



ATTACHMENT 2
VIC-P17
GIPPSLAND BASIN
TARRA NO. 1
RIG MOVE REPORT - POSITIONING
AND
SIDESCAN SONAR SEABED
CLEARANCE SURVEYS

- 7 JAN 1984

PG/195/83

CIL and GAS DIVISION

BOX 1 OF 2

RIG MOVE REPORT
OASIS AND JMR POSITIONING
AT
TARRA-1 LOCATION
FOR
AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD

Prepared by:

RACAL-DECCA SURVEY AUSTRALIA

96 Reserve Road
P.O. Box 355
ARTARMON NSW 2064

Telephone : (02) 439-7595
Telex : AA 25441

Cnr Stock & Stockdale Roads
P.O Box 261
HAMILTON HILL WA 6163

Telephone : (09) 331 1199
Telex : AA 94341

DSA 1115

24 February- 10 March 1983

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OME0-1 (Re-runs)

ABSTRACT

The following report gives details of the survey operations involved in moving the drilling rig "OCEAN DIGGER" onto the TARRA-1 location in the GIPPSLAND BASIN VIC P17, carried out by Racal-Decca Survey Australia on behalf of Australian Aquitaine Petroleum Pty. Ltd.

The project commenced on the 24 February 1983 when the survey personnel were mobilised to Port Welshpool to carry out the Rig Move. "OCEAN DIGGER" was finally positioned on 3 March 1983.

Laying of the location marker buoys and provisional positioning of the "OCEAN DIGGER" was by means of the Decca OASIS system. The final position was determined by independent 3D Satellite Doppler observations by a JMR-4A Satellite Receiver.

1. REQUIREMENTS

The TARRA-1 location co-ordinates were supplied by Australian Aquitaine Petroleum Pty. Ltd.

The co-ordinates were as follows:

LATITUDE	38 ⁰	38'	37"4	South
LONGITUDE	147 ⁰	42'	09"8	East

AUSTRALIAN GEODETIC DATUM.

A.M.G., Zone 55, Central Meridian 147⁰ East

Easting 561154 Northing 5722511

The requirements of the project were as follows:

- a) To lay and calibrate a pattern of acoustic transponders to be used as the position fixing system.

- b) To carry out a Sidescan Sonar Survey of the drilling site seabed with the purpose of establishing the presence or absence of any debris on the seabed.
- c) To lay location and anchor position marker buoys to guide the "OCEAN DIGGER" on to location.
- d) To provide provisional positioning co-ordinates for the "OCEAN DIGGER" prior to the commencement of drilling operation.
- e) To carry out a 3D satellite doppler fix on the "OCEAN DIGGER" for final positioning co-ordinates.
- f) To carry out a Sidescan Sonar Survey of the KYARRA-1A location following the departure of the drilling rig from the site, to establish the presence or absence of any debris on the seabed attributable to the drilling operation at KYARRA-1A.

2. SUMMARY OF EVENTS

24 February 1983 Survey Personnel mobilised to Welshpool
Fitting M.V. "Christmas Creek"
2230 All equipment operational
2250 Sail from Port Welshpool

25 February 1983 Deploy seabed transponders at Tarra-1 Location.
Commence calibration of OASIS net.

27 February 1983
0930 Commence Sidescan Sonar Survey at Tarra-1
1630 Abandon Sidescan Sonar Survey due to rough
weather, survey approx 50% complete.
Accept calibration of OASIS net as satisfactory
after 24 successful passes. Weather stand-by.

2 March 1983
1100 OCEAN DIGGER on location

3 March 1983
2215 OCEAN DIGGER Anchors tensioned. Final acoustic
Fix.

4 march 1983
1200 JMR-4A observation on OCEAN DIGGER commenced.

7 March-10 March 1983
Post drilling Sidescan Sonar Surveys at OMEO
and KYARRA.

11 March 1983 Demobilise from Port Welshpool.

3. THE RACAL-DECCA SURVEY OASIS SYSTEM

OASIS is an integrated satellite/acoustic navigation and position fixing system, it is independent of shore based radio navigation aids and is capable of the following operations.

- a) Navigation of a vessel to a particular location using Satellite Navigation and Gyro data, with manual inputs of speed and drift.
- b) Precise calibration (Geographical Positioning) of an acoustic net of up to 5 sea-bed transponders.
- c) Accurate tracking of a vessel's position within coverage of the acoustic net.
- d) In the "relay" mode, accurate remote tracking of up to two further vehicles within coverage of the net.

