



FIELD REPORT
2D SEISMIC SURVEY, BASS BASIN TASMANIA, SHELDUCK,
PERMIT T/18P
for
ORIGIN ENERGY RESOURCES LTD.

Client Reference :
Date of Field Work : 04.06. - 09.06.2001
Date of Report : JUNE 2001
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- 2.1 MSX streamer cable configuration.
 - 2.2 A simplified diagram of the towing configuration used for the survey.
Configuration is theoretical in terms of all offsets.
- A The principal scheme of online processing system.



1 INTRODUCTION

The Shelduck Seismic Survey was conducted by Fugro-Geoteam AS. as an exclusive 2D survey within permit T/18P in the central Bass Strait between Tasmania and the Victoria, Australia. The operator for the survey was Origin Energy Resources Ltd. The vessel was the RV Geo Arctic. Specifications for the vessel are found in Appendix 4.

The survey consisted of 20 lines of average length 20km giving a full fold coverage of 375 km acquired during June 2001.

The "Marine Specifications" document contains guidelines for the performance of this project. Origin Energy Resources Ltd. supplied an Environment plan and Fugro Geoteam Ltd had a MEDEVAC and Emergency Response Plan in place for the area.

A separate HSE Plan was made for this project, and was forwarded to the authorities in Tasmania and Victoria.

The Client had a Representative onboard during the acquisition.

1.1 SCOPE OF WORK

2D seismic survey acquisition:

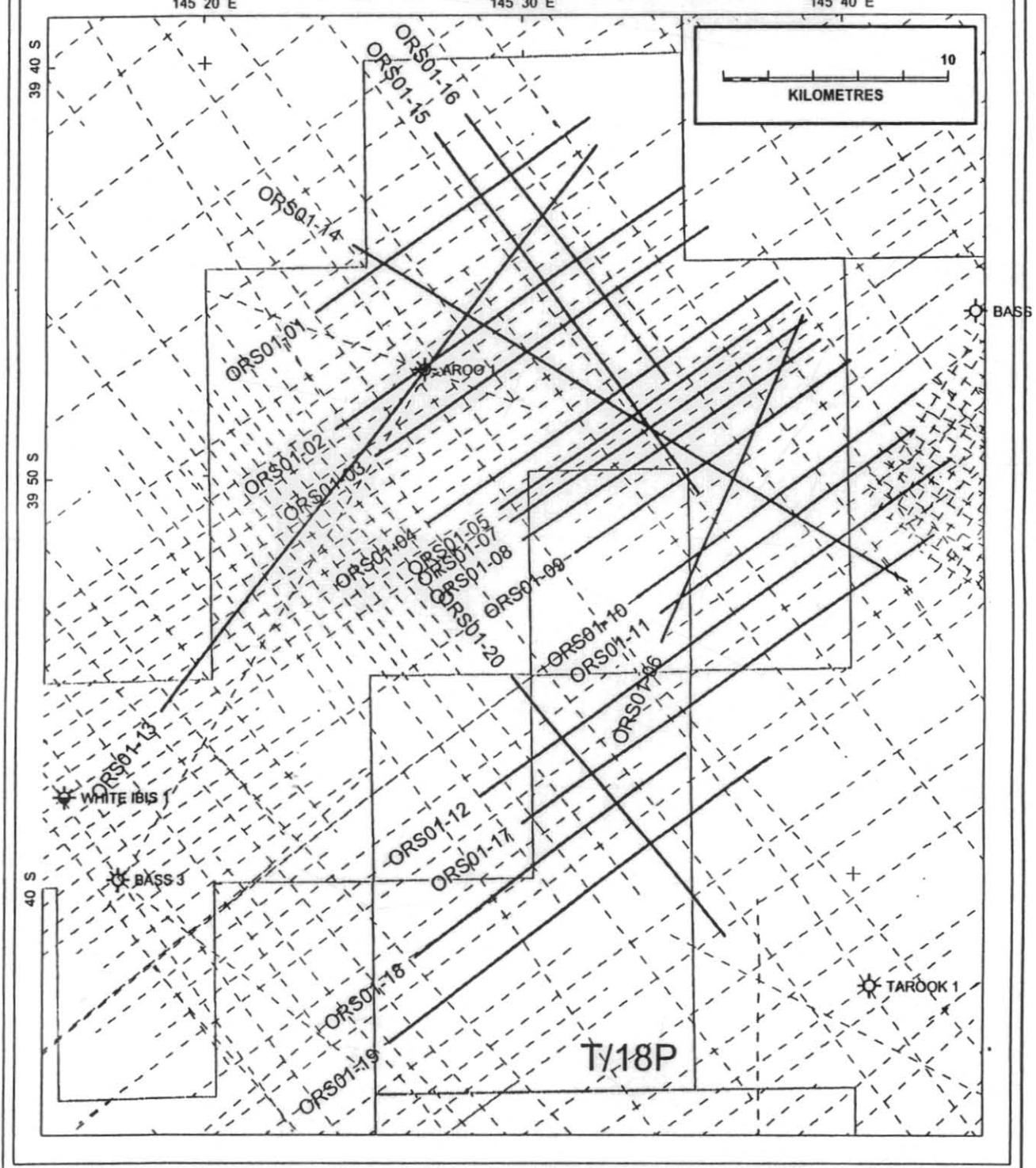
Client:	Origin Energy Resources Pty. Ltd.
Location:	Permit T/18P,Bass basin, Tasmania
Project no:	34834
Survey size:	375km full fold
Vessel:	RV Geo Arctic
Water depth:	70-90m
Fixed obstructions:	None known.
Number of lines:	20



1.2 WORK AREA / SURVEY PROGRAM



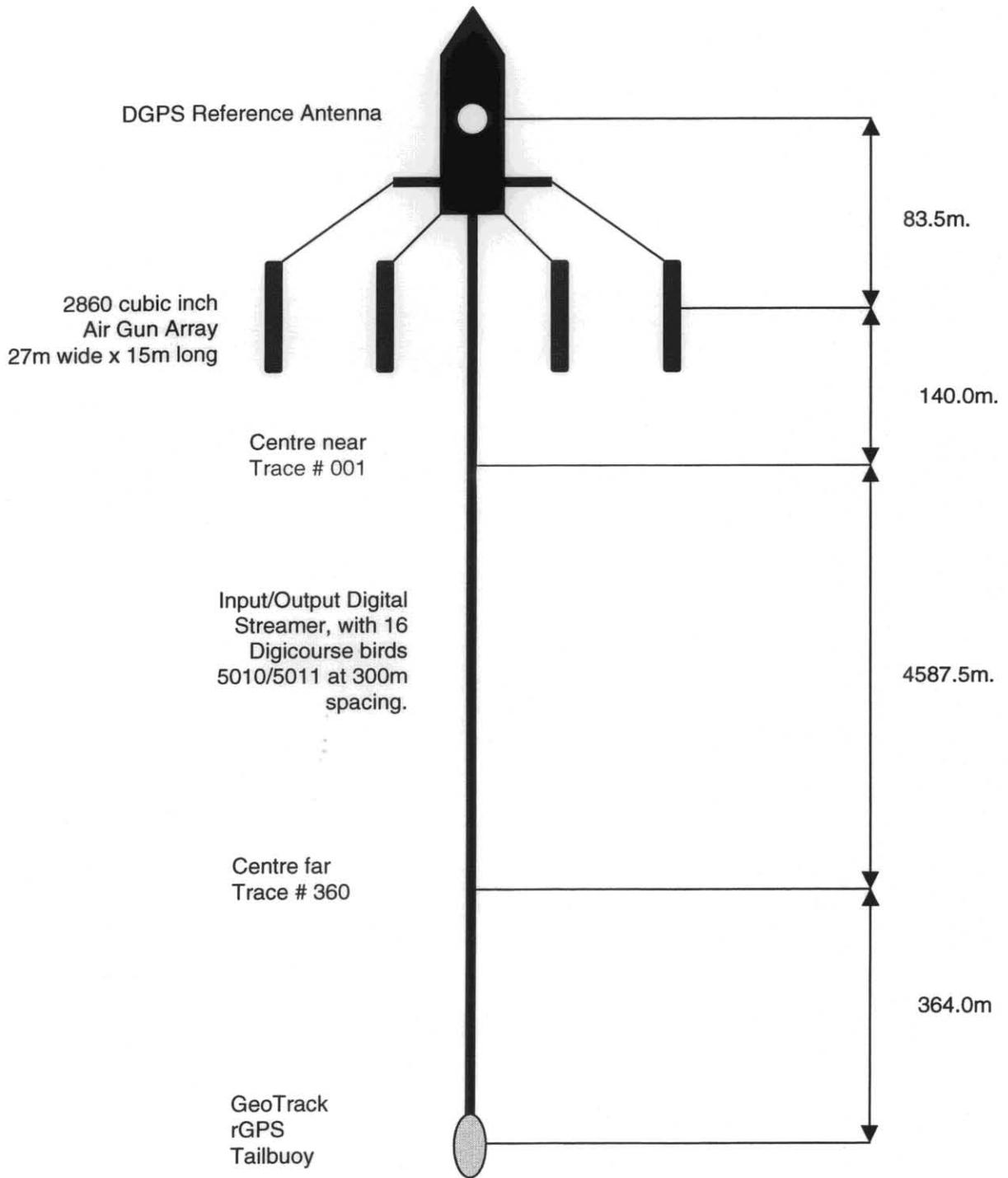
T/18P Bass Basin Shelduck SS



5 cm



1.3 SYSTEM LAYOUT



All Dimensions are Nominal



1.4 PLANNING AND PREPARATION - TIME SCHEDULE

Geo Arctic had a planned port call at Burnie, Tasmania for the purpose of re-supply and partial crew change on the 30th May. Origin's representative together with several Fugro Geoteam personnel were to join the vessel and it had been originally intended for the vessel to proceed directly to the Shelduck Survey site to begin acquisition, but due to a recent cable break incident this plan was changed.

The port call and pick up of the Origin Energy rep proceeded as planned. After this the plan was changed for the vessel to steam out and find sheltered waters in the lee of King Island and make all necessary cable repairs before continuing on to her previous work area to complete the last two lines to the SW of King island. Geo Arctic would then steam back in to the Bass straights in early June to begin the Origin Resources Ltd. project.

On completion of the acquisition the client's representative was to be then put ashore at the first opportunity together with a copy of the data before Geo Arctic could return to work on other projects in the area.

1.5 OTHER DOCUMENTATION

The following documentation is referred to directly or indirectly and was available throughout the survey, to ensure that all information, specifications, guidelines and agreements for this project were available :

- QC Specifications
- HSE Plan
- MEDEVAC Plan
- Fugro-Geoteam AS' QA and HSE documentation.
- Health, Safety and Environmental related documents according to contract.

2 ACQUISITION PARAMETERS

Fugro-Geoteam AS ensured that the equipment in use met the manufacture specifications, and also met Fugro-Geoteam's quality requirement.

2.1 DEFINITION

Acquisition mode	:	Single vessel
Configuration	:	Single streamer, single source
Shot interval	:	18.75 m.
CDP spacing	:	6.25 m.
Coverage	:	120 full fold



2.2 SEISMIC PARAMETERS.

2.2.1 Seismic recording systems

Recording type	:	I/O MSX
Recording length	:	5 seconds
Sampling rate	:	2ms
Low-cut filter	:	4Hz, 12dB/Oct
Hi-cut filter	:	206Hz , 264dB/Oct
Format	:	SEG-D Demux
Tape media	:	3590
Source type	:	Sodera G guns.
Recording mode	:	Single source

2.2.2 Seismic streamer

Streamer type	:	I/O MSX 24 bit digital
Streamer length	:	4600m
Nominal streamer depth	:	7.5m (but can be dropped to 10m with approval)
Near offset	:	150m
No of groups	:	368
Group interval	:	12,5m
Group length	:	17,55m
No of birds	:	17

2.2.3 Energy source:

Source type	:	G Guns
Air pressure	:	2000 psi
Volume	:	2860 cubic inch
No of subarrays	:	4
Source depth	:	5m.
Source width	:	27m
Source length	:	15m
Peak-peak	:	84.2 bar-m
P/b ratio	:	18.7 : 1

2.2.4 Gravity and magnetomer

Gravity and Magnetic data is not required on this survey.

2.3 GEODETIC PARAMETERS.

2.3.1 Survey datum.

Datum	:	GDA 94
Ellipsoid	:	GRS80
Semi Major Axis (a)	:	6378137.0
Inverse Flattening (1/f)	:	298.257222
Projection System	:	Universal Transverse Mercator (UTM)



Central Meridian : 147° East
 Scale Factor at CM : 0.9996
 Latitude at Origin : 0° (Equator)
 False Easting : 500,000
 False Northing : 10,000,000
 Grid Units : Meters

2.3.2 World Geodetic System 84 (WGS-84)

Ellipsoid : WGS84
 Semi Major Axis (a) : 6378137.0m
 Inverse Flattening (1/f) : 298.257224

2.4 LINE NAME CONVENTION

The line naming convention was as follows:

ORS01-NNR

Where ORS01 is the Prefix, and

NN is the line number. R is the re-shoot code. R=A for the first re-shoot, R=B for the second re-shoot, etc.

Shotpoint numbering was to be ascending when shooting from west to east or south to north. Shot point numbering was to be decrementing when shooting from east to west or north to south.

2.5 POSITIONING SYSTEMS

Primary Vessel Positioning

System: STARFIX-Spot DGPS with Starfix reference stations.
 Optus satellite delivering RTCM Type 1 and 3 differential corrections.
 Recommended set-up "weighted mean".

Equipment: Trimble 4000 DS GPS Receiver
 Trimble antenna
 Starfix 6500 MK II demodulator
 Allison Spot antenna
 Pentium computer running MRDGPS software

STARFIX-Spot

Starfix Spot was used as the vessels Primary position, d/t diff stations available on Spotbeam being closer than ref stns available on MN8. The correction stations used for Spotbeam were;

Station Name	Station ID	Distance
Melbourne	385	158kms
Bathurst	336	795kms
Port Augusta	326	1071kms
Brisbane	275	1536kms



Secondary Vessel Positioning

System: Fugro STARFIX MN8 Differential GPS via InMarSat (P.O.R.).

Equipment: Trimble 4000 DS GPS Receiver
Trimble antenna
Starfix 6500 MK II demodulator
Pentium computer running MRDGPS software

2.6 IN SEA POSITIONING SYSTEMS:

Tailbuoy

A Tail-Buoy (TB) was deployed at the tail of the streamer for positioning. The TB was fitted with Geo-Track - relative GPS, and radar reflector.

Relevant work book :WB.NAV.002 Tail Buoy Nav. Work Book

Relevant work instruction :WI.NAV.109 Work Instruction for
STARFIX/GEOTRACK Operators

Source Positioning N/A

Magnetic Compasses and birds

The compasses and birds will be mounted at 300m intervals on the streamer. A total of 16 depth controllers/compasses will be mounted on the streamer. The depth controllers / compasses will be Digicourse model 5010 / 5011. Extra compass birds will be mounted in the front and tail of the streamer for redundancy.

Magnetic Declination

The value at the centre of the survey, 39 50 S, 145 30 E is calculated at 12.55 deg. This is the average value of the IGRF 2000 and WMM 2000 models.

2.7 NAVIGATION PROCESSING.

This is to be performed onboard, using the latest version of QCPro software from ECL.

FINAL data format : UKOOA P190
Final data medium : SEG Y
Relevant Procedure : TP.304



3 FIELD WORK SUMMARY

3.1 MOBILISATION

Geo Arctic sailed from Burnie, Tasmania on the 31st May to first complete some lines on a spec. project in the Sorrell basin to the SW of King Island. Client's Representative Rodney Waldon had joined the vessel on the 30th to wait onboard until we were ready to suspend the Sorrell basin work and transfer to the Origin Energy Resources project.

At 00:00 on the 4th June Geo Arctic completed picking up our cable to the SW of King Island and started steaming east towards Bass Strait. At 07:00 the 4.6km cable deployment was begun 30km to the SW of the prospect and by 12:29 all equipment had been launched into the sea ready for testing.

The first line ORS01-03 was started at 14:02 4th June completing the mobilisation phase of the project.

3.2 ACCEPTANCE TEST

With the 4.6km cable fully deployed after 12:00 on the 4th June a full set of instrument tests were run on the MSX recording system. All channels were found to be in specification except for one channel, but this was considered acceptable within the terms of the contract specification.

Note the contract called for a 4.5km cable with 350 12.5m long groups. The MSX must have an even number of active sections therefore a 4.6km cable was configured with 368 12.5m groups. It was accepted that this configuration exceeded the minimum requirements and that there would be no extra charge for the increased number of channels.

The 26 G -gun source was proved to be fully functional with all guns firing as per the 2860 cu .in. array specification with 7 spare guns in the sea.

3.3 CALIBRATION

Instruments test : A full set of I/O MSX instrument tests were performed on site June 4th 2001 with the equipment ready to start production. All parameters were found to be within specification. Results were displayed on paper on paper printout and stored to tape cartridge.

Gyro calibration : Underwater Surveys Ltd. Pty performed calibration check on the Plath survey gyro on the 15th December while the vessel was in Cape Town dry dock.

GPS verification : . On the 31st December Underwater Surveys Ltd. Pty. performed an independent survey of the position of the GPS navigation antennas and tailbuoy tracking system. A report showing that all equipment was within specification was received on the 27th December.

Draught measurement : An echosounder bar check was completed when the vessel left the Cape Town dry dock on the 19th December .

Sound velocity : Nominal 1500 m/s was used.



3.4 SURVEY SUMMARY AND PERFORMANCE

Survey summary

The project started on the 4th of June 2001 with the vessel's arrival onsite in the Bass Strait. The 4.6km cable was deployed into a calm sea and tested followed by the guns. As no problems were encountered the operation was ready to approach the first line and start production on line ORS01-03 at 14:02 hours.

Although Gravity and Magnetometer recording were not part of the specification it was agreed to record this data in case the Client decided that they may want to purchase it at a later date.

As the first short 20km line went well and the seas remained calm the next line shot was ORS01-13, the priority 'well tie' line. As required in the specification when shooting east to west of north to south, the shot points decrement. To ensure that the vessel fired a shot exactly on the well location it was entered as a way point. Unfortunately this caused a hang up with the navigation program and it was necessary to abort the line at sp2033 right on the well location. A circle was made with a 7km run-in and a half cable overlap. The second part of the line ORS01-13A was successfully shot to complete full coverage of the priority line by 02:41 on the 5th June.

With continuing good weather Geo Arctic proceeded to run from line to line through the program with the cable towed at 7.5m depth in calm seas. Excellent data quality was recorded through 5th to the beginning of the 8th June with 352km acquired in 17 lines. At the beginning of the 8th June however the winds and swell increased and although line -15 was shot in its entirety it had to be later rejected due to excess swell noise.

After 14 hours of weather down time on 8th June, Geo Arctic made another attempt at line -15A with the cable down at 10m. This was acquired with acceptable noise level at the beginning, which reduced further during the line. As the seas calmed down we were able to return the cable to 7.5m depth before the start of the next line ORS01-06A.

The last line of the project ORS01-14 was completed in calm seas on the 9th June. As Geo Arctic was not planning to return to port the Client's representative Rod Waldon left the vessel by pre-arranged helicopter less than one hour after the last line was acquired. He hand carried all the data except for the last line recorded which was left on board until a copy could be made.

Geo Arctic recovered all the guns but encountered winds up to 35 knots when recovering the cable. The vessel then steamed north west to Victorian waters to resume the previous spec project.

3.5 DATA QUALITY

Surface navigation and position Position accuracy was maintained throughout the survey and checked by comparisons between the Primary Starfix Spot DGPS and the Secondary Starfix MN8 system. There was on navigation program failure on the vessel first attempt so shot the longer tie line ORS01-13 which had the well location programmed in as a way point. The program hung up at this point and the vessel had to circle to resume the line. See navigation report for details.

Seismic system

The noise specification was quite tight and the cable towed at 7.5m, fortunately most of the survey was acquired in excellent weather conditions and the noise specification was easily met. On the 7th June two line -15 were rejected when the weather increased quickly. After the weather front passed through on the 8th June it was reacquired with a 10m cable depth and



Otherwise there were no technical problems with the guns or recording system and excellent data quality was obtained throughout the project within the expected time frame.

3.6 POSITION PROCESSING

Position processing was performed onboard using QCPro software. On-line P294 data was imported from StarfixSeis and processed into a P190 output tape ready for delivery to the customer. There were no real problems, see the Position Processing Report for details.

3.7 SEISMIC PROCESSING

The MSX recorded field tapes were read into the Focus/DISCO Unix processing system for the purpose of QC checking. Noise analysis was carried out, a near trace profile produced. Velocities were picked every 1km along each line and a stacked section produced for display to the client representative. Checks for gun performance were made by examining the near field signatures recorded on the aux. channels as well as exact offset checks. Excellent results were produced throughout the survey without any technical problems. See the QC processing report for details.

3.8 WEATHER

Generally the weather during the survey was excellent. The exception was on the period from 18:00 7th through to 12:00 8th June when the winds and swell quickly increased. Also on the 9th June during cable recovery after acquisition had been completed the winds and swell quickly increased.

3.9 TIDES AND CURRENTS

There were only slight noticeable effects from tides and currents and they did not interfere with survey operations.

3.10 OBSTRUCTIONS AND SHALLOWS

Nil

3.11 SEISMIC ACTIVITY

Nil

3.12 FISHING AND SHIPPING ACTIVITIES

Fisheries - A consultant to the fisheries industry, Andrew Levings & Associates, was employed to liase between Fugro Geoteam and the various fishing associations but no fishing activity were seen during this project.

Shipping - There were regular sightings and radio contact with five ferries who crossed the Bass Straights. A faxed warning had been sent to them as well as a general coast guard broadcast advising all shipping of the survey activity. All co-operated fully and there were no difficulties from passing shipping.



3.13 ENVIRONMENTAL ISSUES AND DIVING ACTIVITY

There were no environmental incidents during the project.

A documented whale watch was maintained from the bridge as required by the conditions of the permit. There were however no sightings. Copies of the logs are included in the appendix of this report and the originals sent to the "Marine Species Section" of the Australian Environment Dept., Canberra.

3.14 THIRD PARTY INTERFERENCE

Nil

3.15 DEMOBILISATION

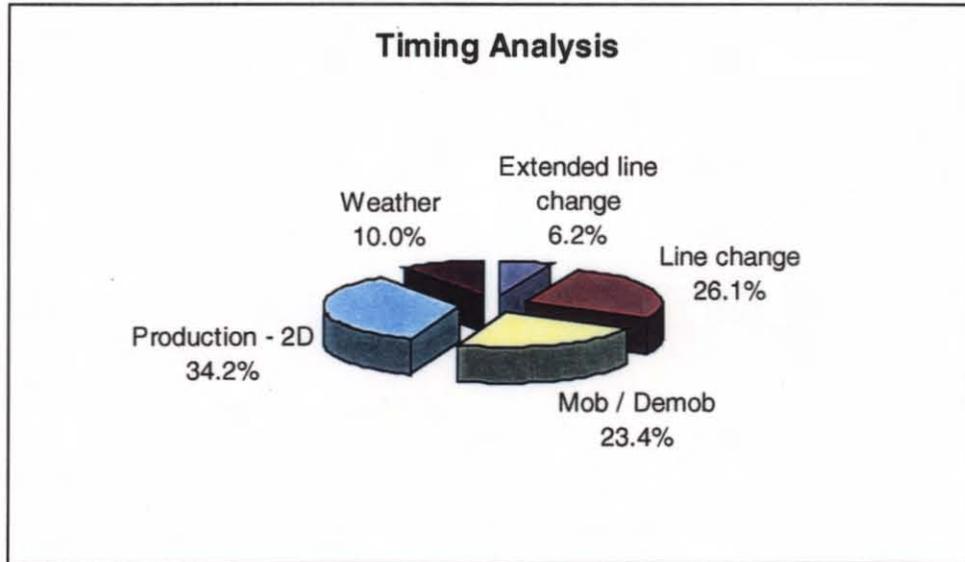
Client's representative Rod Waldon left by helicopter within an hour of the last line being acquired on the afternoon of the 9th June. He carried with him a copy of all the data with the exception of the last line ORS01-14, which was still being copied. Having recovered the cable before midnight of the 9th the vessel steamed north west back to continue work on its previous project to the north west of King Island.

All remaining data was shipped when the vessel eventually reached Port Kembla N.S.W. on the 22nd June.



3.16 SURVEY STATISTICS

Survey performance



Chargeable :-

	Accumulated Hours	
Extended line change	8.72	6.05%
Line change	36.53	25.37%
Mob / Demob	32.78	22.77%
Production - 2D	47.78	33.18%
Weather	13.98	9.71%
	139.80	97.08%

Non Chargeable :-

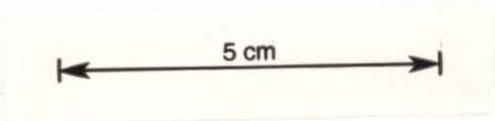
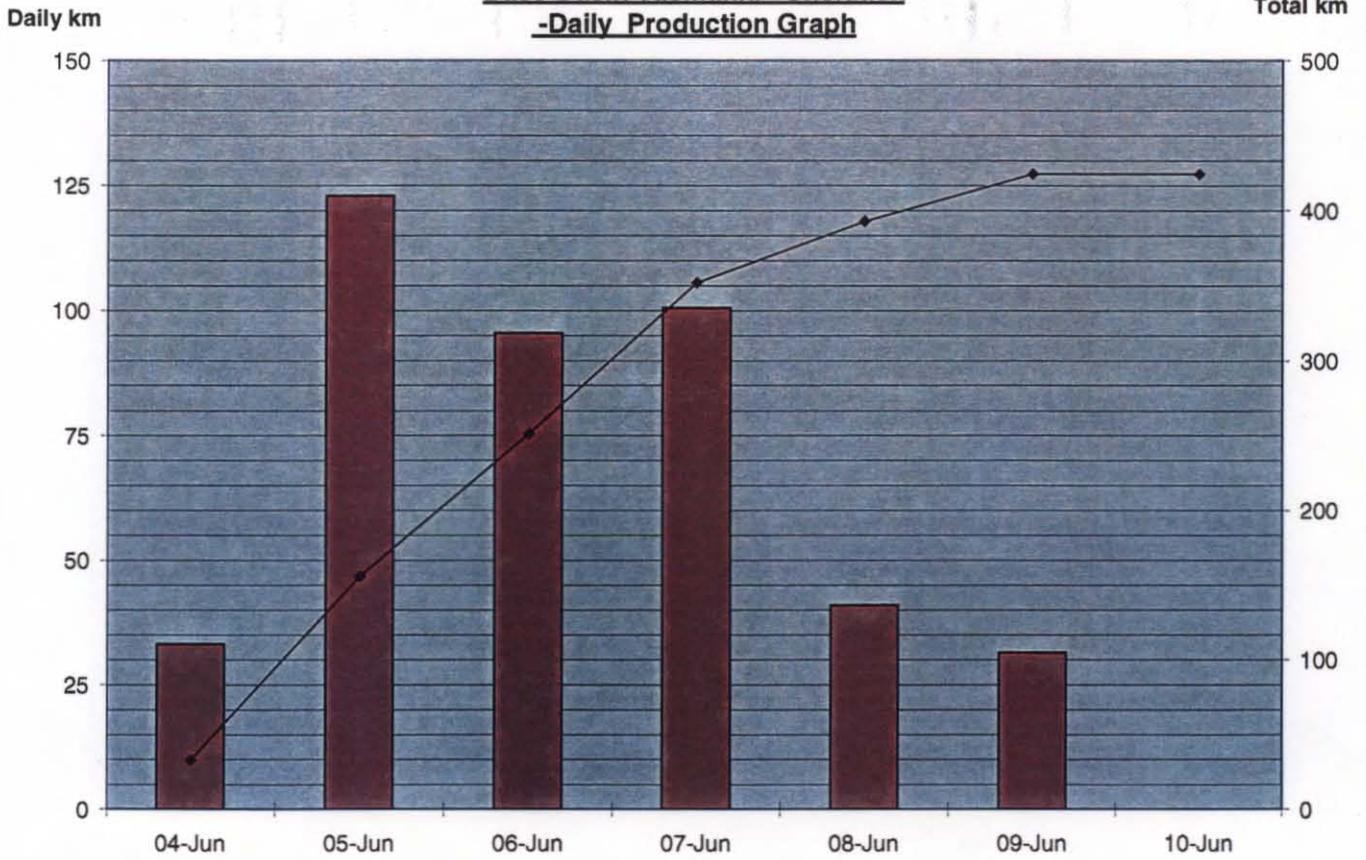
	Accumulated Hours	
Navigation	4.20	2.92%
	4.20	2.92%

Total time = **144.00** hours or **6.00** days

Production :- 20 lines shot in 23 sequences totalling **424.556** kilometres full sail distance.



**Bass Basin Tasmania - Shelduck
-Daily Production Graph**





4 HEALTH, SAFETY AND ENVIRONMENTAL

The contractual commitments and instructions regarding HSE for this project is found in Contract 1100000159 Section IV Appendix I, Health, Safety and Environmental standards. The following documentation is referred to and forms a part of the requirements / specifications :

- E&P Forum 1993, Health Management Guidelines for Remote Land-Based Geophysical Operations. Report No. 6.30/190
 - E&P Forum 1994, Health, Safety and Environmental Schedules for Marine Geophysical Operations. Report No. 6.34/206
 - E&P Forum 1995, Health, Safety and Environmental Schedules for Land Geophysical Operations. Report No. 6.35/207
 - E&P Forum 1994, Health, Safety and Environmental Schedules for Marine Geophysical Operations. Report No. 6.34/206
- and Shell Health, Safety and Environmental Committee documents :
- SHSEC, 1991, Management Guidelines for hearing conservation
 - SHSEC, 1992, Guide for Safety Performance Reporting
 - SHSEC, 1993, Guide for Health Performance Monitoring
 - SHSEC, 1993, Incident Investigation and Analysis Guide
 - SHSEC, 1994, Medical Emergency Guidelines for Management and
 - IAGC, 1991b, Marine geophysical Operations Safety Manual.



4.1 SAFETY OVERVIEW

Toolbox meeting

Minutes of Safety Meeting

08th June 2001

R/V Geo Arctic

Attendance :-

K.Pidzhakov & M.Julier – Master, N.Isaev & D.Dillon – Chf Off. R. Pankratov & C.Gonsalves – Chf. Eng.

S.Platt - Boatswain. V.Olkovskiy Superintendent. - S.Shamarin Ch.Ele. – V.Belous Nav.

R.Waldon – Client rep. J.Carrey – Party Chief, K.Ytterland – Mech Superv.

Meeting opened at 16:00

A: Review of the previous meeting held on the 25th May 2001

Points from the previous meeting were read and briefly discussed.

B: Review of incident reports since last safety meeting.

3 reports since last meeting.

1. ARC 18/01 Coming alongside pier 7 in Burnie, a wooden fender caught a porthole and the glass and surrounding frame were broken.
2. ARC 19/01 Crewmember involved in accidental collision with another person while visiting ashore in Burnie.
3. ARC 20/01 Streamer lost due to broken leadin.
4. ARC 21/01 Crewmember suffered from infected gum.

C: Review of last drills.

31st May 2001 All new crewmembers were given a safety induction tour.

3rd June 2001 Abandon Ship Drill.

D: Review of the outstanding items in the action point registry.

The outstanding points from the Safety Action Point Register were read. The following is an update on the situation regarding these action points :-

71/00 Warnings were missing at some power tool stations. Ref. audit point 17.34.
The feedback from the office dated 09.04.01 has now been filed in the correspondence from the office section of the safety file.
Signs received. Some in place.

Safety delegate / P.C.

83/00: Office to produce list of required Helideck equipment according to CAA regulations (BP/Am audit).

Closed.



02/01 The test control of smoke hoods.
 Some 20 smoke hoods have been weighted and re-sealed. A list of the smoke hoods tested has been entered into the register. The remaining 20+ smoke hoods that are due to expire in June / July **MUST** be done at port call scheduled @ 20th June 2001.
 New plastic covers are now on order to replace the cracked ones. Scheduled to arrive 20th June 2001.
 These will be fitted during the test control weighting + some of the already weighed hoods need new covers.

08/01 Handrails should be installed where possible in the galley area, to reduce the risk of slips and falls in rough weather.
 Ref. incidents ARC 012-01 and ARC 017-01.

P.C. / .Ch.steward. / Ch.Mate

09.01 Electrical extension cables used on deck in poor condition.

Closed

E: Safety Feedback from office :

None.

F: New Business :

The following points were raised and discussed at the meeting.

10-01 New action point - Headset for helicopter communication missing.
 Australian Captain Mike Julier advised that this is a requirement not an optional extra.
 PC to look into specification requirements.

It had been noticed twice that gun crew was recovering guns without required safety gear.

Some crewmembers felt uncertain as to where to assemble in a MOB situation.

