 PLAN No. SAa 2785



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READING INTERVAL 50M

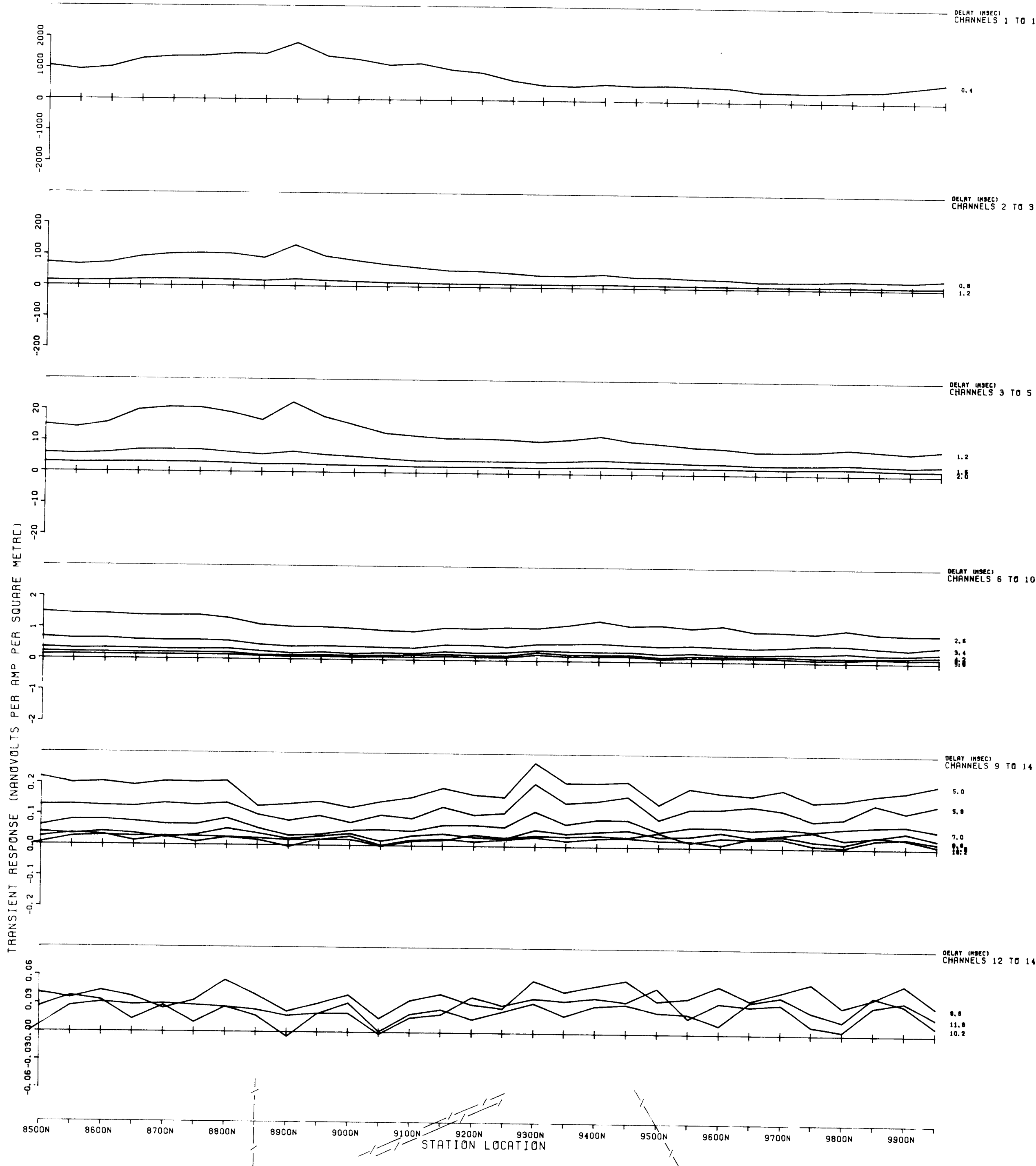
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SCALE : 1:5000
DATE : 23/02/84
MAP : ARDROSSAN, S.A.



5091-15

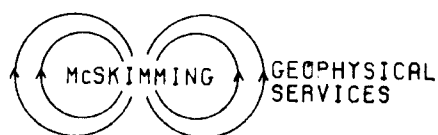
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REPORT No.	12649
PLAN No.	SAa2786



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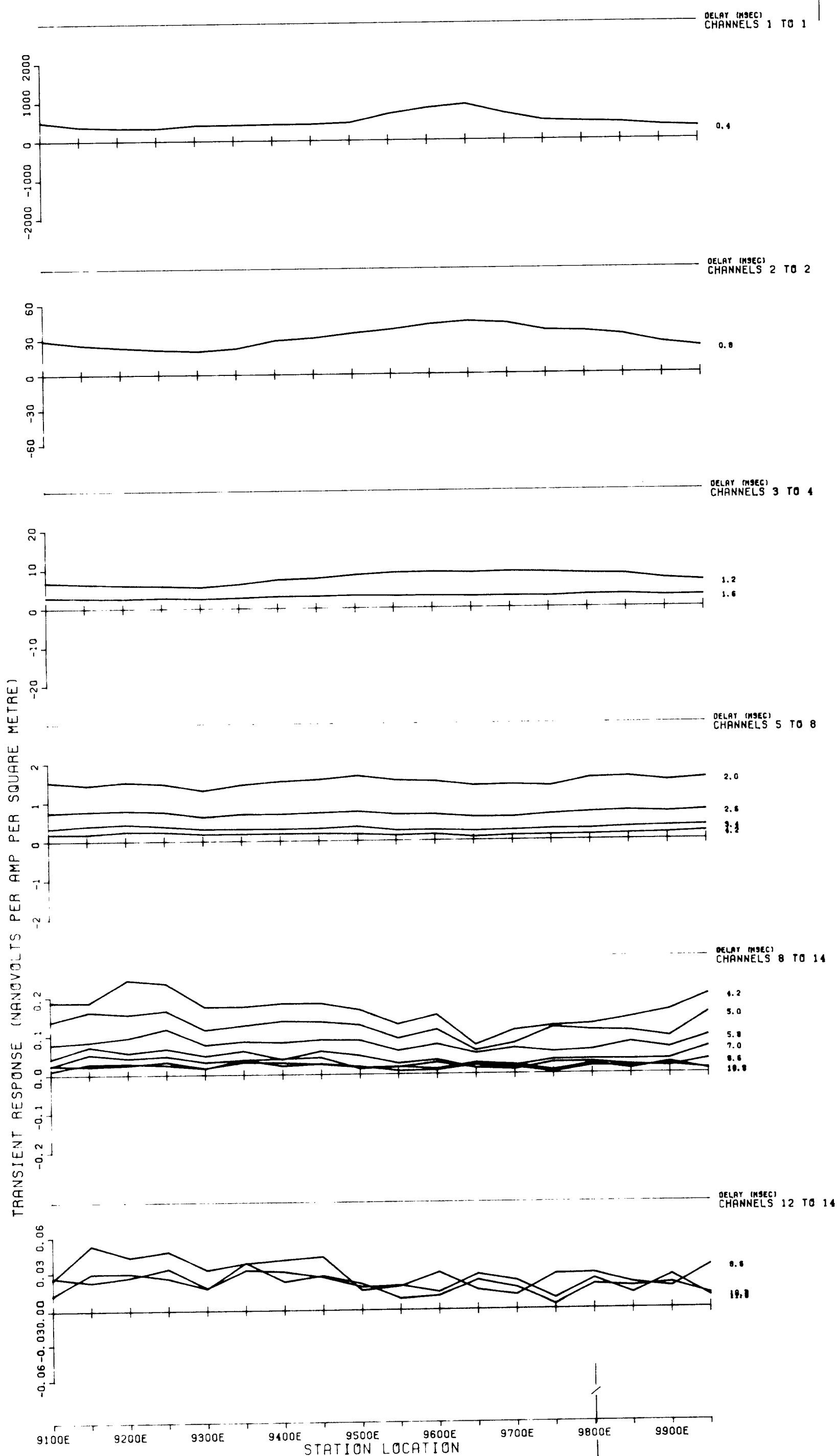
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SCALE: 1:5000
DATE : 24/02/84
MAP : ARDROSSAN, S.A.



5091-16

REF: MAITLAND S153-12
REPORT No. 12649
PLAN No. SAa 2787



INSTRUMENT :SIROTEM
 CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
 IN LOOP RECIEVER
 READING INTERVAL 50M

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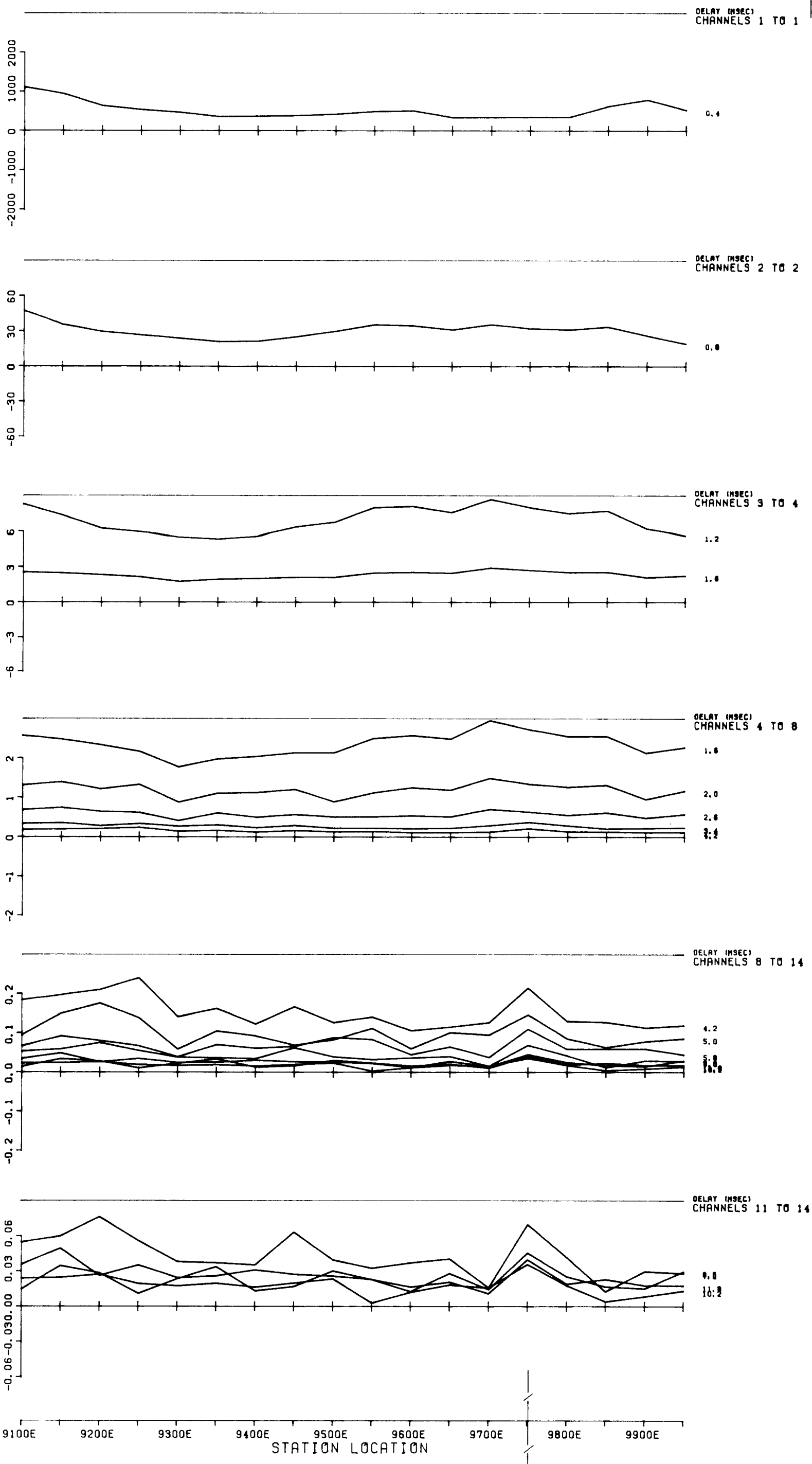
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 DATE : 24/02/84
 MAP : ARDROSSAN, S.A.



REF: MAITLAND S153-12
 REPORT No.
 PLAN No. SAa 2788

5091-17

TRANSIENT RESPONSE (NANOVOLTS PER AMP PER SQUARE METRE)



INSTRUMENT :SIRTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
IN LOOP RECIEVER
READING INTERVAL 50M

SCALE: 1:5000
DATE : 25/02/84
MAP : ARDROSSAN, S.A.

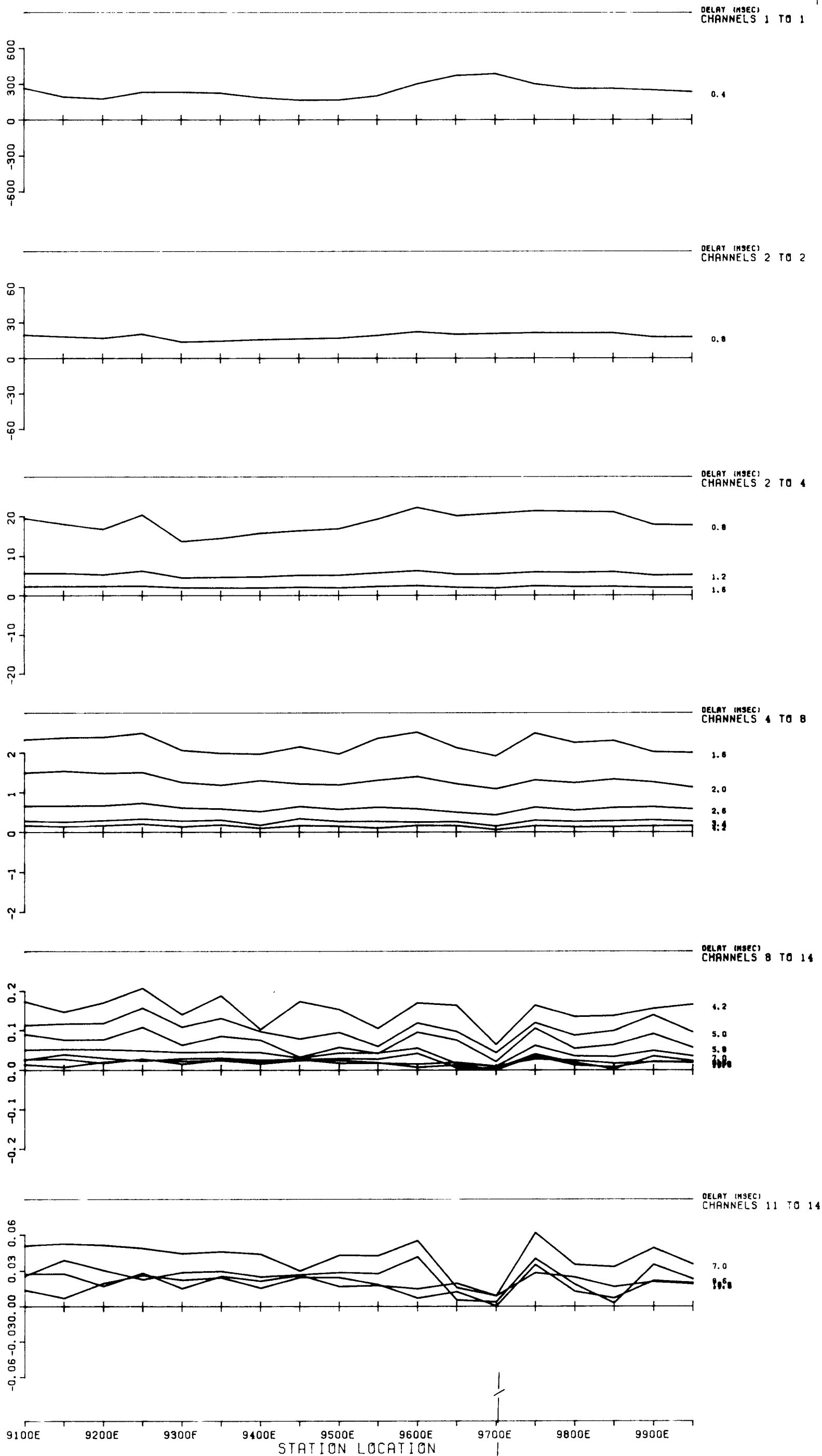
C.R.A. EXPLORATION PTY. LYD.
TRANSIENT E.M. PROFILE
LINE 9750N, ANOMALY A 2.