4. OPERATING PROCEDURES

4.1 NAVIGATION TO LOCATION AND REFERENCE BUOY POSITION

This is undertaken using single-pass solutions from consecutive acceptable satellite passes using gyro data input for heading information and a manual input of ships speed based either on the ships log, or distance and time between satellite fixes. Given a reasonable frequency of acceptable satellite passes, by the time the vessel arrives at location its position should be known accurately enough to enable a reference buoy to be dropped within range of the proposed acoustic net. The vessel can then be either anchored or hove-to alongside this buoy and further satellite positions taken until a satisfactory fix is obtained. Once this has been accomplished the acoustic transponders may be approximately positioned relative to this buoy.

4.2 CALIBRATION OF ACOUSTIC NET

This takes place in 3 phases:

4.2.1 PHASE 1 NET RELATIVE GEOMETRY

This is achieved by navigating through the acoustic net collecting a series of 140 good range sets. The quality of these range sets is ensured by a rigid system of range checking whereby each accepted set is preceded by six correctly predicted sets, the accepted set then must also fall in the predicted "box". The range sets are alternately divided into two groups, the groups are processed and a direct solution for each is found. The operator compares the two results and if acceptable, a least squares solution for each group is generated with a third result being the mean of the two least squares solutions. If this result is accepted by the operator then this mean solution becomes the relative geometry solution - which remains throughout

the calibration.

The results are in the form of X-Y co-ordinates based on a line from transponder A to transponder B as the X-axis with A as origin. Values are in metres.

The time needed for this phase is dependent on the number of transponders involved, and the sea-state.

However, with a 5 transponder net and reasonable weather this phase may take up to six hours.

4.2.2 ORIENTATION PHASE 1A

This phase comprises navigating three legs on as constant headings as possible within coverage of all transponders. The legs should be at 90° - 120° to each other but need not be at any particular orientation with respect to the net.

Using three legs reduces errors due to ship's drift.

The result of this phase is the orientation of the perpendicular to the line drawn from transponder A to transponder B with respect to true north.

The orientation result is based on the gyro and is progressively modified during repositioning Phase 2.

This phase may be expected to take up to 1 hour,

4.2.3 REPOSITIONING PHASE 2

Having completed the geometry and orientation phases, the system now automatically enters the satellite repositioning phase.

At this stage the ship's track may be displayed on the plotter, however the ship's position will be based on the results of the relative geometry, and orientation, with the operator's original estimate of the position of transponder A. Repositioning of the net takes place after the second and subsequent successful satellite passes. Each result is in the form of a block shift of the net in metres and a change of orientation in degrees.

The new positions of all transponders with the new orientation are output after each successful pass.

At pass 15 the programme reconsiders the previous pass information and edits out any passes which appear to be contributing unreasonable errors.

The absolute accuracy of the geographical positions of the transponders depends on the number of passes processed. After twenty passes ± 25 metres is reasonable and after 30 passes ± 10 metres.

This phase of the calibration may take up to 72 hours depending on the frequency and quality of satellite passes.

4.3 ACOUSTIC TRACKING OF VESSELS POSITION

Once the positions of the sea-bed transponders have been established to the degree of accuracy required, the programme may be run in the "Navigate" mode, once this has been done any further satellite data is ignored.

The tracking programme enables the vessels position to be continuously monitored on the plotter, and manual, distance, or time initiated fixes to be

generated, with a fix relay closure for automatic marking of echo sounder or sonar records which may be required for a site-survey.

4.4 "RELAY" MODE TRACKING"

Although outside the scope of this report and not used during this operation, the relay mode enables remote acoustic tracking on the survey vessel, of up to two further relay transponders which may be attached to other vehicles, working in the same area.

4.5 OPERATOR INPUTS TO THE OASIS SYSTEM

4.5.1 SPHEROID AND DATUM TRANSFORMATION CONSTANTS

The following spheroid data, and datum transformation constants from WGS72 to A.G.D were input during the initialisation of the programme.

Note that the $\Delta X, \Delta Y, \Delta Z$, signs are reversed from normal convention for datum transformations from WGS72 to A.G.D, this is a programme requirement.

$$a = 6378160 \quad 1/f = 298.25$$
$$\Delta X = -122, \quad \Delta Y = -41, \quad \Delta Z = 146$$

4.5.2. TIDAL INFORMATION

The programme requires an input of variation of height of tide from mean sea level, this is needed both for the satellite programme antenna height and for the acoustic programme slant range correction.

At the TARRA-1 Location the tidal range is less than two metres and therefore not significant to the OASIS System.