The meeting closed 16:30

Safety audit

On the 20th April 2001 Woodside Offshore Petroleum performed an "Offshore Helideck Inspection" while the vessel was in Hobart. The helideck was pronounced ready for use.



4.2 ACCIDENTS AND NEAR MISS

Accidents Nil

Near miss Nil

4.3 ENVIRONMENTAL

No environmental incidents occurred and there was no chemical garbage spillage in to the sea during the project.

All regulation requirements regarding soft starts of the guns were adhered to.



5 PERSONNEL

5.1 GENERAL

The vessel left Burnie, Tasmania on Wednesday 27th after a partial crew change. To comply with Australian legislation a partial Australian marine crew was employed onboard. Also to comply with the Russian maritime register of shipping a minimum number of Russians were also employed in key positions on the marine crew.

The Canadian gravity engineer was still onboard from the previous project, see note about his activities in the Gravity Report section.

The Russian Superintendent was onboard preparing for an official inspection at the next port call and not part of the project.

5.2 CREW LIST

No.	Name		Rank
1	Pidzhakov	Konstantin	Master
2	Julier	Mike	Master
3	Isaev	Nikolay A.	Chief Mate
4	Dillon	Dion Joseph	Chief Mate
5	Tsygankov	Nikolay A.	Second Mate
6	Ashmore	Bob	Second Mate
7	Namanyuk	Sergey M.	3rd Officer
8	Ilijashevich	Fedor M.	Radio Officer
9	Matsepula	Vladimir	Boatswain
10	Platt	Steve	Boatswain
11	Zelinskiy	Vladimir	A.B.
12	Grishenkov	Vladimir N.	A.B.
13	Moss	Colin	A.B.
14	Cloonet	Michael	A.B.
15	Gough	Michael	A.B.
16	Pankratov	Robert I.	Chief Engineer
17	Gonsalves	Claude	Chief Engineer
18	Karakosov	Evgeny	2nd Engineer
19	Sloane	Patrick	2nd Engineer
20	Vasyutin	Oleg M.	3rd Engineer
21	Joseph	Philip	3rd Engineer
22	Kurochkin	Alexsey	Motorman
23	Karachev	Sergey	Motorman
24	Shamarin	Victor A.	1st Elec. Eng.
25	Jeffries	Kevin	1st Cook
26	Baczik	Michael	2nd Cook
27	Romaniv	Galina Y.	Stewardess
28	Ushmaeva	Antonina	Stewardess
29	Ross	Jeffrey	Steward

GEOTEAM

No.	Name		Rank
30	Polev	Nikolay F.	Chief Observer
31	Medvedev	Viktor S.	Chief Observer
32	Zhuravlev	Vladimir Y.	Observer
33	Zhuravlev	Viktor N.	Observer
34	Svetlichniy	Alexey P.	Chief Navigator
35	Belous	Valeriy	Navigator
36	Teterkin	Alexandr N.	Chief Gun Mech.
37	Nikulin	Ilija B.	Chief Gun Mech.
38	Mogilevskiy	Genadiy	Gun Mech.
39	Egorov	Vasily V.	Gun Mech.
40	Polozov	Nikolay I	Chief Compressor Man
41	Gusev	Anatoliy V.	Compressor Man
42	Olkhovskiy	Vladimir	Superintendent
43	Carrey	John	Party Chief
44	Jones	Tony	Instrument Supervisor
45	Taylor	Kevin	Navigation Supervisor
46	Ytterland	Kare	Mechanical Supervisor
47	Brookes	Kathryn	Seismic Processor
48	Salter	Shawn	Gravity Eng.
49	Barber	Mike	Chief Steward
50	Waldon	Rodney	Client Representative

Total number of persons on board 50



6 DEPARTMENT REPORTS

6.1 POSITION REPORT

6.1.1 Introduction

The vessel mobilised for the survey at sea on the 04/06/01. The "Geo Arctic" was already working in the Bass Strait area prior to the commencement of the Survey. On the 04/06/01 the vessel started reconfiguring for the Shelduck Seismic Survey and headed towards the survey area.

Differential corrections in the survey area were available through P.O.R satellite which was tuned to through the Inmarsat system, and Optus satellite which was tuned to through the Spotbeam system.

Scope of Work	:	2D Seismic Survey
Client	:	Origin Energy Resources Ltd
Project Number	:	34834
Project Name	:	Shelduck Seismic Survey
Location	:	Bass Basin Tasmania, Permit T/18P

6.1.2 Navigation Systems

Navigation System	:	StarfixSeis suite 3.1 (Fugro Survey Pty Ltd)
Primary Navigation	:	Fugro Starfix Spot Differential GPS.
Demodulator	:	Starfix M2 Demodulator
GPS Receiver	:	Trimble 4000DS 9 channel, nav version 7.29
Secondary Navigation	:	Fugro Starfix MN8 Differential GPS
Demodulator	:	Starfix M2 Demodulator
GPS Receiver	:	Trimble 510 Survey receiver 9 channel, nav version 7.29
Tailbuoy and Source Positioning	:	Fugro Geotrack Tailbuoy Tracking System
Acoustics	:	
Binning	:	
Navigation processing	:	QCPro
Seismic Recording	:	Input/Output, 24 bit system
Bird Controller	:	Digicourse 5010/5011
Gun Controller	:	Hydrapulse 200X
Echosounder	:	Simrad EA 500 12 & 27 kHz
Speed log	:	
CTD Probe	:	
Gyro (main)	:	C.Plath, Navigat 2. DHI. Interfaced via Lekmkuhl Digital Gyro repeater with RS232 output to StarfixSeis
Gyro (secondary)	:	SG Brown 1000B



6.1.3 Survey Information

Prior to the start of the Survey there was some confusion as to which datum Origin Resources wished the job to be shot in. Initial information suggested that Origin wanted the survey to be shot in WGS84 and later transformed to GDA94. It was pointed out to Origin through liasing with the onboard client rep that there was no point shift between the two datums just a small difference in inverse flattening and that it was normal procedure for the required datum shift to be carried out by the online system. Origin Resources agreed to this and the survey was shot in GDA94.

Survey Datum and Datum shift parameters

GPS Datum : WGS 84
 Ellipsoid : WGS 84
 Semi-major Axis : 6378137
 Inverse flattening : 298.257224

Survey Datum : GDA 94
 Ellipsoid : GRS80
 Semi-major Axis : 6378137.00
 Inverse flattening: : 298.257222

Shift Parameters :
 X-shift : 0.0
 Y-shift : 0.0
 Z-shift : 0.0
 X-rotation * : 0.0
 Y-rotation * : 0.0
 Z-rotation * : 0.0
 Scale correction : 0.0

(*Bursa Wolf sign convention)

Projection parameters

Projection : Universal Transverse Mercator (UTM)
 UTM Zone : 55 South
 Central meridian : 147°
 Latitude of origin : 0° (Equator)
 False Easting : 500000
 False Northing : 10000000
 Scale Factor : 0.9996

6.1.4 Survey Parameters

Definition

Acquisition mode : Single vessel
 Configuration : Single streamer single source
 Shot interval : 18.75m

**Source**

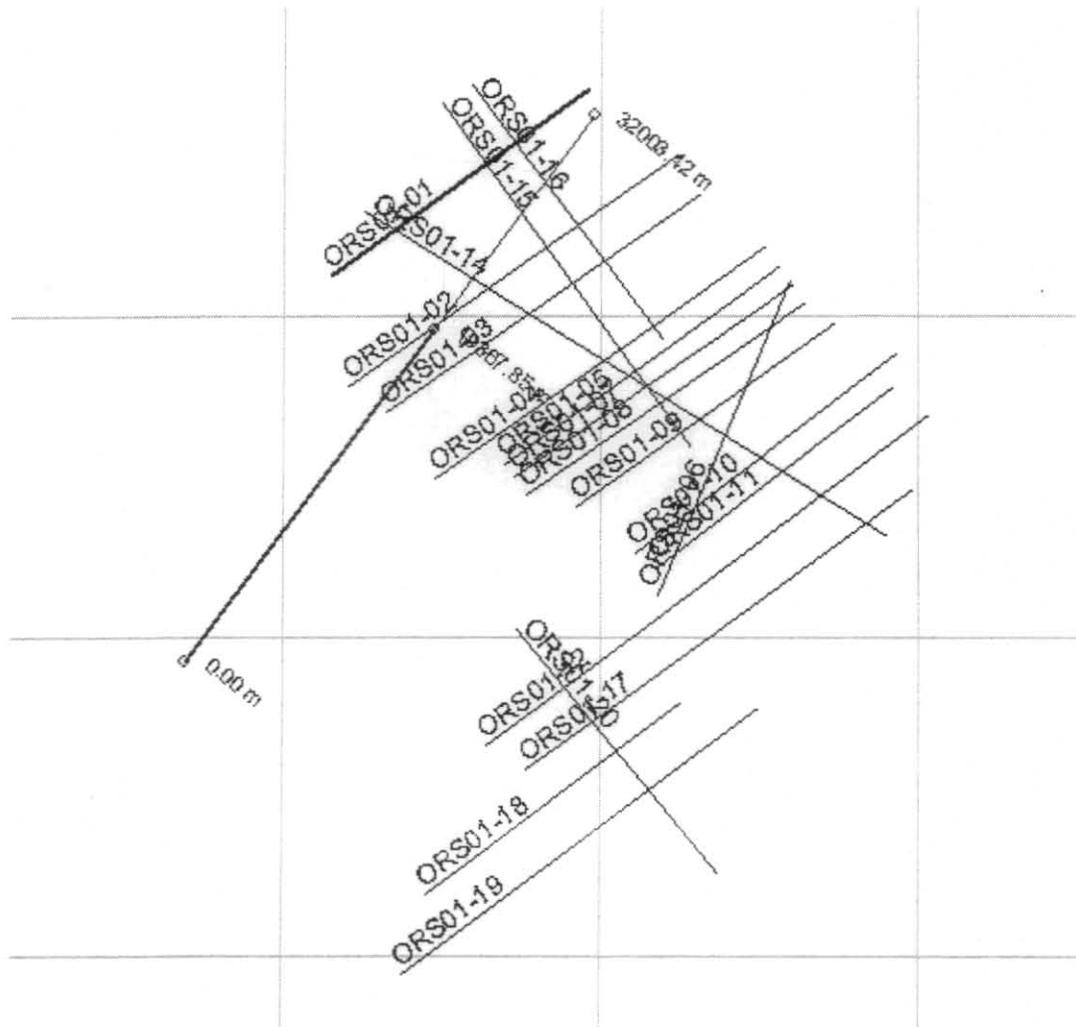
Source type	: G-guns
Air pressure	: 2000psi
No. of sub-arrays	: 4
Source depth	: 5m
Source width	: 27m
Source length	: 27m
Source layout	:

Streamers

Streamer type	: I/O MSX 24 bit digital
No. of streamers	: 1
Streamer active length	: 4500m
Streamer separation	:
Streamer depth	: 7.5m +/- 1.5m
Near offset (inline)	: 150m
No. of groups	: 360
Group interval / length	: 12.5m/17.55m
No. of depth controllers	: 17
Number of compasses	: 9
Magnetic variation	: 12.55° (Average value of IGRF2000 & WMM2000 models at centre of prospect)

6.1.5 Survey Area

The survey area was approx. 120km east of King Island in Permit area T/18P in the Bass Basin Tasmania. The survey consisted of 19 runlines and 1 centreline. The centreline was defined to run through well location Aroo-1.



6.1.6 Naming convention

The line naming convention followed was ORS01-NNR

Where ORS01 is the Prefix, and

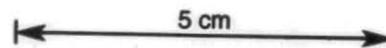
NNN is the line number. R is the reshoot code. R=A for the first reshoot, R=B for the second reshoot, etc. Shotpoint numbering was continuous across reshoots.

Shotpoints were to increment from West – East and North - South

Shotpoints were to Decrement from East-West and South-North

FSP on incrementing lines=1000

LSP on decrementing lines 1000 - runout





Preplots

	SOL	EOL
ORSO1-01	39 45 59.8S 145 23 29.8E	39 41 22.7S 145 32 08.4E
ORSO1-02	39 48 47.9S 145 24 04.2E	39 43 03.6S 145 35 06.5E
ORSO1-03	39 49 28.4S 145 25 18.6E	39 44 05.5S 145 35 49.3E

Preplots

	SOL	EOL	
ORSO1-04	39 51 09.4S 145 26 54.5E	39 45 24.8S 145 37 56.9E	
ORSO1-05	39 50 50.4S 145 29 10.0E	39 45 57.0S 145 38 24.7E	
ORSO1-06	39 54 10.9S 145 3411.7E	39 46 16.2S 145 38 43.8E	
ORSO1-07	39 51 09.3S 145 29 29.5E	39 46 22.5S 145 38 51.1E	
ORSO1-08	39 51 37.0S 145 29 53.0E	39 46 51.3S 145 39 16.2E	
ORSO1-09	39 51 56.9S 145 31 32.2E	39 4721.5S 145 40 12.4E	
ORSO1-10	39 53 05.5S 145 33 27.5E	39 48 08.7S 145 42 14.1E	
ORSO1-11	39 53 28.8S 145 34 10.4E	39 49 02.1S 145 42 07.9E	
ORSO1-12	39 57 54.0S 145 28 26.4E	39 49 45.0S 145 4318.7E	
ORSO1-13	39 55 38.4S 145 18 28.0E	39 47 25.426S 145 26 52.748E	39 42 03.8S 145 32 21.5E
ORSO1-14	39 44 23.0S 145 24 41.2E	39 52 47.4S 145 41 51.0E	
ORSO1-15	39 41 41.3S 145 27 18.0E	39 50 31.1S 145 35 23.5E	
ORSO1-16	39 41 15.0S 145 28 15.4E	39 47 46.6S 145 34 30.0E	
ORSO1-17	39 58 33.3S 145 29 46.5E	39 51 37.0S 145 42 45.0E	
ORSO1-18	40 01 41.5S 145 26 22.4E	39 56 54.2S 145 34 53.7E	
ORSO1-19	40 03 41.4S 145 25 32.2E	39 57 02.7S 145 37 29.0E	
ORSO1-20	39 54 58.6S 145 29 29.3E	40 01 18.5S 145 36 03.0E	

Vessel

The vessel datum $x=0,y=0,z=0$, is defined as the ships main mast projected down to sea level. All vessel offsets such as primary and secondary GPS antennas are offset from this point



Source

Vessel operated in single source mode with the nominal offset from stern to centre of source being 49.85m.

Streamer

Single streamer with nominal head of streamer defined as 187.35m from stern, first trace 199.85m from stern.

Tailbuoy

One active seatex active tailbuoy deployed on the end of the streamer

Digicourse Birds

17 Digicourse birds mounted on the streamer, 9 of which are compass birds

Gun Arrays

Four subarrays 2 each side.

6.1.7 Calibration / Validations

Underwater Surveys (Pty) Ltd, performed a Gyro calibration and position verification of the R/V Geo Arctic navigation equipment, in Cape town, South Africa, 18th and 31st December 2000. Full details of the results are contained in Underwater Surveys (Pty) Ltd, Report No. PSA202Gyro December 2000, which is summarised in **Table 1** and **Table 2** below :

Table1

Gyro Calibrations		
	Survey Gyro 1 C. Plath (°)	Ship's Gyro 2 SG Brown (°)
True azimuth	131.68°	131.68°
Gyro reading	132.50°	132.50°
C-O	-0.82°	-0.82°

Table2

GPS and RGPS Systems verification		
DGPS	Latitude	Longitude
Calculated position	33° 54' 57.212 S	18° 27' 15.837 E
Observed position	33° 54' 57.262 S	18° 27' 15.933 E
C-O	-0.05"	-0.096"
GeoTrack	Northing	Easting
Difference	-0.41 m	-1.70 m

Sound Velocity

Using Default value of 1500 m/s



6.1.8 Position equipment performance

MRDGPS

STARFIX-Spot

Starfix Spot was used as the vessels Primary position, d/t diff stations available on Spotbeam being closer than ref stns available on MN8. The correction stations used for Spotbeam were;

Station Name	Station ID	Distance
Melbourne	385	158kms
Bathurst	336	795kms
Port Augusta	326	1071kms
Brisbane	275	1536kms

Spotbeam performed well throughout the survey.

STARFIX MN8

The coverage available on the P.O.R satellite was not particularly good for this area. Ref station Melbourne was the only station within normal range for a diff station. Reference stations used were;

Station Name	Station ID	Distance
Melbourne	385	158kms
Dunedin	026	2136kms
Auckland	022	2561kms

The MN8 system was in close agreement with Spotbeam solution and proved to be useful secondary system.

Tailbuoy tracking

Performed very well throughout the survey.

Tailbuoy stopped working for a 200 sp period on line ORS01-12. The reason for the dropout is unknown but the tailbuoy has worked well since.

Starfix suit software

The vessel was using Starfix Suite software version 3.1. A problem occurred on seq002 line ORS01-13. It was a client requirement that the line be shot as a centreline since there was a wellhead on the line that the client was interested in. It was also a requirement that the line be shot with decrementing shotpoints in the direction that we acquired the line in. The StarfixSeis software hungup at the sp after the dogleg. Shotpoint spacing was not being computed correctly, the boat had to circle on the line. Fugro software support was notified of the Software problem and data files were sent to them. At the time of writing they are still looking into the problem.

Echosounder

Water depths in the Survey area were fairly constant between around 70 – 80m. Three echosounder transducers were logged online and written to the P294 file. The transducers used



were Simrad EA500 12 and 27 kHz and the Atlas Deso 210 kHz. All transducers performed well throughout the survey.

Streamer compass

All compasses performed well throughout the survey

Acoustics N/A

C-Plath, S.G Brown 1000B

Performed well throughout the survey.

6.1.9 Downtime

Positioning systems:

Nav Software: 4.2hrs

Operator:



6.2 INSTRUMENT REPORT

6.2.1 Introduction

The cable was configured to 4600m and all onboard systems were tested.
Production commenced on the 04th of April for a period six days up to the 11th June.

Scope of work	: 2D Seismic survey
Client	: Origin Energy Resources Ltd.
Project number	: 34834
Location	: Bass Basin Tasmania – Permit: T/18P

6.2.2 Instrument system

Main systems

Recording system	: Input/Output MSX. SW ver 2.0111
Streamer system	: Input/Output MSX.
Bird controller	: Input/Output DigiScan. SW ver 3.12
Gun controller	: Hydro Pulse 200X Ver. 1.a.1 For Windows
Number of streamers	: 1
Length of streamers	: 4600m
Streamer depth	: 7.5m (+/-1.5m)
Shot point interval	: 18.75 m
Near Offset	: 148 m

Recording system

No. of modules	: 23 per streamer
Waterbreak channels	: 4 per streamer
Auxiliary channels	: 16
Cable sensitivity	: 14.0 V/Bar
Total No. of channels	: 368
High cut filter	: 206 Hz, 264 dB/octave
Low cut filter	: 4 Hz, 12dB/Octave
Pre-amp gain	: 6 dB
Group length	: 17.5
Recording Length	: 5 seconds
Sample rate	: 2ms
Trace Summing	: No
DC offset removal	: Yes
Depth transducers	: Not Recorded
Online display	: OYO GS 624-2
Tape deck	: IBM Magstar 3590 Microcode ver.ECD19129DOI8_1EC
Tape format	: SEG D
Data Blanking at SOR	: No
Data recording format	: 8058-IEEE
Max files per tape	: 1500
Navigation interface	: Header Serial link to StarfixSeis



User Header size : 6016
 User header version : 8
 Extended Header ver : 3
 Number of 5010 birds : 2
 Number of 5011 birds : 15

6.2.3 Calibration and checks

A monthly test was performed on the recording system before the start of the project and each time the cables were recovered/deployed where possible. On all occasions the equipment was proved to perform within the contract specifications. Any deviations in the performance was noted in the observer logs. Tests were carried out periodically, when down time or long line changes permitted, to confirm that the equipment was still within specification. The Monthly tests were carried out in accordance with the manufacturers recommended performance verification tests and included the following 24 tests .

MSX Performance Specifications for these tests are given here below:

File No.	Test Mode	Error limit	Data type	Apply low cut filter	DC Offset Removal	Test type	Result
1	T13	0.00%	Special Bit Pat.	No	No	Pattern, All ones	
2	T13	0.00%	Special Bit Pat.	No	No	Pattern, 50% ones	
3	T13	0.00%	Special Bit Pat.	No	No	Pattern, All zeros	
4	T13	<0.0001%	15.625Hz, 0 dB	No	No	Pattern	
5	T2	<0.0005%	15.625Hz, 0 dB	Yes	Yes	Dynamic Range	
6	T2	<0.0020%	15.625Hz, -10 dB	Yes	Yes	Dynamic Range	
7	T2	<0.0050%	15.625Hz, -20 dB	Yes	Yes	Dynamic Range	
8	T2	<0.0160%	15.625Hz, -30 dB	Yes	Yes	Dynamic Range	
9	T2	<0.0500%	15.625Hz, -40 dB	Yes	Yes	Dynamic Range	
10	T2	<0.1600%	15.625Hz, -50 dB	Yes	Yes	Dynamic Range	
11	T2	<0.5000%	15.625Hz, -60 dB	Yes	Yes	Dynamic Range	
12	T2	<1.6000%	15.625Hz, -70 dB	Yes	Yes	Dynamic Range	
13	T2	<5.0000%	15.625Hz, -80 dB	Yes	Yes	Dynamic Range	
14	T2	<20.000%	15.625Hz, -90 dB	Yes	Yes	Dynamic Range	
15	T2	<20.000%	15.625Hz, -100 dB	Yes	Yes	Dynamic Range	
16	T5	< 2.9uV	Special Bit Pat.	Yes	Yes	Cable Noise,50% ones	
17	T10	> 70 dB	15.625Hz, 0 dB	Yes	Yes	Cable Noise	
18	T11	> 60 dB	15.625Hz, 0 dB	Yes	Yes	Cable Noise*	
19	T12	> 60 dB	15.625Hz, 0 dB	Yes	Yes	Cable Noise*	
20	T6	7% ch-ch	Imp. 64 bit, 0.5ms	Yes	Yes	Impulse	
21	T7	7% ch-ch	Imp. 64 bit, 0.5ms	Yes	Yes	Impulse*	
22	T7	7% ch-ch	Imp. 64 bit, 0.5ms	4 Hz	Yes	Impulse*	
23	T0		Special bit Pat.	Yes	Yes	Cable noise*	
24	T4	>1560mV	Analog loopback	No	No	Cable noise, 2.048 V*	

Test mode description

T0	Normal Acquisition	T7	Analog Impulse, phones connected
T2	Analog loopback, phones simulated	T10	CMR (Common Mode Rejection)
T4	Analog loopback, phones connected	T11	Cable crossfeed, Odd pairs driven
T5	Preamplifier terminated	T12	Cable crossfeed, Even pairs driven
T6	Analog Impulse, phones simulated	T13	Digital loopback

* indicates that the test result is dependant on Ambient Noise



Daily tests were performed on appropriate line changes with good weather, or when down time allowed and consisted of a selection of tests from the standard monthly test suite as below;

- Pattern test
- System Dynamic Range test
- Equivalent input noise test
- Impulse test
- Harmonic distortion test
- Amplifier noise and DC offset

Equipment tests, calibration and set-up took place during mobilisation. These included:

MSX 24bit recording system	Acceptance test , parameter set-up
Streamer	Polarity check, offset and balance.
Digibirds	Battery check, function test .
Gun	Depth transducers checked
	Source separation
Inventory	Inventory checked for necessary levels of stationary, cartridges and consumables

6.2.4 Instrument equipment performance

Recording

The MSX recording system performed very well during this survey accumulating no downtime. A Semi-monthly Instrument test was performed Prior to the first Production Line proved the system to be operating well with-in manufacturers specifications. Daily Tests were performed when the consistent production pattern allowed.

Streamer

The streamer balance proved to be a good throughout the project.

Gun controller

The Hydrapulse 200X gun controller performed well throughout the survey. Incurring no downtime.

6.2.5 Downtime

Overall the prospect went extremely well from the instrument department point of view. Down time is as follows:

See Party Chiefs report for fuller statistical analysis.



6.3 SOURCE REPORT

6.3.1 Introduction

The main energy source was a single source, the array used was a Sodera G gun type with a working volume of 2860 cu. inch, with a working pressure of 2000 psi.

6.3.2 Source system

The gun array configuration consists of four sub arrays with a combination of nine or eight guns per sub array.

The source consists of 26 active Sodera G-guns plus 7 guns used as spares on the arrays. The sizes of the Sodera G-guns that are used on this vessel are: 40, 70, 100, 150, and 250 cu. inch.

See diagram for array configuration.

The sub arrays are towed from fixed booms.

The gun depths are monitored in the instrument room.

Source type	Sodera G-gun
Array volume	2860 cu.in.
Air pressure	2000
Number of sub arrays	4
Source depth	5 metres, +/- 0.5 meter
Source length	15 metres
Source separation outer - outer	27 metres
Source separation inner-outer	9 metres
Back deck to centre source	49.85 metres
Shot interval	18.75metres
Source controller	Hydrapulse 200X Minipulse
Source synchronisation	+/- 1 ms

6.3.3 Calibration and checks

All guns solenoid and timing sensor were checked before deployment.

A Click test was performed to verifying the gun positions correspond to the gun controller.

All 12 depth sensors were calibrated prior the start up of the project.

Depth rope was checked for correct source depth of 5.0 metres.

All near field Hydrophones were tap tested before deployment.

6.3.4 Source equipment performance

The Sodera G-gun performance was maintained at a high standard with constant monitoring in the instrument room. All sub arrays were recovered as required for inspection and maintenance. Relevant spare guns were enabled as required.

There are two gun mechanics per shift with one supervisor on call 24 hours per day.

The instrument room is constantly manned during production periods.

The performance of the Sodera G-guns during this project was very good, with only routine maintenance being under taken.

Gun controller performed well during the survey. Gun statistics were produced at the end of each line.

Near field signature were logged in the header together with gun synchronisation and depth data.

Air gun pressures were monitored in the gun shack and in the instrument room by the observers.

If spare guns were used, they were logged by the instrument room observers.



COMPRESSOR PERFORMANCE

The high-pressure air supply for the array source was produced by using the LMF high-pressure air compressor and 3 EK 30 compressors.

The air pressure is regulated by means of a Fisher control valve; the set pressure for this contract was 2000 psi. \pm 10.0 %.

During production periods the compressors temperatures and pressure are logged.

The LMF compressor and the EK 30 compressors in use performed well.

BACK DECK EQUIPMENT PERFORMANCE

The gun sub arrays are deployed and recovered using a combination of hydraulic winches, which are controlled by manual operating handles.

During deployment and recovery of the gun sub arrays three people are required.

The instrument room and the bridge are able to monitor and communicate with the gun deck by means of C.C.T.V and radio system.

The deck equipment performed well through out this project, and only routine maintenance was undertaken. Winches and hydraulic power pack performed well during the survey.

IN WATER EQUIPMENT PERFORMANCE

Generally all arrays towed very well during the survey. Source position was calculated using time measurements.

6.3.5 Downtime

No downtime was logged on this project.



6.4 SEISMIC PROCESSING REPORT

6.4.1 Introduction

This report concerns the Shelduck Seismic Survey, Bass Basin, Tasmania, - Permit T/18P exclusive 2D seismic survey 2001 (ORS01), project number 34834, for Origin Energy Resources Ltd. Approximately 425 km of 2D seismic data were acquired along 23 lines and QC controlled to verify that the data were acceptable for further processing. The 23 lines acquired made up a total of 20 full lines, 3 of which were acquired in more than one pass. Only two of these lines were recorded as NTBP. The survey area was entirely within Australian waters. The length of the full lines varied between 17-31 km. Water depths were less than 100 metres. Data were acquired between 4th and 9th June 2001.

Each line sequence was given a unique identifier and has its own Observers' Log. Failures to completely acquire a line in one attempt were related to weather conditions producing unacceptable swell noise levels and navigation failures. An example of line numbering is the following: ORS01-NNR, where ORS01 is the project name, NN is the line number, and R is the re-shoot code (A for the first reshoot, B for the second, etc).

The main priority of onboard processing was generation of a brute stack for every line. Brute stacks were used for quality control in identifying noise and acquisition related problems.

The seismic data were QC processed using Paradigm Geophysical "Focus/DISCO" UNIX workstation-based software. The data were read in from 3590 tapes, then reformatted from SEG-D to internal DISCO format. Noise analysis was carried out over a time window of 4.5 to 5.0 seconds (raw and filtered with a 6Hz filter applied), and the waterbreaks and nearfield auxiliary channels were inspected. Near trace profiles were generated. Velocities were picked every 1 km and used to create a stacked section, which was then archived in SEG-Y format onto 3590 tapes.



6.4.2 Operational Procedures

Acquisition Configuration

Number of streamers	1
Number of source arrays	1 X 4 strings, 2860 cu.inch
Number of CMP lines per sail pass	1
Shot interval	18.75 m
Number of channels per streamer	368
Receiver group spacing	12.5 m
In-line spacing of CMP's	6.25 m
Fold per bin of subsurface coverage	122
Recording length	5 sec.
Sample interval	2 ms
LC recording filter	4 Hz, 18 dB/octave
HC recording filter	206 Hz, 264 dB/octave
Nominal Source depth	5 m
Nominal Streamer depth	7.5 m (line seq#: 01-20, 22-23) 10 m (line seq#: 21)
Theoretical near offset	150 m

In addition to the configuration described previously, four hydrophones were situated in the cable sections. The first of them is located in the first section with 86 meters distance from the first group. The following hydrophones are situated 200 metres to each other. These are intended for calculation of the water breaks, and were stored on tapes as channel set number 2. Figure 2.1 shows a MSX streamer cable configuration.

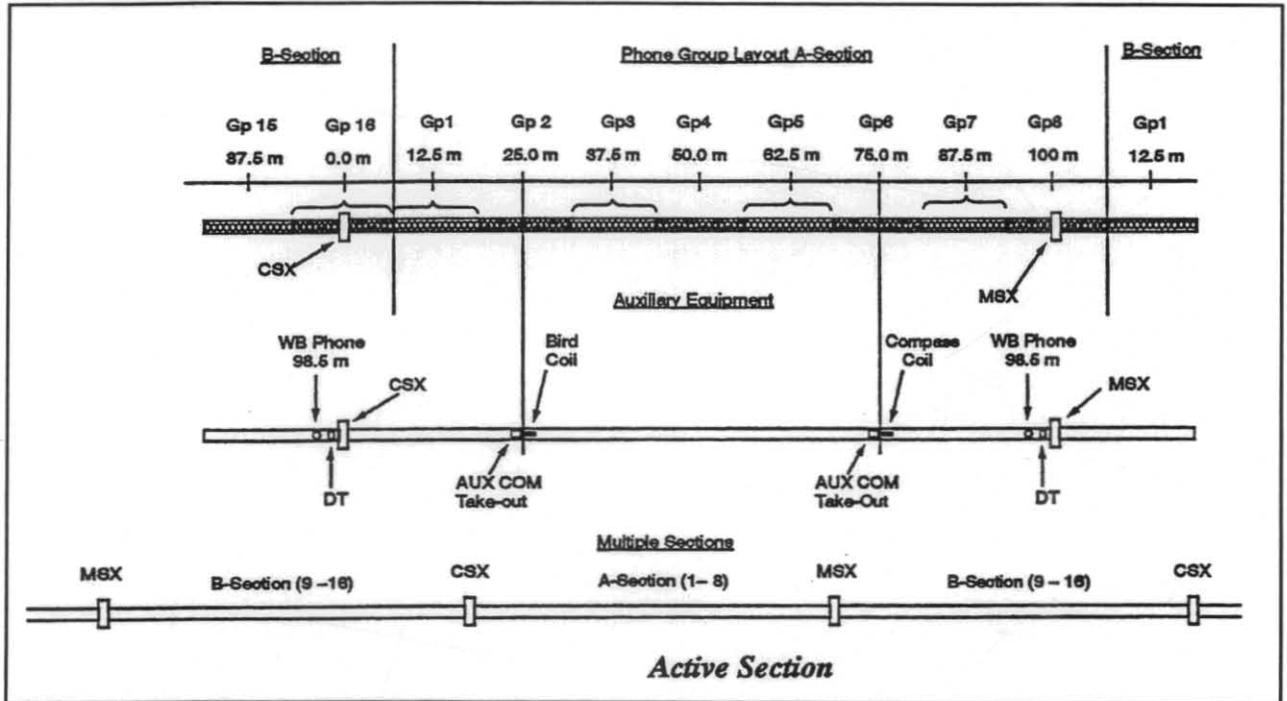


Figure 2.1: MSX streamer cable configuration

Near Field hydrophones (16 auxiliary channels, channel sets 3 to 18) were located on all airguns in the array, and used to check airgun performance and to monitor misfires, auto-fires and air leaks.

