



FINAL FIELD OPERATION REPORT
MARINE SEISMIC REFLECTION SURVEY

**BHPBP
Vic-P/45
Gippsland Basin**

WesternGeco Job No. 9227

ACQUIRED BY

Geco Beta

From August 08th to September 27th 2002



Report Compiled by Party Chief

The Survey Parameters and Job Configuration details listed in this report are for the purpose of reporting General information and should not be used for Data Processing Purpose.

1. Survey Information and Objectives

The purpose of the Exploration Survey was to acquire seismic data, which will assist in defining the potential oil and gas resources using modern geophysical techniques.

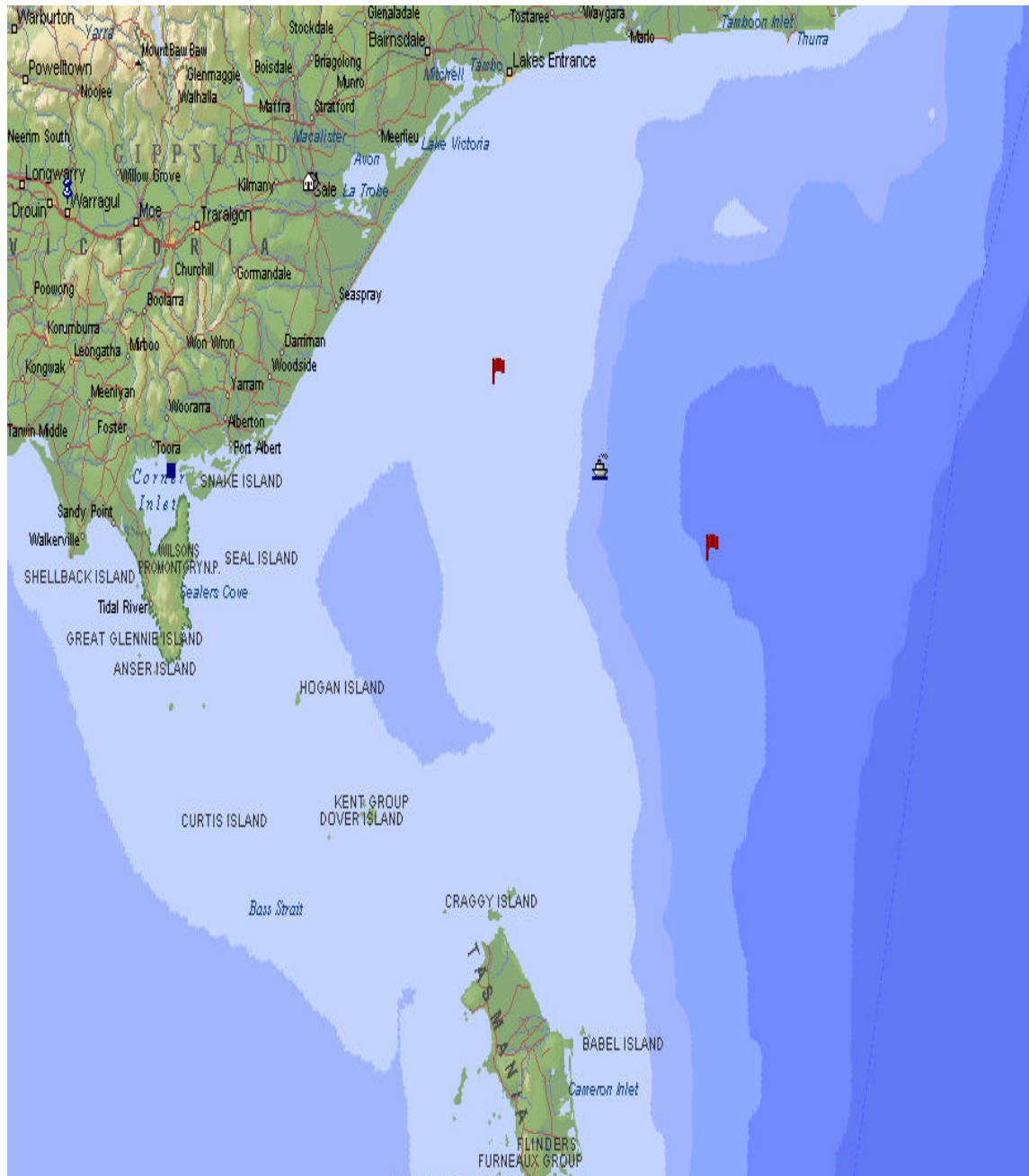
The HGP2002A 3D Seismic Survey was located in the Gippsland Basin in permit area Vic-P45 and included a possible extension into license Vic-L8. Approximately 996 km² of 3D seismic data was acquired. The program was operated by BHP Billiton Petroleum (BHPBP) on behalf of its Vic-P45 Joint Venture (JV) Partner, Inpex Alpha Ltd (40%).