4.5.3. VELOCITY PROFILE

An important input to the programme is velocity of sound in seawater. This was measured frequently using an MC5 Temperature/Salinity bridge, taking readings at ten metre intervals from the sea surface to the seabed. The programme uses these results to compute a velocity profile.

4.5.4 SAT/DOP TROPOSPHERIC CORRECTION

This is calculated by the programme based on operator inputs of temperature, pressure and relative humidity. These were measured at regular intervals using an Aspirated Hygrometer and "Baromec M1915" barometer.

4.5.5. OFFSET BETWEEN TOWFISH AND SAT-NAV ANTENNA

During the calibration of the net the offset between the towfish and the satellite navigation Antenna must be entered in the programme, thus the position plotted at this stage refers to the Antenna position. Prior to the final transit fix on the "OCEAN DIGGER" the offsets were changed to plot the wheelhouse position, from where the transit fixes were observed. Measured offsets can be found at the end of this report.

5 NET CALIBRATION RESULTS

5.1 RELATIVE GEOMETRY, PHASE 1

The results are in the form of X-Y co-ordinates based on a line between transponder A and transponder B with A as origin. Values are in metres.

	<u>X</u>	<u>Y</u>	<u>Depth</u>
A	0.0	0.0	64
B	1096.3	0.0	65
C	1622.8	981.1	65
D	827.7	1824.1	64
E	-311.9	1248.7	64

Discrepancy = 0.84

The discrepancy is a measure of the agreement between the two least squares solutions used to produce the final mean solution.

A value less than five is considered satisfactory.

5.2 ORIENTATION PHASE 1A

The result is the orientation of the perpendicular to the line joining transponder A and transponder B, this is later modified during the satellite repositioning phase.

ORIENTATION = 001⁰

5.3 REPOSITIONING PHASE 2

The end result of an oasis calibration is a set of Grid or geographical co-ordinates for each transponder and the net orientation.

TRANSPONDER FINAL POSITIONS

	Easting	Northing
A	560574	5721479
B	561663	5721604
C	562074	5722639
D	561188	5723385
E	560122	5722684

ORIENTATION = 353⁰.01

Net/repositioned after 24 successful passes.

Using 21 Passes R.M.S. = 30.33

An indication of the probable error in position of the acoustic net can be obtained from the R.M.S. value and the number of passes used:

$$\text{PROBABLE ERROR} = \sqrt{\frac{\text{R.M.S.}^2}{\text{NO OF PASSES USED}}} = 7 \text{ metres.}$$

5.4 TRANSPONDERS

The five transponders used had the following channel numbers, codes and serial numbers:

A	Channel 3	Code A14	Serial No. 329
B	Channel 7	Code AC15	Serial No. 340
C	Channel 2	Code AB3	Serial No. 158
D	Channel 8	Code AC3	Serial No. 349
E	Channel 6	Code AC14	Serial No. 339

6 MARKER BUOYS

A fix was taken on the position of all buoys prior to the arrival on location of the "OCEAN DIGGER" and information regarding the "set" of the buoys passed to the drillship.

Marker buoys were supplied by Australian Aquitaine Petroleum and were laid as follows:

6.1 LOCATION BUOY

On location.

6.2 HEADING BUOY

914 Metres (3000 feet) from location on rig heading of 260°.

6.3 ANCHOR BUOYS

No's. four and nine.

7 DRILLING SITE SEABED SURVEYS

Prior to the arrival of the Drilling Rig on a location a Sidescan Sonar Survey is carried out covering an area of 2.0 km x 2.0 km centred on the proposed location with the purpose of establishing the presence or absence of any debris on the sea bed.

A similar sidescan sonar survey of the drilling site is made following the departure of the rig from any one of the drilling sites to establish the location of any debris resulting from the drilling operation and/or to document the absence of oilfield debris.

The survey at the TARRA-1 Location was commenced at 0930 on 27 February but was only approx 50% completed at 1500 when rough weather conditions forced the survey to be abandoned. Unfortunately the weather conditions did not improve to enable the survey to be completed prior to the arrival on location of the rig OCEAN DIGGER.

Survey lines at 100 metre intervals were run with a Klein dual channel sidescan sonar operating at 100 metre range scale to ensure 100% overlap of the area. The seabed at the location proved to be flat and featureless. No anomalies were detected. A track plot of the survey lines run is enclosed as Appendix E.

The final post drilling sidescan sonar survey at Kyarra-1A site was carried out between 1830 on 8 March and 1430 on 10 March. No significant debris was detected. A track plot of the survey lines run is enclosed as Appendix F.