Figure 2.2 shows a simplified view of the towing configuration used during the survey

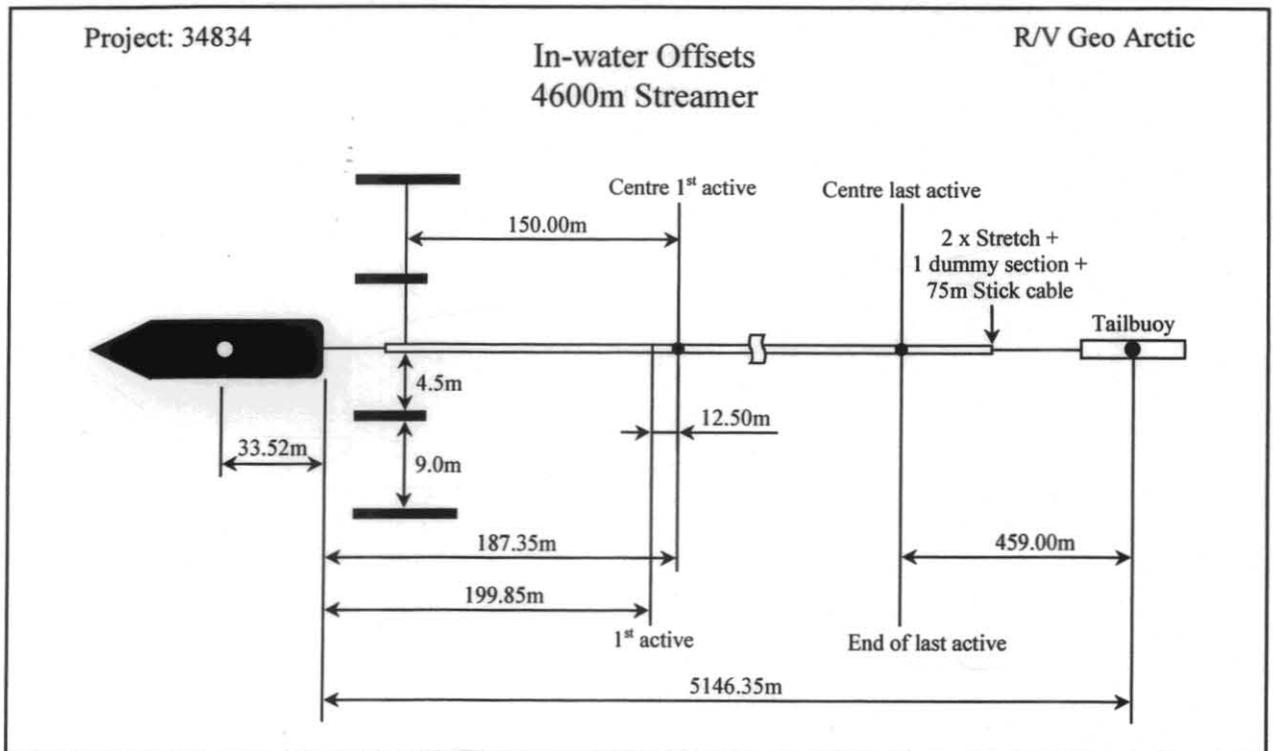


Figure 2.2: A simplified diagram of the towing configuration used for the survey. Configuration is theoretical in terms of all offsets.



Processing Sequence

The main QC-priority was generation of a brute stack for every line, its main use being the identification of noise and acquisition related problems. It should not be used as a substitute for a final product.

RMS amplitude analysis was performed over a noise window between 4500-5000 ms. The intention of this is to give a picture of the ambient noise level as real signals are expected to be negligible at such a time. The noise files generated at both ends of each line were used to assist interpretation. In addition a real-time near trace stack for every line was produced. This is useful for identifying the amount of swell noise and ship noise in the data. Thorough shot examination was performed for the same reasons. Waterbreaks were viewed to check the near offset for each line, and the auxiliary channels were also examined. These are useful for identifying gun auto-fires and errors in timing.

After generation of a brute stack with a single velocity for the entire line, velocities were picked every 1 km. A velocity brute stack was then produced and archived in SEGY format.

The basic processing sequence was as follows:

1. Reformat from SEG-D to internal Disco format:

Resampling from 2 to 4 ms.

2. View Waterbreak Channels (chset 2):

QC the waterbreak channels to make sure the near offset remains correct and constant.

3. View Auxillary Channels (chsets 3-18, gun hydrophones):

View the auxilliary channels to check the gun signatures, enabling airleaks and autofires to be spotted as well as the checking of Observer's Logs for when different guns are turned on and off.

4. View Shotgathers:

View every 200th shot to evaluate the data quality.

5. Excel noiseplots:

Plot unfiltered and 6 Hz, 12 dB/oct low-cut filtered RMS noise graphs for all traces averaged over the whole line (in microbars) using Microsoft® Excel™, from a noise window taken over 4500-5000 ms.



6. Scaled RMS plots:

Create plots showing the average noise for all traces for every shot in microbars (using a noise window over 4500-5000 ms) for both the raw shots and shots with a low-cut filter of 6 Hz, 12dB/oct applied.

7. Near Trace Plot:

A near trace plot is produced real-time.

8. Velocity Analysis:

Pick velocities every 1 kilometre.

9. Velocity Stack plot:

Spherical divergence gain recovery using t^0 , v^2 . Normal moveout correction using the picked velocities and front end muting using 20% stretch muting and a defined mute. Normalised stacking using 122 fold, followed by a datum shift to correct for source and cable depths, and muting above the waterbottom.

Generate velocity stack in SEG-Y format.

QC envelopes were filed in sequential order and put in a box available for inspection by the Client Representative in the Processing room. Processed data were backed up on 3590 tapes when QC was finished and thereafter removed from the system.

QC Products

QC data processing was undertaken to ensure that data recorded were of the highest possible quality. This was achieved by analysis of shot records from each line, producing plots of data and displays of stacked sections. In particular the following products were produced.

- Near trace plot in paper format only
- RMS amplitude - noise plots (raw and 6 Hz, 12 dB/oct low-cut filtered)
- RMS amplitude - noise graph averaged over entire line, (raw and 6 Hz, 12 dB/oct low-cut filtered)
- QC-processing history sheet
- Velocity stacks in paper and SEG-Y format
- Velocities as text files.

6.4.3 Summary

Partitioning of lines.

Each line sequence was given a unique identifier and has its own Observers' Log. Data were processed as acquired. Failure to completely acquire a line in one attempt was related to a combination of problems. These were due to inclement weather creating unacceptable noise levels on the data and navigation problems. A spreadsheet with information about line numbers, sequences, and partitioning is given in the Appendix.



Comments

Data acceptability was decided by the Client Representative onboard, after consideration of all the QC products and Observers Logs and records.

The principal scheme of online processing system used on board R/V "Geo Arctic" in the ORS01 survey is shown on Diagram (Figure A).

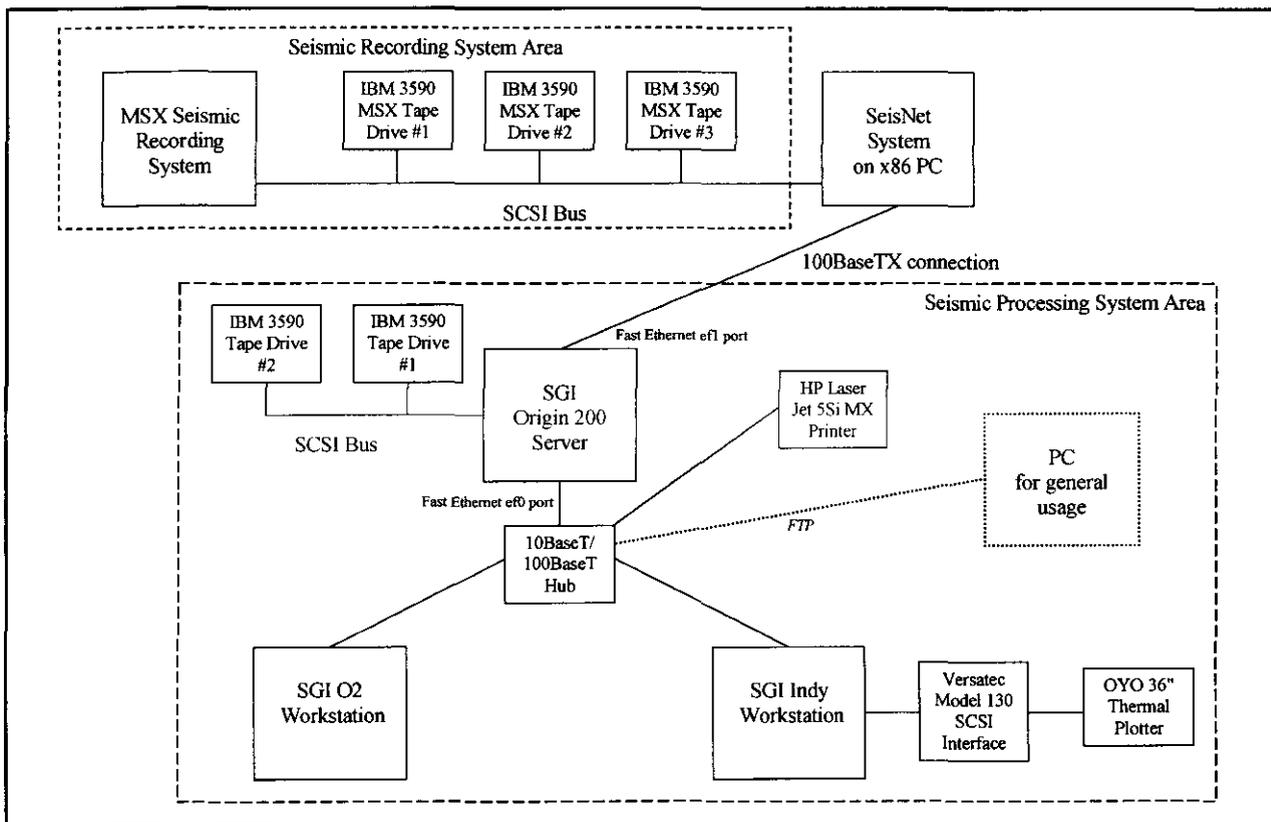


Figure A: The principal scheme of online processing system



6.5 POSITION PROCESSING REPORT

6.5.1 Introduction

The vessel mobilised at sea for the survey on the 04/06/01. Parameter setup in StarfixSeis for seq 001-004 reflected the nominal offsets as proposed for the Survey. After first break analysis minimum offset was determined to be 150m, nominal offset previously entered was 143m. The offsets were adjusted in StarfixSeis to reflect the true minimum offset. These changes were in effect for seq 005 onwards. Seq 001-004 were reprocessed with correct offsets so that the P190 reflects the correct offsets.

An extra 100m active streamer section was added to the streamer prior to the first seq, making the actual active streamer length 4600m, 368 groups. This was not contractual however the MSX recording system needs to operate with an even number of sections. The extra section also helps to dampen tugging noise on the tail.

In the P294 setup the extra section has been treated as a dummy section and active streamer length referred to as 4500m. P190's were made with 360 groups

On seq 021 – 022 after a reboot of the online navigation system, an incorrect parameter file was loaded for P294 logging. The parameters were corrected during nav processing on QCpro, the resultant P190 was computed with correct offsets.

6.5.2 Processing method

Processing was done on QCPro software. Online P294 was imported from StarfixSeis, Some light filtering of compass, echo sounder and Gps was done on the QCPro software and a final P190 made.

6.5.3 Data observation quality

Compass calibration

No dynamic compass calcs were done. Any compass showing a noticeable bias was set passive and changed at first available opportunity.

Compass data was generally quite good. Streamer rotations onto the active tailbouy were in close agreement, rotation were generally in the region of 0.2°

GPS

Both differential GPS systems Spot and MN8 showed good agreement. Spotbeam was used as the Primary navigation system

Tailbouy

Although not used in the streamer shape calculations, tailbouy position was used in QCpro in the process routine to compute streamer stretch. The Seatex active tailbouy performed very well throughout the survey with only one small period of dropout on seq 002

Gyro

Two gyros were in use on the vessel the primary Gyro a C.Plath is situated in the instrument room and interfaced via a Lekmkuuhl digital gyro repeater, and an SG. Brown 1000B which is situated on the bridge and interfaced directly into Starfix.

Both Gyro's were recorded in the P294.

D/t the filtering setup in QCpro which groups gyro data into an observation data category. Some filtering of gyro data was done. Filter values were kept to a minimum however. Both Gyro's performed well during the survey.

**Echosounder**

Three echosounder transducers were recorded during the survey Simrad EA500 12 & 27kHz and the Atlas Deso 210kHz. All 3 were written to the P294 file. Generally the Simrad EA500 12 kHz transducer was used as the primary. Water depths throughout the survey were fairly constant between 70-80m.



6.6 MAGNETIC AND GRAVITY REPORT

Gravity and Magnetics data were recorded by the onboard LCT but this was not part of the specification and only done in case the client changed their mind about interest in this data.

6.7 FISHERY REPORT

All fishery departments and associations were informed of the project activities well in advance. No fishing vessel of any kind were sighted during the period of the project.



7 VESSEL SPECIFICATION

7.1. VESSEL GENERAL

Name	R/V Geo Arctic
Owner	Amige SE, Murmansk
Operator	Amige SE, Murmansk
Type	2D Seismic survey vessel
Port of Registration	Murmansk
Flag	Russian
Class	KM ULI A2
Class registration no.:	M-42019
Call Sign	UGXK
IMO no.	8409018
MMSI	273458600
Year Built/Rebuilt	1988 Polen / 1997 Norway
Length overall	81.85 m
Breadth	14.8 m
Draught, loaded	5.23 m
Tonnage	3225 T, 967 Net T
Cruising Speed	Max 14.5 knot, cruising 12.5 knot
Operation Range	60 days cruising, NM
Endurance seismic	60 days
Main Engine	Zgoda-Zulcer, Type 6ZL 40/48, 4200 HP,(3090 Kw)
Gearbox	Zamech MA90-10, ratio 505/222,6
Propulsion	Zamen, Controllable pitch. LN 13 NM, 4 blade Stainless steel,
Rudder	Traditionally
Steering gear	Zamech
Azimuth thruster	N/A
Bow Thruster	Brunvoll FU-45-LTC-1225, electrical, 600 HP / 441 Kw
Main engine monitoring	Polen
Electrical Power	Total power 2200 Kw Voltage: 3 x 380 (220) VAC, 50 Hz. Shaft generator, 1 x 1200 Kw Generator 2 x 500 Kw
Emergency generator:	217 PMA-39H6. 121 Kw
Clean power:	Rotation generators and several small UPS.
Fuel capacity	1000 m ³
Fuel consumption	Sailing 12.8 t, working 8.4 t, in port 2.8 t
Fresh water capacity	200 ton
Fresh water generator:	VY 125 AD. 7 ton full speed.
Fresh water generator	10 ton full speed, 1 ton in port
Sewage treatment plant	LK-30(2)
Incinerator	Yes
Black water	9,9 m ³
Grey water	N/A
Bilge water	12,0 m ³
Sludge	12,0 m ³
Waste water	3,2 m ³
Lub oil	26,2 m ³
Dirty oil	11,7 m ³



Stabilising system	N/A
Deck Machinery	
Crane	4 ton, 12.5 m max., 2.5 m min. 1 x 1 ton provisions crane front deck 1 x 1 ton folding crane, top aft deck
A-frame	N/A
Winch	2 x Streamer, 6000m aft reel, 3000m fwd reel. Spare streamer, 2 x 2000m Gravity / FF Magnetometer
Paravane	N/A
Gate valve	N/A
Hydraulic power pack:	Hydrakraft A/S. 2 x 45 Kw. 2 x 130 l/min. 220 Bar.
Accommodation	Single cabins 17 + 2 hospital Double cabins 18 Total capacity 55 persons
Galley stores:	2 x Deep freeze 16,2 and 12,2 m ³ 2 x Cool room 14,1 and 21 m ³ 1 x Dry store 28,5 m ³ 1 x Vegetable 13,5 m ³
Mess:	Seating capacity: 31 Size 42 m ²
Day room:	2 x Smoking / Non-smoking 17,2 m ² and 15,9 m ²
Exercise room	20,7 m ²
Air condition:	Tropical
Helicopter landing zone:	Superpuma 9.8 ton

7.2. VESSEL NAVIGATION AIDS

Auto Pilot	Polish (TS-75)
GPS	Furuno GP50 MK II
Radar no.: 1	1 x Kelvin Hughes; 6000, Nucleus 2, ARPA, 10 cm
Radar no.: 2	1 x Nayada-5, Russian 3cm
Gyro no.: 1	1 x Plath, Navigat II with Lehmkuhl LR40 gyro repeater.
Gyro no.: 2	1 x SG Brown Meridian
Speedlog	1 x Atlas Dolog 1 x IEL-2M (Russian)
VHF direction finder	N/A
Wind sensor	Aanderaa 3017 Speed, direction and temperature
Nav. Echo Sounder	GEL-3
Electronic chart:	N/A
Navtex	Furuno NX-500
Weather fax	None



7.3. VESSEL COMMUNICATION AIDS

GMDSS	A1, A2 and A3 Sailor VHF & VHF
Satellite Fixed line:	Telenor Sealink Light. NorSat. Phone, modem and fax.
Inmarsat	Saturn B, Phone, high speed data modem; 64 KB and fax
GSM	2 x Phone,
WAN	Data modem
M/F, H/F	Skanti TRP 7201
VHF stationary	Skanti VHF 3000
	Sailor VHF RT2047D
	Sailor VHF RM2042. (GMDSS)
VHF portable	3 x Tron VHF
UHF portable	3 x Headcom
UHF helicopter communication	Jotron TR-7510
Non-directional beacon	AS Telesupply TS-20B
Watchkeeper	Sailor GMDSS A3
Internal communication	Stationary all rooms.
Telephone numbers	
GSM Bridge	+ 47 9076 4256
NMT Bridge	+ 47 9419 8081
Inmarsat FGAS	+ 871/873 3273 18612
Inmarsat Bridge	+ 871/873 3273 18610
Inmarsat Client	+ 871/873 3273 18611
NorSat FGAS	+ 47 22134789 Tel/Fax
NorSat Bridge	+ 47 22134791 Tel/Fax
NorSat Vessel	N/A
NorSat Client	N/A
Fax numbers	
Inmarsat	+ 871/873 3273 18613
Norsat	+ 47 2213 4789

**7.4. VESSEL SAFETY**

Safety manning level:	55 persons
Covered lifeboat:	Totally enclosed 8.5m, fire protected, model JY-QFN-8.5, seats up to 65 persons
Rescue /MOB Boat	Lifeboat used for MOB
Work boat	Norpower 22ft, 7m open boat
Inflatable Life Rafts	9 x 10 persons
Man overboard Liferaft	2 x 6 person life raft
Survival Suits	100 %
Life Jackets	100 %
Life rings	8
Smoke hoods	100 %
Work vest	4 x Crewsaver
Emergency radios	Sailor GMDSS A3
Emergency beacons	1 x McMurdo E3 EPIRB
Radar transponders	2 x Jotron TronSart
Fire detector system:	INCO UCPP-20
Fire pumps	1 x 100 t Electrical driven 1 x 40 t, Electrical driven
Fire suits	3
Halon systems	Engine room
CO2 systems	Compressor room and streamer store
Foam systems	Streamer deck.



8 EQUIPMENT SPECIFICATION

8.1 SEISMIC RECORDING INSTRUMENT

Type	Input / Output, MSX, 24 bit system
Number of Channels	720 ch. max
Number of waterbreaks	4 channels
Number of auxiliary	16 channels
Sample Rate	1, 2 and 4 ms
Filters	Low cut, high cut
Low Cut	Out, 2 Hz, 6dB/octave 2 Hz, 12 dB/octave 4 Hz, 12 dB/octave 6 Hz, 12 dB/octave 8 Hz, 18 dB/octave
High Cut	1 mS: 412 Hz, 264 dB/octave 2 mS: 206 Hz, 264 dB/octave 4 mS: 103 Hz, 264 dB/octave
Tape Format	SEG-D
Recording Medium	4 x IBM Magstar 3590
QC System	All QC data, QC plots - AGC or fixed gain; harmonic distortion analyses; noise analyses; spectral analysis; Oyo GS 624-2
On-line Display	
Processing	
Hardware	Silicon Graphics Origin 200 with dual MIPS 10000 64 bit processor SCSI Raid disc controller rack with 40 GB capacity (160 GB) Oyo 36" thermal plotter , I/O 8MB/sec Paradigm Disco/Focus v. 4.1
Software	
Capacity	
Tape drives	2 x Magstar IBM 3590 tape drive
Data compression software	N/A

8.2 STREAMER

Type	Input / Output, MSX digital
Max. length	9000 m
Max. outer separation	N/A
Available Group interval	12.5 / 25 m
Section length	99.5 m
Group pr. Section	8
Hydrophone type	Input / Output, Preseis WM1-018B
No. of Hydrophones /Group	14 hydrophones (2.5 m), tapered array, centre weighted. 29 % overlap, total group length 17.55 m
Streamer diameter	63.5 mm
Streamer sensitivity	14 V/Bar
Fault locator	Input / Output
Depth Controller / Compass	Digicourse 5010/5011
Acoustic	N/A
Cable oil clean:	2250 + 960 ltr.
Cable oil dirty:	1.920 ltr.



8.3 ENERGY SOURCE

Type	Sodera G-gun
Size of guns:	40, 70, 100, 150, and 250 cu. Inch.
Max volume:	3660 Cu inch.
Max output. 5 m depth. 0-128 Hz:	3660: 103,3 Barm
Number of Sub. Arrays	4
Configuration:	Single source
Tow width	30 m
Firing control	Hydrapulse 200X
QC	Hydrapulse
Depth transducers	4 x 2
Tow system:	Norwegian buoys
Offset	144m with 6000m streamer. 250m with 9000m streamer
Compressor	1 x LMF, 1100 SCFM 4 x EKA, each 390 SCFM
Compressor capacity	2660 SCFM
Pressure:	2000 PSI

8.4 NAVIGATION EQUIPMENT

On-line Navigation System	Starfix.Seis. (Fugro system)
Primary Navigation	MRDGPS, No differential corrections
GPS receiver	Trimble 4000DS 9 channels nav ver. 7.28
Secondary navigation	GPS / GLONASS
GPS receiver:	Ashtek GG24
Tail buoy tracking	Geotrack RGPS (Fugro) and radar.
Gun array tracking:	N/A
Acoustic	N/A
Laser	N/A
VRU:	Seatex MRU-6
Navigation processing	N/A
Binning	N/A
Multi beam echosounder	N/A
Echosounder	Simrad EA500
Echosounder transducer	12 / 27 khz Maximum range 6000 meter
Streamer Control	Digicourse 5011 Compass
Speed log:	Atlas Dolog, not interfaced to nav system.
CTD probe	Valeport Model 600 Mk3 CTD probe
SVP probe	N/A
Water level recorder	N/A

8.5 GRAVITY / MAGNETICS

Gravity Meter Type	L & R Model S Marine Gravity Meter. Serial No S-65 with ZLS upgrade and Unison DAS.
Magnetometer	Elsac Console

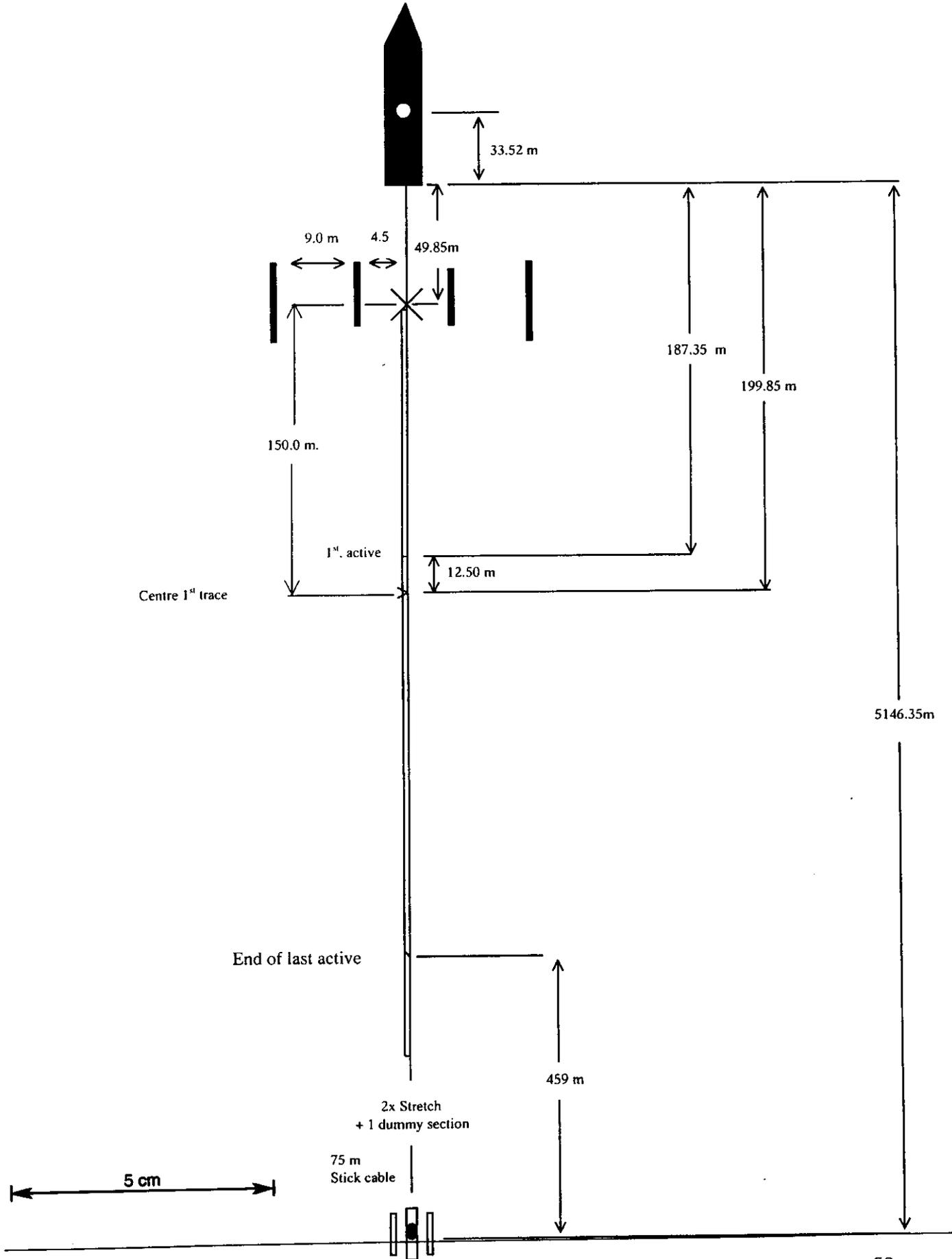


9 DRAWINGS

9.1 OFFSET DIAGRAM



Inwater Offset for Origin Energy Resources Ltd M.V. Geo Arctic 4600m Streamer, 18.75 m Shots

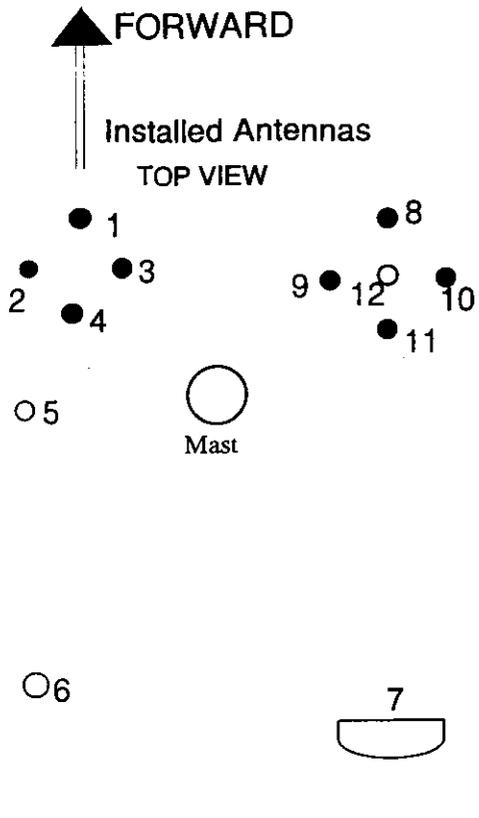




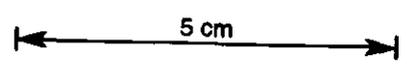
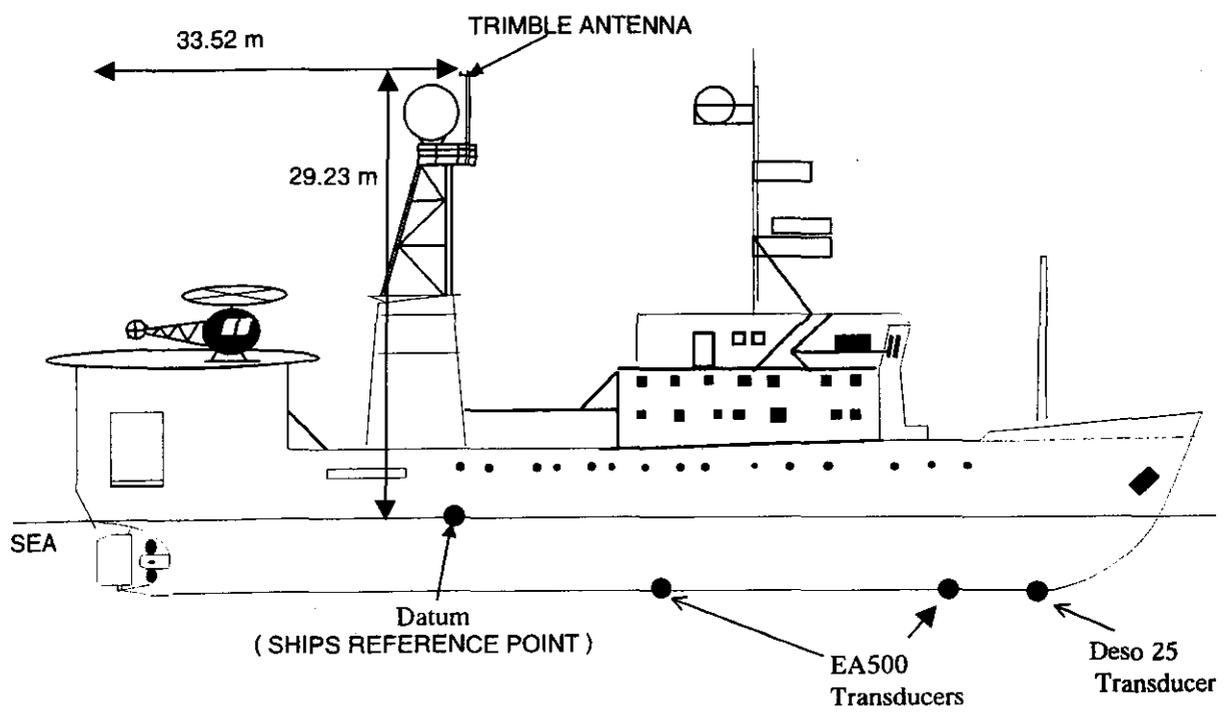
9.2 VESSEL OFFSET

R/V Geo Arctic. (updated 27 April 2001)

ANTENNA OFFSET



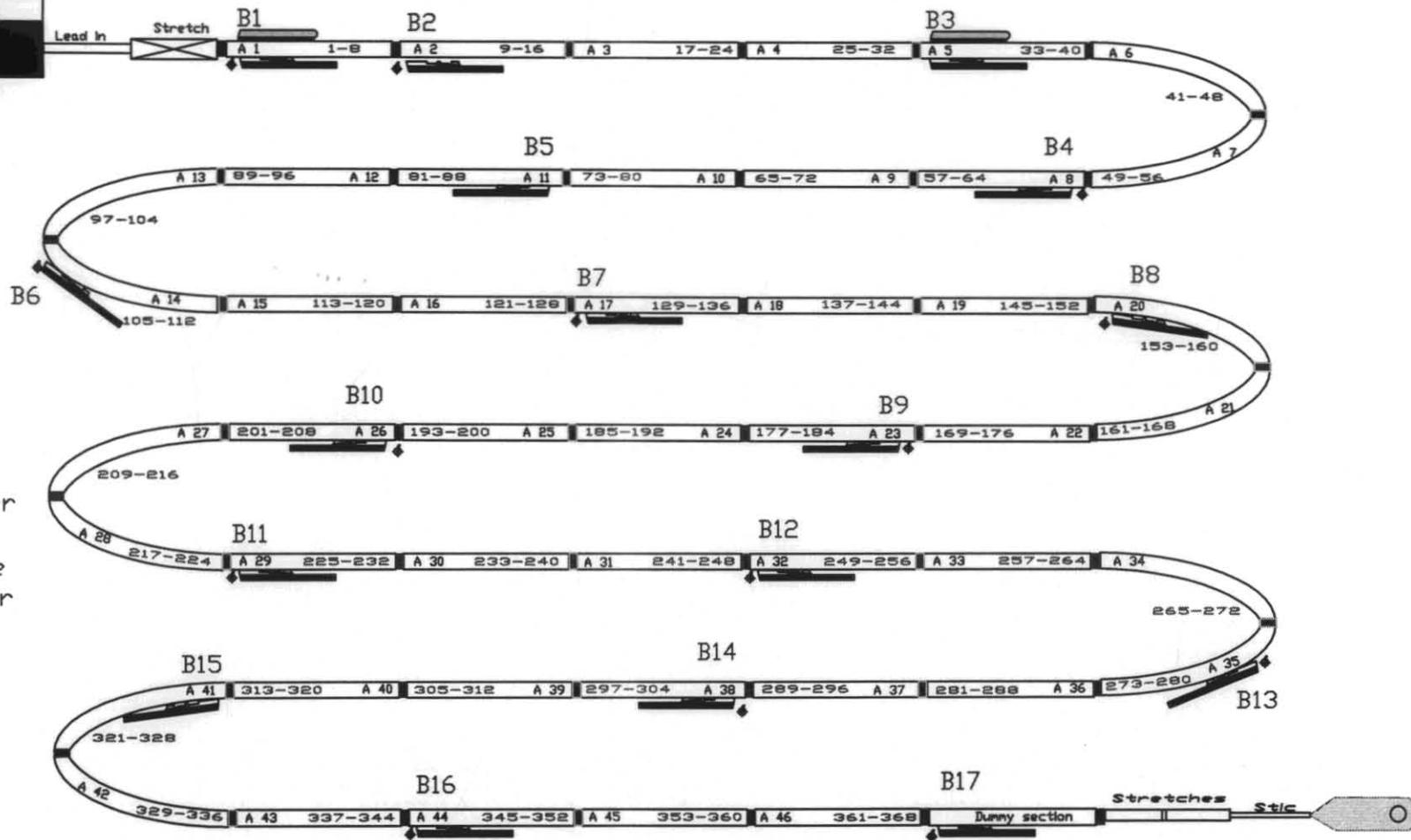
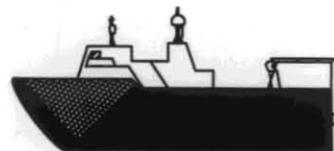
	X m	Y m	Z m
Datum. Mast S/L	0.0	0.0	0.0
Mid. stern	0.0	-33.52	0.0
EA500 27 kHz tran	-1.21	18.53	-4.97
EA500 12 kHz tran	-0.64	31.61	-4.98
Deso 25 transducer	0.01	35.73	-4.99
Survey Gyro	-2.4	9.60	1.0
1 Primary Trimble	-1.51	1.07	29.23
2 Secondary Trimble	-1.86	0.72	29.23
3 Spare Trimble	-1.16	0.72	29.23
4 Glonass	-1.51	0.37	29.23
5 VHF antenna			
6 Seatrack Wipe ant.			
7 Seatrack Panel ant.			
8 Norsat GPS	1.51	1.07	29.23
9 Spotbeam	1.16	0.72	29.23
10	1.86	0.72	29.23
11 Spotbeam	1.51	0.37	29.23
12	1.51	0.72	n/a





9.3 STREAMER CONFIGURATION

M/V GEO ARCTIC



- Depth controller with compass
- Recovery device
- Depth controller
- MSX MODULE
- CSX MODULE
- HSX MODULE
- TSX MODULE
- 480 Trace Numbers

5 cm

FUGRO GEOTEAM AS
 Job No. 34834
 Client : Origin Energy Resources Ltd.
 AREA: Bass Basin Tasmania - Shelduck - Permit T/18P.