The worksite was the M.V. Geco Beta, designed and built for worldwide seismic exploration. The M.V. Geco Beta has a purpose built back deck, where all work involved in the deployment and retrieval of streamers and energy sources was carried out, a dedicated instrument room, where all instrumentation required for the survey was housed, and living accommodation to house the normal complement of approximately 50 crew. M.V. Geco Beta is built to DNV+1A1-EO-HELIDK classification and conforms to the rules and regulation of Solas 1974. International load line requirements are according to international loadline convention of 1966. The vessel is also equipped with a jet powered fast rescue craft as well as a workboat for maintenance of the in-sea equipment.

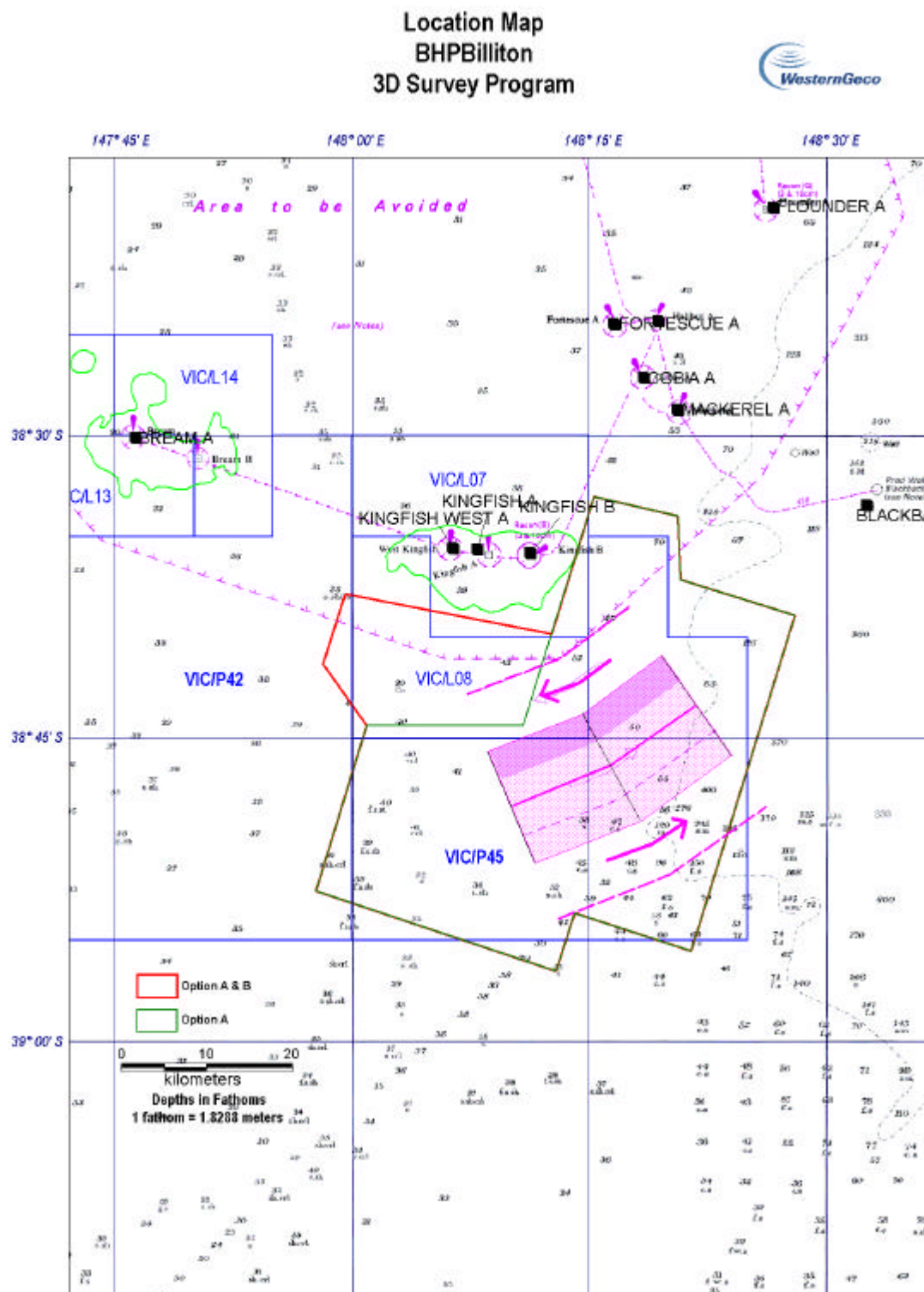
The support vessel for the operation was the 'Total Voyager' operated and owned by Total Marine. The 'Total Voyager' was used to divert shipping and fishing vessels away from the towed equipment, act as a standby vessel during small boat operations and deliver fuel and supplies to the Beta.