In addition some re-runs of lines at the OMEO-1 site were run on 7 March to check some possible anomalies detected on the original survey. The survey lines run are shown in Appendix G.

8 PROVISIONAL DERRICK CO-ORDINATES

Numerous transit fixes were made to enable the rig to manoeuvre on to location, the final transit fix was completed at 2215 on 3 March and gave the derrick position as 20 metres on a bearing of 255° from the intended location, with a heading of 261° . Co-ordinates for this position were calculated and passed to the "OCEAN DIGGER" as provisional derrick co-ordinates.

PROVISIONAL DERRICK CO-ORDINATES FOR "TARRA-1"

Latitude

Longitude

$38^{\circ} 38' 37.52$ South $147^{\circ} 42' 08.99$ East

A.M.G. co-ordinates , Zone 55, Central Meridian 147° E

Easting 561135

Northing 5722506

Heading of Rig 261° (T)

JMR-4A SATELLITE DOPPLER FIX AT TARRA-1 LOCATION

JMR-4A Satellite Doppler observations were taken on board the "OCEAN DIGGER" to confirm the location of TARRA-1 well head which had been positioned by the "OASIS" system.

The JMR-4A contains its own microprocessor for processing of doppler count data obtained from the U.S. Navy Transit Satellite System. Using frequencies transmitted from these satellites it extracts timing information, satellite ephemeris and doppler shift data to provide an accurate position fix anywhere on the earth's surface.

The raw data was recorded on JMR-1 certified cassette tapes and processed using the JMR-4A programme.

The following criteria were used for the computations:

a) Tropospheric Constant	:0.00025
b) Atmospheric Pressure	:1013
c) Doppler Edit	:tight
d) Pass elevation low angle cut off	:20 ⁰
e) Pass elevation high angle cut off	:78 ⁰
f) Drill rig heading	:261 ⁰
g) Offset antenna to drill stem	:brg 081.5 ⁰
	:Dist 34.7m
h) Co-ordinate transformation constants	
WGS -72 to A.G.D.	:Δ X + 0.122
	:Δ Y + 0.41
	:Δ Z - 0.146
i) Australian National Spheroid	: a = 6378160
	: f = $\frac{1}{298.25}$

10 SUMMARY OF RESULTS

Final position of TARRA-1 derived from 3D Satellite/
Doppler Observations. 21 Acceptable passes.

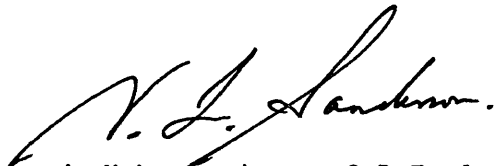
Australian Geodetic Datum:- (1966) (A.G.D.)

Latitude 38⁰ 38' 37.150 South
Longitude 147⁰ 42' 08.207 East

Australian Map Grid Co-ordinates, Zone 55, Central
Meridian 147⁰ East.

Easting 561116
Northings 5722518

Proposed location	→ JMR-4A Final Location	39 Metres, brg 280 ⁰
Proposed location	→ OASIS Prov. Co-Ords	20 Metres, brg 255 ⁰
OASIS Prov.Co-ords.	→ JMR-4A Final Location	22 Metres, brg 302 ⁰


Approved N.L. Sanderson O.B.E. Assoc.
I.S. Aust.
Chief Surveyor
RACAL-DECCA SURVEY AUSTRALIA

PE906399

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The enclosure PE906399 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906399 has the following characteristics:

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CONTAINER_BARCODE = PE906398
NAME = Locality Plan
BASIN = GIPPSLAND
PERMIT = VIC/P17
TYPE = GENERAL
SUBTYPE = MAP
DESCRIPTION = Locality Plan showing Tarra-1
REMARKS =
DATE_CREATED = 10/03/83
DATE_RECEIVED = 7/01/84
W_NO = W806
WELL_NAME = TARRA-1
CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PERSONNEL LIST AND SUMMARY OF PROJECT DIARYPersonnel List

I.A. Freeman	B. Surv M.I.S. Aust Senior Surveyor	R-DSA Sydney
K. Perry	U.W/OASIS Engineer	R-DSA Perth
A. Peart	U.W Engineer	R-DSA Perth