REF:	MAITLAND SI53-12
REPORT No.	12649
PLAN No.	SAa 2789

5091-18

TRANSIENT RESPONSE (NANOVOLTS PER AMP PER SQUARE METRE)



INSTRUMENT :SIROTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
IN LOOP RECIEVER
READING INTERVAL 50M

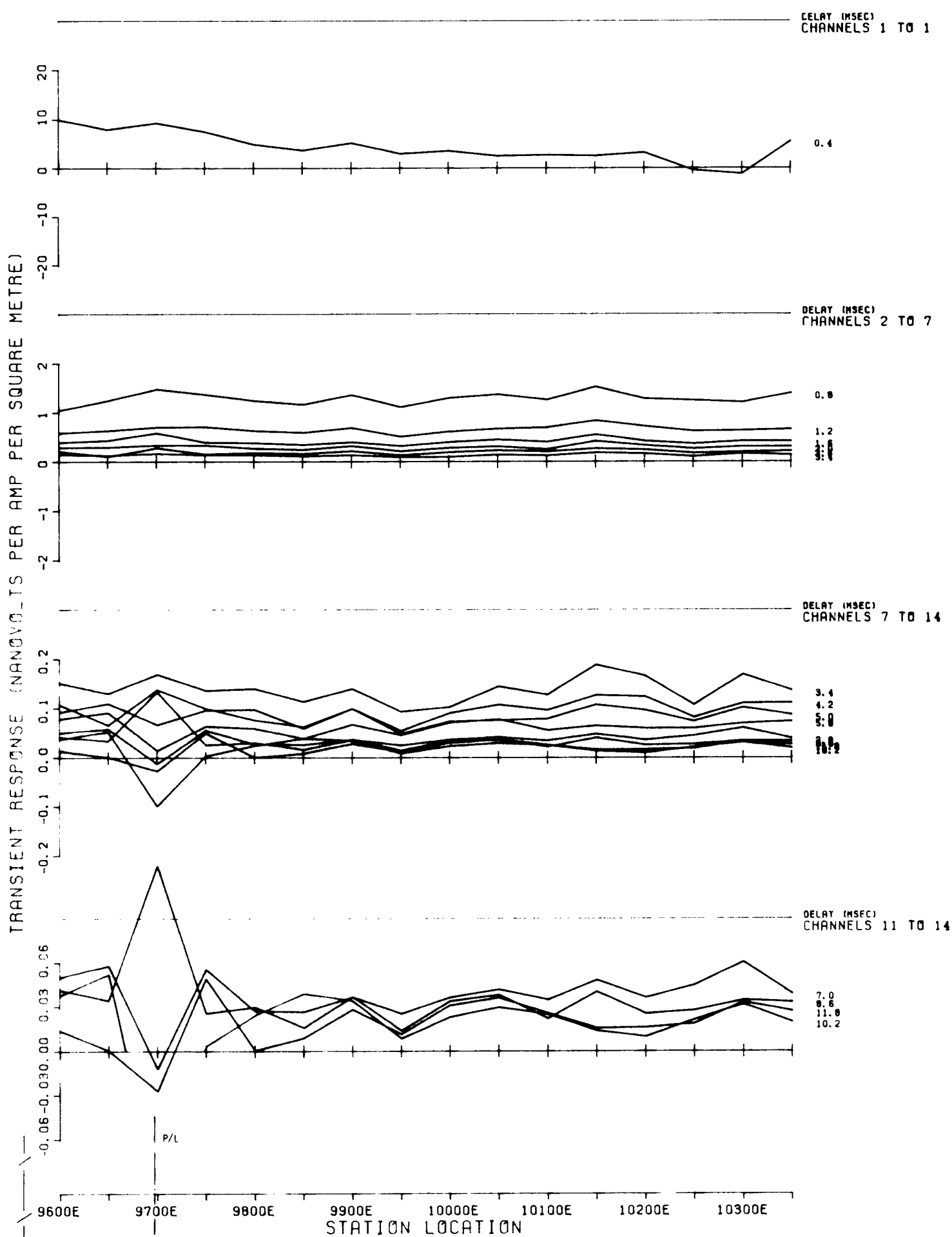
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TRANSIENT E.M. PROFILE
LINE 9550N, ANOMALY A 2.

SCALE: 1:5000
DATE : 25/02/84
MAP : ARDROSSAN, S.A.



REF: MAITLAND SI53-12
REPORT No. 12649
PLAN No. SAa 2790

5081-19



INSTRUMENT :SIROTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
IN LOOP RECIEVER
READING INTERVAL 50M

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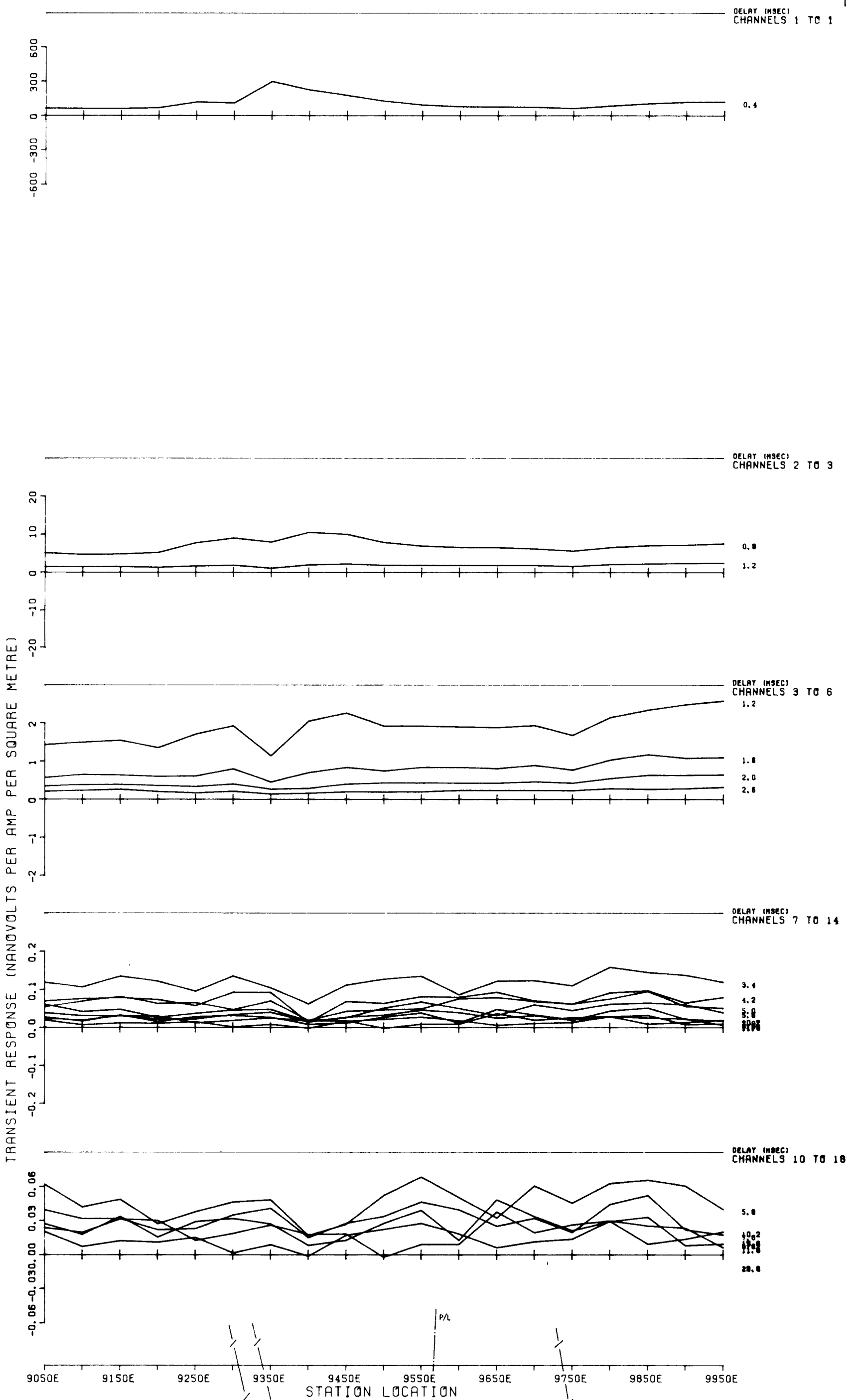
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DATE : 29/02/84
MAP : ARDROSSAN, S.A.



GEOPHYSICAL
SERVICES

REF: MAITLAND SI 53-12
REPORT No. 12649
PLAN No. SAa 2791

5091-20



INSTRUMENT :SIROTEM
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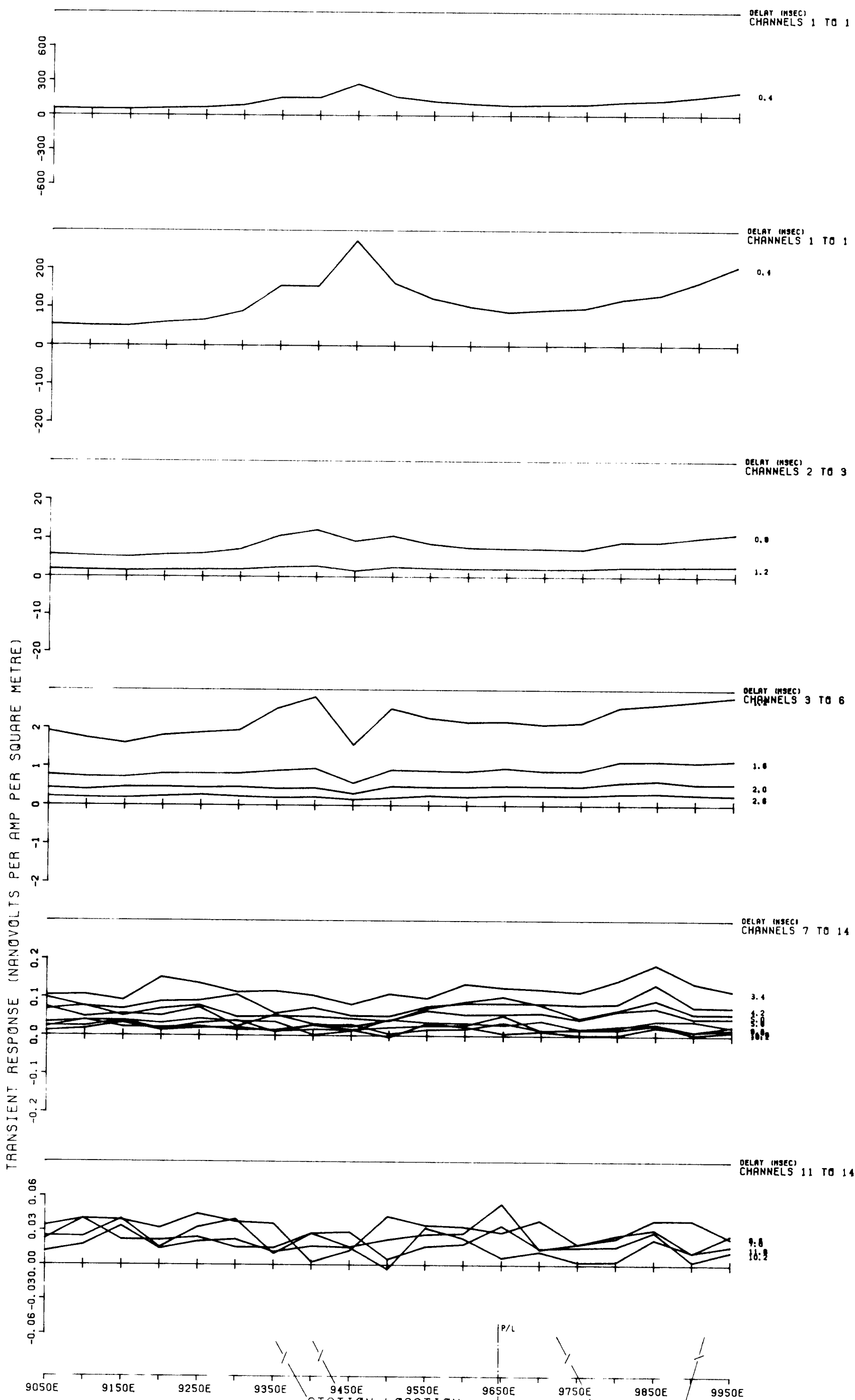
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SCALE: 1:5000
 DATE : 26/02/84
 MAP : ARDROSSAN, S.A.



REF:	MAITLAND S153-12
REPORT No	12649
PLAN No.	SAa 2792

5091-21



INSTRUMENT : SIROTEM
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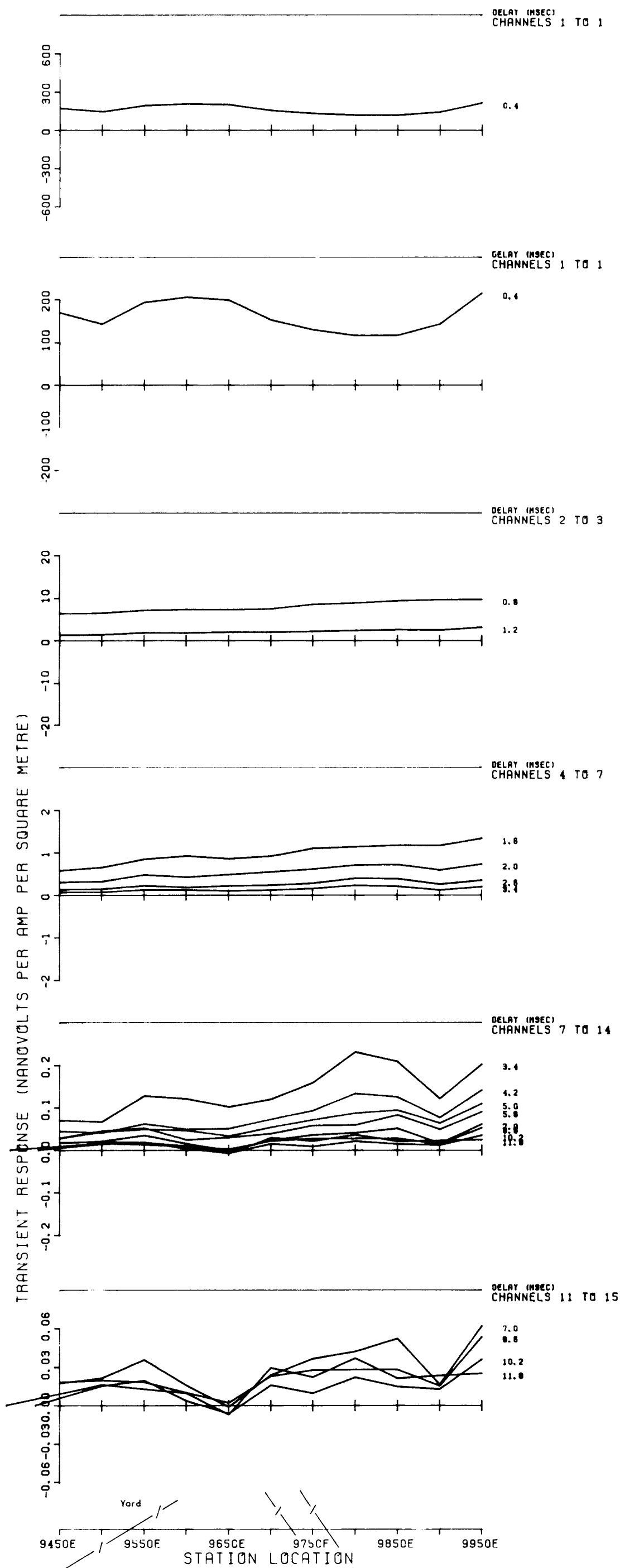
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 DATE: 26/2/84
 MAP: ARDROSSAN, S.A.

C.R.A. EXPLORATION PTY. LTD.
 TRANSIENT E.M. PROFILE
 LINE 9750N, ANOMALY A 4.



REF: MAITLAND SI53-12
 REPORT No. 12649
 PLAN No. SAa 2793

5091-22



INSTRUMENT :SIROTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
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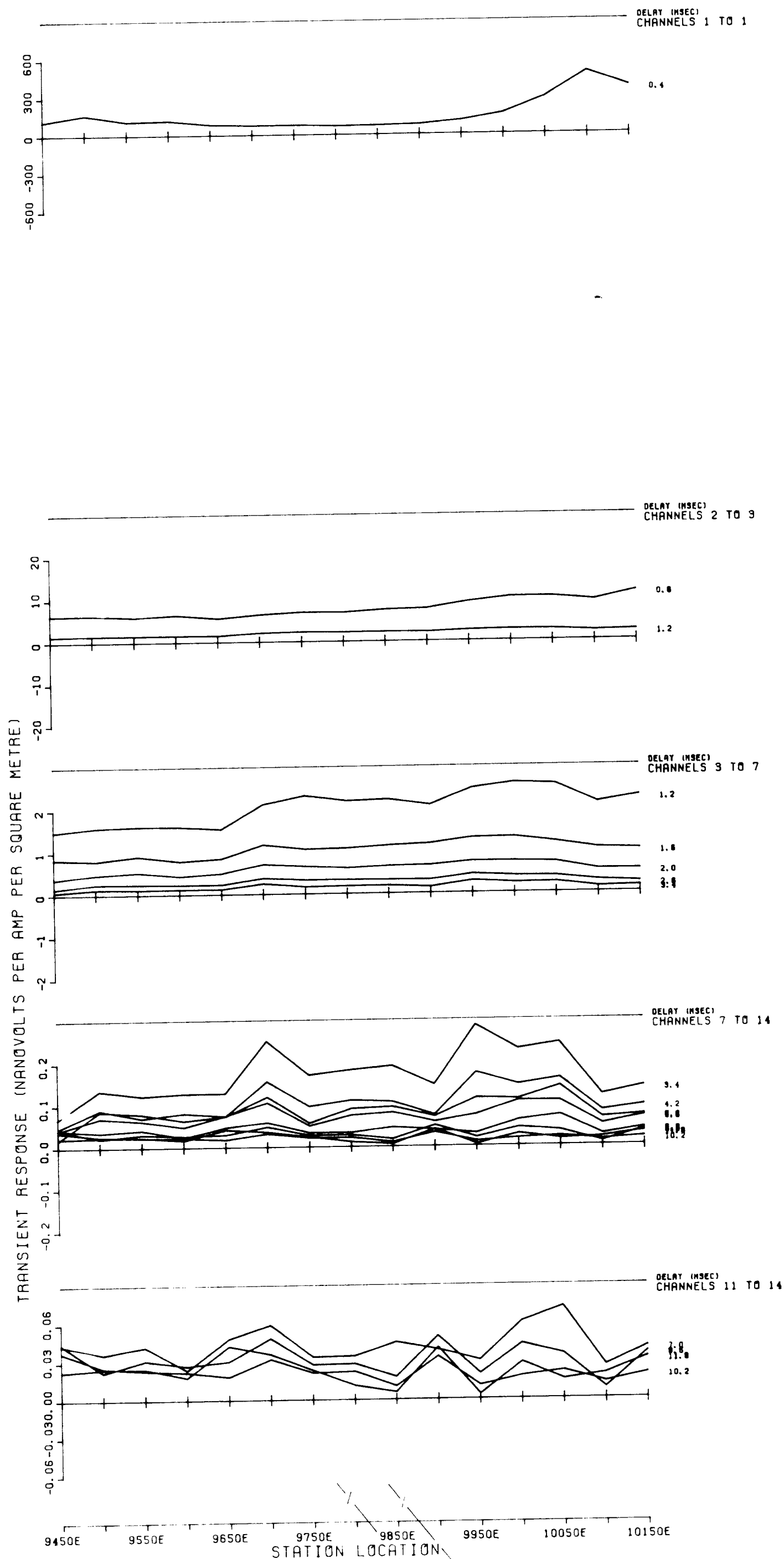
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MAP : ARDROSSAN, S.A.