2. Area Map

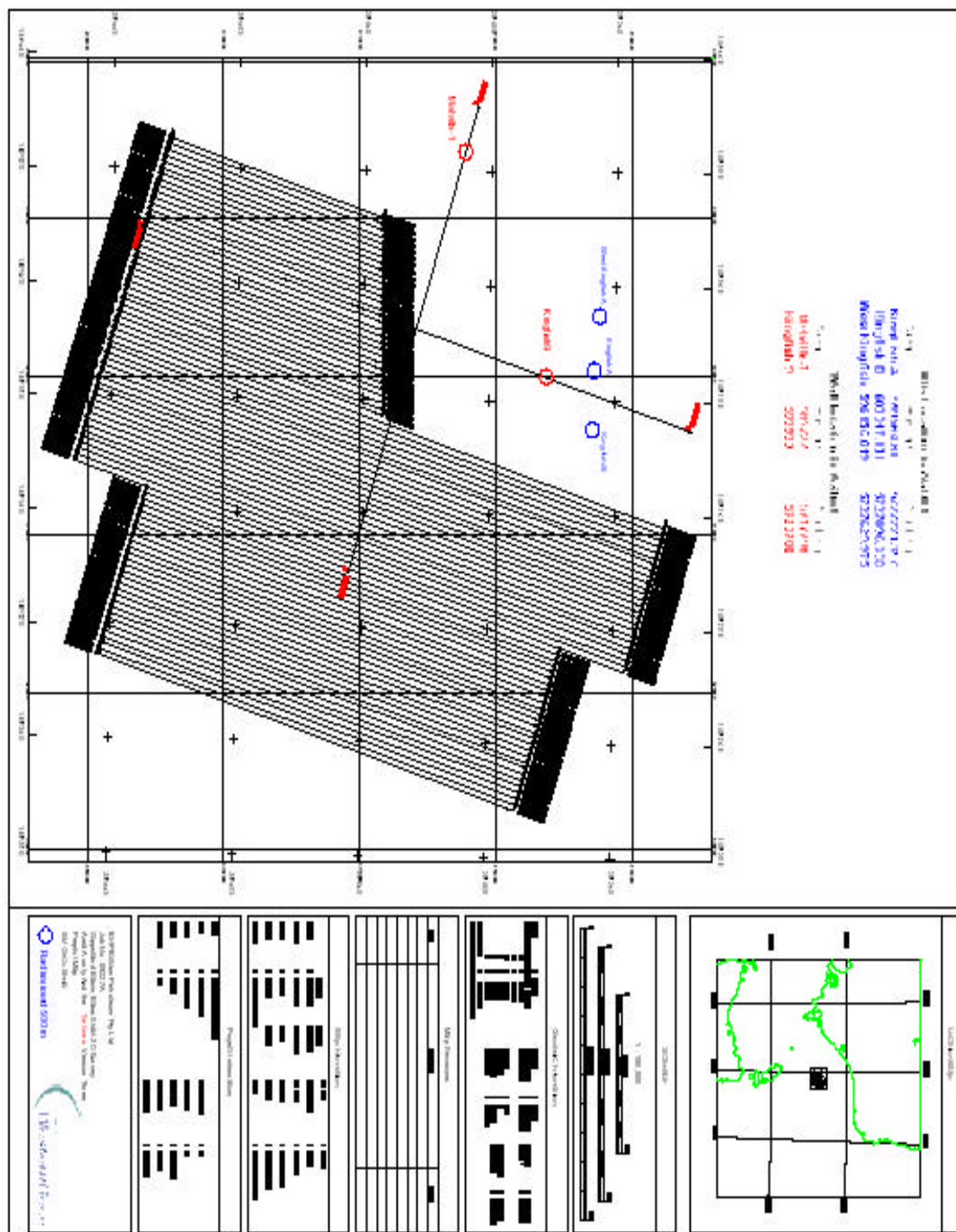
Overall area map



Survey Location Map. Please note that Option A was acquired where the block boundaries are colored in green.



3. Program Map



4. Job Book

Client:	BHP	Provisional	
Area:	Gippsland Basin	Ready for review	Ready for review/ 2-6-02
Job Number:	9227	Reviewed by Vessel	Yes during startup meeting
Date:	24th July 2002	Reviewed by Supervisor	Yes
Version:	4	Reviewed by Client	Yes

Project Geo:	Tim Brice	tbrice@slb.com	+603 27308843
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Acquisition Parameters

General

Client	BHP Billiton Petroleum Pty Ltd
Vessel(s)	Geco Beta
Job Number	9227
Client Contract Number	68000734
Location	Vic/P45, offshore Gippsland Basin,
Type of Survey (2D or 3D)	3D
Area or Total km	996 square kms (Area A)
Average Line Length	30.0 km (full fold)
Heading	198° / 018°
Estimated Start Date	AUG 2002
Estimated Duration	10 weeks
SuperVISION required	Yes

Streamer Parameters

Cable type	Nessie 4 Sections/Nessie 3 Bubbles
Number of streamers	8

Group length	14.86m
Group interval	12.5m
Hydrophone natural frequency	
Hydrophone sensitivity	
Streamer length	4600m
Streamer depth	8m (+/- 1 m)
Streamer separation	100m
Number of groups per streamer	368
Streamer tracking	Sonardyne SIPS 1 acoustics & DigiCourse 5011 compass units
Requested source to receiver offset	As close as possible

Recording

Recording system	Triacq 2.0