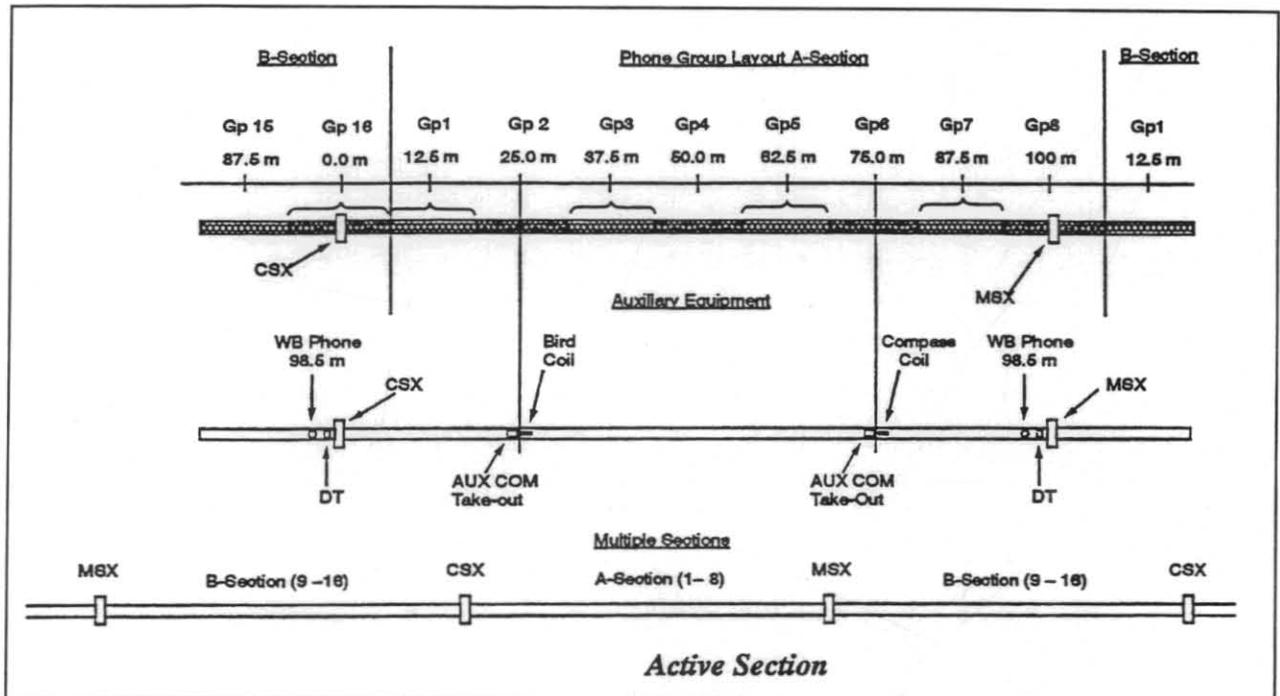
STREAMER.DWG

638028

GEOTEAM



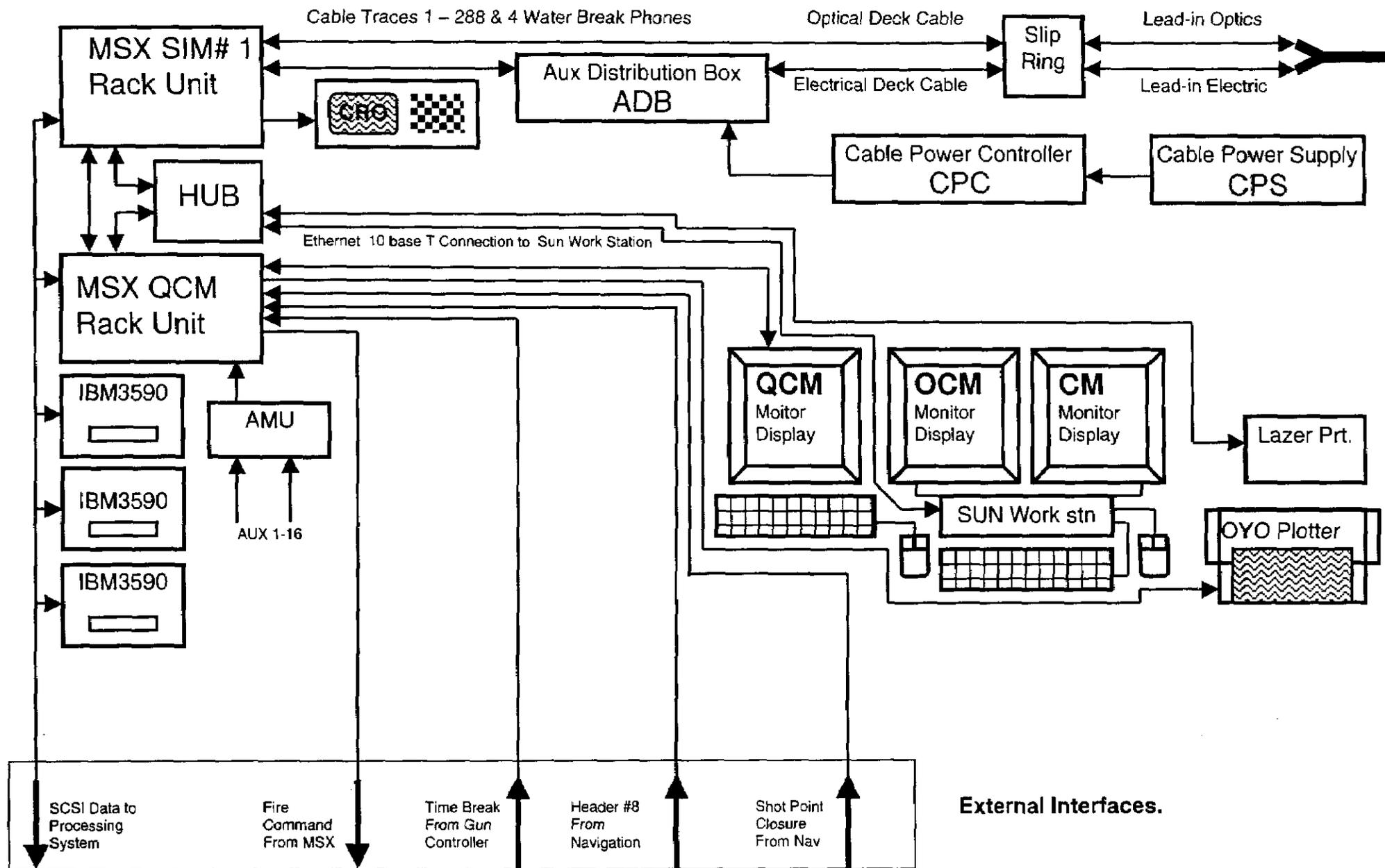
9.4 HYDROPHONE GROUP CONFIGURATION





9.5 INSTRUMENTATION LAYOUT

Fig 1. MSX System Overview

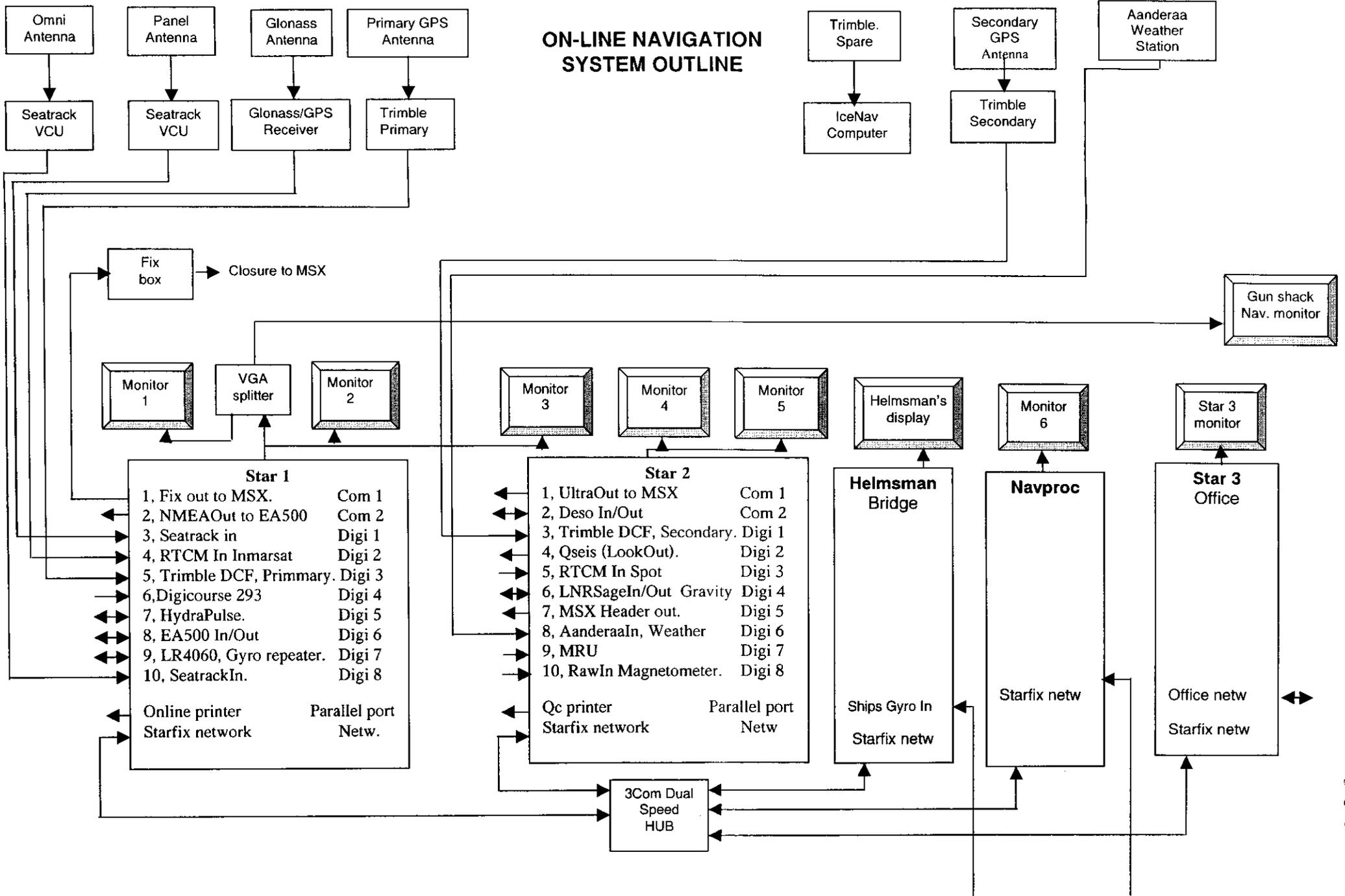


External Interfaces.



9.6 NAVIGATION LAYOUT

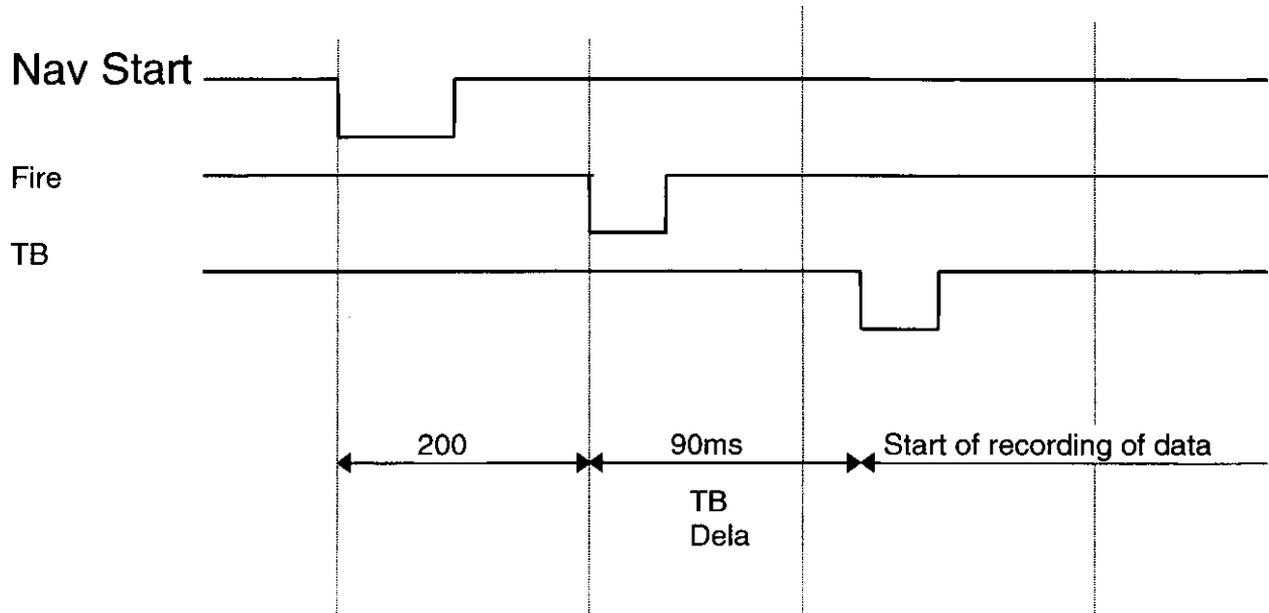
ON-LINE NAVIGATION SYSTEM OUTLINE





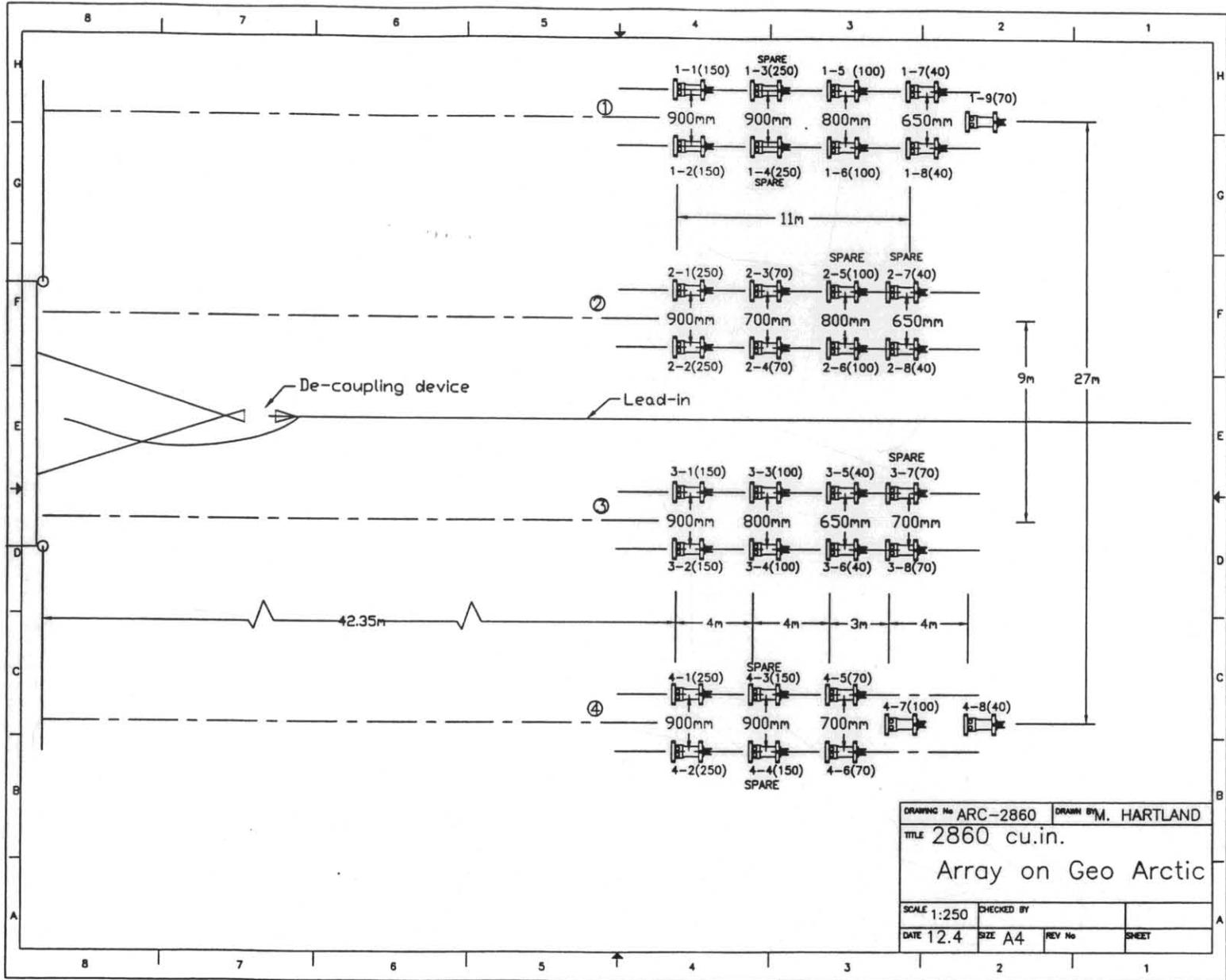
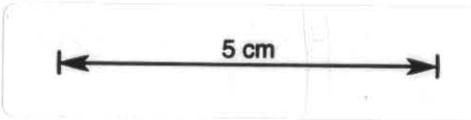
9.7 SYSTEM TIMING

External Interface Timing





9.8 SOURCE LAYOUT



DRAWING No	ARC-2860	DRAWN BY	M. HARTLAND
TITLE	2860 cu.in. Array on Geo Arctic		
SCALE	1:250	CHECKED BY	
DATE	12.4	SIZE	A4
		REV No	
		SHEET	

GEOTEAM**1. DAILY LOGS**

Time Zone: UTC + 10 hours

04 June 2001

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
00:00	07:00	Yes	7.00	Mob / Demob	Transit to cable deployment area
07:00	11:45	Yes	4.75	Mob / Demob	Deploy 4.7km cable and trim balance.
11:45	12:29	Yes	0.73	Mob / Demob	Deploy guns.
12:29	14:02	Yes	1.55	Mob / Demob	Approach first line and soft start guns.
14:02	16:23	Yes	2.35	Production - 2D	ORS01-03 sp 1000-2091 completed.
16:23	18:23	Yes	2.00	Line change	
18:23	18:36	Yes	0.22	Extended line	
18:36	20:02	Yes	1.43	Production - 2D	ORS01-13 sp 2707-2033 aborted
20:02	23:57	No	3.92	Navigation	Circle due to navigation crash
23:57	23:59	No	0.05	Navigation	ORS01-13A 2163-2143 overlap

05 June 2001

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
00:00	00:14	No	0.23	Navigation	ORS01-13A sp 2142-2033 Overlap
00:14	02:41	Yes	2.45	Production - 2D	ORS01-13A sp 2032-869 Completed.
02:41	04:41	Yes	2.00	Line change	Nominal line turn
04:41	05:13	Yes	0.53	Extended line	
05:13	08:24	Yes	3.18	Production - 2D	ORS01-12 sp1000-2518 Completed
08:24	10:24	Yes	2.00	Line change	
10:24	10:43	Yes	0.32	Extended line	
10:43	12:43	Yes	2.00	Production - 2D	ORS01-10 sp1828-870 Completed.
12:43	14:36	Yes	1.88	Line change	
14:36	16:41	Yes	2.08	Production - 2D	ORS01-08 sp1000-1986 Completed.
16:41	18:12	Yes	1.52	Line change	
18:12	20:38	Yes	2.43	Production - 2D	ORS01-04 sp2014-870 Completed.
20:38	22:19	Yes	1.68	Line change	
22:19	23:59	Yes	1.68	Production - 2D	ORS01-02 sp 1000-1783 continues.
23:59	23:59	Yes	0.00	Production - 2D	Midnight sp 1783

06 June 2001

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
00:00	00:46	Yes	0.77	Production - 2D	ORS01-02 sp 1784-2144 completed.
00:46	02:21	Yes	1.58	Line change	
02:21	04:18	Yes	1.95	Production - 2D	ORS01-01 sp 1802-870 completed.
04:18	06:18	Yes	2.00	Line change	
06:18	06:33	Yes	0.25	Extended line	
06:33	08:39	Yes	2.10	Production - 2D	ORS01-05 sp 1000-1984 completed.
08:39	10:39	Yes	2.00	Line change	
10:39	11:07	Yes	0.47	Extended line	
11:07	13:03	Yes	1.93	Production - 2D	ORS01-09 sp 1984-1801 completed.
13:03	15:03	Yes	2.00	Line change	
15:03	15:12	Yes	0.15	Extended line	
15:12	17:15	Yes	2.05	Production - 2D	ORS01-07 sp 1000-1985 completed.
17:15	19:08	Yes	1.88	Line change	
19:08	21:00	Yes	1.87	Production - 2D	ORS01-11 sp 1748-870 completed.

GEOTEAM**06 June 2001**

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
21:00	23:00	Yes	2.00	Line change	
23:00	23:58	Yes	0.97	Extended line	
23:58	23:59	Yes	0.03	Production - 2D	ORS01-17 sp 1000-1014 continues.
23:59	23:59	Yes	0.00	Production - 2D	Midnight sp 1014

07 June 2001

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
00:00	02:45	Yes	2.75	Production - 2D	ORS01-17 sp 1015-2331 Completed.
02:45	04:45	Yes	2.00	Line change	
04:45	05:40	Yes	0.92	Extended line	
05:40	07:38	Yes	1.97	Production - 2D	ORS01-18 sp 1802-870 Completed
07:38	09:38	Yes	2.00	Line change	
09:38	09:49	Yes	0.18	Extended line	
09:49	12:26	Yes	2.62	Production - 2D	ORS01-19 sp 1000-2250 Completed.
12:26	14:26	Yes	2.00	Line change	
14:26	15:48	Yes	1.37	Extended line	
15:48	17:46	Yes	1.97	Production - 2D	ORS01-20 sp 1800-870 Completed.
17:46	19:46	Yes	2.00	Line change	
19:46	20:43	Yes	0.95	Extended line	
20:43	22:43	Yes	2.00	Production - 2D	ORS01-16 sp 1801-870 Completed.
22:43	23:59	Yes	1.28	Line change	

08 June 2001

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
00:00	00:42	Yes	0.70	Line change	
00:42	03:14	Yes	2.53	Weather	ORS01-15 sp 1000-2198 Rejected.due to swell
03:14	06:37	Yes	3.38	Weather	Line turn
06:37	06:47	Yes	0.17	Weather	ORS01-06 sp 1000-1077 Aborted due to swell
06:47	14:41	Yes	7.90	Weather	Steaming north during bad weather.
14:41	17:16	Yes	2.58	Production - 2D	ORS01-15A sp 1000-2198 Completed.
17:16	19:16	Yes	2.00	Line change	
19:16	19:57	Yes	0.68	Extended line	
19:57	22:00	Yes	2.05	Production - 2D	ORS01-06A sp 1000-1984 Completed.
22:00	23:59	Yes	2.00	Line change	

09 June 2001

<u>Start</u>	<u>End</u>	<u>Charge</u>	<u>Hrs</u>	<u>Activity</u>	<u>Details</u>
00:00	01:43	Yes	1.72	Extended line	
01:43	05:15	Yes	3.53	Production - 2D	ORS01-14 sp 2548-1000 completed.
05:15	06:06	Yes	0.85	Mob / Demob	Start recovery of guns.
06:06	06:22	Yes	0.27	Mob / Demob	Helicopter on deck to take off Client Rep.
06:22	07:00	Yes	0.63	Mob / Demob	Recover all guns.
07:00	12:45	Yes	5.75	Mob / Demob	Recover cable.
12:45	23:59	Yes	11.25	Mob / Demob	Transit NW back to Otway/Sorell Basin area.



2. LINE SUMMARY

Production											
<u>Date</u>	<u>Seq.</u>	<u>Line</u>	<u>Dir</u>	<u>Type</u>	<u>FSP</u>	<u>FCSP</u>	<u>LCSP</u>	<u>LSP</u>	<u>Charge</u>	<u>No Charge</u>	<u>Status</u>
04/06/01	1	ORS01 03	56	2D	1000	1000	2091	2091	20.4750	0.0000	COMPLETED
04/06/01	2	ORS01 13	217	2D	2707	2707	2033	2022	12.6563	0.2063	Aborted
04/06/01	3	ORS01 13A	217	2D	2163	0	0	2143	0.0000	0.3750	Midnight SP
05/06/01	3	ORS01 13a	217	2D	2144	2032	869	869	21.8250	2.1000	COMPLETED
05/06/01	4	ORS01 12	54	2D	1000	1000	2518	2518	28.4812	0.0000	COMPLETED
05/06/01	5	ORS01 10	233	2D	1828	1828	870	870	17.9812	0.0000	COMPLETED
05/06/01	6	ORS01 08	56	2D	1000	1000	1986	1986	18.5063	0.0000	COMPLETED
05/06/01	7	ORS01 04	236	2D	2014	2014	870	870	21.4688	0.0000	COMPLETED
05/06/01	8	ORS01 02	56	2D	1000	1000	1783	1783	14.7000	0.0000	Midnight SP
06/06/01	8	ORS01 02	56	2D	1784	1784	2144	2144	6.7687	0.0000	COMPLETED
06/06/01	9	ORS01 01	235	2D	1802	1802	870	870	17.4937	0.0000	COMPLETED
06/06/01	10	ORS01 05	55	2D	1000	1000	1984	1984	18.4688	0.0000	COMPLETED
06/06/01	11	ORS01 09	235	2D	1801	1801	870	870	17.4750	0.0000	COMPLETED
06/06/01	12	ORS01 07	56	2D	1000	1000	1985	1985	18.4875	0.0000	COMPLETED
06/06/01	13	ORS01 11	234	2D	1748	1748	870	870	16.4812	0.0000	COMPLETED
06/06/01	14	ORS01 17	56	2D	1000	1000	1014	1014	0.2813	0.0000	Midnight SP
07/06/01	14	ORS01 17	56	2D	1015	1015	2331	2331	24.6938	0.0000	COMPLETED
07/06/01	15	ORS01 18	233	2D	1802	1802	870	870	17.4937	0.0000	COMPLETED
07/06/01	16	ORS01 19	54	2D	1000	1000	2250	2250	23.4563	0.0000	COMPLETED
07/06/01	17	ORS01 20	321	2D	1800	1800	870	870	17.4563	0.0000	COMPLETED
07/06/01	18	ORS01 16	323	2D	1801	1801	870	870	17.4750	0.0000	COMPLETED
08/06/01	19	ORS01 15	145	2D	1000	0	0	2198	0.0000	22.4625	NTBP
08/06/01	20	ORS01 06	24	2D	1000	0	0	1077	0.0000	1.4437	NTBP
08/06/01	21	ORS01 15A	145	2D	1000	1000	2198	2198	22.4812	0.0000	COMPLETED
08/06/01	22	ORS01 06A	24	2D	1000	1000	1984	1984	18.4688	0.0000	COMPLETED
09/06/01	23	ORS01 14	302	2D	2548	2548	870	870	31.4812	0.0000	COMPLETED

Total Production = 424.556 26.588 km

Total acquisition on this project = 100.37%

GEOTEAM



3. LINE QC

r/v Geo Arctic

SEISMIC QC , LINE SUMMARY

Client : Origin Energy Resources Ltd	Project : 2D Exclusive	Group Interval : 12.5m
Project #: 34834	Date Commenced : 04.06.2001	Group Number : 368
Area: Bass Basin Tasmania	Date Completed :	Cable Length : 3600m
SP Interval: 18.75m	Array : 2860 cu. in.	Cable Depth : 7.5m

Seq.	Date	Line I.D.	DIR	FSP	FCSP	LCSP	LSP	Charg'ble km	Gun Timing % off spec.	SOL Noise uB	SOL Feather	EOL Feather	Max Feather	EOL Noise uB	Depth % off spec.	Run-out m.	Status	
1	04.Sep	3	58	1000	1000	2091	2091	20.475	0.20%	3.2	-2.8	-2.3	-2.9	3.4	0.0%	2456.25	Completed	
2	04.Sep	13	217	2702	2707	2033	2022	12.65625	0.00%	2.8	-0.2	-1.9	-1.9	3.5	0.00%	0	Aborted	
3	04.Sep	13A	217	2163	2032	869	869	21.825	0.00%	3.2	0.1	1.2	1.3	3	0.00%	2456.25	Completed	
4	05.Jun	12	54	1000	1000	2518	2518	28.481	0.00%	2.8	0.9	3.2	3.2	2.7	0.00%	2456.25	Completed	
5	05.Jun	10	239	1828	1828	870	870	17.98125	0.00%	3.2	-3.2	0.6	-3.2	3.4	0.00%	2456.25	Completed	
6	05.Jun	8	56	1000	1000	1986	1986	18.506	0.00%	3.4	1.3	-2.3	-2.3	3.1	0.00%	2456.25	Completed	
7	05.Jun	4	236	2014	2014	870	870	21.46875	0.00%	3	-2.5	-1.7	-2.5	3.1	0.00%	2456.25	Completed	
8	05.Jun	2	56	1000	1000	2144	2144	21.469	0.00%	3.6	10.1	1.3	10.1	4.4	0.02%	2456.25	Completed	
9	06.Jun	1	235	1802	1802	870	870	17.49375	0.00%	3.4	-2	-0.7	-2	5	0.00%	2456.25	Completed	
10	06.Jun	5	55	1000	1000	1984	1984	18.469	0.20%	3.1	-1.4	2.4	2.4	2.5	0.00%	2456.25	Completed	
11	06.Jun	9	234	1801	1801	870	870	17.475	0.30%	2.8	-1.5	-0.6	-2.2	3.2	0.00%	2456.25	Completed	
12	06.Jun	7	56	1000	1000	1985	1985	18.488	0.00%	3	-1	-2.2	-2.2	3.4	0.00%	2456.25	Completed	
13	06.Jun	11	234	1748	1748	870	870	16.48125	0.10%	2.5	4.6	-0.5	4.6	2.7	0.00%	2456.25	Completed	
14	06.Jun	17	55	1000	1000	2331	2331	24.975	0.00%	2.8	1.6	1.3	4.7	3	0.00%	2456.25	Completed	
15	07.Jun	18	239	1802	1802	870	870	17.49375	0.20%	2.9	-2.2	-0.8	-2.6	3.2	0.10%	2456.25	Completed	
16	07.Jun	19	54	1000	1000	2250	2250	23.456	0.20%	2.8	-0.6	3	4.7	3.4	0.00%	2456.25	Completed	
17	07.Jun	20	321	1800	1800	870	870	17.45625	0.00%	no data	-1	-2.1	-2.2	2.6	0.00%	2456.25	Completed	
18	07.Jun	16	323	1801	1801	870	870	17.475	0.00%	2.7	-2.6	0.4	-2.6	4.6	0.10%	2456.25	Completed	
19	07.Jun	15	145	1000			2198	0.000	0.10%	4.4	-5	-1.9	-5	82.5	3.70%	0	NTBP	
20	08.Jun	6	24	1000			1077	0								0	NTBP	
21	08.Jun	15A	145	1000	1000	2198	2198	22.481	0.00%	5.5	-2.3	2.1	-2.3	3.2	1.70%	2456.25	Completed	
22	08.Jun	06A	24	1000	1000	1984	1984	18.469	0.00%	3.7	1	1.4	1.6	3.3	0.01%	2456.25	Completed	
23	08.Jun	14	302	2548	2548	870	870	31.48125	0.20%	3.2	0.6	2	2	3.2	0.00%	2456.25	Completed	
Total =								424.556										

<u>r/v Geo Arctic</u>		
Seq.	Line I.D.	Comments
	ORS01	
1	3	All in spec.
2	13	Aborted due to navigation failure
3	13A	All in spec.
4	12	All in spec.
5	10	All in spec.
6	8	All in spec.
7	4	All in spec.
8	2	All in spec.
9	1	All in spec.
10	5	All in spec.
11	9	All in spec.
12	7	All in spec.
13	11	All in spec.
14	17	All in spec.
15	18	All in spec.
16	19	All in spec.
17	20	All in spec.
18	16	All in spec.
19	15	Swell noise to high, line rejected.
20	6	Swell noise to high, line rejected.
21	15A	Cable at 10m. All in spec otherwise.
22	06A	Cable at 7.5m All in spec.
23	14	Cable at 7.5m , all in spec. Data not included in first shipment.