GEOPHYSICAL
SERVICES

REF: MAITLAND SI 53-12
REPORT No. 12649
PLAN No. SAa 2794

5091-23



INSTRUMENT : SIROTEM
 CONFIGURATION: 100M SQUARE TRANSMITTER LOOP,
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C.R.A. EXPLORATION PTY. LTD.
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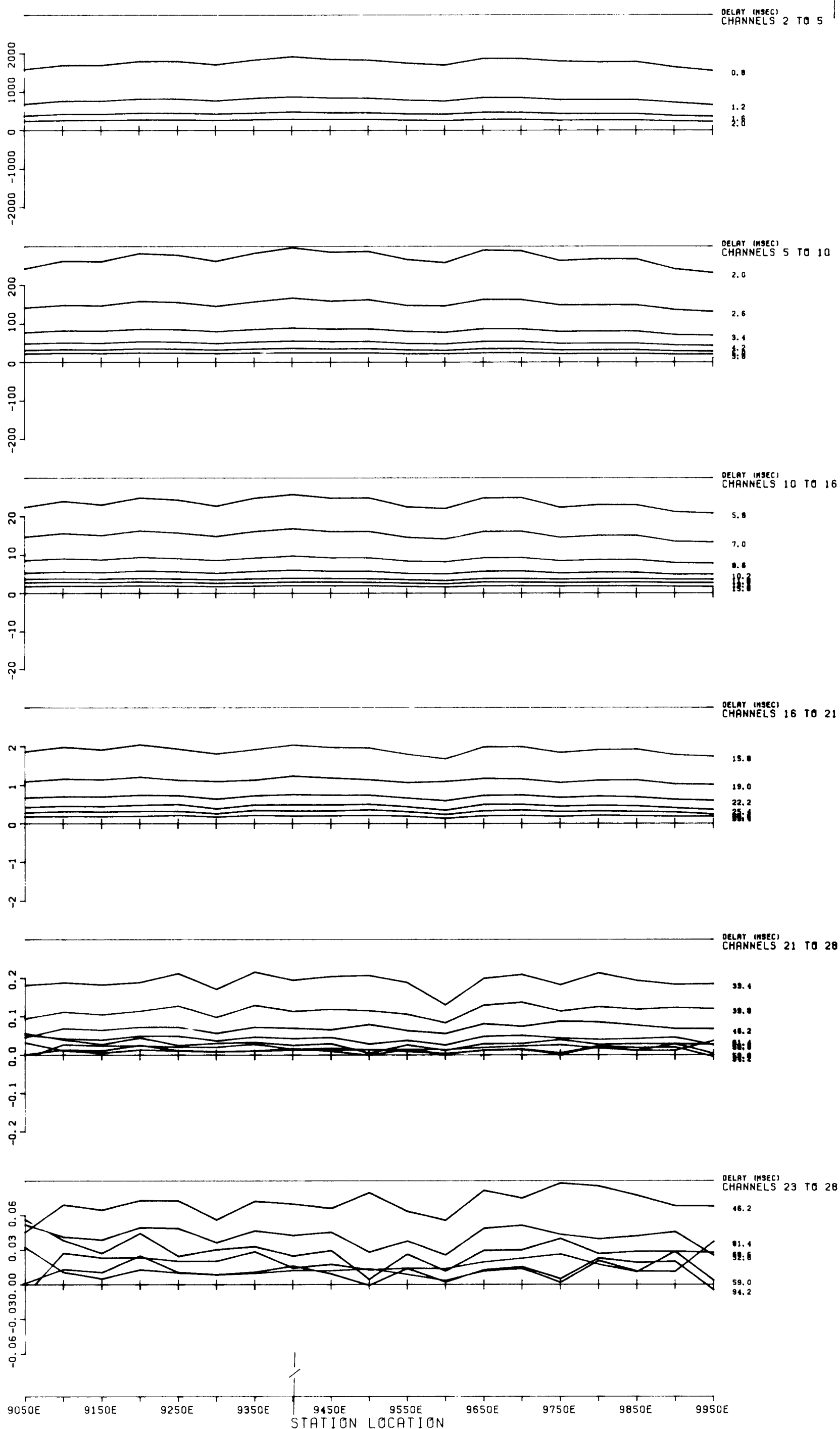
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 DATE: 28/02/84
 MAP: ARDROSSAN, S.A.



REF: MAITLAND SI 53-12
 REPORT No. 12649
 PLAN No SAa 2795

5091-24

TRANSIENT RESPONSE (NANOVOLTS PER AMP PER SQUARE METRE)



INSTRUMENT :SIROTEM
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READING INTERVAL 50M

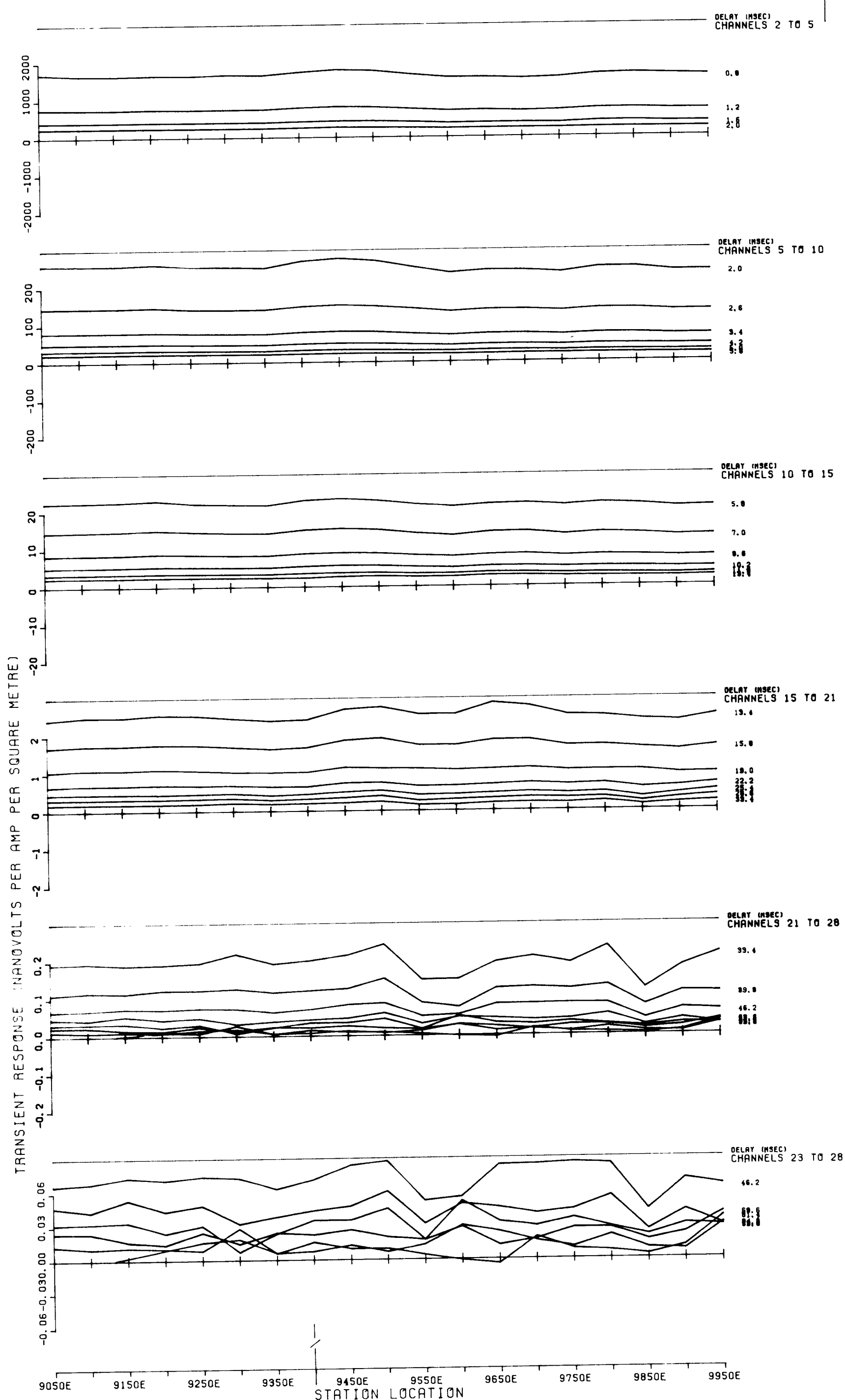
C.R.A. EXPLORATION PTY.LTD.
TRANSIENT E.M. PROFILE
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SCALE: 1:5000
DATE : 28/02/84
MAP : ARDROSSAN, S.A.



REF: MAITLAND SI53-12
REPORT No. 12649
PLAN No SAa 2796

5091-25



INSTRUMENT :SIOTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
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READING INTERVAL 50M

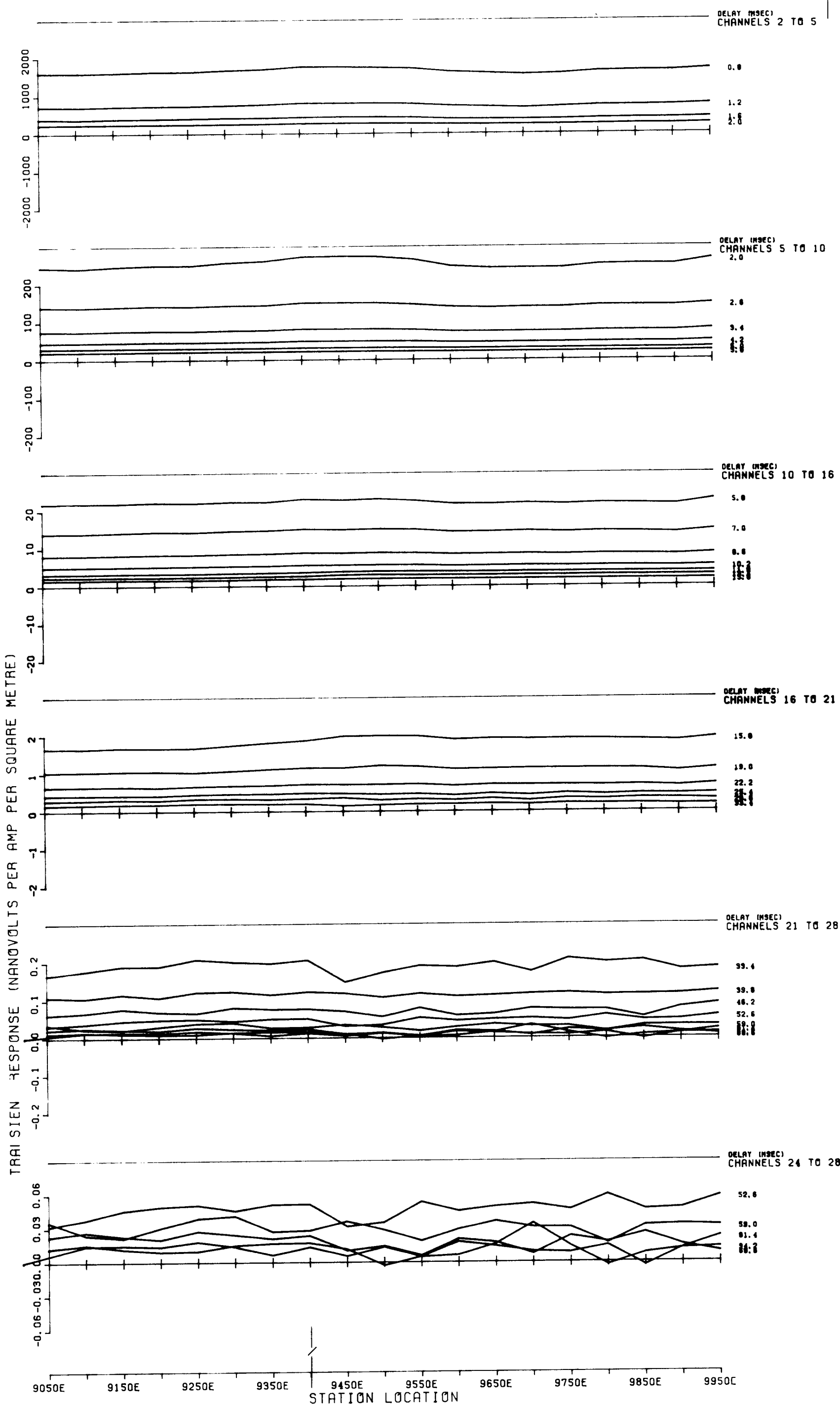
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SCALE: 1:5000
DATE : 26/02/84
MAP : ARDROSSAN, S.A.



REF: MAITLAND S153-12
REPORT No. 12649
PLAN No. SAa 2797

5091-26



INSTRUMENT :SIROTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
IN LOOP RECIEVER
READING INTERVAL 50M

C.R.A. EXPLORATION PTY. LTD.
TRANSIENT E.M. PROFILE
LINE 9750N, ANOMALY A 5.

SCALE: 1:5000
DATE : 26/02/84
MAP : ARDROSSAN, S.A.



REF: MAITLAND S153-12
REPORT No. 12649
PLAN No. SAa2798

5091-27

CRA EXPLORATION PTY. LIMITED

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SIXTH QUARTERLY REPORT FOR
ARDROSSAN E. L. 1110, SOUTH AUSTRALIA,
FOR THE PERIOD ENDING 14TH AUGUST, 1984

AUTHOR: D. L. ANDREWS

COPIES TO: CIS CANBERRA
SADME
POSEIDON MINERALS

DATE: 4TH SEPTEMBER, 1984

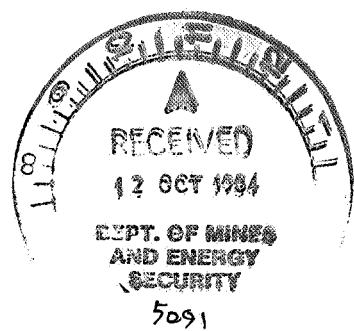
SUBMITTED BY:

D. L. Andrews

ACCEPTED BY:

Alan D. Turnbull

12792



	<u>PAGE</u>
1.0 SUMMARY	3
2.0 CONCLUSIONS AND RECOMMENDATIONS	3
3.0 INTRODUCTION	3
4.0 WORK DONE	4
4.1 Ground Magnetic Surveys	4
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1.0 SUMMARY

Ground magnetic grids are currently being established over three aeromagnetic anomalies within E.L. 1110. These magnetic anomalies may represent areas of shallow pre Cambrian basement.

Problems associated with gridding and formatting of the Price located magnetic data tape, reported in the last quarterly report, have delayed reprocessing of the aeromagnetic data.

2.0 CONCLUSIONS AND RECOMMENDATIONS

Further work within E.L. 1110 will be dependent upon the interpretation of the reprocessed airborne magnetic data and the ground magnetic data.

3.0 INTRODUCTION

Ardrossan E.L. 1110 covers an area of approximately 875 square kilometres on the north eastern end of the Yorke Peninsula. The area covered was originally granted to Poseidon Limited as E.L. 923 on the 16th November, 1981, for a period of one year (plan SAa 2345). This title has been succeeded by E.L. 1110 which was granted on the 15th February, for a period of twelve months. An extension of a further twenty four months was granted on the 10th January, 1984. A transfer from Poseidon Limited to Poseidon Minerals Limited was lodged with the Minister of Mines and Energy on 10th November, 1983.

A joint venture agreement between Poseidon Minerals Limited and CRA Exploration Pty. Limited was signed on the 18th January, 1984.

This report summarises work completed during the quarter ending 14th July, 1984.

4.0 WORK COMPLETED

4.1 Ground Magnetic Surveys

Three aeromagnetic anomalies, which may represent areas of shallow basement, were selected from the detailed 1978 Aquitaine Price aeromagnetic survey for ground magnetics investigation. The locations of the grids are shown on plan SAa 2651.

Work is currently in progress on these grids and will be reported in the next quarterly report.

4.2 Rock Chip Geochemistry

During preliminary field inspection of the aeromagnetic anomalies seven rock chip samples of Lower Cambrian or basement float were collected. These samples were analysed for Cu, Pb, Zn, Ni, Co, Mo, P, Bi, Ag and Au. Results are presented in Appendix I.

4.3 Aeromagnetic Data Processing

Reformatting and gridding of the 1978 Aquitaine Price aeromagnetic data tape has been completed. It is anticipated that results from image processing of this data will be available during the next quarter.



D. L. ANDREWS

DLA/pw

EXPENDITURE

Expenditure for the period ended 31st July, 1984, the nearest accounting period was \$13 043.00, as listed below.