K. Perry relieved I.A. Freeman on 2 March 1983.

Summary of Project Diary

24 February 1983 Mobilise to Port Welshpool
 2230 - All equipment operational
 2250 - Sail from Port Welshpool

25 February 1983 At TARRA-1 Location
 Deploy OASIS seabed transponder net. Commence calibration.

26 February 1983 Continue OASIS calibration

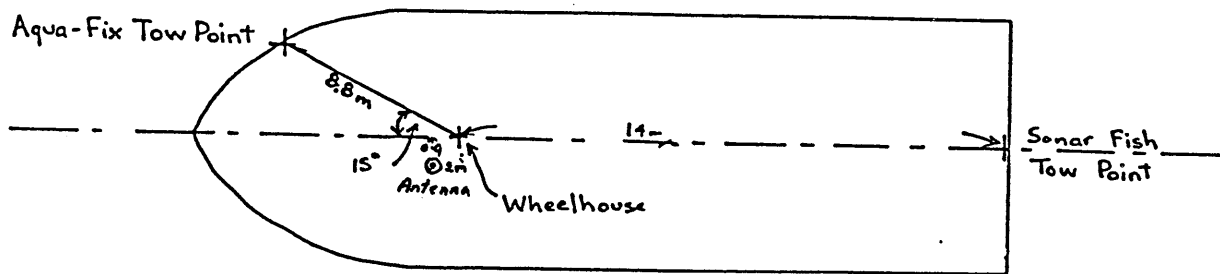
27 February 1983
 0930 - Commence TARRA-1 pre-drilling sidescan sonar survey.
 1630 - Abandon survey due to rough weather.
 OASIS Calibration complete after 24 Satellite Passes.

28 February 1983 Weather Standby.
 1800 - Laid Anchor Marker Buoys as OCEAN DIGGER ETA 0600 tomorrow.

1 March 1983 Weather conditions poor - OCEAN DIGGER ETA delayed. Buoys laid yesterday missing or drifted off location.

- 2 March 1983 Weather conditions improved - foggy.
0830 - Laid location, Heading, and Anchor buoys 4 and 9.
1100 - OCEAN DIGGER on location and running anchors in thick fog.
2300 - Transit fix positions rig 12 metres from location.
- 3 March 1983 OCEAN DIGGER running anchors
2215 - Anchor tensioning complete. Transit fix positions rig 20 metres off location. Christmas Creek released to proceed to Welshpool for crew change.
- 4 March 1983 K. Perry helicopter to OCEAN DIGGER to commence JMR-4A confirmation fix.
- 7 March 1983 JMR-4A observations completed. JMR-4 demobilised to Welshpool.
K.Perry transfer to "Christmas Creek"
Run check sidescan Sonar lines at OMEO-1.
- 8 March 1983 Release OMEO site transponders.
Three transponders with Channel Nos. 1, 4 and 6 not recovered. (Channel 6 subsequently recovered by fisherman S-E of Lakes Entrance and returned to A.A.P)
1830 - Commence post-drilling Sidescan Sonar survey at Kyarra site.
- 9 March 1983 Weather Standby
- 10 March 1983
0900 Recommence survey.
1430 Survey completed. Transponders left on site until detailed inspection of sidescan sonar records completed.
- 11 march 1983
0900 Christmas Creek arrives Port Welshpool. Demobilise.