GEOTEAM

4. ENERGY SOURCE DROP OUT SPECIFICATION

- Loss of 10% in peak amplitude is allowed.
- Loss of 10% in primary-bubble ratio is allowed.
- Combined loss of peak amplitude and primary-bubble ratio not to exceed 15%.

Please see the lists below.

DROP-OUT SIGNATURE ANALYSIS

Array: ar-a-60-r

CREATED ON 21/07/00 BY G. LU (FUGRO-GEOTEAM AS)

Dropped gun no.	Volumes	P	%ch	P/B	%ch
	Full array	-54.03	0	25.73	0
3-6	40	-52.96	-2	24.37	-5.3
3-5	40	-52.95	-2	24.36	-5.3
1-7	40	-52.87	-2.2	23.73	-7.8
1-8	40	-52.87	-2.2	23.49	-8.7
4-5	70	-52.59	-2.7	21.42	-16.8
4-6	70	-52.58	-2.7	21.33	-17.1
2-3	70	-52.46	-2.9	22.67	-11.9
2-4	70	-52.46	-2.9	22.87	-11.1
2-8	40	-52.42	-3	26.87	4.4
4-8	40	-52.36	-3.1	27.89	8.4
1-5	100	-52.33	-3.2	20.57	-20.1
1-6	100	-52.33	-3.2	20.52	-20.3
3-3	100	-52.26	-3.3	22.77	-11.5
3-4	100	-52.26	-3.3	22.8	-11.4
3-1	150	-52.09	-3.6	22.58	-12.2
3-2	150	-52.09	-3.6	22.51	-12.5
1-1	150	-52.08	-3.6	21.58	-16.2
1-2	150	-52.08	-3.6	21.6	-16.1
3-8	70	-51.99	-3.8	24.77	-3.7
1-9	70	-51.89	-4	25.16	-2.2
2-2	250	-51.87	-4	18.72	-27.2
2-1	250	-51.86	-4	18.53	-28
4-1	250	-51.85	-4	20.22	-21.4
4-2	250	-51.85	-4	20.14	-21.7
1-7 3-6	40 40	-51.79	-4.1	22.45	-12.7
1-8 3-6	40 40	-51.79	-4.1	22.3	-13.4
1-7 3-5	40 40	-51.78	-4.2	22.3	-13.3
1-8 3-5	40 40	-51.78	-4.2	22.28	-13.4
4-7	100	-51.72	-4.3	23.53	-8.6
2-6	100	-51.65	-4.4	23.15	-10
3-6 4-5	40 70	-51.51	-4.7	22.83	-11.3
3-6 4-6	40 70	-51.51	-4.7	22.91	-11
3-5 4-5	40 70	-51.5	-4.7	22.88	-11.1
3-5 4-6	40 70	-51.5	-4.7	22.74	-11.6
1-7 4-5	40 70	-51.42	-4.8	22.57	-12.3
1-7 4-6	40 70	-51.42	-4.8	22.48	-12.6
1-8 4-5	40 70	-51.42	-4.8	22.41	-12.9
1-8 4-6	40 70	-51.42	-4.8	22.19	-13.8
2-4 3-6	70 40	-51.39	-4.9	24.24	-5.8

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Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-3 3-6	70 40	-51.38	-4.9	24.16	-6.1
2-4 3-5	70 40	-51.38	-4.9	24.07	-6.4
2-3 3-5	70 40	-51.37	-4.9	24.04	-6.6
3-5 3-6	40 40	-51.35	-5	24.35	-5.4
2-8 3-6	40 40	-51.34	-5	25.19	-2.1
2-8 3-5	40 40	-51.33	-5	25.04	-2.7
1-7 1-8	40 40	-51.32	-5	24.53	-4.7
1-7 2-3	40 70	-51.3	-5.1	23.33	-9.3
1-7 2-4	40 70	-51.3	-5.1	23.42	-9
1-8 2-4	40 70	-51.3	-5.1	23.33	-9.3
1-8 2-3	40 70	-51.29	-5.1	23.28	-9.5
3-5 4-8	40 40	-51.28	-5.1	26.27	2.1
3-6 4-8	40 40	-51.28	-5.1	26.2	1.8
1-5 3-6	100 40	-51.25	-5.1	21.48	-16.5
1-6 3-6	100 40	-51.25	-5.1	21.45	-16.6
1-7 2-8	40 40	-51.25	-5.1	24.47	-4.9
1-8 2-8	40 40	-51.25	-5.1	24.49	-4.8
1-5 3-5	100 40	-51.24	-5.2	21.42	-16.8
1-6 3-5	100 40	-51.24	-5.2	21.45	-16.6
1-7 4-8	40 40	-51.19	-5.3	25.61	-0.5
1-8 4-8	40 40	-51.19	-5.3	25.94	0.8
3-3 3-6	100 40	-51.18	-5.3	23.53	-8.6
3-4 3-6	100 40	-51.18	-5.3	23.3	-9.4
3-3 3-5	100 40	-51.17	-5.3	23.46	-8.8
3-4 3-5	100 40	-51.17	-5.3	23.22	-9.8
1-5 1-8	100 40	-51.13	-5.4	21.28	-17.3
1-6 1-7	100 40	-51.13	-5.4	21.51	-16.4
1-5 1-7	100 40	-51.12	-5.4	21.25	-17.4
1-6 1-8	100 40	-51.12	-5.4	21.29	-17.3
1-7 3-3	40 100	-51.1	-5.4	23.1	-10.2
1-7 3-4	40 100	-51.1	-5.4	23.08	-10.3
1-8 3-3	40 100	-51.1	-5.4	23.04	-10.5
1-8 3-4	40 100	-51.1	-5.4	23.01	-10.6
2-4 4-5	70 70	-51.02	-5.6	17.36	-32.5
3-1 3-6	150 40	-51.02	-5.6	22.33	-13.2
3-2 3-6	150 40	-51.02	-5.6	22.1	-14.1
1-1 3-6	150 40	-51.01	-5.6	21.44	-16.7
1-2 3-6	150 40	-51.01	-5.6	21.49	-16.5
2-3 4-5	70 70	-51.01	-5.6	17.43	-32.3
2-3 4-6	70 70	-51.01	-5.6	17.44	-32.2
2-4 4-6	70 70	-51.01	-5.6	17.37	-32.5
3-1 3-5	150 40	-51.01	-5.6	22.13	-14
3-2 3-5	150 40	-51.01	-5.6	22.16	-13.9
1-1 3-5	150 40	-51	-5.6	21.5	-16.4
1-2 3-5	150 40	-51	-5.6	21.36	-17
2-8 4-5	40 70	-50.97	-5.7	20.86	-18.9
2-8 4-6	40 70	-50.97	-5.7	20.9	-18.8
1-7 3-1	40 150	-50.93	-5.7	21.83	-15.2
1-7 3-2	40 150	-50.93	-5.7	21.81	-15.3
1-8 3-1	40 150	-50.93	-5.7	21.81	-15.3
1-8 3-2	40 150	-50.93	-5.7	21.71	-15.6



Dropped gun no.	Volumes	P	%ch	P/B	%ch
1-1 1-7	150 40	-50.92	-5.8	20.64	-19.8
1-1 1-8	150 40	-50.92	-5.8	20.67	-19.7
1-2 1-7	150 40	-50.92	-5.8	20.65	-19.8
1-2 1-8	150 40	-50.92	-5.8	20.64	-19.8
4-5 4-8	70 40	-50.91	-5.8	20.74	-19.4
4-6 4-8	70 40	-50.91	-5.8	20.95	-18.6
1-5 4-5	100 70	-50.88	-5.8	16.54	-35.7
1-5 4-6	100 70	-50.88	-5.8	16.54	-35.7
1-6 4-5	100 70	-50.88	-5.8	16.51	-35.8
1-6 4-6	100 70	-50.88	-5.8	16.39	-36.3
3-5 3-8	40 70	-50.86	-5.9	22.06	-14.3
3-6 3-8	40 70	-50.86	-5.9	22.07	-14.2
2-3 2-8	70 40	-50.85	-5.9	23.07	-10.4
2-4 2-8	70 40	-50.85	-5.9	23.29	-9.5
1-7 3-8	40 70	-50.82	-5.9	22.91	-11
1-8 3-8	40 70	-50.82	-5.9	22.72	-11.7
1-9 3-6	70 40	-50.82	-6	23.68	-8
3-3 4-5	100 70	-50.82	-5.9	18.67	-27.4
3-3 4-6	100 70	-50.82	-6	18.69	-27.4
3-4 4-5	100 70	-50.82	-6	18.54	-27.9
1-9 3-5	70 40	-50.81	-6	23.68	-8
3-4 4-6	100 70	-50.81	-6	18.74	-27.2
2-1 3-6	250 40	-50.79	-6	18	-30.1
2-2 3-6	250 40	-50.79	-6	18.06	-29.8
2-3 4-8	70 40	-50.79	-6	22.62	-12.1
2-4 4-8	70 40	-50.79	-6	22.42	-12.9
2-1 3-5	250 40	-50.78	-6	17.94	-30.3
2-2 3-5	250 40	-50.78	-6	18.25	-29.1
3-6 4-1	40 250	-50.78	-6	19.27	-25.1
3-6 4-2	40 250	-50.78	-6	19.16	-25.5
3-5 4-1	40 250	-50.77	-6	19.26	-25.2
3-5 4-2	40 250	-50.77	-6	19.35	-24.8
1-5 2-4	100 70	-50.76	-6.1	16.96	-34.1
1-6 2-4	100 70	-50.76	-6.1	16.89	-34.4
1-5 2-3	100 70	-50.75	-6.1	16.92	-34.3
1-6 2-3	100 70	-50.75	-6.1	16.88	-34.4
2-8 4-8	40 40	-50.75	-6.1	25.32	-1.6
1-7 1-9	40 70	-50.72	-6.1	22.22	-13.7
1-8 1-9	40 70	-50.72	-6.1	22.24	-13.6
1-5 2-8	100 40	-50.71	-6.1	20.35	-20.9
1-6 2-8	100 40	-50.71	-6.1	20.27	-21.2
1-7 2-1	40 250	-50.7	-6.2	17.63	-31.5
1-7 2-2	40 250	-50.7	-6.2	17.68	-31.3
1-8 2-1	40 250	-50.7	-6.2	17.48	-32.1
1-8 2-2	40 250	-50.7	-6.2	17.59	-31.6
1-7 4-1	40 250	-50.69	-6.2	18.98	-26.2
1-7 4-2	40 250	-50.69	-6.2	18.81	-26.9
1-8 4-1	40 250	-50.69	-6.2	18.94	-26.4
1-8 4-2	40 250	-50.69	-6.2	18.67	-27.4
2-3 3-3	70 100	-50.69	-6.2	19.09	-25.8
2-3 3-4	70 100	-50.69	-6.2	19.41	-24.6

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Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-4 3-3	70 100	-50.69	-6.2	19.2	-25.4
2-4 3-4	70 100	-50.69	-6.2	19.11	-25.7
1-5 4-8	100 40	-50.65	-6.3	19.97	-22.4
1-6 4-8	100 40	-50.65	-6.3	19.9	-22.7
2-8 3-3	40 100	-50.65	-6.3	22.78	-11.5
2-8 3-4	40 100	-50.65	-6.3	22.99	-10.7
3-1 4-5	150 70	-50.65	-6.3	21.32	-17.2
3-1 4-6	150 70	-50.65	-6.3	21.08	-18.1
3-2 4-5	150 70	-50.65	-6.3	21.14	-17.9
3-2 4-6	150 70	-50.65	-6.3	21.26	-17.4
1-1 4-5	150 70	-50.64	-6.3	21.75	-15.5
1-2 4-5	150 70	-50.64	-6.3	21.76	-15.4
1-2 4-6	150 70	-50.64	-6.3	21.79	-15.3
3-5 4-7	40 100	-50.64	-6.3	22.31	-13.3
3-6 4-7	40 100	-50.64	-6.3	22.32	-13.3
1-1 4-6	150 70	-50.63	-6.3	21.82	-15.2
3-3 4-8	100 40	-50.59	-6.4	22.73	-11.7
3-4 4-8	100 40	-50.59	-6.4	22.61	-12.1
2-6 3-6	100 40	-50.58	-6.4	21.91	-14.9
1-5 3-3	100 100	-50.56	-6.4	17.35	-32.6
1-5 3-4	100 100	-50.56	-6.4	17.26	-32.9
1-6 3-3	100 100	-50.56	-6.4	17.36	-32.6
1-6 3-4	100 100	-50.56	-6.4	17.39	-32.4
2-6 3-5	100 40	-50.56	-6.4	21.96	-14.7
1-7 4-7	40 100	-50.55	-6.4	21.72	-15.6
1-8 4-7	40 100	-50.55	-6.4	21.63	-16
3-8 4-5	70 70	-50.54	-6.5	22.79	-11.4
3-8 4-6	70 70	-50.54	-6.5	22.82	-11.3
1-2 2-4	150 70	-50.52	-6.5	22.45	-12.8
2-3 3-1	70 150	-50.52	-6.5	22.86	-11.2
2-3 3-2	70 150	-50.52	-6.5	22.89	-11.1
2-4 3-1	70 150	-50.52	-6.5	22.99	-10.7
2-4 3-2	70 150	-50.52	-6.5	23.01	-10.6
1-1 2-3	150 70	-50.51	-6.5	22.65	-12
1-1 2-4	150 70	-50.51	-6.5	22.58	-12.3
1-2 2-3	150 70	-50.51	-6.5	22.39	-13
4-5 4-6	70 70	-50.51	-6.5	22.47	-12.7
1-7 2-6	40 100	-50.49	-6.6	21.33	-17.1
1-8 2-6	40 100	-50.49	-6.6	21.18	-17.7
2-8 3-1	40 150	-50.48	-6.6	22.48	-12.6
2-8 3-2	40 150	-50.48	-6.6	22.36	-13.1
1-1 2-8	150 40	-50.47	-6.6	21.49	-16.5
1-2 2-8	150 40	-50.47	-6.6	21.43	-16.7
1-9 4-5	70 70	-50.45	-6.6	22.93	-10.9
1-9 4-6	70 70	-50.44	-6.6	22.71	-11.7
2-1 4-5	250 70	-50.42	-6.7	18.66	-27.5
2-1 4-6	250 70	-50.42	-6.7	18.46	-28.3
2-2 4-5	250 70	-50.42	-6.7	18.77	-27.1
2-2 4-6	250 70	-50.42	-6.7	18.59	-27.7
2-3 3-8	70 70	-50.42	-6.7	24.24	-5.8
2-4 3-8	70 70	-50.42	-6.7	24.32	-5.5



Dropped gun no.	Volumes	P	%ch	P/B	%ch
3-1 4-8	150 40	-50.42	-6.7	22.67	-11.9
3-2 4-8	150 40	-50.42	-6.7	22.51	-12.5
1-1 4-8	150 40	-50.41	-6.7	21.5	-16.5
1-2 4-8	150 40	-50.41	-6.7	21.53	-16.3
4-1 4-5	250 70	-50.41	-6.7	20.14	-21.7
4-1 4-6	250 70	-50.41	-6.7	20.23	-21.4
4-2 4-5	250 70	-50.41	-6.7	20.14	-21.7
4-2 4-6	250 70	-50.4	-6.7	20.11	-21.9
1-5 3-1	100 150	-50.39	-6.7	20.66	-19.7
1-5 3-2	100 150	-50.39	-6.7	20.73	-19.4
1-6 3-1	100 150	-50.39	-6.7	20.65	-19.7
1-6 3-2	100 150	-50.39	-6.7	20.63	-19.8
1-1 1-5	150 100	-50.38	-6.8	18.47	-28.2
1-1 1-6	150 100	-50.38	-6.8	18.34	-28.7
1-2 1-5	150 100	-50.38	-6.8	18.12	-29.6
1-2 1-6	150 100	-50.38	-6.8	18.2	-29.3
2-8 3-8	40 70	-50.37	-6.8	25.81	0.3
1-2 3-3	150 100	-50.32	-6.9	18.1	-29.7
1-9 2-3	70 70	-50.32	-6.9	24.12	-6.3
1-9 2-4	70 70	-50.32	-6.9	24.4	-5.2
3-1 3-3	150 100	-50.32	-6.9	18.35	-28.7
3-1 3-4	150 100	-50.32	-6.9	18.4	-28.5
3-2 3-3	150 100	-50.32	-6.9	18.34	-28.7
1-1 3-3	150 100	-50.31	-6.9	18.29	-28.9
1-1 3-4	150 100	-50.31	-6.9	18.17	-29.4
1-2 3-4	150 100	-50.31	-6.9	18.07	-29.8
3-2 3-4	150 100	-50.31	-6.9	18.43	-28.4
3-8 4-8	70 40	-50.31	-6.9	27.37	6.4
2-3 2-4	70 70	-50.3	-6.9	23.55	-8.5
2-1 2-4	250 70	-50.29	-6.9	19.91	-22.6
2-2 2-3	250 70	-50.29	-6.9	19.49	-24.3
2-2 2-4	250 70	-50.29	-6.9	19.54	-24.1
2-4 4-1	70 250	-50.29	-6.9	20.08	-22
1-5 3-8	100 70	-50.28	-6.9	21.35	-17
1-6 3-8	100 70	-50.28	-6.9	21.35	-17
1-9 2-8	70 40	-50.28	-6.9	26.27	2.1
2-1 2-3	250 70	-50.28	-6.9	19.47	-24.3
2-3 4-1	70 250	-50.28	-6.9	19.97	-22.4
2-3 4-2	70 250	-50.28	-6.9	20.01	-22.2
2-4 4-2	70 250	-50.28	-6.9	19.88	-22.7
2-1 2-8	250 40	-50.25	-7	19.36	-24.8
2-2 2-8	250 40	-50.25	-7	19.3	-25
2-8 4-1	40 250	-50.24	-7	20.61	-19.9
2-8 4-2	40 250	-50.24	-7	20.88	-18.9
1-9 4-8	70 40	-50.22	-7.1	27.67	7.5
3-3 3-8	100 70	-50.22	-7.1	23.77	-7.6
3-4 3-8	100 70	-50.22	-7.1	23.73	-7.8
4-5 4-7	70 100	-50.22	-7.1	22.87	-11.1
2-6 4-5	100 70	-50.21	-7.1	20.92	-18.7
4-6 4-7	70 100	-50.21	-7.1	23.09	-10.3
2-6 4-6	100 70	-50.2	-7.1	20.94	-18.6



Dropped gun no.	Volumes	P	%ch	P/B	%ch
1-5 1-9	100 70	-50.19	-7.1	21.61	-16
1-6 1-9	100 70	-50.19	-7.1	21.47	-16.6
2-1 4-8	250 40	-50.19	-7.1	19.74	-23.3
2-2 4-8	250 40	-50.19	-7.1	19.51	-24.2
4-1 4-8	250 40	-50.18	-7.1	21.38	-16.9
4-2 4-8	250 40	-50.18	-7.1	21.62	-16
1-5 2-1	100 250	-50.16	-7.2	19.46	-24.4
1-5 2-2	100 250	-50.16	-7.2	19.42	-24.5
1-6 2-1	100 250	-50.16	-7.2	19.2	-25.4
1-6 2-2	100 250	-50.16	-7.2	19.47	-24.4
1-2 3-1	150 150	-50.15	-7.2	17.72	-31.2
1-2 3-2	150 150	-50.15	-7.2	17.71	-31.2
1-5 4-1	100 250	-50.15	-7.2	20.2	-21.5
1-5 4-2	100 250	-50.15	-7.2	20.19	-21.6
1-6 4-1	100 250	-50.15	-7.2	20.19	-21.6
1-6 4-2	100 250	-50.15	-7.2	20.11	-21.9
2-3 4-7	70 100	-50.15	-7.2	23.29	-9.5
2-4 4-7	70 100	-50.15	-7.2	23.28	-9.5
1-1 3-1	150 150	-50.14	-7.2	17.81	-30.8
1-1 3-2	150 150	-50.14	-7.2	17.68	-31.3
1-9 3-3	70 100	-50.12	-7.2	23.42	-9
1-9 3-4	70 100	-50.12	-7.2	23.45	-8.9
2-8 4-7	40 100	-50.11	-7.3	24.31	-5.5
2-1 3-3	250 100	-50.1	-7.3	18.54	-27.9
2-1 3-4	250 100	-50.1	-7.3	18.85	-26.7
2-2 3-4	250 100	-50.1	-7.3	18.58	-27.8
2-2 3-3	250 100	-50.09	-7.3	18.82	-26.9
3-3 4-1	100 250	-50.09	-7.3	20.41	-20.7
3-3 4-2	100 250	-50.09	-7.3	20.48	-20.4
3-4 4-2	100 250	-50.09	-7.3	20.16	-21.7
3-4 4-1	100 250	-50.08	-7.3	20.35	-20.9
2-3 2-6	70 100	-50.07	-7.3	22.7	-11.8
2-4 2-6	70 100	-50.07	-7.3	22.81	-11.4
3-1 3-8	150 70	-50.05	-7.4	21.97	-14.6
3-2 3-8	150 70	-50.05	-7.4	21.93	-14.8
1-1 3-8	150 70	-50.04	-7.4	21.41	-16.8
1-2 3-8	150 70	-50.04	-7.4	21.28	-17.3
4-7 4-8	100 40	-50.03	-7.4	26.83	4.3
1-5 4-7	100 100	-50.01	-7.4	21.56	-16.2
1-6 4-7	100 100	-50.01	-7.4	21.46	-16.6
1-5 1-6	100 100	-49.99	-7.5	25.34	-1.5
2-6 4-8	100 40	-49.98	-7.5	25.35	-1.5
1-5 2-6	100 100	-49.95	-7.6	22.03	-14.4
1-6 2-6	100 100	-49.95	-7.6	21.92	-14.8
1-9 3-1	70 150	-49.95	-7.5	21.93	-14.8
1-9 3-2	70 150	-49.95	-7.5	21.9	-14.9
2-6 2-8	100 40	-49.95	-7.5	25.56	-0.7
3-3 4-7	100 100	-49.95	-7.6	23.55	-8.5
3-4 4-7	100 100	-49.95	-7.6	23.49	-8.7
1-1 1-9	150 70	-49.94	-7.6	21.17	-17.7
1-2 1-9	150 70	-49.94	-7.6	21.08	-18.1

GEOTEAM

Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-1 3-1	250 150	-49.93	-7.6	18.31	-28.9
2-1 3-2	250 150	-49.93	-7.6	18.12	-29.6
2-2 3-1	250 150	-49.93	-7.6	18.41	-28.5
2-2 3-2	250 150	-49.93	-7.6	18.43	-28.4
1-1 2-2	150 250	-49.92	-7.6	20.58	-20
1-2 2-2	150 250	-49.92	-7.6	20.89	-18.8
3-1 4-1	150 250	-49.92	-7.6	19.23	-25.3
3-1 4-2	150 250	-49.92	-7.6	19.04	-26
3-2 4-2	150 250	-49.92	-7.6	18.99	-26.2
1-1 2-1	150 250	-49.91	-7.6	20.8	-19.2
1-2 2-1	150 250	-49.91	-7.6	20.75	-19.4
1-2 4-1	150 250	-49.91	-7.6	21.76	-15.4
1-2 4-2	150 250	-49.91	-7.6	21.79	-15.3
3-2 4-1	150 250	-49.91	-7.6	19.14	-25.6
1-1 4-1	150 250	-49.9	-7.6	21.74	-15.5
1-1 4-2	150 250	-49.9	-7.6	21.98	-14.6
2-6 3-3	100 100	-49.88	-7.7	23.83	-7.4
2-6 3-4	100 100	-49.88	-7.7	23.79	-7.5
1-9 3-8	70 70	-49.85	-7.7	24.19	-6
2-1 3-8	250 70	-49.82	-7.8	17.92	-30.4
2-2 3-8	250 70	-49.82	-7.8	18.07	-29.8
3-3 3-4	100 100	-49.81	-7.8	25.04	-2.7
3-8 4-1	70 250	-49.81	-7.8	19.53	-24.1
3-8 4-2	70 250	-49.81	-7.8	19.55	-24
3-1 4-7	150 100	-49.78	-7.9	22.39	-13
3-2 4-7	150 100	-49.78	-7.9	22.5	-12.6
1-1 4-7	150 100	-49.77	-7.9	22.96	-10.8
1-2 4-7	150 100	-49.77	-7.9	22.8	-11.4
1-9 2-2	70 250	-49.73	-8	18.32	-28.8
1-9 2-1	70 250	-49.72	-8	18.2	-29.3
1-9 4-1	70 250	-49.72	-8	19.71	-23.4
2-6 3-1	100 150	-49.72	-8	22.17	-13.8
1-2 2-6	150 100	-49.71	-8	21.45	-16.6
1-9 4-2	70 250	-49.71	-8	19.66	-23.6
2-6 3-2	100 150	-49.71	-8	22.11	-14.1
1-1 2-6	150 100	-49.7	-8	21.65	-15.9
2-1 4-1	250 250	-49.69	-8	14.67	-43
2-1 4-2	250 250	-49.69	-8	14.51	-43.6
2-2 4-1	250 250	-49.69	-8	14.65	-43.1
2-2 4-2	250 250	-49.69	-8	14.9	-42.1
3-8 4-7	70 100	-49.67	-8.1	22.64	-12
2-6 3-8	100 70	-49.61	-8.2	22.25	-13.5
1-9 4-7	70 100	-49.58	-8.2	22.81	-11.4
2-1 4-7	250 100	-49.55	-8.3	17.59	-31.7
2-2 4-7	250 100	-49.55	-8.3	17.71	-31.2
4-1 4-7	250 100	-49.54	-8.3	18.68	-27.4
4-2 4-7	250 100	-49.54	-8.3	19.06	-25.9
1-9 2-6	70 100	-49.52	-8.4	22.52	-12.5
2-1 2-6	250 100	-49.48	-8.4	17.44	-32.2
2-2 2-6	250 100	-49.48	-8.4	17.66	-31.4
2-6 4-1	100 250	-49.48	-8.4	18.46	-28.3

GEOTEAM

Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-6 4-2	100 250	-49.47	-8.4	18.59	-27.7
3-1 3-2	150 150	-49.36	-8.6	23.99	-6.8
1-1 1-2	150 150	-49.34	-8.7	25.04	-2.7
2-6 4-7	100 100	-49.34	-8.7	21.28	-17.3
2-1 2-2	250 250	-48.57	-10.1	21.69	-15.7
4-1 4-2	250 250	-48.55	-10.2	22.65	-12

GEOTEAM



5. ORIGINAL DATA ACQUISITION PROGRAM



Conversion method to WGS84: Bursa

Conversion parameters: -116.00, -50.47, 141.69, 0.23, 0.39 0.34

0.098000 0.000000 Final datum parameters:

GDA94; ellipsoid: GRS 1980 Conversion method to WGS84: Bursa

Conversion parameters: 0.00, 0.00, 0.00, 0.00, 0.00 0.00 0.000000

0.000000

Line	SP	LAT	LONG
ORS01-01	100	394559.8S	1452329.8E
ORS01-01	110	394555.1S	1452338.4E
ORS01-01	120	394550.5S	1452347.0E
ORS01-01	130	394545.9S	1452355.7E
ORS01-01	140	394541.3S	1452404.3E
ORS01-01	150	394536.7S	1452412.9E
ORS01-01	160	394532.1S	1452421.6E
ORS01-01	170	394527.5S	1452430.2E
ORS01-01	180	394522.9S	1452438.8E
ORS01-01	190	394518.3S	1452447.4E
ORS01-01	200	394513.7S	1452456.1E
ORS01-01	210	394509.1S	1452504.7E
ORS01-01	220	394504.4S	1452513.3E
ORS01-01	230	394459.8S	1452522.0E
ORS01-01	240	394455.2S	1452530.6E
ORS01-01	250	394450.6S	1452539.2E
ORS01-01	260	394446.0S	1452547.8E
ORS01-01	270	394441.4S	1452556.5E
ORS01-01	280	394436.8S	1452605.1E
ORS01-01	290	394432.2S	1452613.7E
ORS01-01	300	394427.6S	1452622.4E
ORS01-01	310	394423.0S	1452631.0E
ORS01-01	320	394418.3S	1452639.6E
ORS01-01	330	394413.7S	1452648.3E
ORS01-01	340	394409.1S	1452656.9E
ORS01-01	350	394404.5S	1452705.5E
ORS01-01	360	394359.9S	1452714.1E
ORS01-01	370	394355.3S	1452722.8E
ORS01-01	380	394350.7S	1452731.4E
ORS01-01	390	394346.1S	1452740.0E
ORS01-01	400	394341.5S	1452748.7E
ORS01-01	410	394336.9S	1452757.3E
ORS01-01	420	394332.3S	1452805.9E
ORS01-01	430	394327.6S	1452814.5E
ORS01-01	440	394323.0S	1452823.2E
ORS01-01	450	394318.4S	1452831.8E
ORS01-01	460	394313.8S	1452840.4E
ORS01-01	470	394309.2S	1452849.1E
ORS01-01	480	394304.6S	1452857.7E
ORS01-01	490	394300.0S	1452906.3E
ORS01-01	500	394255.4S	1452914.9E
ORS01-01	510	394250.8S	1452923.6E