Recording format	SEG-D Rev 2 8015
Record length	6144 ms
Sample rate	2ms
Recording filter (Hi-Cut)	180Hz 72dB/octave
Recording filter (Low-Cut)	3Hz 18dB/octave
Recording filter delay	-
Filter type	N3
Recording system delay	None
Recording media	IBM 3590 Model B11 tape drives (10Gb)
Dual recording / Tape copies	Yes (dual recording)
Auxiliary channels	
TOC (Diskos/Petrobank) files required?	Not applicable

Source Parameters

Source type	Airgun array
Number of sources	2
Source separation	50m
Shotpoint interval per shot	18.75m (37.5m per CMP line)
Array volume / source	3542cu in
Operating pressure	2000psi

Source depth	7 m
Number of subarrays per source	3
Subarray separation	8m
Number of Airguns per Subarray	8/9
Sub array length	15
Gun Timing Specification	+/- 1ms
Alternatively fired sources (flip-flop)	yes
Source control system	Trisor
Firing delay	0
Record nearfields	Yes
Total SCFM required at 4.8 knots	
Source timing specifications	
Calibrated Marine Source (CMS) required	No
CMS positions	No

Additional Notes

1. First update 3 June 2002. All dept's need to check the parameters

Client:	BHP Billiton Petroleum	Provisional	
Area:	Bass Strait	Ready for review	
Job Number:	9227A	Reviewed by Vessel	Yes during startup meeting
Date:	8th AUG 2002	Reviewed by Supervisor	Yes
Version:	6	Reviewed by Client	Yes
Project Geo:	Name Kumara Krishnasamy	Email kkrishnasamy@slb.com	Telephone +60 3 27308851