	\$
Payroll	7 294
Supplies	615
Vehicle	458
Travel	316
Property	1 175
Tenements	40
Contractors	325
Overheads	2 820

Total	\$13 043

LOCATION

Maitland	SI 53-12	1:250 000 sheet
Adelaide	SI 54-9	1:250 000 sheet

KEYWORDS

Geophys.-ground mag., Geophys.-aeromag., Image Processing.

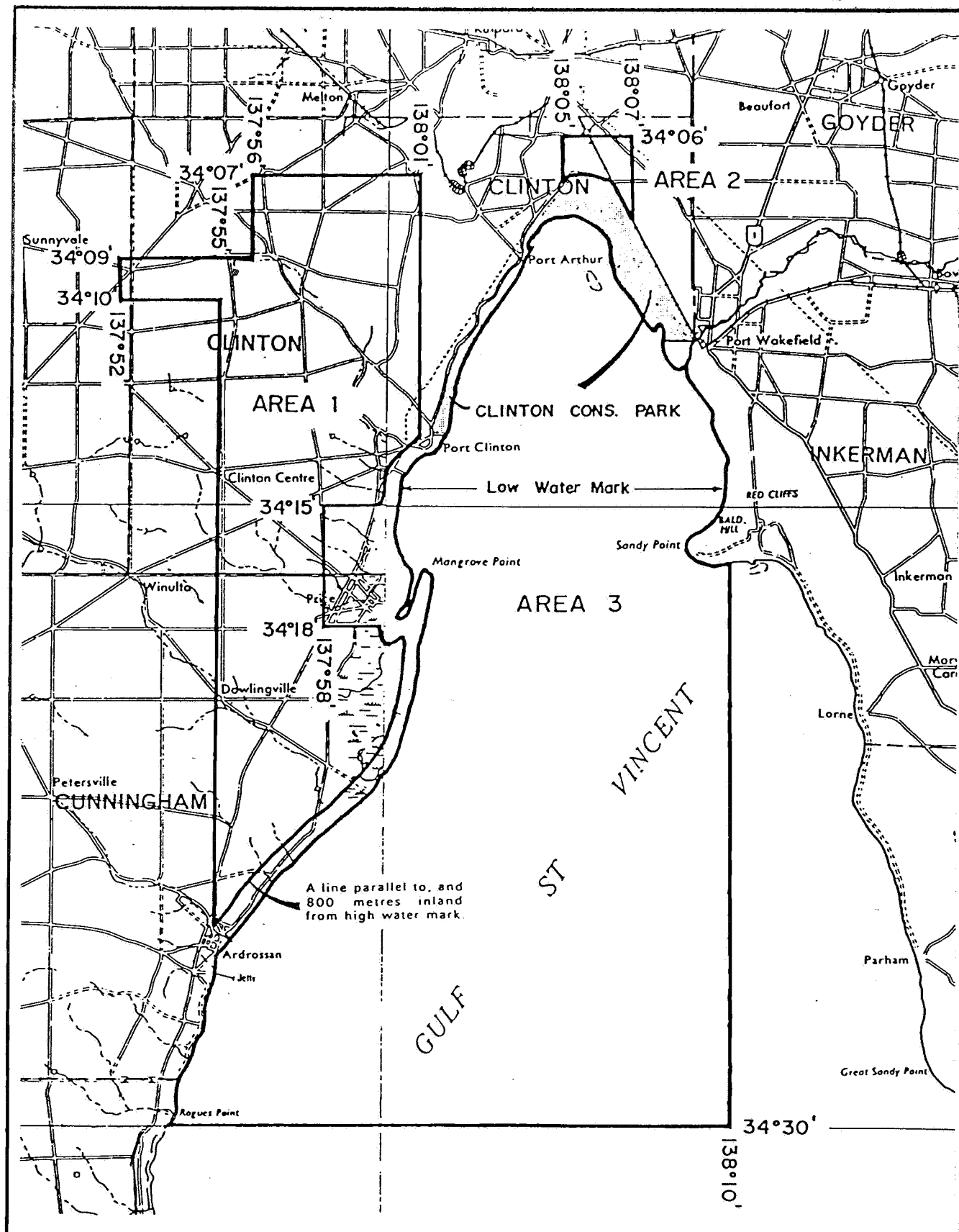
LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
SAa 2345	Ardrossan Area, S.A. First Schedule Farm-In and J.V. between Poseidon and CRAE	1:250 000
SAa 2651	Ardrossan E.L. 1110, S.A. Proposed SIROTEM Survey and Ground Magnetic Grids	1:100 000

LIST OF APPENDICES

Appendix I Rock Assay Results, Pt. Clinton area,
 Ardrossan E.L. 1110

APPENDIX IROCK ASSAY RESULTS, PT. CLINTON AREA,ARDROSSAN E.L. 1110



SCALE 1:250 000

KM 5 0 5 10 KM.

CRA EXPLORATION PTY LIMITED

FIRST SCHEDULE
 'ARDROSSAN' AREA, S.A.
 FARM-IN AND JOINT VENTURE BETWEEN
 POSEIDON LIMITED
 AND CRA EXPLORATION PTY LIMITED
 Area: 875 km² Approximately

REF. MAITLAND SI 53-12, ADELAIDE SI 54-9

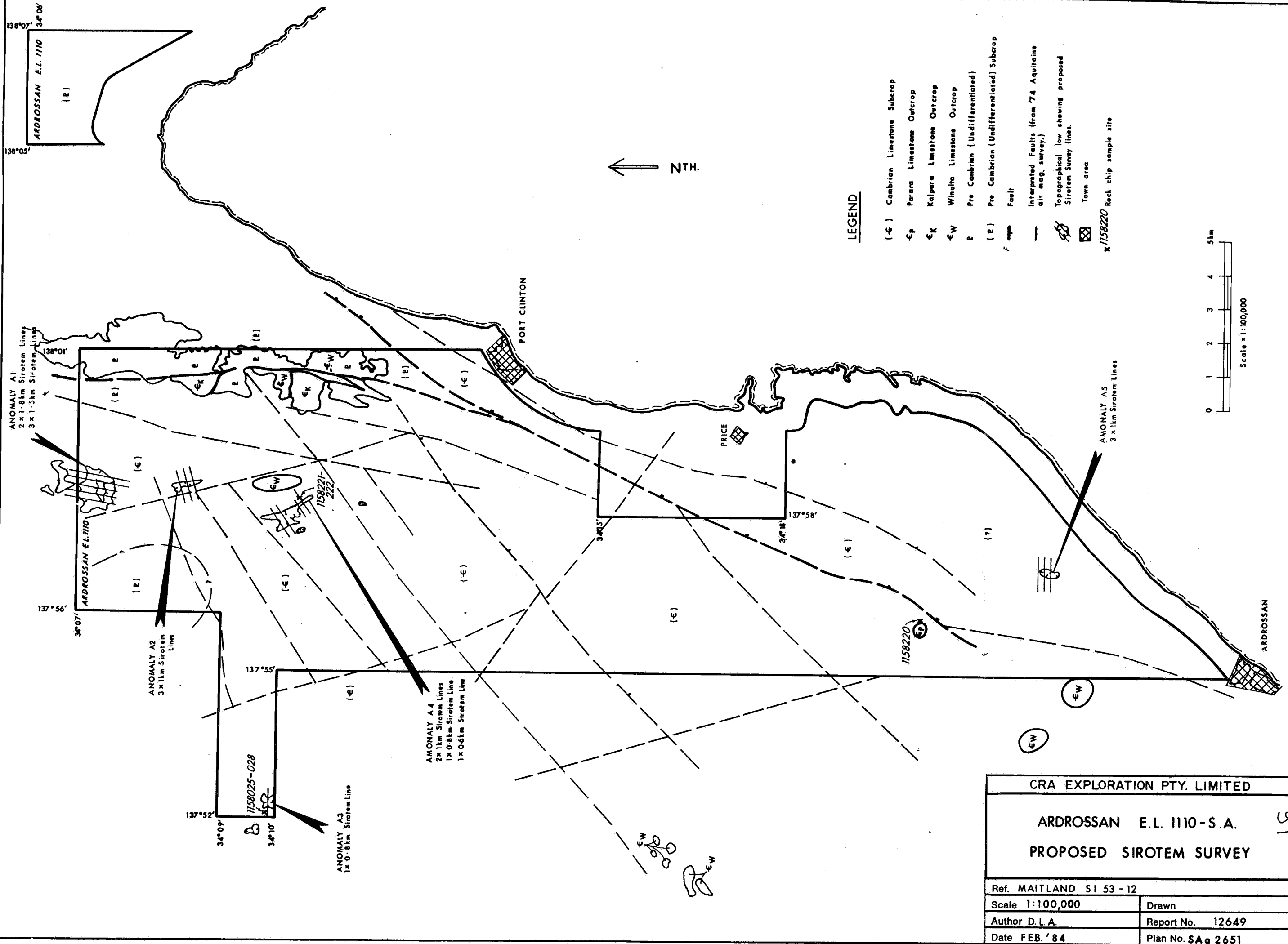
SCALE 1:250 000

AUTHOR D.K.R.

REPORT 12792

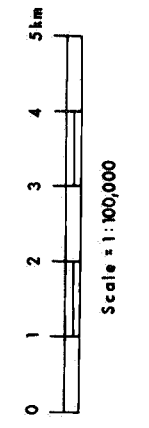
DATE 4 OCTOBER, 1983

PLAN No S A a 2345



LEGEND

- (E) Cambrian Limestone Subcrop
- Ep Perera Limestone Outcrop
- Ek Kalpara Limestone Outcrop
- EW Winulta Limestone Outcrop
- P Pre Cambrian (Undifferentiated)
- (P) Pre Cambrian (Undifferentiated) Subcrop
- F Fault
- Interpreted Faults (from '74 Aquitaine air mag. survey,.)
- ... Topographical low showing proposed Sirotek Survey lines.
- ▣ Town area
- ✱ 1158220 Rock chip sample site



CRA EXPLORATION PTY. LIMITED	
ARDROSSAN E.L. 1110-S.A.	
PROPOSED SIROTEM SURVEY	
Ref. MAITLAND SI 53-12	
Scale 1:100,000	Drawn
Author D.L.A.	Report No. 12649
Date FEB. '84	Plan No. SA 2651

CRA EXPLORATION PTY. LIMITED

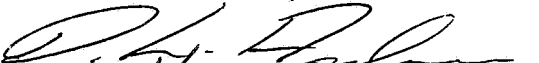
The contents of this report remain
the property of C.R.A. Exploration
Pty. Limited and may not be published
in whole or in part nor used in a
company prospectus without the
written consent of the Company.

SEVENTH QUARTERLY REPORT FOR
ARDROSSAN E.L. 1110, SOUTH AUSTRALIA,
FOR THE PERIOD ENDING 14TH NOVEMBER, 1984.

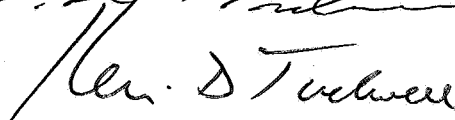
AUTHOR: D.L. ANDREWS
R.J.L. LANE

COPIES TO: CIS CANBERRA
SADME
POSEIDON

DATE: 15TH NOVEMBER, 1984

SUBMITTED BY: 

ACCEPTED BY:



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1. SUMMARY

Ground magnetic grids over the three aeromagnetic anomalies were completed during the month. Modelling of data from the Kainton Grid suggests a depth to top of the magnetic source of approximately 100-120 m. One 250 m drill hole is planned to test this anomaly.

Modelling of the Pt. Clinton and Fairfield ground magnetic data indicate depths greater than 200 m for the sources of these anomalies.

No significant enhancement of the aeromagnetic survey flown by Aquitaine was observed in the image processed data.

2. CONCLUSIONS AND RECOMMENDATIONS

It is recommended that one 250 m percussion drill hole be completed to test the source of the Kainton magnetic anomaly. If no encouragement is received from this drill hole then the title should be allowed to lapse.

3. INTRODUCTION

Ardrossan E.L. 1110 covers an area of approximately 875 square kilometres on the north eastern end of the Yorke Peninsula. The area covered was originally granted to Poseidon Limited as E.L. 923 on the 16th November, 1981, for a period of one year (plan SAa 2345). This title has been succeeded by E.L. 1110 which was granted on the 15th February, for a period of twelve months. An extension of a further twenty four months was granted on the 10th January, 1984. A transfer from Poseidon Limited to Poseidon Minerals Limited was lodged with the Minister of Mines and Energy on 10th November, 1983.

A joint venture agreement between Poseidon Minerals Limited and CRA Exploration Pty. Limited was signed on the 18th January, 1984. This J.V. agreement was approved by the SADME on 1st April, 1984.

This report summarises work completed during the quarter ending 14th November, 1984.

4. WORK COMPLETED

4.1 Aeromagnetic Data Processing

Copies of image processed data from the 1978 Aquitaine aeromagnetic survey were received during the quarter. However, errors in flight line recovery, errors inherent in the uncontrolled photomosaics and excessive noise levels in the data have resulted in no significant enhancement of the contoured data provided by Aquitaine.

4.2 Ground Magnetic Surveys

Three magnetic anomalies possibly reflecting shallow magnetic basement were selected for ground investigation from the 1978 Aquitaine Price aeromagnetic survey. Plan SAa 2651 shows the location of these anomalies.

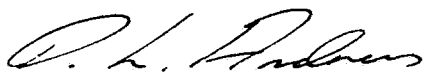
Ground magnetic measurements were made at 20 m intervals along lines 200 m apart. Hourly repeat readings were taken to enable corrections for the diurnal variation to be made.

Ground magnetic results for the Pt. Clinton Grid (plans SAa 2910 and 2911) show a very broad positive feature with an amplitude of 100-150 nT. The source of this anomaly would lie at a depth of more than several hundred metres. The aeromagnetic anomaly has been satisfactorily recovered and requires no further work.

The ground magnetic profiles for the Fairfield Grid (plans SAa 2901 and 2902) show a broad negative anomaly of 50-150 nT amplitude. Preliminary calculations suggest a depth of more than 200 m to the magnetic source.

A curvilinear magnetic feature is present on the Kainton Grid (plans SAa 2903 and 2904). The maximum peak-to-trough amplitude is around 300 nT on line 11800N. Tabular, prismatic, step and ribbon models were used to investigate the anomaly. Only the ribbon model, a thin, dipping, depth-limited model, was successful in producing the observed anomaly form. Plan SAa 2972 shows the calculated profile for line 11800N. The model is a thin, westerly-dipping body with a susceptibility-thickness product of 3.75 (SI), and depth-to-top of 100 to 120 m.

The change in the anomaly shape from line 10600N to 12200N indicates in general a steepening of the dip from 30° W to 50° W.



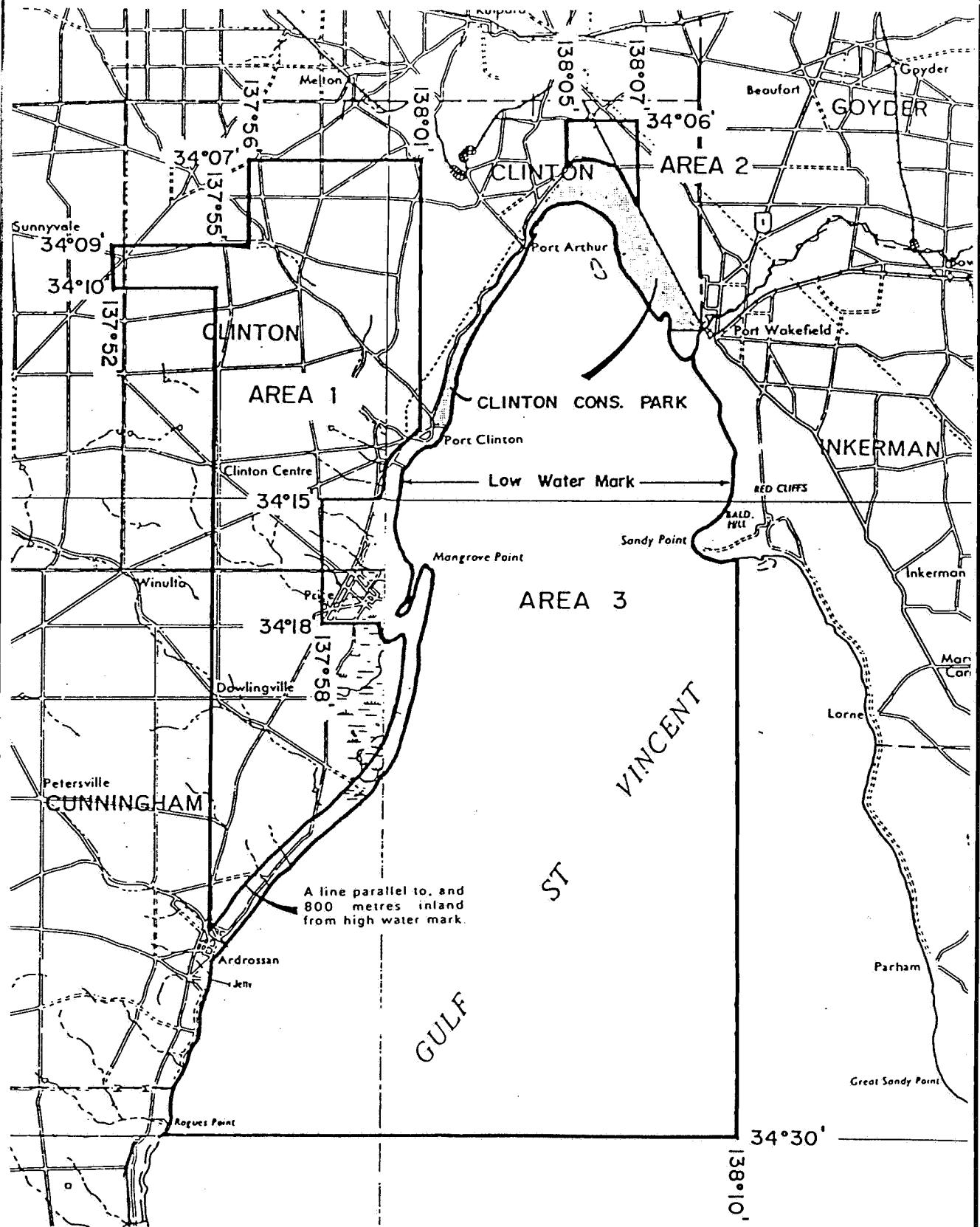
D.L. ANDREWS & R.J.L. LANE

EXPENDITURE

Expenditure for the period ended 31st October, 1984, the nearest accounting period was \$10 408.00, as listed below.