"CHRISTMAS CREEK" OFFSETS



TOWFISH TO SAT NAV ANTENNA

L = 17 metres H = 3.5 metres B = 28° D = 7.3 metres

TOWFISH TO WHEELHOUSE

L = 17 metres H = 3.5 metres B = 15° D = 8.3 metres

Sonar fish towpoint to wheelhouse datum = 14 metres

L = Length of tow cable

H = Height of tow point above water line

B = bearing of tow point w.r.t. ships head

D = distance of tow point from ships datum

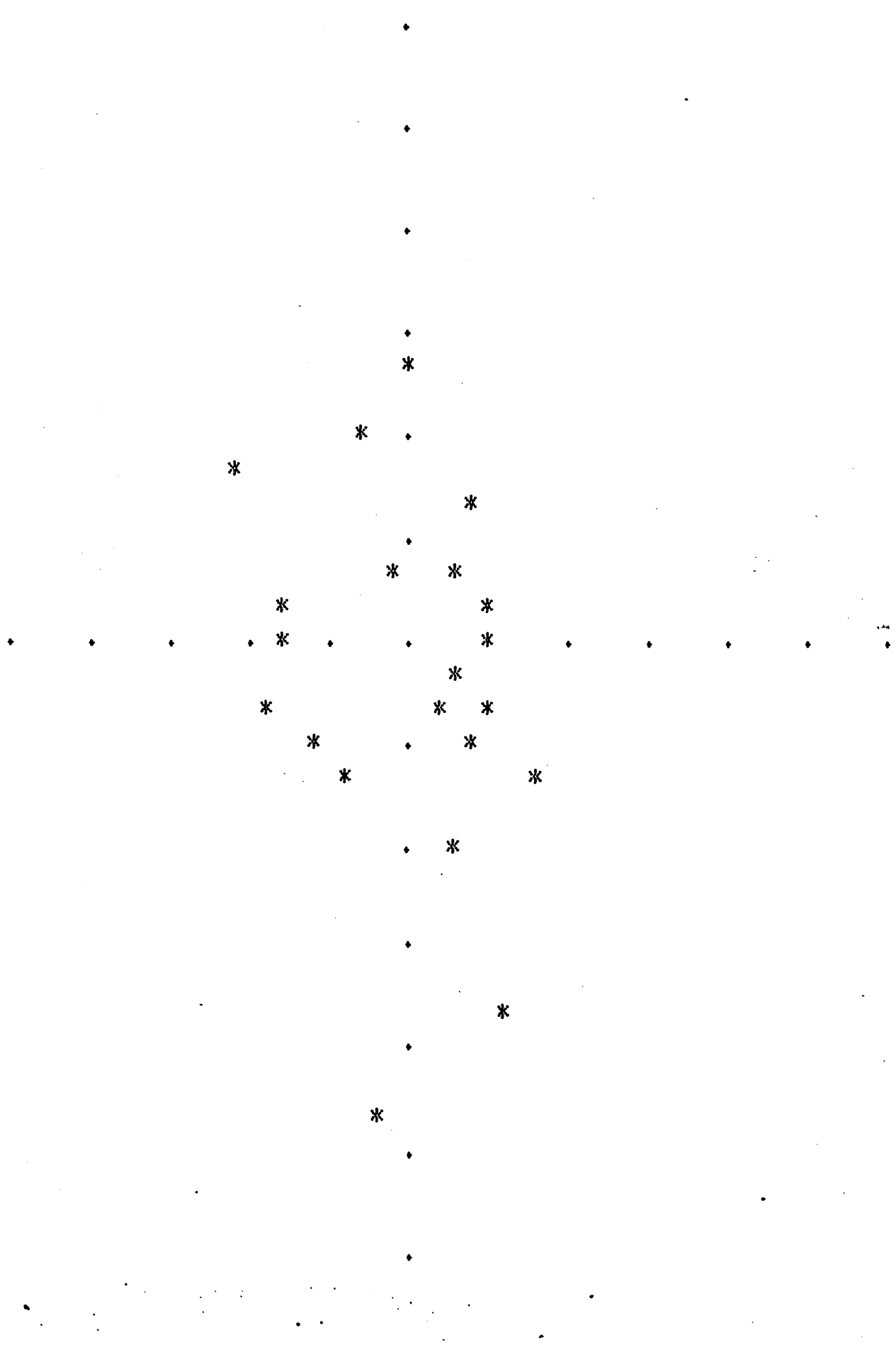
TARRA-1 JMR-4A ANTENNA - SCATTER PLOT.

*

>

< --- 10 METERS

N O R T H



PE906400

This is an enclosure indicator page.
The enclosure PE906400 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906400 has the following characteristics:

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CONTAINER_BARCODE = PE906398
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 BASIN = GIPPSLAND
 PERMIT = VIC/P17
 TYPE = WELL
 SUBTYPE = MAP
 DESCRIPTION = Pre-Drill Sidescan Sonar Survey for
 Tarra-1
 REMARKS =
 DATE_CREATED = 10/03/83
 DATE_RECEIVED = 7/01/84
 W_NO = W806
 WELL_NAME = TARRA-1
 CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
 CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906401

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container PE906398 at this location in this
document.

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CONTAINER_BARCODE = PE906398
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BASIN = GIPPSLAND
PERMIT = VIC/P17
TYPE = WELL
SUBTYPE = MAP
DESCRIPTION = Kyarra-1 Post-Drill Sonar Survey
REMARKS =
DATE_CREATED = 10/03/83
DATE_RECEIVED = 7/01/84
W_NO = W806
WELL_NAME = TARRA-1
CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906402

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container PE906398 at this location in this
document.