Positioning

Acquisition Geodetic Parameters

Spheroid	Australia National Spheroid
Semi Major Axis	6378160.00
Inverse Flattening	298.250000
Work Datum	AGD84
Datum Transformation	From WGS84 to Work Datum <i>Bursa Wolf Convention</i>
dX (m)	Plus 116.000
dY (m)	Plus 50.470
dZ (m)	Minus 141.690
rX (arc secs)	Minus 0.230
rY (arc secs)	Minus 0.390
rZ (arc secs)	Minus 0.344
Scale (ppm)	Minus 0.0983
Projection	UTM South
Zone if UTM	Zone 55
Central Meridian	147 E
Scale Factor	0.999600
False Easting (m)	500000 m
False Northing (m)	10000000 m
Latitude of Origin	0

Datum Transformation & Test Point

Transformation from Datum	WGS 84
Transformation to Datum	AGD 84
Latitude in WGS 84	38° 42' 29.164" S
Longitude in WGS 84	148° 10' 47.973" E
Latitude in Local Datum	38° 42' 34.681" S
Longitude in Local Datum	148° 10' 43.315" E
Northing in Local Projection	5714770.694 m
Easting in Local Projection	602483.381 m

Post Processing Geodetic Parameters (List only if different from acquisition parameters) To be done by EDRH

Spheroid	Geodetic Reference System 1980 (GRS80)
Semi Major Axis	6378137.00
Inverse Flattening	298.257222101
Work Datum	GDA-94 (Geocentric Datum of Australia 1994)
Datum Transformation	From WGS84 to Work Datum <i>Bursa Wolf Convention</i>
dX (m)	Minus 117.763
dY (m)	Minus 51.510
dZ (m)	Plus 139.061
rX (arc secs)	Minus 0.292
rY (arc secs)	Minus 0.443
rZ (arc secs)	Minus 0.277
Scale (ppm)	Minus 0.191
Projection	UTM South
Zone if UTM	Zone 55
Central Meridian	147° E
Scale Factor	0.999600
False Easting (m)	500000.00
False Northing (m)	0.00
Latitude of Origin	00 00 00.000 N

Magnetic Variation & Geoidal Height

Location of Prospect Centre: Lat	38° 45' 04.820" S AGD84
Location of Prospect Centre: Lon	148° 14' 33.185" E AGD84
Magnetic Variation Data	Plus 13° 20' (Variation) Plus 1'/year (Annual Variation)
Source of Variation Data	IGRF 2000
Geoidal Height Data	EGM96 model
Date for which values calculated	20 Aug 2002

Vessel Positioning

1. Integrated Navigation System (Navigation/Binning/QC)

Trinav INS 2.6

2. Primary Navigation System

Navigation System	TRINAV GPS
RTCM Delivery System	Thales Skyfix/ CNav
DGPS Reference Stations	Adelaide, Melbourne & Sydney / CNav
Survey & Differential Company	Thales Geo-Solutions/C&C Technologies
Contact Person	Norman.Mackay@thales-geosolutions.com rick.shannon@cctechnol.com

3. Secondary Navigation System

Navigation System	Multifix 3
RTCM Delivery System	Thales Skyfix
DGPS Reference Stations	Adelaide, Melbourne & Sydney
Survey & Differential Company	Norman.Mackay@thales-geosolutions.com
Contact Person	Norman MAckay, Norman.Mackay@thales-geosolutions.com

4. Tertiary Navigation System

Navigation System	CNAV
RTCM Delivery System	Worldwide Satellite Orbital corrections via INmarsat
DGPS Reference Stations	
Survey & Differential Company	C&C Technologies (www.cctechnol.com)
Contact Person	Rick Shannon, rick.shannon@cctechnol.com, +65 97825658

Streamer

Positioning	
Source Surface Positioning	Seatrack 330
Front-Net In-Sea Positioning	Sonardyne SIPS 1
Mid-Streamer In-Sea Positioning	Sonardyne SIPS 1
Tailbuoy Surface Positioning	Seatrack 220

Tail-Net In-Sea Positioning	Sonardyne SIPS 1
Compass Bird Type	DigiCOURSE 5011
Compass Birds Per Streamer	Every 300m
Line & Shotpoint Numbering	
Line Prefix	HGP2002A
Line Name Format: Prime	HGP2002A1008PSSS where SSS is sequence number
Line Name Format: Reshoot	HGP2002A1008A,B,C...SSS
Line Name Format: Infill	HGP2002A1008J,K,L...SSS
<i>Line Name EXAMPLE</i>	HGP2002A1024B023 Second reshoot of Line 1024 shot on seq23
First Shotpoint Number: Prime	1001
First Shotpoint Number: Reshoot	SP to be remained the same
First Shotpoint Number: Infill	SP to be remained the same
Incrementing/Decrementing	Yes
Source Firing on Even Numbers	Port (Even)

Preferred Shooting Plan

Race track

Known Obstructions

Kingfisher platform outside survey full fold area but its position will affect run in/runout on some swathes.