GEOTEAM

Line	SP	LAT	LONG
ORS01-01	520	394246.2S	1452932.2E
ORS01-01	530	394241.6S	1452940.8E
ORS01-01	540	394236.9S	1452949.5E
ORS01-01	550	394232.3S	1452958.1E
ORS01-01	560	394227.7S	1453006.7E
ORS01-01	570	394223.1S	1453015.3E
ORS01-01	580	394218.5S	1453024.0E
ORS01-01	590	394213.9S	1453032.6E
ORS01-01	600	394209.3S	1453041.2E
ORS01-01	610	394204.7S	1453049.9E
ORS01-01	620	394200.1S	1453058.5E
ORS01-01	630	394155.5S	1453107.1E
ORS01-01	640	394150.8S	1453115.8E
ORS01-01	650	394146.2S	1453124.4E
ORS01-01	660	394141.6S	1453133.0E
ORS01-01	670	394137.0S	1453141.6E
ORS01-01	680	394132.4S	1453150.3E
ORS01-01	690	394127.8S	1453158.9E
ORS01-01	700	394123.2S	1453207.5E
ORS01-01	701	394122.7S	1453208.4E
ORS01-02	100	394847.9S	1452404.2E
ORS01-02	110	394843.4S	1452413.0E
ORS01-02	120	394838.9S	1452421.7E
ORS01-02	130	394834.3S	1452430.4E
ORS01-02	140	394829.8S	1452439.1E
ORS01-02	150	394825.3S	1452447.8E
ORS01-02	160	394820.7S	1452456.5E
ORS01-02	170	394816.2S	1452505.2E
ORS01-02	180	394811.7S	1452514.0E
ORS01-02	190	394807.2S	1452522.7E
ORS01-02	200	394802.6S	1452531.4E
ORS01-02	210	394758.1S	1452540.1E
ORS01-02	220	394753.6S	1452548.8E
ORS01-02	230	394749.0S	1452557.5E
ORS01-02	240	394744.5S	1452606.2E
ORS01-02	250	394740.0S	1452615.0E
ORS01-02	260	394735.4S	1452623.7E
ORS01-02	270	394730.9S	1452632.4E
ORS01-02	280	394726.4S	1452641.1E
ORS01-02	290	394721.8S	1452649.8E
ORS01-02	300	394717.3S	1452658.5E
ORS01-02	310	394712.8S	1452707.2E
ORS01-02	320	394708.3S	1452715.9E
ORS01-02	330	394703.7S	1452724.7E
ORS01-02	340	394659.2S	1452733.4E
ORS01-02	350	394654.7S	1452742.1E
ORS01-02	360	394650.1S	1452750.8E
ORS01-02	370	394645.6S	1452759.5E
ORS01-02	380	394641.1S	1452808.2E



Line	SP	LAT	LONG
ORS01-02	390	394636.5S	1452816.9E
ORS01-02	400	394632.0S	1452825.7E
ORS01-02	410	394627.5S	1452834.4E
ORS01-02	420	394622.9S	1452843.1E
ORS01-02	430	394618.4S	1452851.8E
ORS01-02	440	394613.9S	1452900.5E
ORS01-02	450	394609.4S	1452909.2E
ORS01-02	460	394604.8S	1452917.9E
ORS01-02	470	394600.3S	1452926.7E
ORS01-02	480	394555.8S	1452935.4E
ORS01-02	490	394551.2S	1452944.1E
ORS01-02	500	394546.7S	1452952.8E
ORS01-02	510	394542.2S	1453001.5E
ORS01-02	520	394537.6S	1453010.2E
ORS01-02	530	394533.1S	1453018.9E
ORS01-02	540	394528.6S	1453027.7E
ORS01-02	550	394524.0S	1453036.4E
ORS01-02	560	394519.5S	1453045.1E
ORS01-02	570	394515.0S	1453053.8E
ORS01-02	580	394510.5S	1453102.5E
ORS01-02	590	394505.9S	1453111.2E
ORS01-02	600	394501.4S	1453119.9E
ORS01-02	610	394456.9S	1453128.7E
ORS01-02	620	394452.3S	1453137.4E
ORS01-02	630	394447.8S	1453146.1E
ORS01-02	640	394443.3S	1453154.8E
ORS01-02	650	394438.7S	1453203.5E
ORS01-02	660	394434.2S	1453212.2E
ORS01-02	670	394429.7S	1453220.9E
ORS01-02	680	394425.1S	1453229.7E
ORS01-02	690	394420.6S	1453238.4E
ORS01-02	700	394416.1S	1453247.1E
ORS01-02	710	394411.6S	1453255.8E
ORS01-02	720	394407.0S	1453304.5E
ORS01-02	730	394402.5S	1453313.2E
ORS01-02	740	394358.0S	1453321.9E
ORS01-02	750	394353.4S	1453330.7E
ORS01-02	760	394348.9S	1453339.4E
ORS01-02	770	394344.4S	1453348.1E
ORS01-02	780	394339.8S	1453356.8E
ORS01-02	790	394335.3S	1453405.5E
ORS01-02	800	394330.8S	1453414.2E
ORS01-02	810	394326.2S	1453422.9E
ORS01-02	820	394321.7S	1453431.7E
ORS01-02	830	394317.2S	1453440.4E
ORS01-02	840	394312.7S	1453449.1E
ORS01-02	850	394308.1S	1453457.8E
ORS01-02	860	394303.6S	1453506.5E
ORS01-03	100	394928.4S	1452518.6E

GEOTEAM

Line	SP	LAT	LONG
ORS01-03	110	394923.9S	1452527.4E
ORS01-03	120	394919.4S	1452536.2E
ORS01-03	130	394915.0S	1452544.9E
ORS01-03	140	394910.5S	1452553.7E
ORS01-03	150	394906.0S	1452602.4E
ORS01-03	160	394901.5S	1452611.2E
ORS01-03	170	394857.0S	1452620.0E
ORS01-03	180	394852.5S	1452628.7E
ORS01-03	190	394848.0S	1452637.5E
ORS01-03	200	394843.6S	1452646.2E
ORS01-03	210	394839.1S	1452655.0E
ORS01-03	220	394834.6S	1452703.7E
ORS01-03	230	394830.1S	1452712.5E
ORS01-03	240	394825.6S	1452721.3E
ORS01-03	250	394821.1S	1452730.0E
ORS01-03	260	394816.7S	1452738.8E
ORS01-03	270	394812.2S	1452747.5E
ORS01-03	280	394807.7S	1452756.3E
ORS01-03	290	394803.2S	1452805.1E
ORS01-03	300	394758.7S	1452813.8E
ORS01-03	310	394754.2S	1452822.6E
ORS01-03	320	394749.7S	1452831.3E
ORS01-03	330	394745.3S	1452840.1E
ORS01-03	340	394740.8S	1452848.8E
ORS01-03	350	394736.3S	1452857.6E
ORS01-03	360	394731.8S	1452906.4E
ORS01-03	370	394727.3S	1452915.1E
ORS01-03	380	394722.8S	1452923.9E
ORS01-03	390	394718.3S	1452932.6E
ORS01-03	400	394713.9S	1452941.4E
ORS01-03	410	394709.4S	1452950.2E
ORS01-03	420	394704.9S	1452958.9E
ORS01-03	430	394700.4S	1453007.7E
ORS01-03	440	394655.9S	1453016.4E
ORS01-03	450	394651.4S	1453025.2E
ORS01-03	460	394647.0S	1453033.9E
ORS01-03	470	394642.5S	1453042.7E
ORS01-03	480	394638.0S	1453051.5E
ORS01-03	490	394633.5S	1453100.2E
ORS01-03	500	394629.0S	1453109.0E
ORS01-03	510	394624.5S	1453117.7E
ORS01-03	520	394620.0S	1453126.5E
ORS01-03	530	394615.6S	1453135.3E
ORS01-03	540	394611.1S	1453144.0E
ORS01-03	550	394606.6S	1453152.8E
ORS01-03	560	394602.1S	1453201.5E
ORS01-03	570	394557.6S	1453210.3E
ORS01-03	580	394553.1S	1453219.1E
ORS01-03	590	394548.6S	1453227.8E



Line	SP	LAT	LONG
ORS01-03	600	394544.2S	1453236.6E
ORS01-03	610	394539.7S	1453245.3E
ORS01-03	620	394535.2S	1453254.1E
ORS01-03	630	394530.7S	1453302.8E
ORS01-03	640	394526.2S	1453311.6E
ORS01-03	650	394521.7S	1453320.4E
ORS01-03	660	394517.3S	1453329.1E
ORS01-03	670	394512.8S	1453337.9E
ORS01-03	680	394508.3S	1453346.6E
ORS01-03	690	394503.8S	1453355.4E
ORS01-03	700	394459.3S	1453404.2E
ORS01-03	710	394454.8S	1453412.9E
ORS01-03	720	394450.3S	1453421.7E
ORS01-03	730	394445.9S	1453430.4E
ORS01-03	740	394441.4S	1453439.2E
ORS01-03	750	394436.9S	1453447.9E
ORS01-03	760	394432.4S	1453456.7E
ORS01-03	770	394427.9S	1453505.5E
ORS01-03	780	394423.4S	1453514.2E
ORS01-03	790	394418.9S	1453523.0E
ORS01-03	800	394414.5S	1453531.7E
ORS01-03	810	394410.0S	1453540.5E
ORS01-03	820	394405.5S	1453549.3E
ORS01-04	100	395109.4S	1452654.5E
ORS01-04	110	395104.9S	1452703.2E
ORS01-04	120	395100.4S	1452711.9E
ORS01-04	130	395055.8S	1452720.6E
ORS01-04	140	395051.3S	1452729.3E
ORS01-04	150	395046.8S	1452738.0E
ORS01-04	160	395042.2S	1452746.7E
ORS01-04	170	395037.7S	1452755.5E
ORS01-04	180	395033.2S	1452804.2E
ORS01-04	190	395028.6S	1452812.9E
ORS01-04	200	395024.1S	1452821.6E
ORS01-04	210	395019.6S	1452830.3E
ORS01-04	220	395015.0S	1452839.0E
ORS01-04	230	395010.5S	1452847.8E
ORS01-04	240	395006.0S	1452856.5E
ORS01-04	250	395001.4S	1452905.2E
ORS01-04	260	394956.9S	1452913.9E
ORS01-04	270	394952.4S	1452922.6E
ORS01-04	280	394947.8S	1452931.3E
ORS01-04	290	394943.3S	1452940.1E
ORS01-04	300	394938.8S	1452948.8E
ORS01-04	310	394934.2S	1452957.5E
ORS01-04	320	394929.7S	1453006.2E
ORS01-04	330	394925.2S	1453014.9E
ORS01-04	340	394920.6S	1453023.6E
ORS01-04	350	394916.1S	1453032.4E



Line	SP	LAT	LONG
ORS01-04	360	394911.6S	1453041.1E
ORS01-04	370	394907.0S	1453049.8E
ORS01-04	380	394902.5S	1453058.5E
ORS01-04	390	394858.0S	1453107.2E
ORS01-04	400	394853.4S	1453115.9E
ORS01-04	410	394848.9S	1453124.7E
ORS01-04	420	394844.3S	1453133.4E
ORS01-04	430	394839.8S	1453142.1E
ORS01-04	440	394835.3S	1453150.8E
ORS01-04	450	394830.7S	1453159.5E
ORS01-04	460	394826.2S	1453208.2E
ORS01-04	470	394821.7S	1453217.0E
ORS01-04	480	394817.1S	1453225.7E
ORS01-04	490	394812.6S	1453234.4E
ORS01-04	500	394808.1S	1453243.1E
ORS01-04	510	394803.5S	1453251.8E
ORS01-04	520	394759.0S	1453300.5E
ORS01-04	530	394754.5S	1453309.2E
ORS01-04	540	394749.9S	1453318.0E
ORS01-04	550	394745.4S	1453326.7E
ORS01-04	560	394740.9S	1453335.4E
ORS01-04	570	394736.3S	1453344.1E
ORS01-04	580	394731.8S	1453352.8E
ORS01-04	590	394727.3S	1453401.5E
ORS01-04	600	394722.7S	1453410.3E
ORS01-04	610	394718.2S	1453419.0E
ORS01-04	620	394713.7S	1453427.7E
ORS01-04	630	394709.1S	1453436.4E
ORS01-04	640	394704.6S	1453445.1E
ORS01-04	650	394700.1S	1453453.8E
ORS01-04	660	394655.5S	1453502.6E
ORS01-04	670	394651.0S	1453511.3E
ORS01-04	680	394646.5S	1453520.0E
ORS01-04	690	394641.9S	1453528.7E
ORS01-04	700	394637.4S	1453537.4E
ORS01-04	710	394632.9S	1453546.1E
ORS01-04	720	394628.3S	1453554.9E
ORS01-04	730	394623.8S	1453603.6E
ORS01-04	740	394619.3S	1453612.3E
ORS01-04	750	394614.7S	1453621.0E
ORS01-04	760	394610.2S	1453629.7E
ORS01-04	770	394605.6S	1453638.4E
ORS01-04	780	394601.1S	1453647.2E
ORS01-04	790	394556.6S	1453655.9E
ORS01-04	800	394552.0S	1453704.6E
ORS01-04	810	394547.5S	1453713.3E
ORS01-04	820	394543.0S	1453722.0E
ORS01-04	830	394538.4S	1453730.7E
ORS01-04	840	394533.9S	1453739.5E



Line	SP	LAT	LONG
ORS01-04	850	394529.4S	1453748.2E
ORS01-04	860	394524.8S	1453756.9E
ORS01-05	100	395050.4S	1452910.0E
ORS01-05	110	395045.8S	1452918.6E
ORS01-05	120	395041.2S	1452927.3E
ORS01-05	130	395036.7S	1452936.0E
ORS01-05	140	395032.1S	1452944.6E
ORS01-05	150	395027.5S	1452953.3E
ORS01-05	160	395022.9S	1453002.0E
ORS01-05	170	395018.3S	1453010.6E
ORS01-05	180	395013.7S	1453019.3E
ORS01-05	190	395009.1S	1453028.0E
ORS01-05	200	395004.6S	1453036.6E
ORS01-05	210	395000.0S	1453045.3E
ORS01-05	220	394955.4S	1453054.0E
ORS01-05	230	394950.8S	1453102.6E
ORS01-05	240	394946.2S	1453111.3E
ORS01-05	250	394941.6S	1453120.0E
ORS01-05	260	394937.0S	1453128.6E
ORS01-05	270	394932.5S	1453137.3E
ORS01-05	280	394927.9S	1453146.0E
ORS01-05	290	394923.3S	1453154.6E
ORS01-05	300	394918.7S	1453203.3E
ORS01-05	310	394914.1S	1453212.0E
ORS01-05	320	394909.5S	1453220.6E
ORS01-05	330	394905.0S	1453229.3E
ORS01-05	340	394900.4S	1453238.0E
ORS01-05	350	394855.8S	1453246.6E
ORS01-05	360	394851.2S	1453255.3E
ORS01-05	370	394846.6S	1453304.0E
ORS01-05	380	394842.0S	1453312.6E
ORS01-05	390	394837.4S	1453321.3E
ORS01-05	400	394832.9S	1453330.0E
ORS01-05	410	394828.3S	1453338.6E
ORS01-05	420	394823.7S	1453347.3E
ORS01-05	430	394819.1S	1453356.0E
ORS01-05	440	394814.5S	1453404.6E
ORS01-05	450	394809.9S	1453413.3E
ORS01-05	460	394805.3S	1453422.0E
ORS01-05	470	394800.8S	1453430.6E
ORS01-05	480	394756.2S	1453439.3E
ORS01-05	490	394751.6S	1453448.0E
ORS01-05	500	394747.0S	1453456.6E
ORS01-05	510	394742.4S	1453505.3E
ORS01-05	520	394737.8S	1453514.0E
ORS01-05	530	394733.2S	1453522.6E
ORS01-05	540	394728.7S	1453531.3E
ORS01-05	550	394724.1S	1453540.0E
ORS01-05	560	394719.5S	1453548.7E



Line	SP	LAT	LONG
ORS01-05	570	394714.9S	1453557.3E
ORS01-05	580	394710.3S	1453606.0E
ORS01-05	590	394705.7S	1453614.7E
ORS01-05	600	394701.1S	1453623.3E
ORS01-05	610	394656.6S	1453632.0E
ORS01-05	620	394652.0S	1453640.7E
ORS01-05	630	394647.4S	1453649.3E
ORS01-05	640	394642.8S	1453658.0E
ORS01-05	650	394638.2S	1453706.7E
ORS01-05	660	394633.6S	1453715.3E
ORS01-05	670	394629.0S	1453724.0E
ORS01-05	680	394624.5S	1453732.7E
ORS01-05	690	394619.9S	1453741.3E
ORS01-05	700	394615.3S	1453750.0E
ORS01-05	710	394610.7S	1453758.7E
ORS01-05	720	394606.1S	1453807.3E
ORS01-05	730	394601.5S	1453816.0E
ORS01-05	740	394557.0S	1453824.7E
ORS01-06	100	395410.9S	1453411.7E
ORS01-06	110	395403.5S	1453416.0E
ORS01-06	120	395356.1S	1453420.2E
ORS01-06	130	395348.7S	1453424.5E
ORS01-06	140	395341.2S	1453428.7E
ORS01-06	150	395333.8S	1453433.0E
ORS01-06	160	395326.4S	1453437.2E
ORS01-06	170	395319.0S	1453441.5E
ORS01-06	180	395311.6S	1453445.7E
ORS01-06	190	395304.2S	1453450.0E
ORS01-06	200	395256.7S	1453454.2E
ORS01-06	210	395249.3S	1453458.5E
ORS01-06	220	395241.9S	1453502.7E
ORS01-06	230	395234.5S	1453507.0E
ORS01-06	240	395227.1S	1453511.2E
ORS01-06	250	395219.7S	1453515.5E
ORS01-06	260	395212.2S	1453519.7E
ORS01-06	270	395204.8S	1453524.0E
ORS01-06	280	395157.4S	1453528.2E
ORS01-06	290	395150.0S	1453532.5E
ORS01-06	300	395142.6S	1453536.8E
ORS01-06	310	395135.2S	1453541.0E
ORS01-06	320	395127.7S	1453545.3E
ORS01-06	330	395120.3S	1453549.5E
ORS01-06	340	395112.9S	1453553.8E
ORS01-06	350	395105.5S	1453558.0E
ORS01-06	360	395058.1S	1453602.3E
ORS01-06	370	395050.7S	1453606.5E
ORS01-06	380	395043.2S	1453610.8E
ORS01-06	390	395035.8S	1453615.0E
ORS01-06	400	395028.4S	1453619.3E



Line	SP	LAT	LONG
ORS01-06	410	395021.0S	1453623.5E
ORS01-06	420	395013.6S	1453627.8E
ORS01-06	430	395006.2S	1453632.0E
ORS01-06	440	394958.7S	1453636.3E
ORS01-06	450	394951.3S	1453640.5E
ORS01-06	460	394943.9S	1453644.8E
ORS01-06	470	394936.5S	1453649.0E
ORS01-06	480	394929.1S	1453653.3E
ORS01-06	490	394921.7S	1453657.5E
ORS01-06	500	394914.2S	1453701.8E
ORS01-06	510	394906.8S	1453706.0E
ORS01-06	520	394859.4S	1453710.3E
ORS01-06	530	394852.0S	1453714.5E
ORS01-06	540	394844.6S	1453718.8E
ORS01-06	550	394837.2S	1453723.0E
ORS01-06	560	394829.7S	1453727.3E
ORS01-06	570	394822.3S	1453731.5E
ORS01-06	580	394814.9S	1453735.8E
ORS01-06	590	394807.5S	1453740.1E
ORS01-06	600	394800.1S	1453744.3E
ORS01-06	610	394752.7S	1453748.6E
ORS01-06	620	394745.2S	1453752.8E
ORS01-06	630	394737.8S	1453757.1E
ORS01-06	640	394730.4S	1453801.3E
ORS01-06	650	394723.0S	1453805.6E
ORS01-06	660	394715.6S	1453809.8E
ORS01-06	670	394708.2S	1453814.1E
ORS01-06	680	394700.7S	1453818.3E
ORS01-06	690	394653.3S	1453822.6E
ORS01-06	700	394645.9S	1453826.8E
ORS01-06	710	394638.5S	1453831.1E
ORS01-06	720	394631.1S	1453835.3E
ORS01-06	730	394623.7S	1453839.6E
ORS01-06	740	394616.2S	1453843.8E
ORS01-07	100	395109.3S	1452929.5E
ORS01-07	110	395104.8S	1452938.2E
ORS01-07	120	395100.4S	1452947.0E
ORS01-07	130	395055.9S	1452955.8E
ORS01-07	140	395051.4S	1453004.5E
ORS01-07	150	395046.9S	1453013.3E
ORS01-07	160	395042.5S	1453022.0E
ORS01-07	170	395038.0S	1453030.8E
ORS01-07	180	395033.5S	1453039.6E
ORS01-07	190	395029.0S	1453048.3E
ORS01-07	200	395024.6S	1453057.1E
ORS01-07	210	395020.1S	1453105.9E
ORS01-07	220	395015.6S	1453114.6E
ORS01-07	230	395011.1S	1453123.4E
ORS01-07	240	395006.7S	1453132.1E



Line	SP	LAT	LONG
ORS01-07	250	395002.2S	1453140.9E
ORS01-07	260	394957.7S	1453149.7E
ORS01-07	270	394953.2S	1453158.4E
ORS01-07	280	394948.8S	1453207.2E
ORS01-07	290	394944.3S	1453216.0E
ORS01-07	300	394939.8S	1453224.7E
ORS01-07	310	394935.3S	1453233.5E
ORS01-07	320	394930.9S	1453242.2E
ORS01-07	330	394926.4S	1453251.0E
ORS01-07	340	394921.9S	1453259.8E
ORS01-07	350	394917.4S	1453308.5E
ORS01-07	360	394913.0S	1453317.3E
ORS01-07	370	394908.5S	1453326.1E
ORS01-07	380	394904.0S	1453334.8E
ORS01-07	390	394859.5S	1453343.6E
ORS01-07	400	394855.1S	1453352.3E
ORS01-07	410	394850.6S	1453401.1E
ORS01-07	420	394846.1S	1453409.9E
ORS01-07	430	394841.6S	1453418.6E
ORS01-07	440	394837.2S	1453427.4E
ORS01-07	450	394832.7S	1453436.2E
ORS01-07	460	394828.2S	1453444.9E
ORS01-07	470	394823.7S	1453453.7E
ORS01-07	480	394819.3S	1453502.4E
ORS01-07	490	394814.8S	1453511.2E
ORS01-07	500	394810.3S	1453520.0E
ORS01-07	510	394805.8S	1453528.7E
ORS01-07	520	394801.4S	1453537.5E
ORS01-07	530	394756.9S	1453546.3E
ORS01-07	540	394752.4S	1453555.0E
ORS01-07	550	394747.9S	1453603.8E
ORS01-07	560	394743.5S	1453612.5E
ORS01-07	570	394739.0S	1453621.3E
ORS01-07	580	394734.5S	1453630.1E
ORS01-07	590	394730.0S	1453638.8E
ORS01-07	600	394725.6S	1453647.6E
ORS01-07	610	394721.1S	1453656.4E
ORS01-07	620	394716.6S	1453705.1E
ORS01-07	630	394712.1S	1453713.9E
ORS01-07	640	394707.7S	1453722.6E
ORS01-07	650	394703.2S	1453731.4E
ORS01-07	660	394658.7S	1453740.2E
ORS01-07	670	394654.2S	1453748.9E
ORS01-07	680	394649.8S	1453757.7E
ORS01-07	690	394645.3S	1453806.5E
ORS01-07	700	394640.8S	1453815.2E
ORS01-07	710	394636.3S	1453824.0E
ORS01-07	720	394631.9S	1453832.7E
ORS01-07	730	394627.4S	1453841.5E



Line	SP	LAT	LONG
ORS01-07	740	394622.9S	1453850.3E
ORS01-07	741	394622.5S	1453851.1E
ORS01-08	100	395137.0S	1452953.0E
ORS01-08	110	395132.6S	1453001.8E
ORS01-08	120	395128.1S	1453010.6E
ORS01-08	130	395123.6S	1453019.4E
ORS01-08	140	395119.2S	1453028.2E
ORS01-08	150	395114.7S	1453037.0E
ORS01-08	160	395110.3S	1453045.7E
ORS01-08	170	395105.8S	1453054.5E
ORS01-08	180	395101.3S	1453103.3E
ORS01-08	190	395056.9S	1453112.1E
ORS01-08	200	395052.4S	1453120.9E
ORS01-08	210	395048.0S	1453129.7E
ORS01-08	220	395043.5S	1453138.5E
ORS01-08	230	395039.1S	1453147.2E
ORS01-08	240	395034.6S	1453156.0E
ORS01-08	250	395030.1S	1453204.8E
ORS01-08	260	395025.7S	1453213.6E
ORS01-08	270	395021.2S	1453222.4E
ORS01-08	280	395016.8S	1453231.2E
ORS01-08	290	395012.3S	1453240.0E
ORS01-08	300	395007.9S	1453248.7E
ORS01-08	310	395003.4S	1453257.5E
ORS01-08	320	394958.9S	1453306.3E
ORS01-08	330	394954.5S	1453315.1E
ORS01-08	340	394950.0S	1453323.9E
ORS01-08	350	394945.6S	1453332.7E
ORS01-08	360	394941.1S	1453341.4E
ORS01-08	370	394936.6S	1453350.2E
ORS01-08	380	394932.2S	1453359.0E
ORS01-08	390	394927.7S	1453407.8E
ORS01-08	400	394923.3S	1453416.6E
ORS01-08	410	394918.8S	1453425.4E
ORS01-08	420	394914.4S	1453434.2E
ORS01-08	430	394909.9S	1453442.9E
ORS01-08	440	394905.4S	1453451.7E
ORS01-08	450	394901.0S	1453500.5E
ORS01-08	460	394856.5S	1453509.3E
ORS01-08	470	394852.1S	1453518.1E
ORS01-08	480	394847.6S	1453526.9E
ORS01-08	490	394843.2S	1453535.6E
ORS01-08	500	394838.7S	1453544.4E
ORS01-08	510	394834.2S	1453553.2E
ORS01-08	520	394829.8S	1453602.0E
ORS01-08	530	394825.3S	1453610.8E
ORS01-08	540	394820.9S	1453619.6E
ORS01-08	550	394816.4S	1453628.4E
ORS01-08	560	394811.9S	1453637.1E



Line	SP	LAT	LONG
ORS01-08	570	394807.5S	1453645.9E
ORS01-08	580	394803.0S	1453654.7E
ORS01-08	590	394758.6S	1453703.5E
ORS01-08	600	394754.1S	1453712.3E
ORS01-08	610	394749.7S	1453721.1E
ORS01-08	620	394745.2S	1453729.9E
ORS01-08	630	394740.7S	1453738.6E
ORS01-08	640	394736.3S	1453747.4E
ORS01-08	650	394731.8S	1453756.2E
ORS01-08	660	394727.4S	1453805.0E
ORS01-08	670	394722.9S	1453813.8E
ORS01-08	680	394718.5S	1453822.6E
ORS01-08	690	394714.0S	1453831.3E
ORS01-08	700	394709.5S	1453840.1E
ORS01-08	710	394705.1S	1453848.9E
ORS01-08	720	394700.6S	1453857.7E
ORS01-08	730	394656.2S	1453906.5E
ORS01-08	740	394651.7S	1453915.3E
ORS01-08	741	394651.3S	1453916.2E
ORS01-09	100	395156.9S	1453132.2E
ORS01-09	110	395152.3S	1453140.8E
ORS01-09	120	395147.7S	1453149.5E
ORS01-09	130	395143.1S	1453158.2E
ORS01-09	140	395138.6S	1453206.9E
ORS01-09	150	395134.0S	1453215.5E
ORS01-09	160	395129.4S	1453224.2E
ORS01-09	170	395124.8S	1453232.9E
ORS01-09	180	395120.2S	1453241.5E
ORS01-09	190	395115.6S	1453250.2E
ORS01-09	200	395111.0S	1453258.9E
ORS01-09	210	395106.4S	1453307.5E
ORS01-09	220	395101.8S	1453316.2E
ORS01-09	230	395057.2S	1453324.9E
ORS01-09	240	395052.7S	1453333.6E
ORS01-09	250	395048.1S	1453342.2E
ORS01-09	260	395043.5S	1453350.9E
ORS01-09	270	395038.9S	1453359.6E
ORS01-09	280	395034.3S	1453408.2E
ORS01-09	290	395029.7S	1453416.9E
ORS01-09	300	395025.1S	1453425.6E
ORS01-09	310	395020.5S	1453434.2E
ORS01-09	320	395015.9S	1453442.9E
ORS01-09	330	395011.3S	1453451.6E
ORS01-09	340	395006.8S	1453500.3E
ORS01-09	350	395002.2S	1453508.9E
ORS01-09	360	394957.6S	1453517.6E
ORS01-09	370	394953.0S	1453526.3E
ORS01-09	380	394948.4S	1453534.9E
ORS01-09	390	394943.8S	1453543.6E



Line	SP	LAT	LONG
ORS01-09	400	394939.2S	1453552.3E
ORS01-09	410	394934.6S	1453601.0E
ORS01-09	420	394930.0S	1453609.6E
ORS01-09	430	394925.4S	1453618.3E
ORS01-09	440	394920.8S	1453627.0E
ORS01-09	450	394916.3S	1453635.6E
ORS01-09	460	394911.7S	1453644.3E
ORS01-09	470	394907.1S	1453653.0E
ORS01-09	480	394902.5S	1453701.6E
ORS01-09	490	394857.9S	1453710.3E
ORS01-09	500	394853.3S	1453719.0E
ORS01-09	510	394848.7S	1453727.7E
ORS01-09	520	394844.1S	1453736.3E
ORS01-09	530	394839.5S	1453745.0E
ORS01-09	540	394834.9S	1453753.7E
ORS01-09	550	394830.4S	1453802.3E
ORS01-09	560	394825.8S	1453811.0E
ORS01-09	570	394821.2S	1453819.7E
ORS01-09	580	394816.6S	1453828.3E
ORS01-09	590	394812.0S	1453837.0E
ORS01-09	600	394807.4S	1453845.7E
ORS01-09	610	394802.8S	1453854.4E
ORS01-09	620	394758.2S	1453903.0E
ORS01-09	630	394753.6S	1453911.7E
ORS01-09	640	394749.0S	1453920.4E
ORS01-09	650	394744.5S	1453929.0E
ORS01-09	660	394739.9S	1453937.7E
ORS01-09	670	394735.3S	1453946.4E
ORS01-09	680	394730.7S	1453955.1E
ORS01-09	690	394726.1S	1454003.7E
ORS01-09	700	394721.5S	1454012.4E
ORS01-10	100	395305.5S	1453327.5E
ORS01-10	110	395300.7S	1453336.0E
ORS01-10	120	395255.9S	1453344.5E
ORS01-10	130	395251.1S	1453353.0E
ORS01-10	140	395246.3S	1453401.5E
ORS01-10	150	395241.5S	1453410.0E
ORS01-10	160	395236.8S	1453418.5E
ORS01-10	170	395232.0S	1453427.0E
ORS01-10	180	395227.2S	1453435.5E
ORS01-10	190	395222.4S	1453443.9E
ORS01-10	200	395217.6S	1453452.4E
ORS01-10	210	395212.8S	1453500.9E
ORS01-10	220	395208.0S	1453509.4E
ORS01-10	230	395203.3S	1453517.9E
ORS01-10	240	395158.5S	1453526.4E
ORS01-10	250	395153.7S	1453534.9E
ORS01-10	260	395148.9S	1453543.4E
ORS01-10	270	395144.1S	1453551.9E



Line	SP	LAT	LONG
ORS01-10	280	395139.3S	1453600.4E
ORS01-10	290	395134.5S	1453608.9E
ORS01-10	300	395129.7S	1453617.4E
ORS01-10	310	395125.0S	1453625.9E
ORS01-10	320	395120.2S	1453634.4E
ORS01-10	330	395115.4S	1453642.9E
ORS01-10	340	395110.6S	1453651.3E
ORS01-10	350	395105.8S	1453659.8E
ORS01-10	360	395101.0S	1453708.3E
ORS01-10	370	395056.2S	1453716.8E
ORS01-10	380	395051.4S	1453725.3E
ORS01-10	390	395046.7S	1453733.8E
ORS01-10	400	395041.9S	1453742.3E
ORS01-10	410	395037.1S	1453750.8E
ORS01-10	420	395032.3S	1453759.3E
ORS01-10	430	395027.5S	1453807.8E
ORS01-10	440	395022.7S	1453816.3E
ORS01-10	450	395017.9S	1453824.8E
ORS01-10	460	395013.1S	1453833.3E
ORS01-10	470	395008.4S	1453841.8E
ORS01-10	480	395003.6S	1453850.2E
ORS01-10	490	394958.8S	1453858.7E
ORS01-10	500	394954.0S	1453907.2E
ORS01-10	510	394949.2S	1453915.7E
ORS01-10	520	394944.4S	1453924.2E
ORS01-10	530	394939.6S	1453932.7E
ORS01-10	540	394934.8S	1453941.2E
ORS01-10	550	394930.1S	1453949.7E
ORS01-10	560	394925.3S	1453958.2E
ORS01-10	570	394920.5S	1454006.7E
ORS01-10	580	394915.7S	1454015.2E
ORS01-10	590	394910.9S	1454023.7E
ORS01-10	600	394906.1S	1454032.2E
ORS01-10	610	394901.3S	1454040.7E
ORS01-10	620	394856.5S	1454049.2E
ORS01-10	630	394851.8S	1454057.6E
ORS01-10	640	394847.0S	1454106.1E
ORS01-10	650	394842.2S	1454114.6E
ORS01-10	660	394837.4S	1454123.1E
ORS01-10	670	394832.6S	1454131.6E
ORS01-10	680	394827.8S	1454140.1E
ORS01-10	690	394823.0S	1454148.6E
ORS01-10	700	394818.2S	1454157.1E
ORS01-10	710	394813.5S	1454205.6E
ORS01-10	720	394808.7S	1454214.1E
ORS01-11	100	395328.8S	1453410.4E
ORS01-11	110	395324.0S	1453419.0E
ORS01-11	120	395319.2S	1453427.5E
ORS01-11	130	395314.5S	1453436.0E