	\$
Payroll	4 463
Supplies	707
Vehicle	803
Travel	2 429
Property	729
Contractors	44
Laboratory	101
Overheads	<u>1 132</u>
<u>Total</u>	<u>\$10 408</u>

**PAGE 114
IS
MISSING**



SCALE 1:250 000



CRA EXPLORATION PTY LIMITED

FIRST SCHEDULE
'ARDROSSAN' AREA, S.A.
FARM-IN AND JOINT VENTURE BETWEEN
POSEIDON LIMITED
AND CRA EXPLORATION PTY LIMITED
Area: 875 km² Approximately

REF. MAITLAND SI 53-12, ADELAIDE SI 54-9

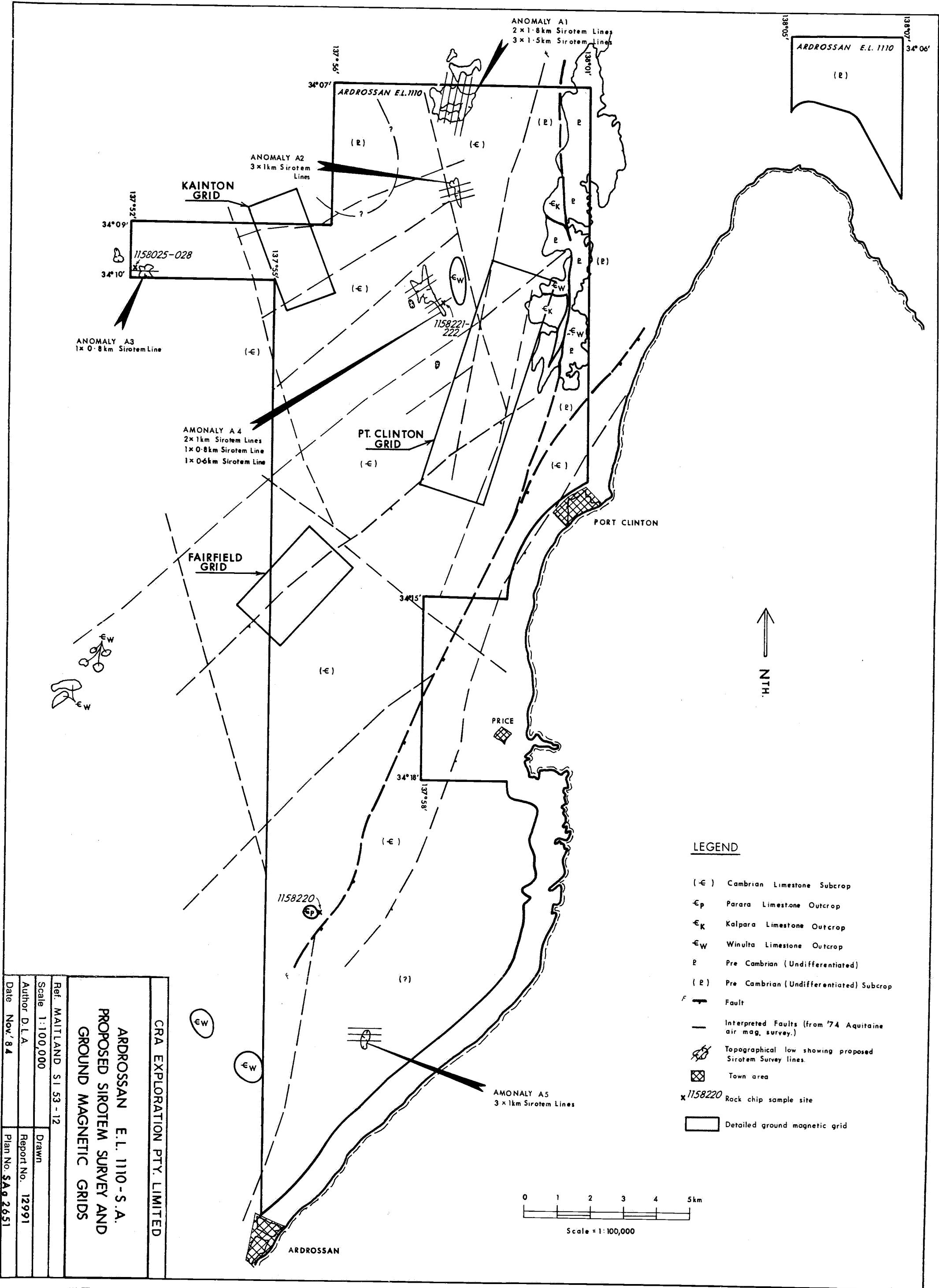
SCALE 1:250 000

AUTHOR D. L. A.

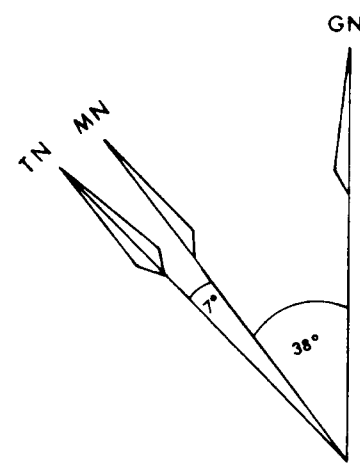
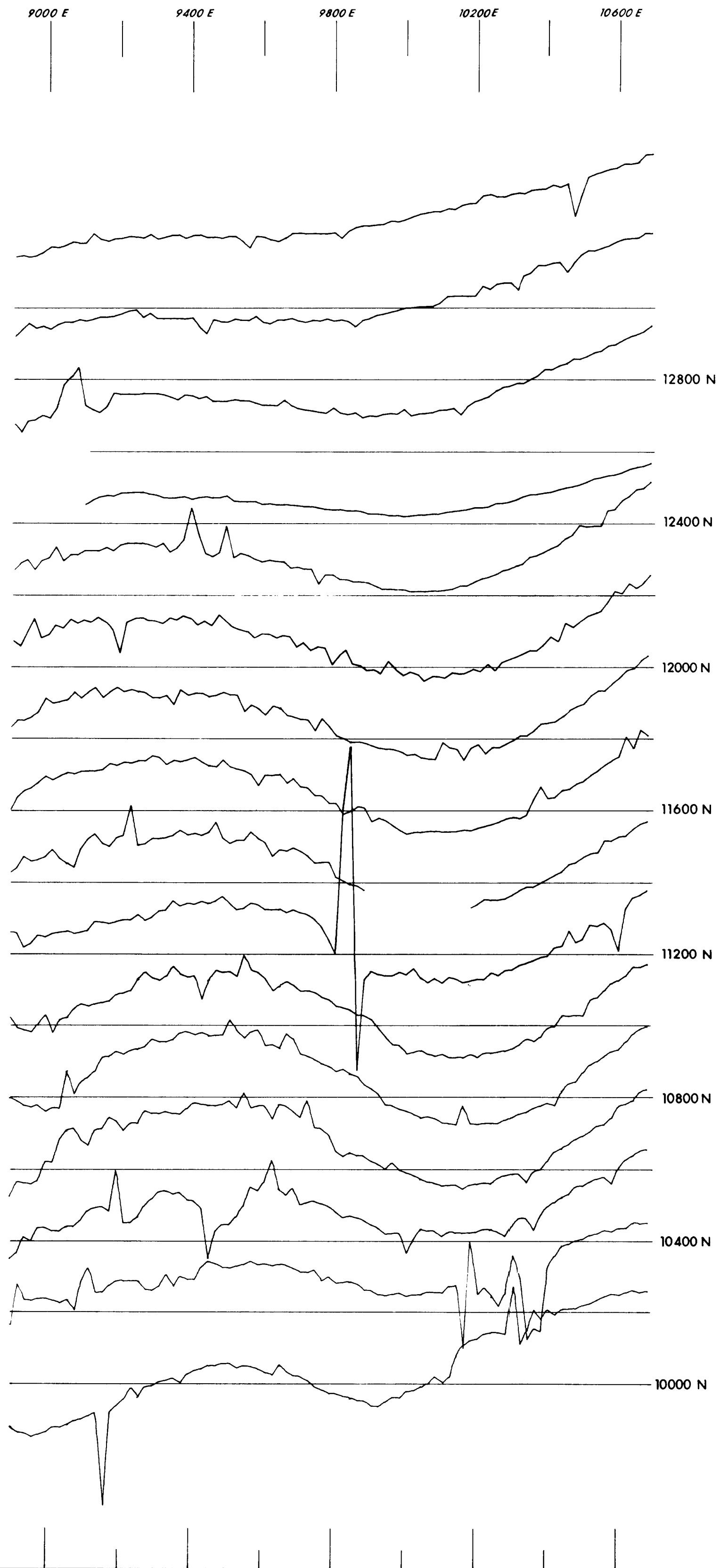
DATE Nov. '84

REPORT 12991

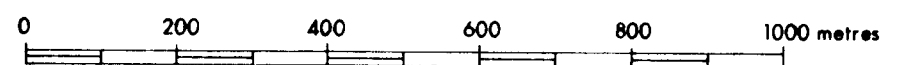
PLAN No SA 2345



CRA EXPLORATION PTY. LIMITED			
ARDROSSAN E.L. 1110-S.A.			
PROPOSED SIROTEK SURVEY AND			
GROUND MAGNETIC GRIDS			
Ref. MAITLAND SI 53-12	Scale 1:100,000	Drawn	
Author D.L.A.	Report No. 12991		
Date Nov '84	Plan No. SA 2651		

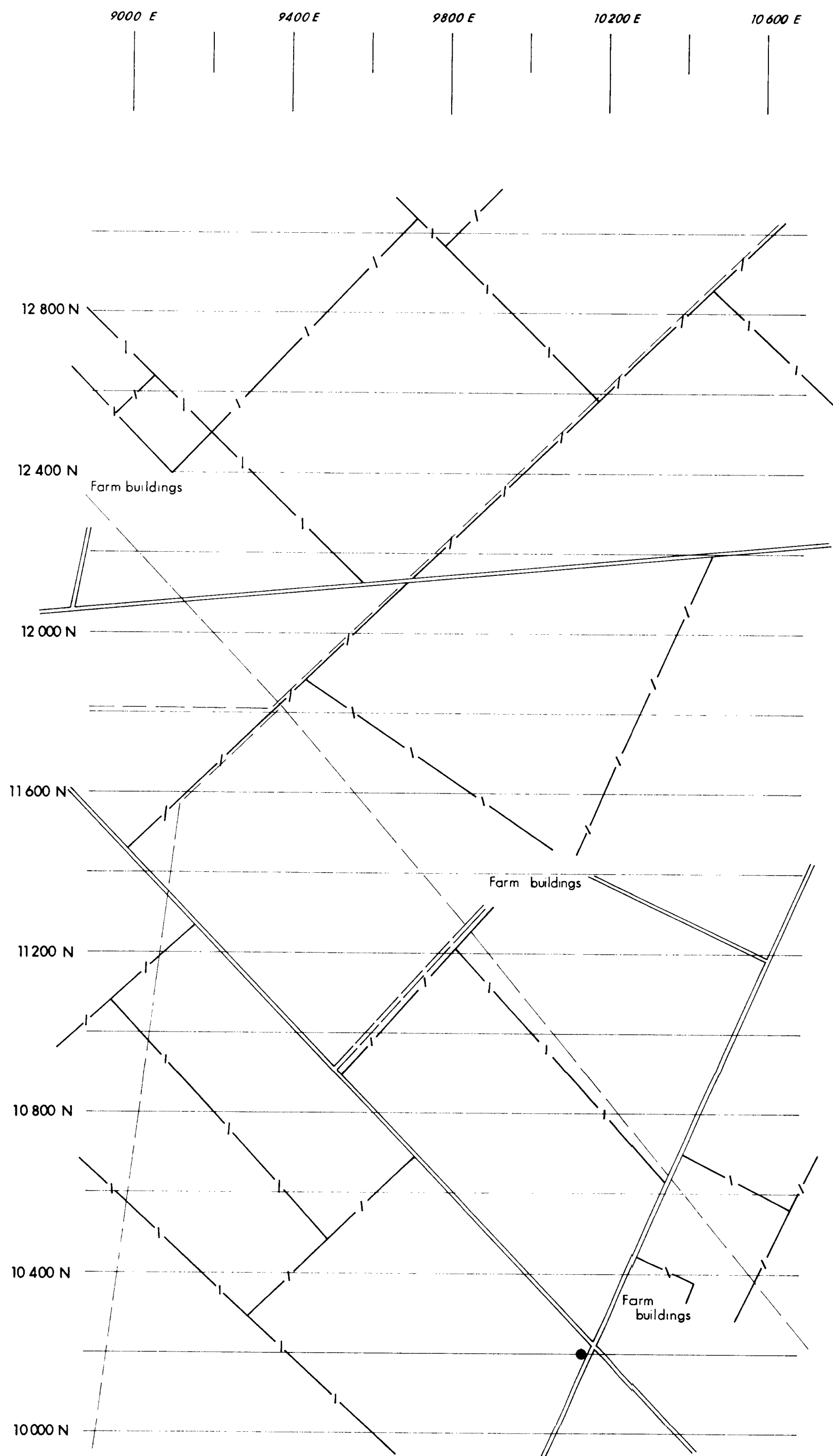


Station interval 20m
Vertical scale 1cm = 50nT
Profiles plotted with
base level of 59400nT



5091-28

CRA EXPLORATION PTY LIMITED			
ARDROSSAN EL 1110 - S.A.			
GROUND MAGNETIC PROFILES			
FAIRFIELD GRID			
REF	MAITLAND S153-12		
SCALE	1:10,000		
AUTHOR	RJLL	REPORT	12991
DATE	Nov. '84	PLAN No	SAa 2901



5091-29

CRA EXPLORATION PTY LIMITED

ARDROSSAN EL1110 - S.A.
FAIRFIELD GRID

REF MAITLAND S153-12

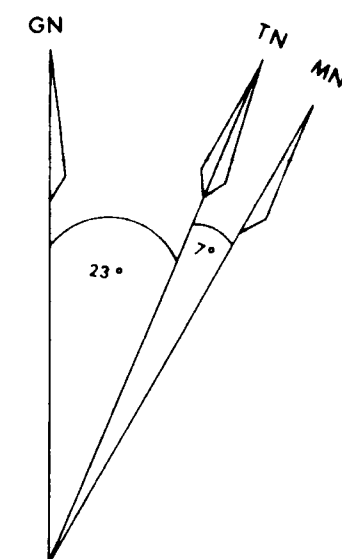
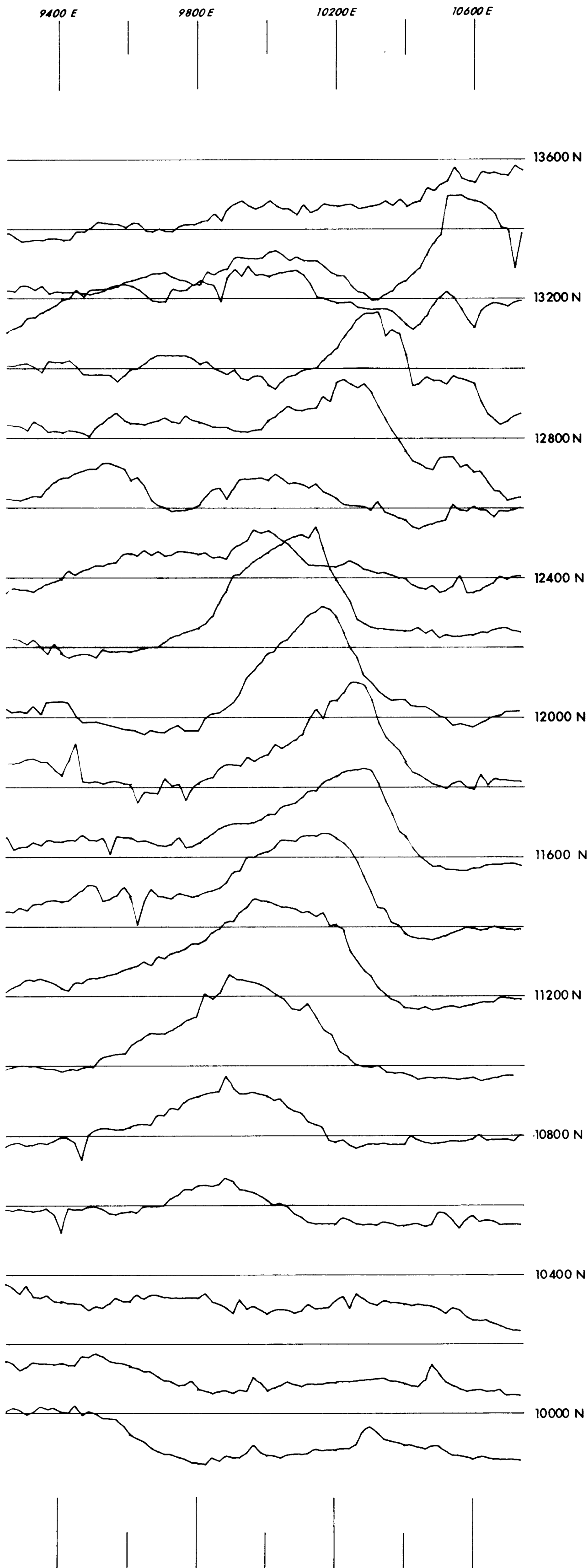
SCALE 1:10,000