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- CONTAINER_BARCODE = PE906398
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- BASIN = GIPPSLAND
- PERMIT = VIC/P17
- TYPE = WELL
- SUBTYPE = MAP
- DESCRIPTION = Omeo-1 Sonar Survey Reruns, 8 March
1983
- REMARKS =
- DATE_CREATED = 10/03/83
- DATE_RECEIVED = 7/01/84
- W_NO = W806
- WELL_NAME = TARRA-1
- CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
- CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

SIDECAN SONAR SEABEDS
CLEARANCE SURVEYS

GIPPSLAND BASIN
SIDESCAN SONAR SEABED CLEARANCE SURVEYS
OF
DRILLING SITES IN VIC P17
FOR
AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

PREPARED BY
RACAL-DECCA SURVEY AUSTRALIA

47 Talavera Road
North Ryde, NSW 2113
PO Box 368, North Ryde
Ph: (02) 888 2233
Tlx: AA 20365

Cnr. Stock & Stockdale Roads
PO Box 261
Hamilton Hill, WA 6163
Ph: (09) 331 1199
Tlx: AA 94341

R-DSA 1155

October 1982 - April 1983

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ABSTRACT

The following report gives details of the Sidescan Sonar Seabed Clearance Surveys carried out at the EDINA, OMEO, KYARRA and TARRA drilling locations during the Australian Aquitaine Petroleum drilling program in the Gippsland Basin Vic P17 between September 1982 and April 1983.

1- REQUIREMENTS

To conduct pre and post drilling Sidescan Sonar Surveys covering an area 2.0 km by 2.0 km centred around the drilling locations with the purpose of establishing the presence or absence of any debris on the seabed.

2- SUMMARY OF EVENTS

- 25/9/82 - Drilling Rig 'OCEAN DIGGER' positioned at EDINA location
- 18/10/82 - Sidescan Sonar equipment mobilised and installed in survey vessel MV 'CHRISTMAS CREEK'
- 28/10/82 - OMEO pre-drill seabed survey
- 2/11/82 - 'OCEAN DIGGER' positioned at OMEO location
- 5-6/11/82 - EDINA post-drill seabed survey
- 21-22/1/83 - KYARRA pre-drill seabed survey
- 11/2/83 - 'OCEAN DIGGER' positioned at KYARRA location
- 12-13/2/83 - OMEO post-drill seabed survey
- 27/2/83 - TARRA pre-drill seabed survey
- 2/3/83 - 'OCEAN DIGGER' positioned at TARRA location
- 7/3/83 - OMEO site re-runs to check anomaly
- 8-10/3/83 - KYARRA post-drill seabed survey
- 23-24/4/83 - TARRA post-drill seabed survey

3- WELLHEAD LOCATIONS

Australian Geodetic Datum - A.M.G. Zone 55

3.1 EDINA-1

Latitude 38° 36' 22".539 south
Longitude 147° 52' 41".949 east
Easting 576476 Northing 5726535

3.2 OMEQ-1

Latitude 38° 36' 45".006 south
Longitude 147° 43' 02".245 east
Easting 562449 Northing 5725964

3.3 KYARRA-1A

Latitude 38° 40' 52".532 south
Longitude 147° 11' 12".288 east
Easting 516243 Northing 5718562

3.4 TARRA-1

Latitude 38° 38' 37".150 south
Longitude 147° 42' 08".207 east
Easting 561116 Northing 5722518

4- DRILLING SITE SEABED SURVEYS

Prior to the arrival of the drilling rig at a location a sidescan sonar survey was carried out covering an area 2.0 km x 2.0 km centred on the proposed location with the purpose of establishing the presence or absence of any debris on the seabed.

A similar sidescan sonar survey of each drilling site was made following the departure of the rig from the location to locate any debris resulting from the drilling operation and/or document the absence of oil-field debris.

A Klein Hydrosan 420 Dual Channel Sidescan Sonar was fitted in the Aquitaine survey/standby vessel MV 'CHRISTMAS CREEK' to carry out the surveys. Positioning of the survey vessel was by the RACAL-DECCA OASIS system which was also used to position the drilling rig 'OCEAN DIGGER' at each location. The OASIS system, an integrated satellite/acoustic navigation and position fixing system is fully described in the Rig Move Reports, together with details of the Acoustic Net Calibration at each site.

Survey lines at 100 metre intervals were run with the dual channel sidescan sonar operating at 100m or 150m range scale to ensure 100% overlap of the entire area. Any anomalies detected were examined by running interlines on an expanded range scale.

5- SUMMARY OF RESULTS

Generally the seabed proved to be flat and featureless.

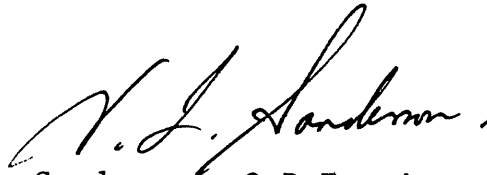
No significant debris was detected at any of the sites except what appears to be the remains of No.3 anchor marker buoy at the OMEO-1 location.