Line	SP	LAT	LONG
ORS01-11	140	395309.7S	1453444.5E
ORS01-11	150	395305.0S	1453453.1E
ORS01-11	160	395300.2S	1453501.6E
ORS01-11	170	395255.4S	1453510.1E
ORS01-11	180	395250.7S	1453518.6E
ORS01-11	190	395245.9S	1453527.2E
ORS01-11	200	395241.1S	1453535.7E
ORS01-11	210	395236.4S	1453544.2E
ORS01-11	220	395231.6S	1453552.7E
ORS01-11	230	395226.9S	1453601.3E
ORS01-11	240	395222.1S	1453609.8E
ORS01-11	250	395217.3S	1453618.3E
ORS01-11	260	395212.6S	1453626.8E
ORS01-11	270	395207.8S	1453635.4E
ORS01-11	280	395203.1S	1453643.9E
ORS01-11	290	395158.3S	1453652.4E
ORS01-11	300	395153.5S	1453701.0E
ORS01-11	310	395148.8S	1453709.5E
ORS01-11	320	395144.0S	1453718.0E
ORS01-11	330	395139.2S	1453726.5E
ORS01-11	340	395134.5S	1453735.1E
ORS01-11	350	395129.7S	1453743.6E
ORS01-11	360	395125.0S	1453752.1E
ORS01-11	370	395120.2S	1453800.6E
ORS01-11	380	395115.4S	1453809.2E
ORS01-11	390	395110.7S	1453817.7E
ORS01-11	400	395105.9S	1453826.2E
ORS01-11	410	395101.2S	1453834.7E
ORS01-11	420	395056.4S	1453843.3E
ORS01-11	430	395051.6S	1453851.8E
ORS01-11	440	395046.9S	1453900.3E
ORS01-11	450	395042.1S	1453908.8E
ORS01-11	460	395037.3S	1453917.4E
ORS01-11	470	395032.6S	1453925.9E
ORS01-11	480	395027.8S	1453934.4E
ORS01-11	490	395023.1S	1453942.9E
ORS01-11	500	395018.3S	1453951.5E
ORS01-11	510	395013.5S	1454000.0E
ORS01-11	520	395008.8S	1454008.5E
ORS01-11	530	395004.0S	1454017.0E
ORS01-11	540	394959.3S	1454025.6E
ORS01-11	550	394954.5S	1454034.1E
ORS01-11	560	394949.7S	1454042.6E
ORS01-11	570	394945.0S	1454051.1E
ORS01-11	580	394940.2S	1454059.7E
ORS01-11	590	394935.4S	1454108.2E
ORS01-11	600	394930.7S	1454116.7E
ORS01-11	610	394925.9S	1454125.3E
ORS01-11	620	394921.2S	1454133.8E



Line	SP	LAT	LONG
ORS01-11	630	394916.4S	1454142.3E
ORS01-11	640	394911.6S	1454150.8E
ORS01-11	650	394906.9S	1454159.4E
ORS01-11	660	394902.1S	1454207.9E
ORS01-12	100	395754.0S	1452826.4E
ORS01-12	110	395749.3S	1452835.0E
ORS01-12	120	395744.6S	1452843.6E
ORS01-12	130	395739.9S	1452852.2E
ORS01-12	140	395735.2S	1452900.8E
ORS01-12	150	395730.5S	1452909.3E
ORS01-12	160	395725.8S	1452917.9E
ORS01-12	170	395721.1S	1452926.5E
ORS01-12	180	395716.4S	1452935.1E
ORS01-12	190	395711.7S	1452943.7E
ORS01-12	200	395707.0S	1452952.2E
ORS01-12	210	395702.3S	1453000.8E
ORS01-12	220	395657.6S	1453009.4E
ORS01-12	230	395652.9S	1453018.0E
ORS01-12	240	395648.2S	1453026.6E
ORS01-12	250	395643.5S	1453035.1E
ORS01-12	260	395638.8S	1453043.7E
ORS01-12	270	395634.1S	1453052.3E
ORS01-12	280	395629.4S	1453100.9E
ORS01-12	290	395624.7S	1453109.5E
ORS01-12	300	395620.0S	1453118.0E
ORS01-12	310	395615.3S	1453126.6E
ORS01-12	320	395610.6S	1453135.2E
ORS01-12	330	395605.9S	1453143.8E
ORS01-12	340	395601.2S	1453152.4E
ORS01-12	350	395556.5S	1453200.9E
ORS01-12	360	395551.8S	1453209.5E
ORS01-12	370	395547.1S	1453218.1E
ORS01-12	380	395542.4S	1453226.7E
ORS01-12	390	395537.7S	1453235.3E
ORS01-12	400	395533.0S	1453243.8E
ORS01-12	410	395528.3S	1453252.4E
ORS01-12	420	395523.6S	1453301.0E
ORS01-12	430	395518.9S	1453309.6E
ORS01-12	440	395514.2S	1453318.1E
ORS01-12	450	395509.5S	1453326.7E
ORS01-12	460	395504.8S	1453335.3E
ORS01-12	470	395500.1S	1453343.9E
ORS01-12	480	395455.4S	1453352.5E
ORS01-12	490	395450.7S	1453401.0E
ORS01-12	500	395446.0S	1453409.6E
ORS01-12	510	395441.3S	1453418.2E
ORS01-12	520	395436.6S	1453426.8E
ORS01-12	530	395431.9S	1453435.4E
ORS01-12	540	395427.1S	1453443.9E



Line	SP	LAT	LONG
ORS01-12	550	395422.4S	1453452.5E
ORS01-12	560	395417.7S	1453501.1E
ORS01-12	570	395413.0S	1453509.7E
ORS01-12	580	395408.3S	1453518.3E
ORS01-12	590	395403.6S	1453526.8E
ORS01-12	600	395358.9S	1453535.4E
ORS01-12	610	395354.2S	1453544.0E
ORS01-12	620	395349.5S	1453552.6E
ORS01-12	630	395344.8S	1453601.2E
ORS01-12	640	395340.1S	1453609.7E
ORS01-12	650	395335.4S	1453618.3E
ORS01-12	660	395330.7S	1453626.9E
ORS01-12	670	395326.0S	1453635.5E
ORS01-12	680	395321.3S	1453644.1E
ORS01-12	690	395316.6S	1453652.6E
ORS01-12	700	395311.9S	1453701.2E
ORS01-12	710	395307.2S	1453709.8E
ORS01-12	720	395302.5S	1453718.4E
ORS01-12	730	395257.8S	1453727.0E
ORS01-12	740	395253.1S	1453735.5E
ORS01-12	750	395248.4S	1453744.1E
ORS01-12	760	395243.7S	1453752.7E
ORS01-12	770	395239.0S	1453801.3E
ORS01-12	780	395234.3S	1453809.8E
ORS01-12	790	395229.6S	1453818.4E
ORS01-12	800	395224.9S	1453827.0E
ORS01-12	810	395220.2S	1453835.6E
ORS01-12	820	395215.5S	1453844.2E
ORS01-12	830	395210.8S	1453852.7E
ORS01-12	840	395206.1S	1453901.3E
ORS01-12	850	395201.4S	1453909.9E
ORS01-12	860	395156.7S	1453918.5E
ORS01-12	870	395152.0S	1453927.1E
ORS01-12	880	395147.3S	1453935.6E
ORS01-12	890	395142.6S	1453944.2E
ORS01-12	900	395137.9S	1453952.8E
ORS01-12	910	395133.2S	1454001.4E
ORS01-12	920	395128.5S	1454010.0E
ORS01-12	930	395123.8S	1454018.5E
ORS01-12	940	395119.1S	1454027.1E
ORS01-12	950	395114.4S	1454035.7E
ORS01-12	960	395109.7S	1454044.3E
ORS01-12	970	395105.0S	1454052.9E
ORS01-12	980	395100.3S	1454101.4E
ORS01-12	990	395055.6S	1454110.0E
ORS01-12	1000	395050.8S	1454118.6E
ORS01-12	1010	395046.1S	1454127.2E
ORS01-12	1020	395041.4S	1454135.8E
ORS01-12	1030	395036.7S	1454144.3E



Line	SP	LAT	LONG
ORS01-12	1040	395032.0S	1454152.9E
ORS01-12	1050	395027.3S	1454201.5E
ORS01-12	1060	395022.6S	1454210.1E
ORS01-12	1070	395017.9S	1454218.7E
ORS01-12	1080	395013.2S	1454227.2E
ORS01-12	1090	395008.5S	1454235.8E
ORS01-12	1100	395003.8S	1454244.4E
ORS01-12	1110	394959.1S	1454253.0E
ORS01-12	1120	394954.4S	1454301.5E
ORS01-12	1130	394949.7S	1454310.1E
ORS01-12	1140	394945.0S	1454318.7E
ORS01-13	100	395538.4S	1451828.0E
ORS01-13	110	395532.1S	1451834.5E
ORS01-13	120	395525.7S	1451841.0E
ORS01-13	130	395519.4S	1451847.6E
ORS01-13	140	395513.0S	1451854.1E
ORS01-13	150	395506.6S	1451900.6E
ORS01-13	160	395500.3S	1451907.1E
ORS01-13	170	395453.9S	1451913.6E
ORS01-13	180	395447.5S	1451920.1E
ORS01-13	190	395441.2S	1451926.6E
ORS01-13	200	395434.8S	1451933.1E
ORS01-13	210	395428.4S	1451939.6E
ORS01-13	220	395422.1S	1451946.2E
ORS01-13	230	395415.7S	1451952.7E
ORS01-13	240	395409.3S	1451959.2E
ORS01-13	250	395403.0S	1452005.7E
ORS01-13	260	395356.6S	1452012.2E
ORS01-13	270	395350.2S	1452018.7E
ORS01-13	280	395343.9S	1452025.2E
ORS01-13	290	395337.5S	1452031.7E
ORS01-13	300	395331.2S	1452038.2E
ORS01-13	310	395324.8S	1452044.8E
ORS01-13	320	395318.4S	1452051.3E
ORS01-13	330	395312.1S	1452057.8E
ORS01-13	340	395305.7S	1452104.3E
ORS01-13	350	395259.3S	1452110.8E
ORS01-13	360	395253.0S	1452117.3E
ORS01-13	370	395246.6S	1452123.8E
ORS01-13	380	395240.2S	1452130.3E
ORS01-13	390	395233.9S	1452136.8E
ORS01-13	400	395227.5S	1452143.4E
ORS01-13	410	395221.1S	1452149.9E
ORS01-13	420	395214.8S	1452156.4E
ORS01-13	430	395208.4S	1452202.9E
ORS01-13	440	395202.0S	1452209.4E
ORS01-13	450	395155.7S	1452215.9E
ORS01-13	460	395149.3S	1452222.4E
ORS01-13	470	395143.0S	1452228.9E



Line	SP	LAT	LONG
ORS01-13	480	395136.6S	1452235.4E
ORS01-13	490	395130.2S	1452242.0E
ORS01-13	500	395123.9S	1452248.5E
ORS01-13	510	395117.5S	1452255.0E
ORS01-13	520	395111.1S	1452301.5E
ORS01-13	530	395104.8S	1452308.0E
ORS01-13	540	395058.4S	1452314.5E
ORS01-13	550	395052.0S	1452321.0E
ORS01-13	560	395045.7S	1452327.5E
ORS01-13	570	395039.3S	1452334.0E
ORS01-13	580	395032.9S	1452340.6E
ORS01-13	590	395026.6S	1452347.1E
ORS01-13	600	395020.2S	1452353.6E
ORS01-13	610	395013.8S	1452400.1E
ORS01-13	620	395007.5S	1452406.6E
ORS01-13	630	395001.1S	1452413.1E
ORS01-13	640	394954.8S	1452419.6E
ORS01-13	650	394948.4S	1452426.1E
ORS01-13	660	394942.0S	1452432.6E
ORS01-13	670	394935.7S	1452439.2E
ORS01-13	680	394929.3S	1452445.7E
ORS01-13	690	394922.9S	1452452.2E
ORS01-13	700	394916.6S	1452458.7E
ORS01-13	710	394910.2S	1452505.2E
ORS01-13	720	394903.8S	1452511.7E
ORS01-13	730	394857.5S	1452518.2E
ORS01-13	740	394851.1S	1452524.7E
ORS01-13	750	394844.7S	1452531.2E
ORS01-13	760	394838.4S	1452537.8E
ORS01-13	770	394832.0S	1452544.3E
ORS01-13	780	394825.7S	1452550.8E
ORS01-13	790	394819.3S	1452557.3E
ORS01-13	800	394812.9S	1452603.8E
ORS01-13	810	394806.6S	1452610.3E
ORS01-13	820	394800.2S	1452616.8E
ORS01-13	830	394753.8S	1452623.3E
ORS01-13	840	394747.5S	1452629.8E
ORS01-13	850	394741.1S	1452636.4E
ORS01-13	860	394734.7S	1452642.9E
ORS01-13	870	394728.4S	1452649.4E
ORS01-13	880	394722.0S	1452655.9E
ORS01-13	890	394715.6S	1452702.4E
ORS01-13	900	394709.3S	1452708.9E
ORS01-13	910	394702.9S	1452715.4E
ORS01-13	920	394656.5S	1452721.9E
ORS01-13	930	394650.2S	1452728.4E
ORS01-13	940	394643.8S	1452735.0E
ORS01-13	950	394637.5S	1452741.5E
ORS01-13	960	394631.1S	1452748.0E

GEOTEAM



Line	SP	LAT	LONG
ORS01-13	970	394624.7S	1452754.5E
ORS01-13	980	394618.4S	1452801.0E
ORS01-13	990	394612.0S	1452807.5E
ORS01-13	1000	394605.6S	1452814.0E
ORS01-13	1010	394559.3S	1452820.5E
ORS01-13	1020	394552.9S	1452827.0E
ORS01-13	1030	394546.5S	1452833.6E
ORS01-13	1040	394540.2S	1452840.1E
ORS01-13	1050	394533.8S	1452846.6E
ORS01-13	1060	394527.4S	1452853.1E
ORS01-13	1070	394521.1S	1452859.6E
ORS01-13	1080	394514.7S	1452906.1E
ORS01-13	1090	394508.3S	1452912.6E
ORS01-13	1100	394502.0S	1452919.1E
ORS01-13	1110	394455.6S	1452925.6E
ORS01-13	1120	394449.3S	1452932.2E
ORS01-13	1130	394442.9S	1452938.7E
ORS01-13	1140	394436.5S	1452945.2E
ORS01-13	1150	394430.2S	1452951.7E
ORS01-13	1160	394423.8S	1452958.2E
ORS01-13	1170	394417.4S	1453004.7E
ORS01-13	1180	394411.1S	1453011.2E
ORS01-13	1190	394404.7S	1453017.7E
ORS01-13	1200	394358.3S	1453024.3E
ORS01-13	1210	394352.0S	1453030.8E
ORS01-13	1220	394345.6S	1453037.3E
ORS01-13	1230	394339.2S	1453043.8E
ORS01-13	1240	394332.9S	1453050.3E
ORS01-13	1250	394326.5S	1453056.8E
ORS01-13	1260	394320.1S	1453103.3E
ORS01-13	1270	394313.8S	1453109.8E
ORS01-13	1280	394307.4S	1453116.3E
ORS01-13	1290	394301.1S	1453122.9E
ORS01-13	1300	394254.7S	1453129.4E
ORS01-13	1310	394248.3S	1453135.9E
ORS01-13	1320	394242.0S	1453142.4E
ORS01-13	1330	394235.6S	1453148.9E
ORS01-13	1340	394229.2S	1453155.4E
ORS01-13	1350	394222.9S	1453201.9E
ORS01-13	1360	394216.5S	1453208.4E
ORS01-13	1370	394210.1S	1453214.9E
ORS01-13	1380	394203.8S	1453221.5E
ORS01-14	100	394423.0S	1452441.2E
ORS01-14	110	394427.3S	1452450.1E
ORS01-14	120	394431.7S	1452459.0E
ORS01-14	130	394436.0S	1452507.9E
ORS01-14	140	394440.4S	1452516.7E
ORS01-14	150	394444.7S	1452525.6E
ORS01-14	160	394449.1S	1452534.5E



Line	SP	LAT	LONG
ORS01-14	170	394453.4S	1452543.4E
ORS01-14	180	394457.8S	1452552.2E
ORS01-14	190	394502.1S	1452601.1E
ORS01-14	200	394506.5S	1452610.0E
ORS01-14	210	394510.8S	1452618.9E
ORS01-14	220	394515.2S	1452627.7E
ORS01-14	230	394519.5S	1452636.6E
ORS01-14	240	394523.9S	1452645.5E
ORS01-14	250	394528.2S	1452654.4E
ORS01-14	260	394532.6S	1452703.3E
ORS01-14	270	394536.9S	1452712.1E
ORS01-14	280	394541.3S	1452721.0E
ORS01-14	290	394545.6S	1452729.9E
ORS01-14	300	394550.0S	1452738.8E
ORS01-14	310	394554.3S	1452747.6E
ORS01-14	320	394558.7S	1452756.5E
ORS01-14	330	394603.0S	1452805.4E
ORS01-14	340	394607.4S	1452814.3E
ORS01-14	350	394611.7S	1452823.2E
ORS01-14	360	394616.0S	1452832.0E
ORS01-14	370	394620.4S	1452840.9E
ORS01-14	380	394624.7S	1452849.8E
ORS01-14	390	394629.1S	1452858.7E
ORS01-14	400	394633.4S	1452907.5E
ORS01-14	410	394637.8S	1452916.4E
ORS01-14	420	394642.1S	1452925.3E
ORS01-14	430	394646.5S	1452934.2E
ORS01-14	440	394650.8S	1452943.1E
ORS01-14	450	394655.2S	1452951.9E
ORS01-14	460	394659.5S	1453000.8E
ORS01-14	470	394703.9S	1453009.7E
ORS01-14	480	394708.2S	1453018.6E
ORS01-14	490	394712.6S	1453027.4E
ORS01-14	500	394716.9S	1453036.3E
ORS01-14	510	394721.3S	1453045.2E
ORS01-14	520	394725.6S	1453054.1E
ORS01-14	530	394730.0S	1453103.0E
ORS01-14	540	394734.3S	1453111.8E
ORS01-14	550	394738.7S	1453120.7E
ORS01-14	560	394743.0S	1453129.6E
ORS01-14	570	394747.4S	1453138.5E
ORS01-14	580	394751.7S	1453147.3E
ORS01-14	590	394756.1S	1453156.2E
ORS01-14	600	394800.4S	1453205.1E
ORS01-14	610	394804.8S	1453214.0E
ORS01-14	620	394809.1S	1453222.9E
ORS01-14	630	394813.4S	1453231.7E
ORS01-14	640	394817.8S	1453240.6E
ORS01-14	650	394822.1S	1453249.5E



Line	SP	LAT	LONG
ORS01-14	660	394826.5S	1453258.4E
ORS01-14	670	394830.8S	1453307.2E
ORS01-14	680	394835.2S	1453316.1E
ORS01-14	690	394839.5S	1453325.0E
ORS01-14	700	394843.9S	1453333.9E
ORS01-14	710	394848.2S	1453342.8E
ORS01-14	720	394852.6S	1453351.6E
ORS01-14	730	394856.9S	1453400.5E
ORS01-14	740	394901.3S	1453409.4E
ORS01-14	750	394905.6S	1453418.3E
ORS01-14	760	394910.0S	1453427.1E
ORS01-14	770	394914.3S	1453436.0E
ORS01-14	780	394918.7S	1453444.9E
ORS01-14	790	394923.0S	1453453.8E
ORS01-14	800	394927.4S	1453502.7E
ORS01-14	810	394931.7S	1453511.5E
ORS01-14	820	394936.1S	1453520.4E
ORS01-14	830	394940.4S	1453529.3E
ORS01-14	840	394944.8S	1453538.2E
ORS01-14	850	394949.1S	1453547.0E
ORS01-14	860	394953.5S	1453555.9E
ORS01-14	870	394957.8S	1453604.8E
ORS01-14	880	395002.2S	1453613.7E
ORS01-14	890	395006.5S	1453622.5E
ORS01-14	900	395010.8S	1453631.4E
ORS01-14	910	395015.2S	1453640.3E
ORS01-14	920	395019.5S	1453649.2E
ORS01-14	930	395023.9S	1453658.1E
ORS01-14	940	395028.2S	1453706.9E
ORS01-14	950	395032.6S	1453715.8E
ORS01-14	960	395036.9S	1453724.7E
ORS01-14	970	395041.3S	1453733.6E
ORS01-14	980	395045.6S	1453742.4E
ORS01-14	990	395050.0S	1453751.3E
ORS01-14	1000	395054.3S	1453800.2E
ORS01-14	1010	395058.7S	1453809.1E
ORS01-14	1020	395103.0S	1453818.0E
ORS01-14	1030	395107.4S	1453826.8E
ORS01-14	1040	395111.7S	1453835.7E
ORS01-14	1050	395116.1S	1453844.6E
ORS01-14	1060	395120.4S	1453853.5E
ORS01-14	1070	395124.8S	1453902.3E
ORS01-14	1080	395129.1S	1453911.2E
ORS01-14	1090	395133.5S	1453920.1E
ORS01-14	1100	395137.8S	1453929.0E
ORS01-14	1110	395142.2S	1453937.9E
ORS01-14	1120	395146.5S	1453946.7E
ORS01-14	1130	395150.9S	1453955.6E
ORS01-14	1140	395155.2S	1454004.5E



Line	SP	LAT	LONG
ORS01-14	1150	395159.6S	1454013.4E
ORS01-14	1160	395203.9S	1454022.2E
ORS01-14	1170	395208.2S	1454031.1E
ORS01-14	1180	395212.6S	1454040.0E
ORS01-14	1190	395216.9S	1454048.9E
ORS01-14	1200	395221.3S	1454057.8E
ORS01-14	1210	395225.6S	1454106.6E
ORS01-14	1220	395230.0S	1454115.5E
ORS01-14	1230	395234.3S	1454124.4E
ORS01-14	1240	395238.7S	1454133.3E
ORS01-14	1250	395243.0S	1454142.1E
ORS01-14	1260	395247.4S	1454151.0E
ORS01-15	100	394141.3S	1452718.0E
ORS01-15	110	394147.9S	1452724.1E
ORS01-15	120	394154.5S	1452730.1E
ORS01-15	130	394201.1S	1452736.2E
ORS01-15	140	394207.8S	1452742.3E
ORS01-15	150	394214.4S	1452748.3E
ORS01-15	160	394221.0S	1452754.4E
ORS01-15	170	394227.6S	1452800.5E
ORS01-15	180	394234.2S	1452806.5E
ORS01-15	190	394240.9S	1452812.6E
ORS01-15	200	394247.5S	1452818.7E
ORS01-15	210	394254.1S	1452824.8E
ORS01-15	220	394300.7S	1452830.8E
ORS01-15	230	394307.4S	1452836.9E
ORS01-15	240	394314.0S	1452843.0E
ORS01-15	250	394320.6S	1452849.0E
ORS01-15	260	394327.2S	1452855.1E
ORS01-15	270	394333.9S	1452901.2E
ORS01-15	280	394340.5S	1452907.2E
ORS01-15	290	394347.1S	1452913.3E
ORS01-15	300	394353.7S	1452919.4E
ORS01-15	310	394400.3S	1452925.4E
ORS01-15	320	394407.0S	1452931.5E
ORS01-15	330	394413.6S	1452937.6E
ORS01-15	340	394420.2S	1452943.7E
ORS01-15	350	394426.8S	1452949.7E
ORS01-15	360	394433.5S	1452955.8E
ORS01-15	370	394440.1S	1453001.9E
ORS01-15	380	394446.7S	1453007.9E
ORS01-15	390	394453.3S	1453014.0E
ORS01-15	400	394459.9S	1453020.1E
ORS01-15	410	394506.6S	1453026.1E
ORS01-15	420	394513.2S	1453032.2E
ORS01-15	430	394519.8S	1453038.3E
ORS01-15	440	394526.4S	1453044.4E
ORS01-15	450	394533.1S	1453050.4E
ORS01-15	460	394539.7S	1453056.5E



Line	SP	LAT	LONG
ORS01-15	470	394546.3S	1453102.6E
ORS01-15	480	394552.9S	1453108.6E
ORS01-15	490	394559.6S	1453114.7E
ORS01-15	500	394606.2S	1453120.8E
ORS01-15	510	394612.8S	1453126.8E
ORS01-15	520	394619.4S	1453132.9E
ORS01-15	530	394626.0S	1453139.0E
ORS01-15	540	394632.7S	1453145.0E
ORS01-15	550	394639.3S	1453151.1E
ORS01-15	560	394645.9S	1453157.2E
ORS01-15	570	394652.5S	1453203.3E
ORS01-15	580	394659.2S	1453209.3E
ORS01-15	590	394705.8S	1453215.4E
ORS01-15	600	394712.4S	1453221.5E
ORS01-15	610	394719.0S	1453227.5E
ORS01-15	620	394725.7S	1453233.6E
ORS01-15	630	394732.3S	1453239.7E
ORS01-15	640	394738.9S	1453245.7E
ORS01-15	650	394745.5S	1453251.8E
ORS01-15	660	394752.1S	1453257.9E
ORS01-15	670	394758.8S	1453303.9E
ORS01-15	680	394805.4S	1453310.0E
ORS01-15	690	394812.0S	1453316.1E
ORS01-15	700	394818.6S	1453322.2E
ORS01-15	710	394825.3S	1453328.2E
ORS01-15	720	394831.9S	1453334.3E
ORS01-15	730	394838.5S	1453340.4E
ORS01-15	740	394845.1S	1453346.4E
ORS01-15	750	394851.8S	1453352.5E
ORS01-15	760	394858.4S	1453358.6E
ORS01-15	770	394905.0S	1453404.6E
ORS01-15	780	394911.6S	1453410.7E
ORS01-15	790	394918.2S	1453416.8E
ORS01-15	800	394924.9S	1453422.9E
ORS01-15	810	394931.5S	1453428.9E
ORS01-15	820	394938.1S	1453435.0E
ORS01-15	830	394944.7S	1453441.1E
ORS01-15	840	394951.4S	1453447.1E
ORS01-15	850	394958.0S	1453453.2E
ORS01-15	860	395004.6S	1453459.3E
ORS01-15	870	395011.2S	1453505.3E
ORS01-15	880	395017.8S	1453511.4E
ORS01-15	890	395024.5S	1453517.5E
ORS01-15	900	395031.1S	1453523.5E
ORS01-16	100	394115.0S	1452815.4E
ORS01-16	110	394121.5S	1452821.7E
ORS01-16	120	394128.0S	1452827.9E
ORS01-16	130	394134.6S	1452834.1E
ORS01-16	140	394141.1S	1452840.4E



Line	SP	LAT	LONG
ORS01-16	150	394147.6S	1452846.6E
ORS01-16	160	394154.2S	1452852.9E
ORS01-16	170	394200.7S	1452859.1E
ORS01-16	180	394207.2S	1452905.4E
ORS01-16	190	394213.7S	1452911.6E
ORS01-16	200	394220.3S	1452917.8E
ORS01-16	210	394226.8S	1452924.1E
ORS01-16	220	394233.3S	1452930.3E
ORS01-16	230	394239.8S	1452936.6E
ORS01-16	240	394246.4S	1452942.8E
ORS01-16	250	394252.9S	1452949.1E
ORS01-16	260	394259.4S	1452955.3E
ORS01-16	270	394305.9S	1453001.5E
ORS01-16	280	394312.5S	1453007.8E
ORS01-16	290	394319.0S	1453014.0E
ORS01-16	300	394325.5S	1453020.3E
ORS01-16	310	394332.1S	1453026.5E
ORS01-16	320	394338.6S	1453032.8E
ORS01-16	330	394345.1S	1453039.0E
ORS01-16	340	394351.6S	1453045.2E
ORS01-16	350	394358.2S	1453051.5E
ORS01-16	360	394404.7S	1453057.7E
ORS01-16	370	394411.2S	1453104.0E
ORS01-16	380	394417.7S	1453110.2E
ORS01-16	390	394424.3S	1453116.5E
ORS01-16	400	394430.8S	1453122.7E
ORS01-16	410	394437.3S	1453128.9E
ORS01-16	420	394443.8S	1453135.2E
ORS01-16	430	394450.4S	1453141.4E
ORS01-16	440	394456.9S	1453147.7E
ORS01-16	450	394503.4S	1453153.9E
ORS01-16	460	394510.0S	1453200.2E
ORS01-16	470	394516.5S	1453206.4E
ORS01-16	480	394523.0S	1453212.6E
ORS01-16	490	394529.5S	1453218.9E
ORS01-16	500	394536.1S	1453225.1E
ORS01-16	510	394542.6S	1453231.4E
ORS01-16	520	394549.1S	1453237.6E
ORS01-16	530	394555.6S	1453243.9E
ORS01-16	540	394602.2S	1453250.1E
ORS01-16	550	394608.7S	1453256.3E
ORS01-16	560	394615.2S	1453302.6E
ORS01-16	570	394621.7S	1453308.8E
ORS01-16	580	394628.3S	1453315.1E
ORS01-16	590	394634.8S	1453321.3E
ORS01-16	600	394641.3S	1453327.5E
ORS01-16	610	394647.8S	1453333.8E
ORS01-16	620	394654.4S	1453340.0E
ORS01-16	630	394700.9S	1453346.3E



Line	SP	LAT	LONG
ORS01-16	640	394707.4S	1453352.5E
ORS01-16	650	394714.0S	1453358.8E
ORS01-16	660	394720.5S	1453405.0E
ORS01-16	670	394727.0S	1453411.2E
ORS01-16	680	394733.5S	1453417.5E
ORS01-16	690	394740.1S	1453423.7E
ORS01-16	700	394746.6S	1453430.0E
ORS01-17	100	395833.3S	1452946.5E
ORS01-17	110	395828.7S	1452955.2E
ORS01-17	120	395824.1S	1453003.8E
ORS01-17	130	395819.5S	1453012.5E
ORS01-17	140	395814.8S	1453021.1E
ORS01-17	150	395810.2S	1453029.8E
ORS01-17	160	395805.6S	1453038.4E
ORS01-17	170	395801.0S	1453047.1E
ORS01-17	180	395756.3S	1453055.7E
ORS01-17	190	395751.7S	1453104.4E
ORS01-17	200	395747.1S	1453113.0E
ORS01-17	210	395742.5S	1453121.7E
ORS01-17	220	395737.8S	1453130.3E
ORS01-17	230	395733.2S	1453139.0E
ORS01-17	240	395728.6S	1453147.6E
ORS01-17	250	395724.0S	1453156.3E
ORS01-17	260	395719.3S	1453204.9E
ORS01-17	270	395714.7S	1453213.6E
ORS01-17	280	395710.1S	1453222.2E
ORS01-17	290	395705.5S	1453230.8E
ORS01-17	300	395700.8S	1453239.5E
ORS01-17	310	395656.2S	1453248.1E
ORS01-17	320	395651.6S	1453256.8E
ORS01-17	330	395646.9S	1453305.4E
ORS01-17	340	395642.3S	1453314.1E
ORS01-17	350	395637.7S	1453322.7E
ORS01-17	360	395633.1S	1453331.4E
ORS01-17	370	395628.4S	1453340.0E
ORS01-17	380	395623.8S	1453348.7E
ORS01-17	390	395619.2S	1453357.3E
ORS01-17	400	395614.6S	1453406.0E
ORS01-17	410	395609.9S	1453414.6E
ORS01-17	420	395605.3S	1453423.3E
ORS01-17	430	395600.7S	1453431.9E
ORS01-17	440	395556.1S	1453440.6E
ORS01-17	450	395551.4S	1453449.2E
ORS01-17	460	395546.8S	1453457.9E
ORS01-17	470	395542.2S	1453506.5E
ORS01-17	480	395537.6S	1453515.2E
ORS01-17	490	395532.9S	1453523.8E
ORS01-17	500	395528.3S	1453532.5E
ORS01-17	510	395523.7S	1453541.1E