AUTHOR RJLL

DATE Nov. '84

REPORT 12991

PLAN No. SAa 2902

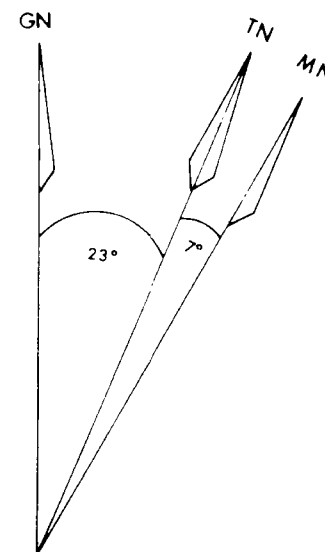
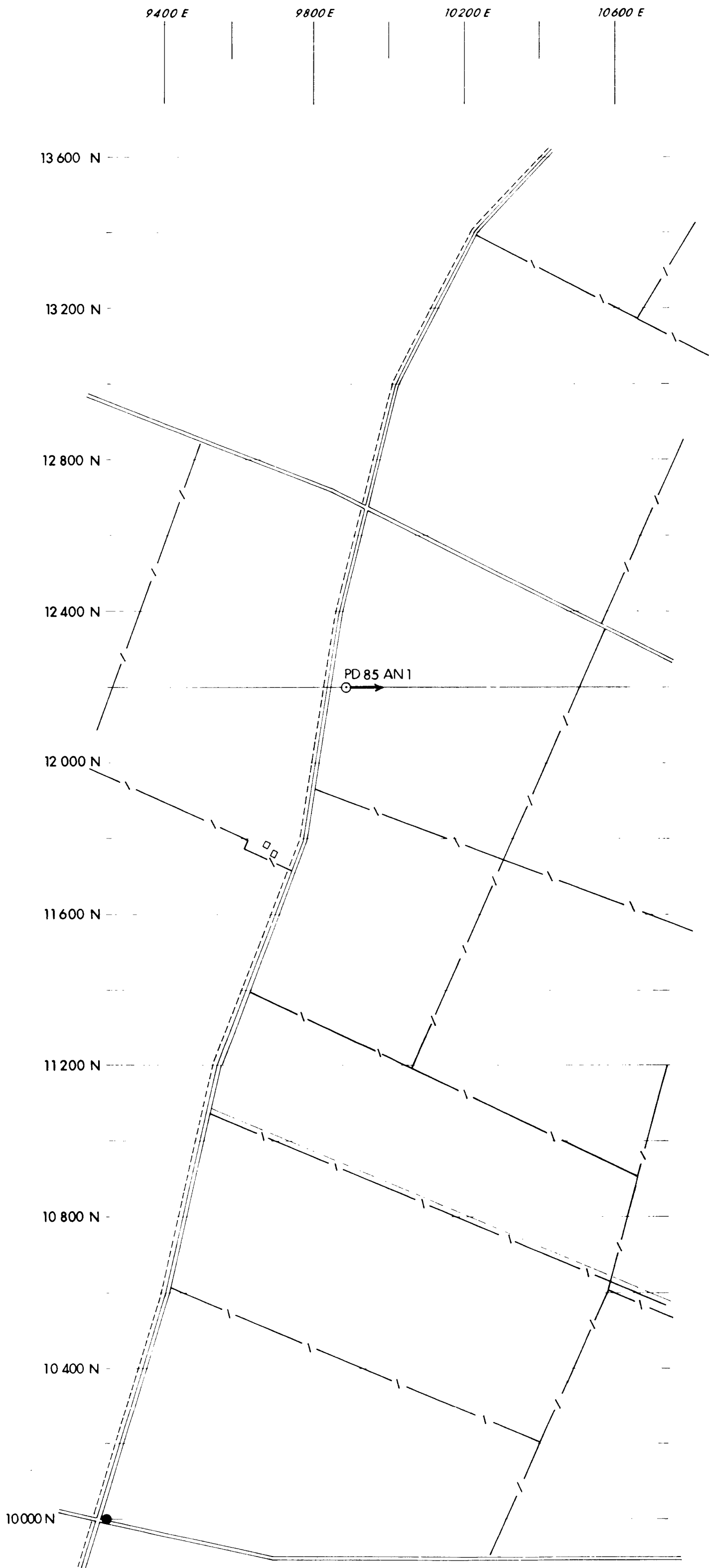


Station interval 20m
Vertical scale 1cm = 100nT
Profiles plotted with a
base level of 59 400 nT

0 200 400 600 800 1000 metres

5091-30

CRA EXPLORATION PTY LIMITED	
ARDROSSAN EL 1110 - S.A.	
GROUND MAGNETIC PROFILES	
KAITON GRID	
REF. MAITLAND S153 - 12	
SCALE 1:10,000	
AUTHOR RJLL	REPORT 12991
DATE Nov. '84	PLAN No SA 2903

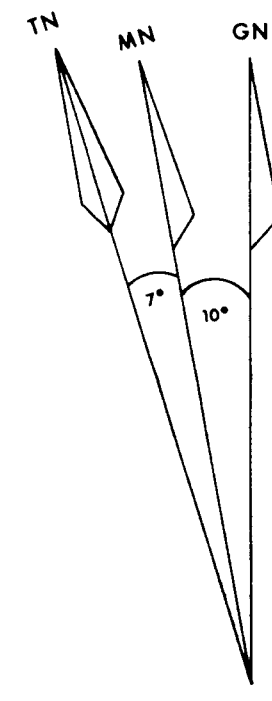
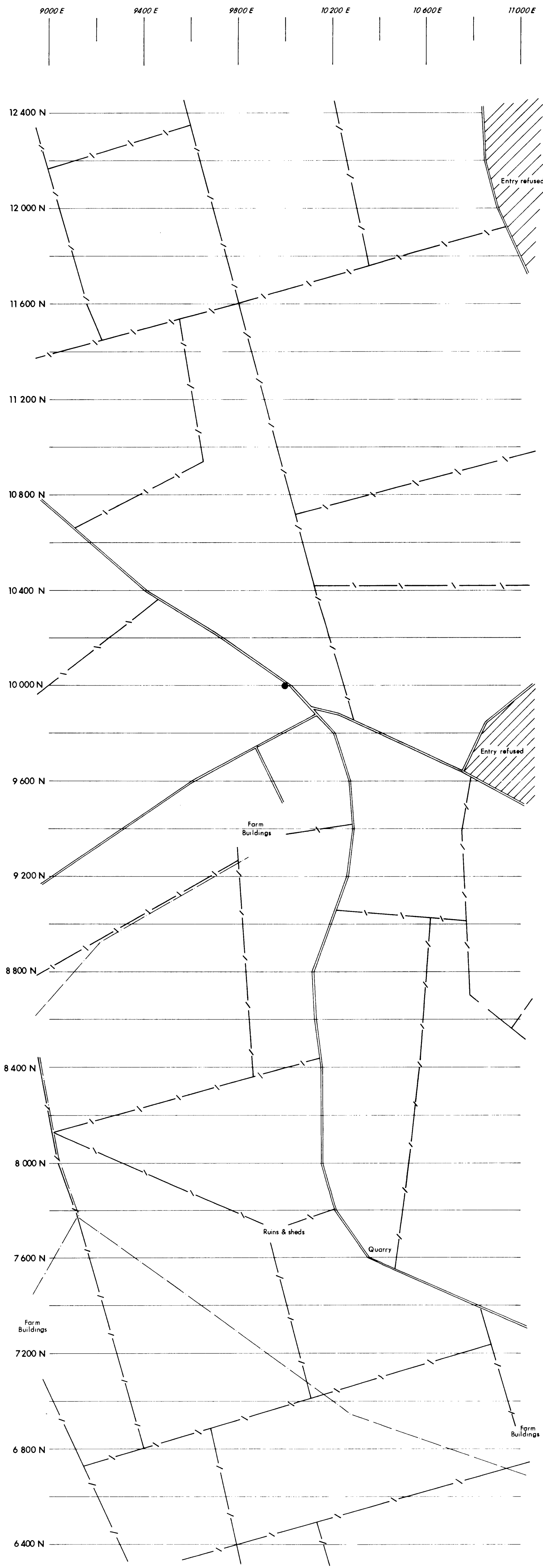


- \ — Fence
 - == Road with fences on both sides
 - - - Power line
 - - - Pipeline
 - Ruins
 - 769400 mE (approx)
6214600 mN
 - → PD 85 AN1 Percussion drill hole
Co-ords. AMG 769300mE
6219650mN
- ? 6216800 mN ?

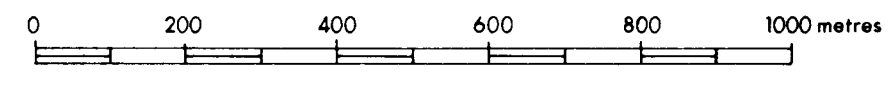


5091-31

CRA EXPLORATION PTY LIMITED	
ARDROSSAN EL 1110 - S.A.	
KAINTON GRID	
REF	MAITLAND SI 53-12
SCALE	1:10,000
AUTHOR	RJLL DLA
DATE	Feb. '85
REPORT No	13157
PLAN No	SAa 2904

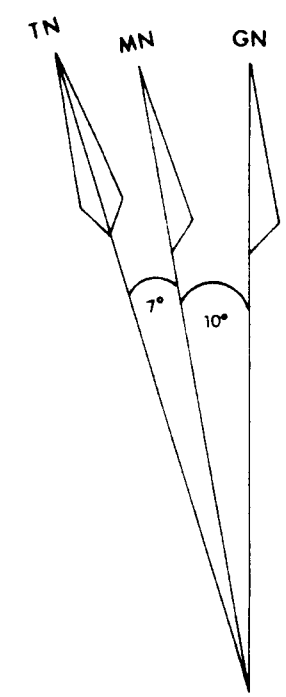
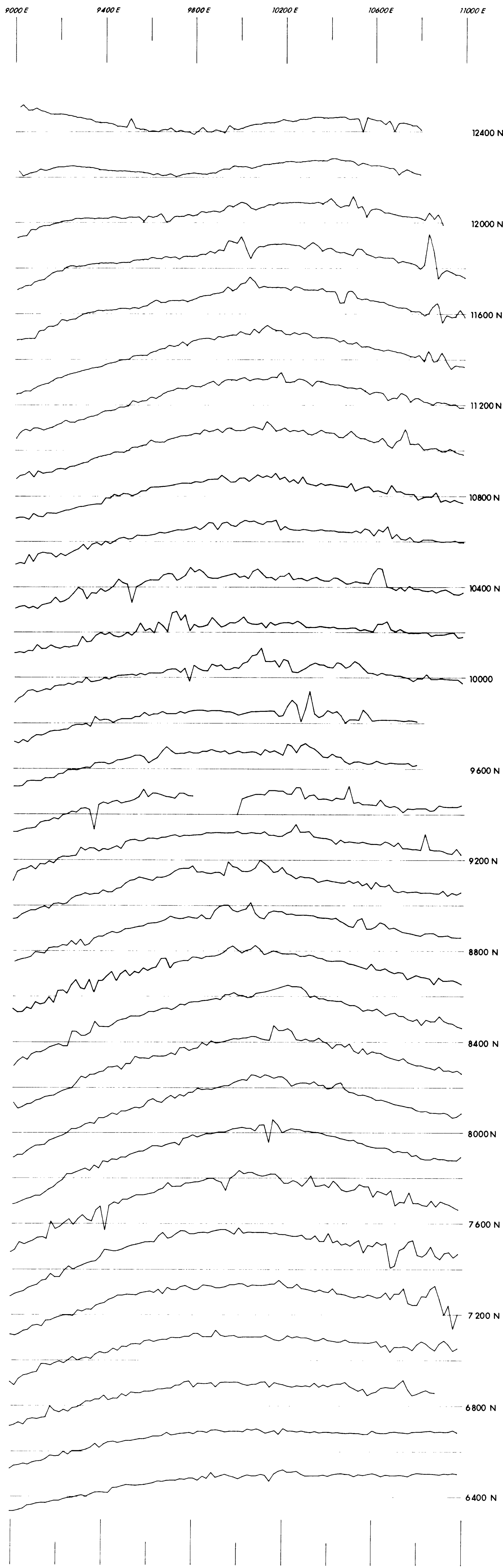


- Fence
- Road with fences on both sides
- Power line
- 775300 mE (approx)
6212700 mN

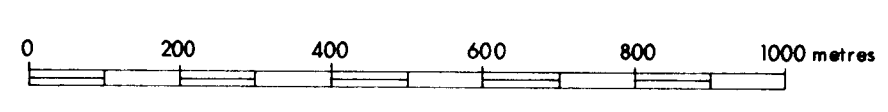


5091-32

CRA EXPLORATION PTY LIMITED			
ARDROSSAN EL 1110 - S.A.			
PT CLINTON GRID			
Ref	MAITLAND S153 - 12		
Scale	1:10,000		
Author	RJLL	Report No.	12991
Date	Nov. '84	Plan No.	SAg 2910



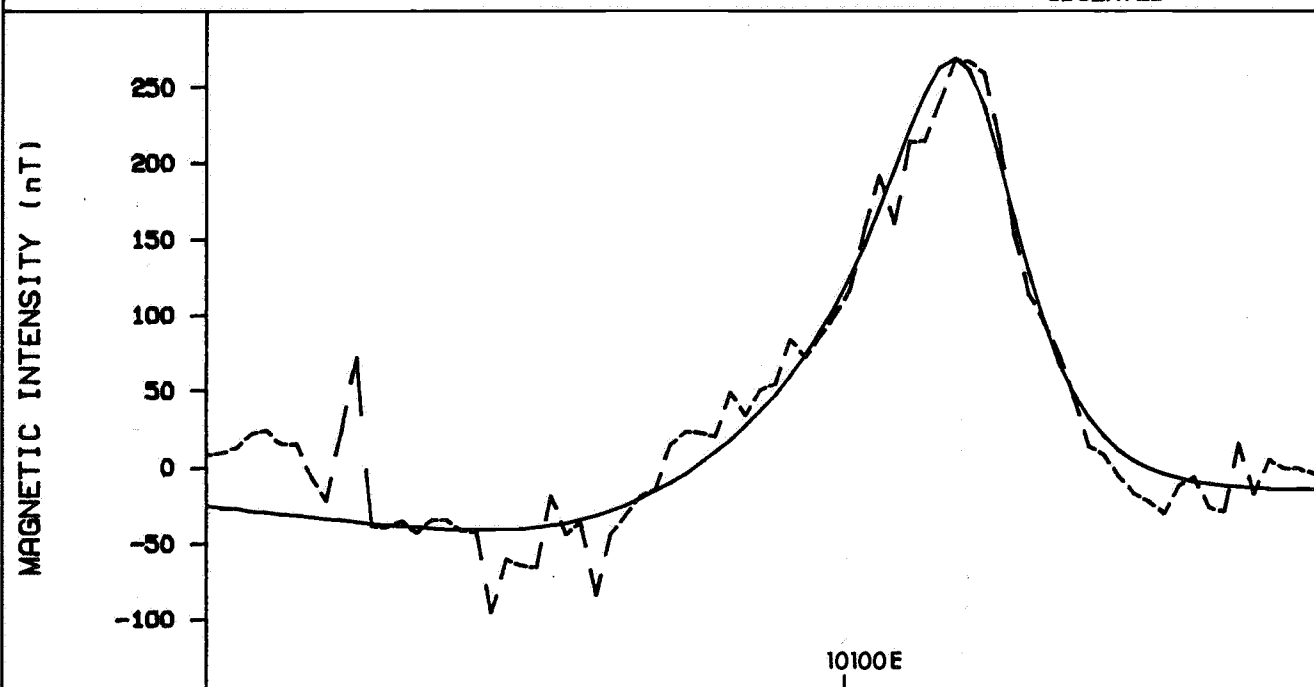
Station interval 20m
Vertical scale 1cm = 100nT
Profiles plotted with a
base level of 59800nT



5091-33

CRA EXPLORATION PTY LIMITED			
ARDROSSAN EL 1110 - S.A.			
GROUND MAGNETIC PROFILES			
PT. CLINTON GRID			
REF	MAITLAND SI53-12		
SCALE	1:10,000		
AUTHOR	RJLL	REPORT	12991
DATE	Nov '84	PLAN No	SAa 2911

KAINTON GND MAG LINE 11800 N

MODEL
OBSERVED

STATION

9450E

9650

9850

10050

10250

10450

10650E

DEPTH (M)

100

200

300

400

BOH. 250m.

2D MODEL

Magnetic field

Declination 7°

Inclination - 66°

Strength 59400nT

Profile direction 63° (true)

Susceptibility - thickness product 3.75 (SI)

Proposed percussion drill hole.

inclined....60° to N.

collar.....11800 mN
10100 mE

CRA EXPLORATION PTY LIMITED

ARDROSSAN EL1110 - S.A.
KAINTON GRID

REFERENCE MAITLAND S153 - 12

SCALE 1:10,000

AUTHOR RJLL

REPORT 12991

DATE Nov. '84

PLAN No SAa 2972

CRA EXPLORATION PTY. LIMITED

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EIGHTH AND FINAL QUARTERLY REPORT FOR
ARDROSSAN E.L. 1110, SOUTH AUSTRALIA,
FOR THE PERIOD ENDING 14TH FEBRUARY, 1985.