A.M.G. Co-ordinates of this anomaly are:

Easting 561785 Northing 5725595

It was detected on the original OMEO survey and confirmed during re-runs in the area on 7/3/83. If it is a sunken marker buoy the rope mooring will eventually part releasing the buoy.

Track plots of the survey lines run at each location are enclosed as appendices.



N.L. Sanderson O.B.E. Assoc. I.S. Aust.
Racal-Decca Survey Australia

PE906403

This is an enclosure indicator page.
The enclosure PE906403 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906403 has the following characteristics:

ITEM_BARCODE = PE906403
CONTAINER_BARCODE = PE906398
 NAME = Locality Plan
 BASIN = GIPPSLAND
 PERMIT = VIC/P17
 TYPE = GENERAL
 SUBTYPE = MAP
 DESCRIPTION = Locality Plan showing Tarra-1
 REMARKS =
 DATE_CREATED = 10/03/83
 DATE_RECEIVED = 7/01/84
 W_NO = W806
 WELL_NAME = TARRA-1
 CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
 CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906404

This is an enclosure indicator page.
The enclosure PE906404 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906404 has the following characteristics:

ITEM_BARCODE = PE906404
CONTAINER_BARCODE = PE906398
 NAME = Edina-1 Post Drill Sonar Survey
 BASIN = GIPPSLAND
 PERMIT = VIC/P17
 TYPE = WELL
 SUBTYPE = MAP
 DESCRIPTION = Edina-1 Post Drill Sidescan Sonar
 Survey
 REMARKS =
 DATE_CREATED = 10/03/83
 DATE_RECEIVED = 7/01/84
 W_NO = W806
 WELL_NAME = TARRA-1
 CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
 CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906405

This is an enclosure indicator page.
The enclosure PE906405 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906405 has the following characteristics:

- ITEM_BARCODE = PE906405
- CONTAINER_BARCODE = PE906398
 - NAME = Omeo-1 Post Drill Sonar Survey
 - BASIN = GIPPSLAND
 - PERMIT = VIC/P17
 - TYPE = WELL
 - SUBTYPE = MAP
- DESCRIPTION = Omeo-1 Post Drill Sonar Seabed Survey
- REMARKS =
- DATE_CREATED = 10/03/83
- DATE_RECEIVED = 7/01/84
 - W_NO = W806
 - WELL_NAME = TARRA-1
- CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
- CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906406

This is an enclosure indicator page.
The enclosure PE906406 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906406 has the following characteristics:

ITEM_BARCODE = PE906406
CONTAINER_BARCODE = PE906398
 NAME = Omeo-1 Sonar Survey Reruns
 BASIN = GIPPSLAND
 PERMIT = VIC/P17
 TYPE = WELL
 SUBTYPE = MAP
 DESCRIPTION = Omeo-1 Sonar Survey Reruns, 7 March
 1983
 REMARKS =
 DATE_CREATED = 10/03/83
 DATE_RECEIVED = 7/01/84
 W_NO = W806
 WELL_NAME = TARRA-1
 CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
 CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906407

This is an enclosure indicator page.
The enclosure PE906407 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906407 has the following characteristics:

ITEM_BARCODE = PE906407
CONTAINER_BARCODE = PE906398
 NAME = Kyarra-1 Post-Drill Sonar Survey
 BASIN = GIPPSLAND
 PERMIT = VIC/P17
 TYPE = WELL
 SUBTYPE = MAP
 DESCRIPTION = Kyarra-1 Post-Drill Sonar Survey
 REMARKS =
 DATE_CREATED = 10/03/83
 DATE_RECEIVED = 7/01/84
 W_NO = W806
 WELL_NAME = TARRA-1
 CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
 CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

PE906408

This is an enclosure indicator page.
The enclosure PE906408 is enclosed within the
container PE906398 at this location in this
document.

The enclosure PE906408 has the following characteristics:

- ITEM_BARCODE = PE906408
- CONTAINER_BARCODE = PE906398
 - NAME = Tarra-1 Debris Survey (Post Drill)
 - BASIN = GIPPSLAND
 - PERMIT = VIC/P17
 - TYPE = WELL
 - SUBTYPE = MAP
- DESCRIPTION = Tarra-1 Debris Survey (Post Drill)
- REMARKS =
- DATE_CREATED = 10/03/83
- DATE_RECEIVED = 7/01/84
 - W_NO = W806
 - WELL_NAME = TARRA-1
- CONTRACTOR = RACAL-DECCA SURVEY AUSTRALIA
- CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)