Line	SP	LAT	LONG
ORS01-17	520	395519.1S	1453549.8E
ORS01-17	530	395514.4S	1453558.4E
ORS01-17	540	395509.8S	1453607.1E
ORS01-17	550	395505.2S	1453615.7E
ORS01-17	560	395500.6S	1453624.4E
ORS01-17	570	395455.9S	1453633.0E
ORS01-17	580	395451.3S	1453641.7E
ORS01-17	590	395446.7S	1453650.3E
ORS01-17	600	395442.1S	1453659.0E
ORS01-17	610	395437.4S	1453707.6E
ORS01-17	620	395432.8S	1453716.3E
ORS01-17	630	395428.2S	1453724.9E
ORS01-17	640	395423.6S	1453733.6E
ORS01-17	650	395418.9S	1453742.2E
ORS01-17	660	395414.3S	1453750.9E
ORS01-17	670	395409.7S	1453759.5E
ORS01-17	680	395405.1S	1453808.2E
ORS01-17	690	395400.4S	1453816.8E
ORS01-17	700	395355.8S	1453825.5E
ORS01-17	710	395351.2S	1453834.1E
ORS01-17	720	395346.6S	1453842.8E
ORS01-17	730	395341.9S	1453851.4E
ORS01-17	740	395337.3S	1453900.1E
ORS01-17	750	395332.7S	1453908.7E
ORS01-17	760	395328.1S	1453917.4E
ORS01-17	770	395323.4S	1453926.0E
ORS01-17	780	395318.8S	1453934.7E
ORS01-17	790	395314.2S	1453943.3E
ORS01-17	800	395309.5S	1453952.0E
ORS01-17	810	395304.9S	1454000.6E
ORS01-17	820	395300.3S	1454009.3E
ORS01-17	830	395255.7S	1454017.9E
ORS01-17	840	395251.0S	1454026.6E
ORS01-17	850	395246.4S	1454035.2E
ORS01-17	860	395241.8S	1454043.9E
ORS01-17	870	395237.2S	1454052.5E
ORS01-17	880	395232.5S	1454101.2E
ORS01-17	890	395227.9S	1454109.8E
ORS01-17	900	395223.3S	1454118.5E
ORS01-17	910	395218.7S	1454127.1E
ORS01-17	920	395214.0S	1454135.8E
ORS01-17	930	395209.4S	1454144.4E
ORS01-17	940	395204.8S	1454153.1E
ORS01-17	950	395200.2S	1454201.7E
ORS01-17	960	395155.5S	1454210.4E
ORS01-17	970	395150.9S	1454219.0E
ORS01-17	980	395146.3S	1454227.7E
ORS01-17	990	395141.7S	1454236.3E
ORS01-17	1000	395137.0S	1454245.0E



Line	SP	LAT	LONG
ORS01-18	100	400141.5S	1452622.4E
ORS01-18	110	400136.7S	1452630.9E
ORS01-18	120	400131.9S	1452639.4E
ORS01-18	130	400127.2S	1452648.0E
ORS01-18	140	400122.4S	1452656.5E
ORS01-18	150	400117.6S	1452705.0E
ORS01-18	160	400112.8S	1452713.5E
ORS01-18	170	400108.0S	1452722.0E
ORS01-18	180	400103.3S	1452730.5E
ORS01-18	190	400058.5S	1452739.0E
ORS01-18	200	400053.7S	1452747.5E
ORS01-18	210	400048.9S	1452756.0E
ORS01-18	220	400044.1S	1452804.5E
ORS01-18	230	400039.4S	1452813.0E
ORS01-18	240	400034.6S	1452821.5E
ORS01-18	250	400029.8S	1452830.0E
ORS01-18	260	400025.0S	1452838.6E
ORS01-18	270	400020.2S	1452847.1E
ORS01-18	280	400015.5S	1452855.6E
ORS01-18	290	400010.7S	1452904.1E
ORS01-18	300	400005.9S	1452912.6E
ORS01-18	310	400001.1S	1452921.1E
ORS01-18	320	395956.3S	1452929.6E
ORS01-18	330	395951.5S	1452938.1E
ORS01-18	340	395946.8S	1452946.6E
ORS01-18	350	395942.0S	1452955.1E
ORS01-18	360	395937.2S	1453003.6E
ORS01-18	370	395932.4S	1453012.1E
ORS01-18	380	395927.6S	1453020.6E
ORS01-18	390	395922.9S	1453029.2E
ORS01-18	400	395918.1S	1453037.7E
ORS01-18	410	395913.3S	1453046.2E
ORS01-18	420	395908.5S	1453054.7E
ORS01-18	430	395903.7S	1453103.2E
ORS01-18	440	395859.0S	1453111.7E
ORS01-18	450	395854.2S	1453120.2E
ORS01-18	460	395849.4S	1453128.7E
ORS01-18	470	395844.6S	1453137.2E
ORS01-18	480	395839.8S	1453145.7E
ORS01-18	490	395835.1S	1453154.2E
ORS01-18	500	395830.3S	1453202.7E
ORS01-18	510	395825.5S	1453211.2E
ORS01-18	520	395820.7S	1453219.8E
ORS01-18	530	395815.9S	1453228.3E
ORS01-18	540	395811.1S	1453236.8E
ORS01-18	550	395806.4S	1453245.3E
ORS01-18	560	395801.6S	1453253.8E
ORS01-18	570	395756.8S	1453302.3E
ORS01-18	580	395752.0S	1453310.8E



Line	SP	LAT	LONG
ORS01-18	590	395747.2S	1453319.3E
ORS01-18	600	395742.5S	1453327.8E
ORS01-18	610	395737.7S	1453336.3E
ORS01-18	620	395732.9S	1453344.8E
ORS01-18	630	395728.1S	1453353.3E
ORS01-18	640	395723.3S	1453401.8E
ORS01-18	650	395718.6S	1453410.4E
ORS01-18	660	395713.8S	1453418.9E
ORS01-18	670	395709.0S	1453427.4E
ORS01-18	680	395704.2S	1453435.9E
ORS01-18	690	395659.4S	1453444.4E
ORS01-18	700	395654.6S	1453452.9E
ORS01-18	701	395654.2S	1453453.7E
ORS01-19	100	400341.4S	1452532.2E
ORS01-19	110	400336.6S	1452540.8E
ORS01-19	120	400331.9S	1452549.3E
ORS01-19	130	400327.1S	1452557.9E
ORS01-19	140	400322.4S	1452606.4E
ORS01-19	150	400317.6S	1452614.9E
ORS01-19	160	400312.9S	1452623.5E
ORS01-19	170	400308.1S	1452632.0E
ORS01-19	180	400303.4S	1452640.6E
ORS01-19	190	400258.6S	1452649.1E
ORS01-19	200	400253.9S	1452657.7E
ORS01-19	210	400249.1S	1452706.2E
ORS01-19	220	400244.4S	1452714.7E
ORS01-19	230	400239.6S	1452723.3E
ORS01-19	240	400234.9S	1452731.8E
ORS01-19	250	400230.1S	1452740.4E
ORS01-19	260	400225.3S	1452748.9E
ORS01-19	270	400220.6S	1452757.5E
ORS01-19	280	400215.8S	1452806.0E
ORS01-19	290	400211.1S	1452814.5E
ORS01-19	300	400206.3S	1452823.1E
ORS01-19	310	400201.6S	1452831.6E
ORS01-19	320	400156.8S	1452840.2E
ORS01-19	330	400152.1S	1452848.7E
ORS01-19	340	400147.3S	1452857.3E
ORS01-19	350	400142.6S	1452905.8E
ORS01-19	360	400137.8S	1452914.3E
ORS01-19	370	400133.1S	1452922.9E
ORS01-19	380	400128.3S	1452931.4E
ORS01-19	390	400123.6S	1452940.0E
ORS01-19	400	400118.8S	1452948.5E
ORS01-19	410	400114.1S	1452957.1E
ORS01-19	420	400109.3S	1453005.6E
ORS01-19	430	400104.6S	1453014.1E
ORS01-19	440	400059.8S	1453022.7E
ORS01-19	450	400055.1S	1453031.2E



Line	SP	LAT	LONG
ORS01-19	460	400050.3S	1453039.8E
ORS01-19	470	400045.6S	1453048.3E
ORS01-19	480	400040.8S	1453056.9E
ORS01-19	490	400036.0S	1453105.4E
ORS01-19	500	400031.3S	1453114.0E
ORS01-19	510	400026.5S	1453122.5E
ORS01-19	520	400021.8S	1453131.0E
ORS01-19	530	400017.0S	1453139.6E
ORS01-19	540	400012.3S	1453148.1E
ORS01-19	550	400007.5S	1453156.7E
ORS01-19	560	400002.8S	1453205.2E
ORS01-19	570	395958.0S	1453213.8E
ORS01-19	580	395953.3S	1453222.3E
ORS01-19	590	395948.5S	1453230.8E
ORS01-19	600	395943.8S	1453239.4E
ORS01-19	610	395939.0S	1453247.9E
ORS01-19	620	395934.3S	1453256.5E
ORS01-19	630	395929.5S	1453305.0E
ORS01-19	640	395924.8S	1453313.6E
ORS01-19	650	395920.0S	1453322.1E
ORS01-19	660	395915.3S	1453330.6E
ORS01-19	670	395910.5S	1453339.2E
ORS01-19	680	395905.8S	1453347.7E
ORS01-19	690	395901.0S	1453356.3E
ORS01-19	700	395856.3S	1453404.8E
ORS01-19	710	395851.5S	1453413.4E
ORS01-19	720	395846.7S	1453421.9E
ORS01-19	730	395842.0S	1453430.4E
ORS01-19	740	395837.2S	1453439.0E
ORS01-19	750	395832.5S	1453447.5E
ORS01-19	760	395827.7S	1453456.1E
ORS01-19	770	395823.0S	1453504.6E
ORS01-19	780	395818.2S	1453513.2E
ORS01-19	790	395813.5S	1453521.7E
ORS01-19	800	395808.7S	1453530.2E
ORS01-19	810	395804.0S	1453538.8E
ORS01-19	820	395759.2S	1453547.3E
ORS01-19	830	395754.5S	1453555.9E
ORS01-19	840	395749.7S	1453604.4E
ORS01-19	850	395745.0S	1453613.0E
ORS01-19	860	395740.2S	1453621.5E
ORS01-19	870	395735.5S	1453630.0E
ORS01-19	880	395730.7S	1453638.6E
ORS01-19	890	395726.0S	1453647.1E
ORS01-19	900	395721.2S	1453655.7E
ORS01-19	910	395716.5S	1453704.2E
ORS01-19	920	395711.7S	1453712.8E
ORS01-19	930	395707.0S	1453721.3E
ORS01-19	939	395702.7S	1453729.0E



Line	SP	LAT	LONG
ORS01-20	100	395458.6S	1452929.3E
ORS01-20	110	395504.9S	1452935.8E
ORS01-20	120	395511.3S	1452942.4E
ORS01-20	130	395517.6S	1452949.0E
ORS01-20	140	395524.0S	1452955.6E
ORS01-20	150	395530.3S	1453002.1E
ORS01-20	160	395536.6S	1453008.7E
ORS01-20	170	395543.0S	1453015.3E
ORS01-20	180	395549.3S	1453021.9E
ORS01-20	190	395555.7S	1453028.4E
ORS01-20	200	395602.0S	1453035.0E
ORS01-20	210	395608.4S	1453041.6E
ORS01-20	220	395614.7S	1453048.1E
ORS01-20	230	395621.0S	1453054.7E
ORS01-20	240	395627.4S	1453101.3E
ORS01-20	250	395633.7S	1453107.9E
ORS01-20	260	395640.1S	1453114.4E
ORS01-20	270	395646.4S	1453121.0E
ORS01-20	280	395652.8S	1453127.6E
ORS01-20	290	395659.1S	1453134.2E
ORS01-20	300	395705.4S	1453140.7E
ORS01-20	310	395711.8S	1453147.3E
ORS01-20	320	395718.1S	1453153.9E
ORS01-20	330	395724.5S	1453200.4E
ORS01-20	340	395730.8S	1453207.0E
ORS01-20	350	395737.2S	1453213.6E
ORS01-20	360	395743.5S	1453220.2E
ORS01-20	370	395749.8S	1453226.7E
ORS01-20	380	395756.2S	1453233.3E
ORS01-20	390	395802.5S	1453239.9E
ORS01-20	400	395808.9S	1453246.5E
ORS01-20	410	395815.2S	1453253.0E
ORS01-20	420	395821.6S	1453259.6E
ORS01-20	430	395827.9S	1453306.2E
ORS01-20	440	395834.2S	1453312.7E
ORS01-20	450	395840.6S	1453319.3E
ORS01-20	460	395846.9S	1453325.9E
ORS01-20	470	395853.3S	1453332.5E
ORS01-20	480	395859.6S	1453339.0E
ORS01-20	490	395906.0S	1453345.6E
ORS01-20	500	395912.3S	1453352.2E
ORS01-20	510	395918.6S	1453358.7E
ORS01-20	520	395925.0S	1453405.3E
ORS01-20	530	395931.3S	1453411.9E
ORS01-20	540	395937.7S	1453418.5E
ORS01-20	550	395944.0S	1453425.0E
ORS01-20	560	395950.4S	1453431.6E
ORS01-20	570	395956.7S	1453438.2E
ORS01-20	580	400003.0S	1453444.8E



Line	SP	LAT	LONG
ORS01-20	590	400009.4S	1453451.3E
ORS01-20	600	400015.7S	1453457.9E
ORS01-20	610	400022.1S	1453504.5E
ORS01-20	620	400028.4S	1453511.0E
ORS01-20	630	400034.8S	1453517.6E
ORS01-20	640	400041.1S	1453524.2E
ORS01-20	650	400047.4S	1453530.8E
ORS01-20	660	400053.8S	1453537.3E
ORS01-20	670	400100.1S	1453543.9E
ORS01-20	680	400106.5S	1453550.5E
ORS01-20	690	400112.8S	1453557.1E
ORS01-20	699	400118.5S	1453603.0E



6. WEATHER REPORTS

Date	Time	WIND		SEA State Code	PRESSURE mBar
		Speed - m/s	Direction - Degs		
04-Jun-01	06:00	6	0	2	1025
	12:00	6	0	2	1024
	18:00	7	330	2	1026
	24:00	7	0	3	1026
05-Jun-01	06:00	6	0	2	1023
	12:00	6	35	2	1024
	18:00	5	280	2	1021
	24:00	6	0	1	1021
06-Jun-01	06:00	5	20	2	1020
	12:00	5	110	3	1019
	18:00	6	100	2	1016
	24:00	10	3	4	1016
07-Jun-01	06:00	6	50	3	1012
	12:00	7	90	3	1011
	18:00	10	0	3	1010
	24:00	12	350	3	1010
08-Jun-01	06:00	16	340	5	1007
	12:00	12	300	4	1009
	18:00	5	290	3	1010
	24:00	5	280	4	1010
09-Jun-01	06:00	6	Var	2	1015
	12:00	16	90	6	1020
	18:00	13	100	5	1021
	24:00	14	90	5	1021

GEOTEAM



7. **SAFETY ACCIDENTS / NEAR MISS REPORTS**

N/A



8. NAV QC LOG

GEOTEAM



NAVIGATION QC LOG



CLIENT:	Seismic Australia	VESSEL:	RV Geo Arctic	NAV. SYSTEM 1:	Starfix Spot
PROJECT:	2D survey	AREA:	Shelduck T/18P Bass Basin Tasmania	NAV. SYSTEM 2:	Starfix MN8
NAV PROG.:	Starfix Suite 3.1	PROJECT NO.:	34834	REF. STATS:	385,336,326,275,026,022,026

Line Number	Sequence	Cross Course				Shot Point Interval				Satellites	PDOP				Fthr<°		Speed	Comments
		Min	Max	Mean	SD	Min	Max	Mean	SD		Mean	Max	Mean	SD	Min	Max		
03	001	-4.47	4.91	0.17	1.53	18.61	18.88	18.75	0.02	9	4.8	2.7	1.1	-2.9	-2.3	4.67	Complete	
13	002	-4.20	-	-	-	-	-	-	-	6.8	3.2	2.4	0.3	-2.5	-0.1	4.76	Incomplete, Starfix hangup with sps at dogleg	
13A	003	-4.35	4.00	0.05	1.70	18.65	18.84	18.75	0.02	8.3	2.8	2.0	0.4	-0.8	1.4	4.78	Complete	
12	004	-4.71	5.16	-0.62	1.64	18.61	18.88	18.75	0.03	6.1	5.8	2.9	1.0	0.1	3.2	4.83	Complete	
10	005	-3.55	4.19	0.45	1.48	18.61	18.83	18.75	0.02	8.1	2.8	2.1	0.3	-3.4	0.6	4.84	Complete	
08	006	-3.78	3.88	-0.01	1.71	18.59	18.96	18.75	0.03	9.0	4.8	2.9	1.1	-2.5	2.3	4.79	Complete	
04	007	-3.17	5.08	-0.52	1.27	18.65	18.83	18.75	0.02	6.7	3.4	2.7	0.4	-3.7	1.2	4.77	Complete	
02	008	-4.50	4.17	-0.45	1.50	18.58	18.91	18.75	0.03	8	3.0	2.2	0.5	1.2	11.6	4.73	Complete	
01	009	-3.59	5.38	0.03	2.03	18.65	18.84	18.75	0.02	7.5	2.7	2.1	0.4	-2.4	0.6	4.83	Complete	
05	010	-2.81	2.38	-0.11	0.92	18.63	18.86	18.75	0.02	6.2	4.3	2.9	0.4	-1.8	2.4	4.77	Complete	
09	011	-3.11	6.62	0.06	1.61	18.65	18.82	18.75	0.02	8.5	3.3	2.0	0.3	-2.3	-0.6	4.87	Complete	
07	012	-3.73	6.66	0.70	1.99	18.65	18.84	18.75	0.02	9	2.8	2.3	0.3	-2.2	-0.5	4.88	Complete	
11	013	-2.64	1.94	-0.09	0.89	18.69	18.80	18.75	0.01	6.7	3.4	2.5	0.4	-0.5	5.2	4.77	Complete	
17	014	-4.96	4.75	0.22	1.89	18.62	18.88	18.75	0.02	8.2	2.8	2.1	0.4	1.1	4.9	4.84	Complete	
18	015	-5.96	5.81	-0.09	2.05	18.69	18.79	18.75	0.01	6.1	5.7	3.1	1.0	-2.8	-0.8	4.83	Complete	
19	016	-7.77	5.87	-0.29	1.98	18.68	18.83	18.75	0.01	7.7	3.1	2.3	0.3	-1.2	4.7	4.82	Complete	
20	017	-4.63	5.40	0.79	1.91	18.70	18.78	18.75	0.01	9	3.1	2.2	0.4	-3.1	-0.4	4.80	Complete	
16	018	-5.60	6.11	0.06	1.94	18.61	18.86	18.75	0.02	6.8	3.4	2.2	0.6	-3.3	0.5	4.73	Complete	
15	019	-8.17	8.00	0.86	2.97	18.63	18.87	18.75	0.01	8.3	3.0	2.0	1.5	-5.6	-1.4	4.80	Scratched d/t Streamer noise	
06	020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Line aborted data scratched d/t swell noise	
15A	021	-6.79	6.59	0.39	2.76	18.68	18.82	18.75	0.01	9	4.8	2.2	0.3	-2.8	2.6	4.71	Complete	
06A	022	-6.17	6.15	-0.15	2.42	18.67	18.86	18.75	0.02	6.6	3.5	2.5	0.5	-0.6	1.6	4.83	Complete	
14	023	-6.00	5.56	0.17	2.19	18.67	18.82	18.75	0.01	7.1	2.8	2.2	0.4	-2.1	2.0	4.81	Complete	

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9. PROFILES LOG

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SEISMIC PROFILES LOG



Shelduck T/18P Bass Basin

M.V. Geo Arctic

34834

Note:

Seq. #	Line Name ORS01	Start of Line		End of Line		Chargeable Distance Km
		Easting	Northing	Easting	Northing	
001	03	364943.47	5590520.04	381793.21	5602112.05	20.456
002	13	374887.51	5604567.85	367226.60	5594520.24	12.638
003	13A	367114.02	5594354.49	353911.01	5576980.39	21.806
004	12	369672.37	5575011.87	392596.80	5591870.63	28.463
005	10	389046.70	5593368.92	374714.96	5582547.39	17.963
006	18	371530.49	5586671.66	386807.85	5597075.46	18.488
007	04	328853.93	5598330.08	365270.61	5586052.39	21.450
008	02	363148.74	5591742.63	380731.83	5604020.85	21.450
009	01	374437.78	5605664.92	360245.45	5595474.60	17.475
010	05	370485.07	5588090.28	385528.18	5598765.45	18.450
011	09	386129.14	5594784.38	371900.79	5584677.87	17.456
012	07	370961.28	5587511.08	386190.00	5597952.89	18.469
013	11	388923.09	5591720.51	375745.50	5581859.42	16.463
014	17	371594.91	553829.92	391861.65	5588382.95	24.956
015	18	378831.60	5577007.26	364897.00	5566467.73	17.475
016	19	365727.56	5564230.38	384483.63	5578276.70	23.438
017	20	380604.08	5568885.50	369512.96	5582336.38	17.438
018	16	377996.26	5593879.97	367403.30	5607750.35	17.456
019	scratched	d/t	streamer	noise		
020	scratched	d/t	streamer	noise		
021	15A	367527.24	5604971.82	380799.94	5586855.73	22.463
022	06A	377754.86	5582026.48	384945.95	5599012.77	18.450
023	14	388622.93	5584768.70	361801.33	5601202.80	31.463

030.62.112501.0

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10. PRODUCTION LOG

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NAVIGATION PRODUCTION LOG

34834 Shelduck- 2DSeismic Survey



SEQ	DATE	LINE NAME	FILE NAME	DIR deg.	TIME UTC		FSP	LSP	FCSP	LCSP	Prod Km	REMARKS
					START	END						
001	04.06.01	ORS01--03	PC155_03.RAW	56.5	14:02	16:23	1000	2091	1000	2091	20.456	Complete
002	04.06.01	ORS01-13	PC155_05.RAW	217.3	18:36	20:10	2707	2022	2707	2033	12.638	Incomplete, d/t nav system hangup
003	04.06.01	ORS01-13A	PC155_06.RAW	218.2	23:57	02:41	2163	869	2032	869	21.81	Complete
004	05.06.01	ORS01-12	PC156_01.RAW	54.7	05:13	08:24	1000	2518	1000	2518	28.463	Complete
005	05.06.01	ORS01-10	PC156_02.RAW	233.8	10:43	12:43	1828	870	1828	870	17.963	Complete
006	05.06.01	ORS01-08	PC156_03.RAW	56.7	14:36	16:41	1000	1986	1000	1986	18.488	Complete
007	06.06.01	ORS01-04	PC156_04.RAW	235.9	18:12	20:38	2014	870	2014	870	21.450	Complete
008	05.06.01	ORS01-02	PC156_05.RAW	56.1	22:19	00:46	1000	2144	1000	2144	21.450	Complete
009	06.06.01	ORS01-01	PC157_01.RAW	235.5	02:21	04:18	1802	870	1802	870	17.475	Complete
010	06.06.01	ORS01-05	PC157_02.RAW	55.6	06:33	08:39	1000	1984	1000	1984	18.450	Complete
011	06.06.01	ORS01-09	PC157_03.RAW	235.5	11:07	13:03	1801	870	1801	870	17.456	Complete
012	06.06.01	ORS01-07	PC157_04.RAW	56.5	15:12	17:15	1000	1985	1000	1985	18.469	Complete
013	06.06.01	ORS01-11	PC157_05.RAW	234.0	19:08	21:00	1748	870	1748	870	16.463	Complete
014	06.06.01	ORS01-17	PC157_06.RAW	55.3	23:58	02:45	1000	2331	1000	2331	24.946	Complete
015	7.06.01	ORS01-18	PC158-01.RAW	233.8	05:40	07:38	1802	870	1802	870	17.475	Complete
016	07.06.01	ORS01-19	PC158_02.RAW	54.2	09:49	12:26	1000	2250	1000	2250	23.438	Complete
017	07.06.01	ORS01-20	PC158_03.RAW	321.4	15:48	17:46	1800	870	1800	870	17.438	Complete
018	07.06.01	ORS01-16	PC158_04.RAW	323.5	20:43	22:43	1801	870	1801	870	17.456	Complete
019	08.06.01	ORS01-15	PC159_01.RAW	144.8	00:42	03:14	1000	2198	1000	2198	-	Scratched d/t streamer noise
020	08.06.01	ORS01-06			06:37	06:47					-	Aborted scratched d/t streamer noise
021	08.06.01	ORS01-15A	PC159_04.RAW	144.8	14:41	17:16	1000	2198	1000	2198	22.463	Complete

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NAVIGATION PRODUCTION LOG

34834 Shelduck- 2DSeismic Survey



SEQ	DATE	LINE NAME	FILE NAME	DIR deg.	TIME UTC		FSP	LSP	FCSP	LCSP	Prod Km	REMARKS
					START	END						
022	08.06.01	ORS01-06A	PC159_05.RAW	23.9	19:57	22:00	1000	1984	1000	1854	18.450	Complete
023	09.06.01	ORS01-14	PC160_01.RAW	302.3	01:43	05:15	2548	870	2548	870	31.463	Complete

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11. NAV PROCESSING SUMMARY LOG



Client: Origin Energy

Job#: 34834

Area: Shelduck Permit T/18P

Line Name	Seq #	P190 file name Sp range	P294 file Sp range	Status/Comments
ORS01-03	001	ors01-03.p1 Sp1000-2091	Ors01-03.294 Sp1000-2091	OK Seq001-004 min offset 143m in P294, offset corrected for seq 005 onwards to 150m after first break analysis. Seq 001-004 corrected in nav processing
ORS01-13	002	ors01-13.p1 Sp2707-2033	Ors01-13.294 Sp2707-2033	OK, stopped early d/t Nav software hangup
ORS01-13A	003	ors01-13a Sp2163-869	Ors01-13A.294 Sp2163-869	OK
ORS01-12	004	ors01-12.p1 Sp1000-2518	Ors01-12.294 Sp1000-2518	OK
ORS01-10	005	ors01-10.p1 Sp1828-870	Ors01-10.294 Sp1828-870	OK
ORS01-08	006	ors01-08.p1 Sp1000-1986	Ors01-08.294 Sp1000-1986	OK
ORS01-04	007	ors01-04.p1 Sp2014-870	Ors01-04.294 Sp2014-870	OK
ORS01-02	008	ors01-02.p1 Sp1000-2144	Ors01-02.294 Sp1000-2144	OK
ORS01-01	009	ors01-01.p1 Sp 1802-870	Ors01-01 Sp1802-870	Ok
ORS01-05	010	ors01-05.p1 Sp1000-1984	Ors01-05.294 Sp1000-1984	OK
ORS01-09	011	ors01-09.p1 Sp1801-870	Ors01-09.294 Sp1801-870	OK
ORS01-07	012	ors01-07.p1 Sp1000-1985	Ors01-07.294 Sp1000-1985	OK
ORS01-11	013	ors01-11.p1 Sp1748-870	Ors01-11.294 Sp1748-870	OK
ORS01-17	014	ors01-17.p1 Sp1000-2331	Ors01-17.294 Sp1000-2331	OK
ORS01-18	015	ors01-18.p1 Sp1802-870	Ors01-18.294 Sp1802-870	OK
ORS01-19	016	ors01-19.p1 Sp1000-2250	Ors01-19.294 Sp1000-2250	OK
ORS01-20	017	ors01-20.p1 Sp1800-870	Ors01-20.294 Sp1800-870	OK
ORS01-16	018	ors01-18.p1 Sp1801-870	Ors01-18.294 Sp1801-870	OK
ORS01-15	019	ors01-15.p1 Sp1000-2198	Ors01-15.294 Sp1000-2198	Scratched d/t streamer noise
ORS01-06	020			Scratched d/ streamer noise
ORS01-15A	021	ors01-06a.p1 Sp1000-2198	ORS01-15A.294 Sp1000-2198	OK (line shot with incorrect parameter setup in Ministreamer, parameter adjustments made in processing)
ORS01-06A	022	ors01-06a.p1 Sp1000-1984	ORS01-06A.294 Sp1000-1984	OK (line shot with incorrect parameter setup in Ministreamer, parameter adjustments made in processing)
ORS01-14	023	ors01-14.p1 Sp2548-870	Ors01-14.294 Sp2548-870	OK



12. HARDWARE

Processing was carried out using the following hardware:

- Workstation : Silicon Graphics Origin server
- 4 x 225Mhz MIPS R10000 Processors with MIPS R10010 FPU
 - 3Gb main memory
 - 176Gb hard disk.
 - internal 8mm Exabyte Tape drive
 - 1 x 12" terminal and keyboard
- Graphic Displays : 1. Silicon Graphics O2 workstation
- 1 x 180MHz MIPS R5000 Processor with MIPS R5000 FPU
 - 128 MB RAM
 - 1 x 21" Graphic Monitor and keyboard
2. Silicon Graphics Indy workstation
- 1 x 100 MHz MIPS R4600 Processor
 - 32 MB RAM
 - 1 x 21" Graphic Monitor and keyboard
- Storage : Two IBM 3590 Tapes drives both with autoloader
- Plotter : OYO 36" thermal plotter with Versatec 130 SCSI interface
- Printer : HP Laser Jet 5Si MX PostScript Printer
- PC : Computer x86 Family 6 Model 8 Stepping 3 AT/AT Compatible
- 2 x 750MHz Intel Pentium III Processors
 - DC20 SCSI Capture card for connection with MSX
 - 256 Mb RAM
 - 89Gb disk memory.
 - 32 Mb ATI Technologies Inc. Rage128 GL (AGP) Graphic Adapter
 - 1 x 19" Monitor and keyboard



13. SOFTWARE**Workstations:****SGI Origin:**

IRIX64 version 6.5

Paradigm Focus version 4.3

DISCO version 12.3

SGI O2:

IRIX64 version 6.5

SGI Indy:

IRIX64 version 5.3

PC - SeisNet:

Microsoft Windows NT 4.00.1386

Software System Inc. SeisNet Version 5.109

GUIServer Version 1.0

PC - General Usage:

Microsoft Windows NT 4.00.1386

Microsoft® Word 97™ and Excel 97™

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14. LINE LOG SPREADSHEET

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APPENDIX 14 LINE LOG



Client : Origin Energy Resources Ltd

Project : 2D Exclusive

Group Interval : 12,5m

Project #: 34834

Date Commenced : 04.06.2001

Group Number : 368

Area: Bass Basin Tasmania

Date Completed : 09.06.2001

Cable Length : 4600m

SP Interval: 18.75m

Array : 2860 cu. in.

Cable Depth : 7.5m

Seq.	Date 2001	Line I.D. ORS01-	DIR	FSP	FCSP	LCSP	LSP	Charg'ble km	Status	Comments
1	04.Sep	3	58	1000	1000	2091	2091	20.47500	Completed	All in spec.
2	04.Sep	13	217	2702	2707	2033	2022	12.65625	Aborted	Aborted due to navigation failure
3	04.Sep	13A	217	2163	2032	869	869	21.82500	Completed	All in spec.
4	05.Jun	12	54	1000	1000	2518	2518	28.48125	Completed	All in spec.
5	05.Jun	10	239	1828	1828	870	870	17.98125	Completed	All in spec.
6	05.Jun	8	56	1000	1000	1986	1986	18.50625	Completed	All in spec.
7	05.Jun	4	236	2014	2014	870	870	21.46875	Completed	All in spec.
8	05.Jun	2	56	1000	1000	2144	2144	21.46875	Completed	All in spec.
9	06.Jun	1	235	1802	1802	870	870	17.49375	Completed	All in spec.
10	06.Jun	5	55	1000	1000	1984	1984	18.46875	Completed	All in spec.
11	06.Jun	9	234	1801	1801	870	870	17.47500	Completed	All in spec.
12	06.Jun	7	56	1000	1000	1985	1985	18.48750	Completed	All in spec.
13	06.Jun	11	234	1748	1748	870	870	16.48125	Completed	All in spec.
14	06.Jun	17	55	1000	1000	2331	2331	24.97500	Completed	All in spec.
15	07.Jun	18	239	1802	1802	870	870	17.49375	Completed	All in spec.
16	07.Jun	19	54	1000	1000	2250	2250	23.45625	Completed	All in spec.
17	07.Jun	20	321	1800	1800	870	870	17.45625	Completed	All in spec.
18	07.Jun	16	323	1801	1801	870	870	17.47500	Completed	All in spec.
19	07.Jun	15	145	1000			2198	0.00000	NTBP	Swell noise to high, line rejected.
20	08.Jun	6	24	1000			1077	0.00000	NTBP	Swell noise to high, line rejected.
21	08.Jun	15A	145	1000	1000	2198	2198	22.48125	Completed	Cable at 10m. All in spec otherwise.
22	08.Jun	06A	24	1000	1000	1984	1984	18.46875	Completed	Cable at 7.5m All in spec.
23	08.Jun	14	302	2548	2548	870	870	31.48125	Completed	Cable at 7.5m , all in spec. Data not included in first shipment.
								Total =	424.55625	

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