AUTHOR: D.L. ANDREWS

COPIES TO: CIS CANBERRA
SADME
POSEIDON

DATE: 8TH FEBRUARY, 1985

SUBMITTED BY: 

ACCEPTED BY: 

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1. SUMMARY

Work programmes within E.L. 1110 have downgraded the potential of the exploration licence to contain significant base metal sulphides in the Cambrian carbonates.

Ground recovery of three previously untested aeromagnetic anomalies indicated that only one anomaly was due to a source at depth <200 m (Kainton anomaly) within Lower Proterozoic basement.

Drill testing of this anomaly intersected weakly anomalous Ce and La but did not intersect any significant base metal mineralisation.

2. INTRODUCTION

Ardrossan E.L. 1110 covers an area of approximately 875 square kilometres on the north eastern end of the Yorke Peninsula. The area covered was originally granted to Poseidon Limited as E.L. 923 on the 16th November, 1981, for a period of one year (plan SAa 2345). This title has been succeeded by E.L. 1110 which was granted on the 15th February, for a period of twelve months. An extension of a further twenty four months was granted on the 10th January, 1984. A transfer from Poseidon Limited to Poseidon Minerals Limited was lodged with the Minister of Mines and Energy on 10th November, 1983.

A joint venture agreement between Poseidon Minerals Limited and CRA Exploration Pty. Limited was signed on the 18th January, 1984.

This report details all work carried out during the quarter ending 14th February, 1985, and summarises all work carried out by CRA Exploration Pty. Limited.

3. WORK DONE

3.1 Kainton Anomaly Sirotem

1.75 line kilometres of Sirotem using a 100 m square transmitter loop and an in-loop receiver was completed over the Kainton Grid magnetic anomaly (plan SAa 2904).

Line 12150N (plan SAa 3100) shows a large positive response due to a 0.5 m diameter pipeline and two fences which cross the line at 9800E. The noise at 10200E is caused by a fence which crossed the line at this point.

Line 12450N (plan SAa 3101) shows similar cultural anomalies due to a pipeline and fences at 9900E and a road at 10300E.

No bedrock conductors were defined.

3.2 Percussion Drilling

One inclined percussion drill hole was completed at a depth of 198 m on the Kainton Grid. Plan SAa 2904 shows the location of the drill hole. The drill hole, sited to intersect the northern edge of two discrete, sub parallel magnetic anomalies, intersected pre Cambrian biotite-haematite-martite-quartz-felspar schists and gneisses and was completed in hornblende-haematite-quartz-magnetite gneiss. A summary log is presented below and a detailed drill log and assays form Appendix I.

SUMMARY LOG - PD85AN1

0 -	2 m	Buff brown calcrete
2 -	50 m	Kulpara Formation (E _K) Dark grey and grey brown crystalline dolomitic limestone
50 -	64 m	Mt. Terrible Formation (E) White sandstones with minor conglomerate bands
64 -	180 m	Schist (E _L) Dark grey biotite-felspar-haematite (martite)-k'spar-quartz schist locally gneissic
180 -	198 m	Gneiss (E _L) Black hornblende-biotite-minor feldspar -magnetite-martite gneiss

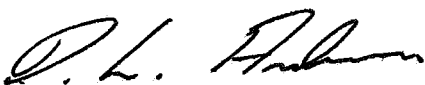
Trace sulphide (chalcopyrite) between 190-198 m. No significant mineralisation was intersected in the drill hole although anomalous Ce and La was intersected between 78-80 m.

3.3 Summary Of Exploration Completed By CRAE

The following listing is a summary of all exploration completed by CRA Exploration within E.L. 1110. Detailed work programmes and results have been reported in previous quarterly reports (Andrews, 1984, 84(a), 84(b), 84(c) and Andrews & Lane 1984).

- a. 17 line kilometres of SIROTEM (100 m x 100 m transmitter loops with readings every 50 m using a roving vector receiver) were completed over 5 topographic anomalies within Cambrian Limestone. No anomalies were attributable to base metal mineralisation.
- b. 120 line kilometres of ground magnetics were completed over 3 areas of interpreted shallow pre Cambrian basement. Two anomalies at depths >200 m.
- c. Image processing of existing aeromagnetic data with no significant enhancement of data presentation/interpretation.
- d. Rock chip geochemistry of Cambrian float and subcrop over magnetic and topographical anomalies. Area of geochemically anomalous grab samples previously tested by Aquitaine.
- e. Two lines (1.75 line kilometres total) over a magnetic anomaly at Kainton. No obvious basement conductors; major interference from cultural features.
- f. One, 198 m percussion drill hole was completed on the Kainton Grid and intersected no significant base metal mineralisation within biotitic and hornblendic basement schists and gneisses.

Work programmes completed by Poseidon are detailed in the 1st-3rd Quarterly Reports, E.L. 1110, submitted to the SADME by Poseidon Minerals Limited.



D.L. ANDREWS

DLA/pw

EXPENDITURE

Expenditure for the period ended 31st January, 1985, the nearest accounting period was \$15 583.00, as listed below.

	\$
Drilling	5 762
Payroll	5 039
Supplies	123
Vehicle	326
Property	401
Tenements	50
Contractors	1 287
Overheads	2 595
Total	\$ 15 583

REFERENCES

Andrews, D.L.
1984(a) Quarterly report for the period ended
14th February, 1984, Ardrossan E.L.
1110, South Australia.

Andrews, D.L.
1984(b) Fifth Quarterly report for Ardrossan
E.L. 1110, South Australia, for the
period ending 14th May, 1984.
CRAE Rpt. No. 12649

Andrews, D.L.
1984(c) Sixth Quarterly report for Ardrossan
E.L. 1110, South Australia, for the
period ending 14th August, 1984.
CRAE Rpt. No. 12792

Andrews, D.L. &
Lane, R.J.L.
1984 Seventh Quarterly Report for Ardrossan
E.L. 1110, South Australia, for the
period ending 14th November, 1984.
CRAE Rpt. No. 12991

LOCATION

Maitland	SI 53-12	1:250 000 sheet
Adelaide	SI 54-9	1:250 000 sheet

KEYWORDS

Geophys-SIROTEM, Drilling-percussion, Geochem-cerium,
Geochem-lanthanum, Geophys-magnetics

LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
SAa 2345	Ardrossan Area, S.A. First Schedule Farm-In and J.V. between Poseidon and CRAE	1:250 000
SAa 2904	Ardrossan E.L. 1110, S.A. Kainton Grid	1: 10 000
SAa 3100	Ardrossan E.L. 1110, S.A., Kainton Prospect, Transient EM Profile Line 12150N	1: 5 000
SAa 3101	Ardrossan E.L. 1110, S.A., Kainton Prospect, Transient EM Profile Line 12450N	1: 5 000

LIST OF APPENDICES

Appendix I PD85AN1: Detailed Log and Geochemical Results

APPENDIX IPD85AN1: DETAILED LOG AND GEOCHEMICAL RESULTS

C.R.A. EXPLORATION PTY. LIMITED

PROJECT ARMSTRONG ELIHO KANTON PROPERTY

DRILL CORE LOG

LOCALITY : 9920 E / 12200 N

CO-ORDINATES ⁴² 16550 N ⁷ 69300 EAZIMUTH 060° mag.DRILLERS MILANUSCOMMENCED 9/1/84DEPTH 198mHOLE No. PD 85 AN 1RL COLLAR 145mINCLINATION 060°DRILL TYPE Rotary 2000COMPLETED 10/1/84CASING LEFT -DPO No(s) BO 823

DEPTH		Core	Core Description	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	ASSAY VALUES									
FROM(M)	TO(M)	Core No. (410-50)	LOGG					Cu	Pb	Zn	Co	Au	U	N	Ce	La	
0		18 35	+	Buff brown calcareous, minor dark grey crystalline limestone		1237201	0	2									
		18 25				2	2	4									
		18 10		2-50 m. Dark grey brown crystalline limestone, dolomite.		3	4	6									
		18 5				4	6	8									
		18 5		Dolomite facies of Kulpara Formation	Minor fracturing and mottling between 8-10m.	5	8	10									
		18 5				6	10	12									
		21 5				7	12	14									
		22 10				8	14	16									
		18 5				9	16	18									
20		18 5				1237210	18	20									
		19 0				11	20	22									
		18 0				12	22	24									
		20 0				13	24	26									
		20 0			Tr. Mn staining	14	26	28									
		20 0			Minor vein gels	15	28	30									
		19 5				16	30	32									
		21 5				17	32	34									
		20 5		Sandy facies between 34-36m.		18	34	36									
		18 0				19	36	38									
40		19 10		Textural and colour banding (buff brown- dark grey) on calcareous matrix	Thin quartz (38)	1237220	38	40									
		20 5				21	40	42									
		19 5				22	42	44									
		20 5				23	44	46									
		30 10		Pale olive grey micaceous siltstone and shaly brown micaceous siltstone (48-49m)		24	46	48									
		32 10		Pk grey (micaceous) dolomite (48-50m)	Dark brown green shale	25	48	50									
		30 20		slightly sandy micaceous black heavy mineral between 52-54m, 58-60m	slightly dolomite.	26	50	52	34	14	14	<4	<0.01	<4	<10	80 30	
		28 20				27	52	54	16	6	12	-	-	-	15	80 30	
		26 25		50-60m <u>Tr. Tactile Formation</u>		28	54	56	12	2	18	-	-	-	10	80	
		30 20				29	56	58	9	4	10	-	-	-	10	30	
60		28 15		White fine grained massive sandstone, slightly friable, becoming e.g. and gradational to for conglomerate between 52-54m, 58-60m and 62-64m	minor black Sgr laminated heavy mineral layers.	1237230	58	60	5	6	7	-	-	-	10	20 20	
		28 20				31	60	62	7	6	9	-	-	-	15	20 20	
		32 25				32	62	64	5	6	34	-	-	-	10	40 20	
		36 25				33	64	66	4	4	9	-	-	-	10	30 20	
		32 45				34	66	68	4	4	12	-	-	-	10	30 20	
		50 45		64-158 <u>Dolomite Series EQUIVALENT: Dark grey</u>		35	68	70	3	14	20	6	-	-	10	100 50	
		50 30		<u>Biotite - Sph - hematite (mottled) -</u>		36	70	72	5	4	26	10	-	-	10	200 100	
		50 60		<u>lign - quartz siltst. (locally greenish)</u>		37	72	74	5	16	36	10	-	-	25	150 90	
		52 100		highly weathered from 64-86m transitional from red brown to dark grey.		38	74	76	5	14	32	10	-	-	20	400 200	
		52 100				39	76	78	5	18	38	12	-	-	10	450 300	
80		80 100				1237240	78	80	4	30	50	14	-	-	100	1500	
		50 30			Slightly stained	41	80	82	3	16	26	14	-	-	44	100 80	
		40 60			Plagioclase green alteration (calc)	42	82	84	3	16	36	14	-	-	680	500	
		48 150				43	84	86	3	10	28	12	-	-	260	230	
		44 100			Minor carbonate veining	44	86	88	3	16	28	10	-	-	70	50	
		46 100				45	88	90	4	14	44	14	-	-	100	70	
		44 100				46	90	92	3	12	20	14	-	-	90	70	
		44 100				47	92	94	3	10	30	14	-	-	60	50	

C.R.A. EXPLORATION PTY. LIMITED

PROJECT

DRILL CORE LOG

CO-ORDINATES

AZIMUTH

DRILLERS

COMMENCED

DEPTH

HOLE No. PD85AN1

RL COLLAR

INCLINATION

DRILL TYPE

COMPLETED

CASING LEFT

DPO No(s)

DEPTH		FROM (M)	TO (M)	Rgs NO. & SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	ASSAY VALUES									
											Cu	Pb	Zn	Co	Au	U	W	Ce	La	
		44	100	\$		Poor Schist (cont.)		1237248	94	96	2	12	32	14	1000	49	110	90	60	
		44	100	\$				49	96	98	4	12	46	12	-	-	-	90	60	
	100	40	50	\$				1237250	98	100	3	10	36	10	-	-	-	80	60	
		44	15	\$			Water table @ approx 100m.	51	180	102	4	12	52	12	-	-	-	80	50	
		48	30	\$			Minor - small cracks from 102m - 104m.	52	102	104	5	14	115	10	-	-	-	90	40	
		44	40	\$				53	104	106	9	18	60	10	-	-	-	60	40	
		48	30	\$				54	106	108	12	20	30	10	-	-	-	90	60	
		48	30	\$			Biotite rich between 108m - 110m.	55	108	110	9	16	24	12	-	-	-	10	90	50
		46	30	\$				56	110	112	9	26	165	17	-	-	-	110	50	40
		46	35	\$			Dark red Gabbro present as porphyritic	57	112	114	4	14	28	10	-	-	-	18	70	50
		44	30	\$			min material (with quartz) and orthoclase	58	114	116	8	14	28	10	-	-	-	10	80	40
		54	45	\$			porphyroblasts in biotite schist (112-114m).	59	116	118	3	16	24	12	-	-	-	110	60	30
	120	50	30	\$			Minor - e.g. biotite segregation (118-120m).	1237260	118	120	5	18	45	12	-	-	-	110	50	30
		48	45	\$				61	120	122	3	16	30	10	-	-	-	50	100	40
		48	40	\$				62	122	124	2	16	28	10	-	-	-	10	90	60
		50	25	\$			Poor Gabbro - some schist	63	124	126	5	16	26	10	-	-	-	10	80	40
		40	20	\$				64	126	128	12	30	80	14	-	-	-	10	60	30
		38	60	\$			Schist (cont.) 95% biotite and pyroxene - biotite	65	128	130	6	18	22	10	-	-	-	110	70	40
		36	50	\$			gneiss (5%)	66	130	132	6	16	24	10	-	-	-	-	60	30
		34	55	\$			Kipar (2.2%) 132-140m both as	67	132	134	7	18	18	8	-	-	-	30	50	
		32	60	\$			discrete grains and alteration adjacent to matrix	68	134	136	5	16	40	12	-	-	-	30	60	
		30	35	\$			Kipar (2.10%) 140-150m present as	69	136	138	3	14	20	10	-	-	-	30	50	
	140	28	35	\$			discrete grains and alteration adjacent to matrix	1237270	138	140	2	12	24	12	-	-	-	60	40	
		28	50	\$				71	140	142	2	14	26	12	-	-	-	130	90	
		44	40	\$				72	142	144	5	22	80	12	-	-	-	100	90	
		46	30	\$				73	144	146	8	14	44	16	-	-	-	90	60	
		50	25	\$				74	146	148	4	16	24	14	-	-	-	120	90	
		52	20	\$				75	148	150	3	20	26	16	-	-	-	140	100	
		46	200	\$			Minor Kipar 150-154m.	76	150	152	2	20	80	20	-	-	-	80	40	
		44	250	\$				77	152	154	3	12	28	10	-	-	-	30	50	
		46	450	\$				78	154	156	3	16	32	12	-	-	-	110	30	
		44	1800	\$				79	156	158	2	18	40	14	-	-	-	120	30	
	160	44	1500	\$		158 - 162m	Poor Schist - biotite, Al-gneiss / black hornblende - Epidote - quartz - gneiss (50%)	1237280	158	160	4	18	65	14	-	-	-	30	60	
		42	300	\$			Kipar - hornblende - Epidote - quartz - gneiss (15%)	81	160	162	3	18	44	22	-	-	-	80	30	
		52	500	\$			+ Epidote - biotite - Al-gneiss - schist (25%)	82	162	164	3	22	65	24	-	-	-	100	100	
		50	200	\$		162 - 178m	Poor Schist - biotite, Al-gneiss / black hornblende - Epidote - quartz - gneiss (25%)	83	164	166	4	18	55	24	-	-	-	80	50	
		48	900	\$			Kipar - Kipar (25%) - quartz - schist - gneiss	84	166	168	16	22	140	28	-	-	-	100	120	
		28	7000	\$				85	168	170	55	18	42	14	-	-	-	140	100	
		64	250	\$				86	170	172	8	20	65	30	-	-	-	100	90	
		40	500	\$			Kipar rich (25%); biotite 172-174m	87	172	174	6	24	50	28	-	-	-	90	60	
		48	500	\$				88	174	176	10	22	80	30	-	-	-	60	40	
		52	200	\$			Al-rich 176-178m.	89	176	178	7	30	80	36	-	-	-	60	60	
	180	52	200	\$			Kipar - hornblende - Epidote - biotite - hornblende - schist - gneiss	1237290	178	180	6	22	65	30	-	-	-	30	10	
		32	100	\$		180 - 188	Poor Schist - biotite, Al-gneiss / black hornblende - Epidote - quartz - gneiss	91	180	182	10	18	42	24	-	-	-	30	30	
		30	550	\$			biotite - minor Gabbro - gneiss	92	182	184	300	14	50	24	-	-	-	30	20	
		20	1500	\$			Poor - 25% Kipar in granitic segregation	93	184	186	195	12	24	24	-	-	-	30	20	
		24	390	\$				94	186	188	530	4	24	24	-	-	-	40	10	

C.R.A. EXPLORATION PTY. LIMITED

PROJECT _____

DRILL CORE LOG

CO-ORDINATES _____

AZIMUTH _____

DRILLERS _____

COMMENCED _____

DEPTH _____

HOLE No. PD85 ANI.

RL COLLAR _____

INCLINATION _____

DRILL TYPE _____

COMPLETED _____

CASING LEFT _____

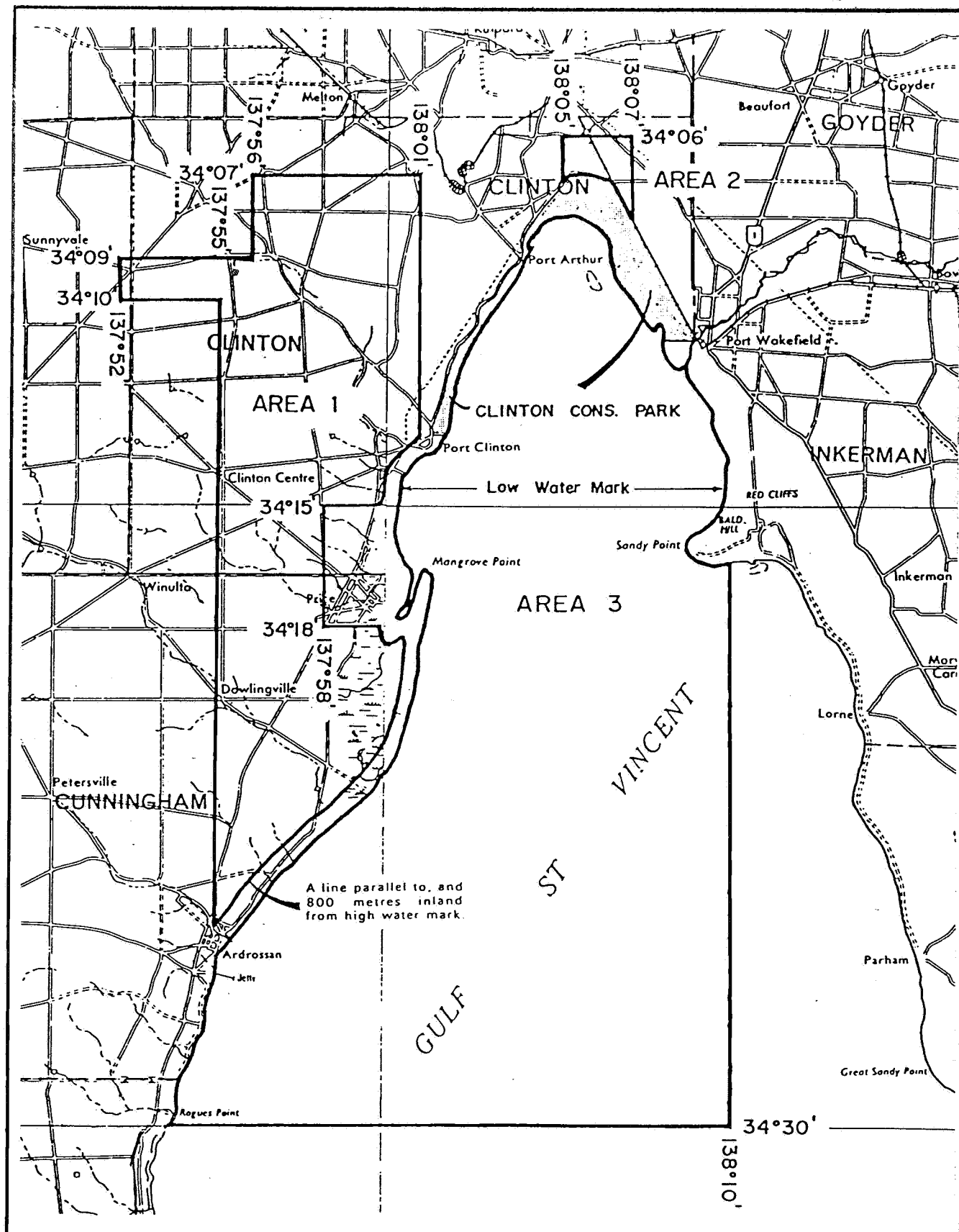
DPO No(s) _____

DEPTH		G.I. (cm)	Rugose 110° SJ	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	ASSAY VALUES												
FROM (M)	TO (M)									Cu	Pb	Zn	Co	Au	U	N	Ca	La				
		28	200	G-1			123295	188	190	450	14	24	23	10-02	44	410	30	20				
		22	400	app. SS		Trace chloropyrite filons	96	190	192	300	16	35	22	-	-	-	30	<20				
		20	500	app. G		Trace app. filons and disseminated cherts	97	192	194	260	12	24	20	-	-	-	20	<20				
		20	2000	app. G		(25 km) 192-194m	98	194	196	135	12	32	26	-	-	-	20	<20				
195	20	1500	app. G			Trace app. filons 196-198m	123299	196	198	190	14	32	24	-	-	-	30	20				
B.O.H. 198m																						
										Method	AFS1	AFS1	AFS1	AFS1	AFS1	AFS1	AFS1	AFS1	AFS1	AFS1	AFS1	

SUMMARY AND
SPECIAL COMMENTS _____LOGGED BY DLA

DATE _____

SHEET 3 OF 3



SCALE 1:250 000

KM 5 0 5 10 KM.

CRA EXPLORATION PTY LIMITED

FIRST SCHEDULE
 'ARDROSSAN' AREA, S.A.
 FARM-IN AND JOINT VENTURE BETWEEN
 POSEIDON LIMITED
 AND CRA EXPLORATION PTY LIMITED
 Area: 875 km² Approximately

REF. MAITLAND SI 53-12, ADELAIDE SI 54-9

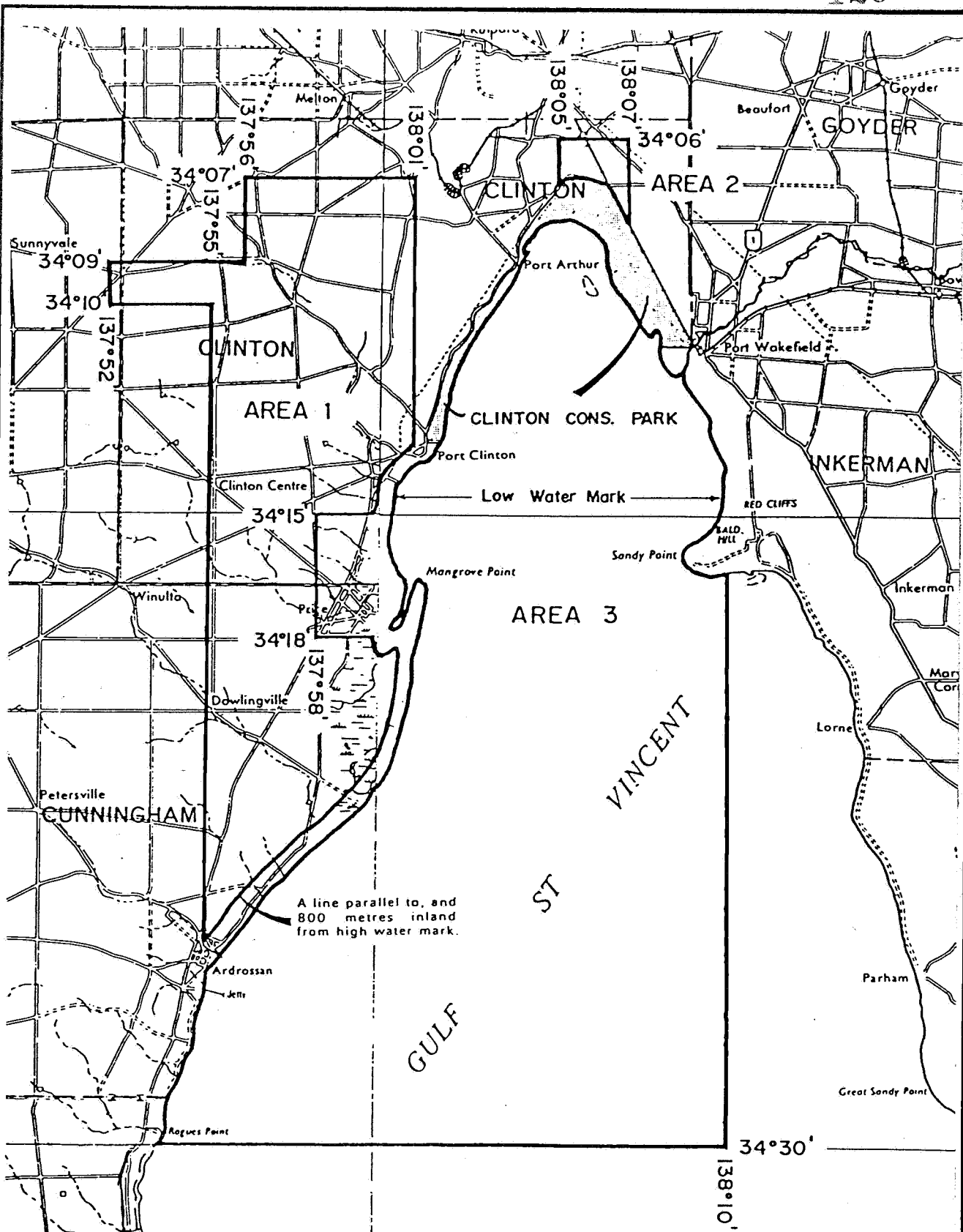
SCALE 1:250 000

AUTHOR D.K.R.

REPORT 12792

DATE 4 OCTOBER, 1983

PLAN No S A a 2345



SCALE 1:250 000

KM 5 0 5 10 KM.

CRA EXPLORATION PTY LIMITED

FIRST SCHEDULE
 'ARDROSSAN' AREA, S.A.
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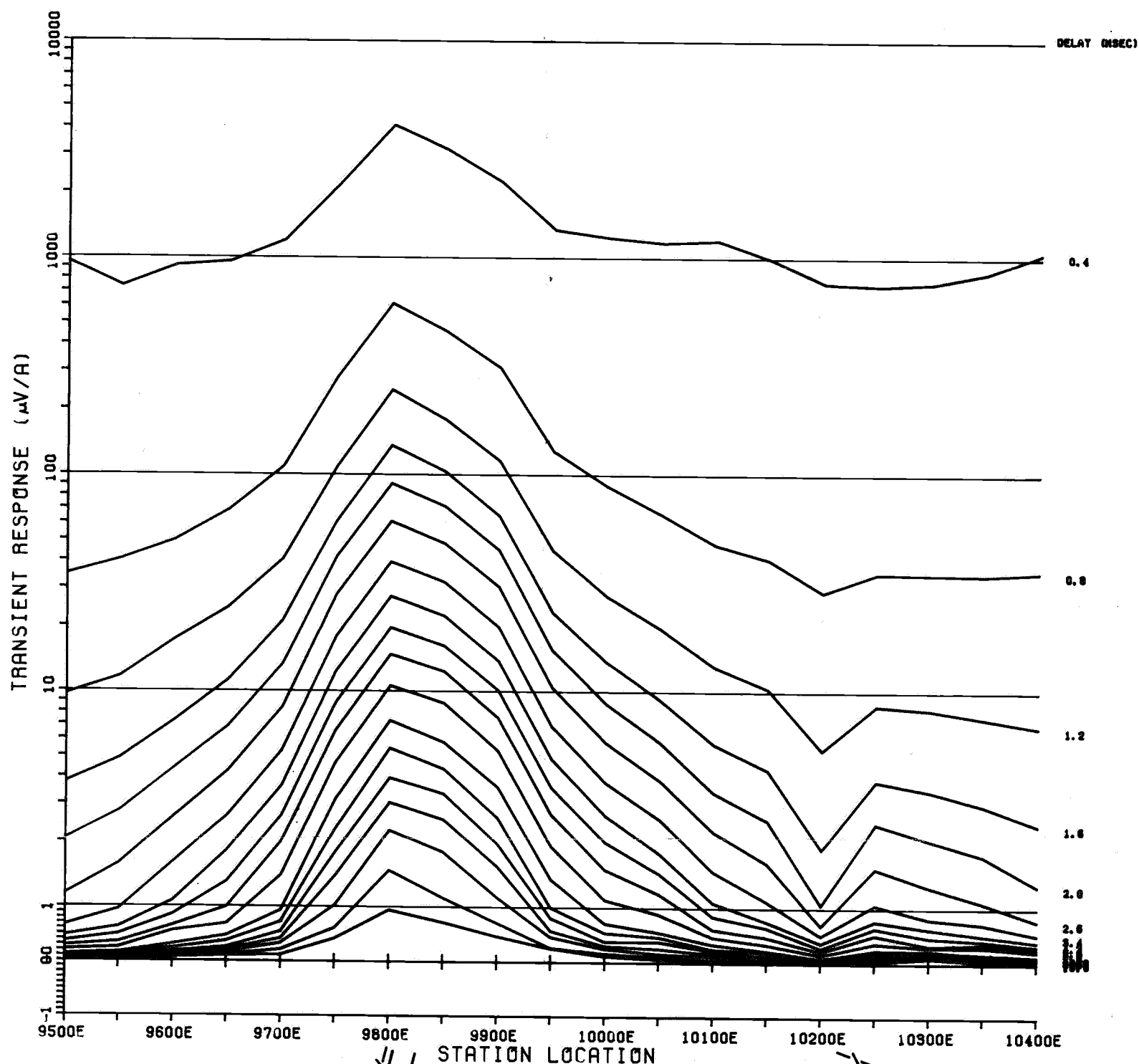
SCALE 1:250 000

AUTHOR D. L. A.

DATE Feb. '85

REPORT 13157

PLAN No SAa 2345



INSTRUMENT :SIROTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP.
IN LOOP RECIEVER
READING INTERVAL 50M

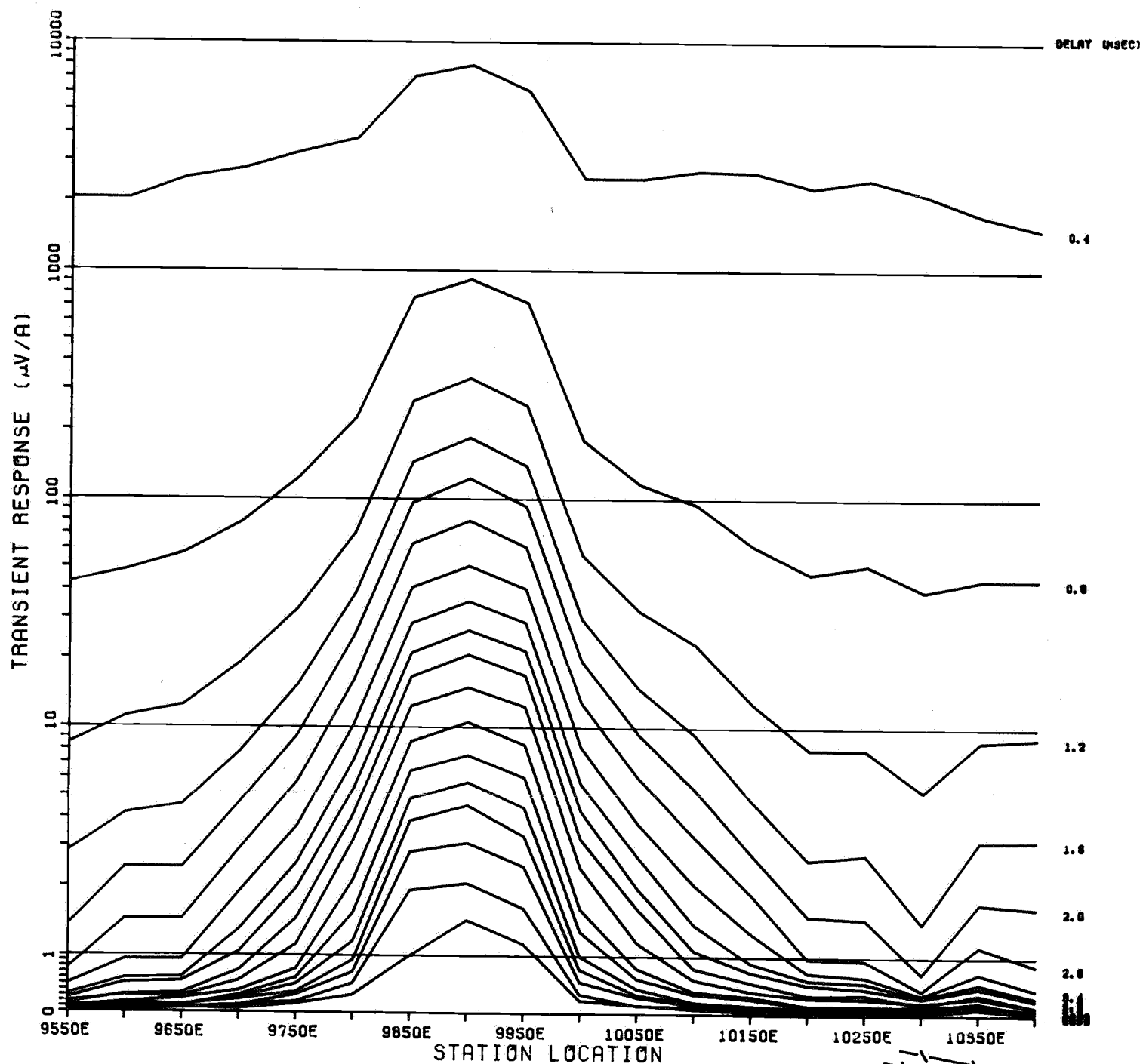
C.R.A. EXPLORATION
TRANSIENT E.M. PROFILE
LINE 12150N, PROSPECT Kainton

SCALE: 1:5000
DATE : 03/01/85



GEOPHYSICAL
SERVICES
Date. Feb. 8
Report No. 1

ARDROSSAN EL1110 - S.A.
Ref. MAITLAND S153-12
Plan No. SAa 3100



INSTRUMENT : SIROTEM
 CONFIGURATION: 100M SQUARE TRANSMITTER LOOP,
 IN LOOP RECIEVER
 READING INTERVAL 50M

C. R. A. EXPLORATION
 TRANSIENT E.M. PROFILE
 LINE 12450N, PROSPECT Kainton

SCALE: 1:5000
 DATE: 03/01/85



Date: Feb '85
 Report No 13157

ARDROSSAN EL 1110 - S.A.
 Ref. MAITLAND S153-12
 Plan No. SAa 3101