3D Parameters

Steering Point	Near Mid Receivers
Survey Grid Rotation	198.000 deg

Water Depth & Processing

Maximum & Minimum Water Depth	55m - 735m
Echosounder Standard Settings	VP=1500ms, Draft=0
Vertical Datum	MSL
Apply Tidal Corrections in Processing?	Yes

Apply Velocity Corrections in Processing?	Yes
Apply Draft Corrections in Processing?	Yes
Tidal Corrections Source	Tidal source file

Binning Parameters

3D Binning & Coverage

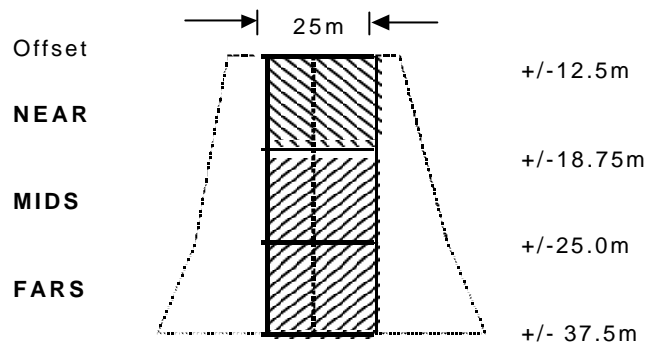
Binning System	TRINAV 2.6.0, patch 19
Navigation Binning Origin	654,859.70 Easting 5,724,181.07 Northing; Northeast of prospect
Map Grid Bearing	198.000 degrees
Sail Line Calculation	Grid
Shooting Directions	198° and 18° Grid
First Shot Point Number	1001 (the Northern end of the Line 1008)
Survey Line Prefix	GP02
CMP Lines per vessel pass	16 for Sequences 1 to 113, 12 for Sequence 114 to 133
Sail Line Spacing	400 metres
CMP column width	25.0 metres
Surface Bin Size	18.75 metres (in-line) x 25.0 metres (cross- line)
Sub-Surface Bin Size	6.25 metres (in-line) x 25.0 metres (cross-line)
Shot Interval	18.75 metres flip-flop
Shot Number Location	Nominal nearest trace CMP
Full Fold Run Out	122 shot points
Number of Overlap Shot Points	10 shot points
Nominal Fold Coverage	61 1/3
Binning Strategy	Unique Radial Offsets
Steering Mode	Maximize Near Mids
Streamer Offset Groups	

Offset Group	Group	Arial Offset	Trace No's	% Hits	Unflexed Fold	Flexed Fold
Nears	1	166 to 1690 metres	1 – 122	90%	18	19
Mids	2	1690 to 3215 metres	123 – 245	80%	16	19
Fars	3	3215 to 4818 metres	245 – 368	70%	14	19

Offset Expansion	Linear expansion from front to tail At front of Nears 100 % expansion of cross- line distance or ± 12.5 metres At tail of Nears front of Mids 150% expansion of cross-line distance or ± 18.75 metres
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At tail of Mids front of Fars 200% expansion of cross-line distance or ± 25.0 metres
 At tail of Fars 300 % expansion of cross-line distance or ± 37.5 metres for a total of 100.0 metres cross-line.
 Non duplicate

Offset Rejection



5. Vessel Description



Vessel Particulars

MAIN PARTICULARS

SHIPS NAME	GECO BETA
CALL SIGN	HP-7674
INTERNATIONAL MARITIME ORG. (IMO) No.	7909853
OWNER	WesternGeco Seismic Shipping Inc.
PREVIOUS NAME	None.
FLAG STATE & PORT OF REGISTRY	Panama/Panama
PANAMA OFFICIAL No.	21461-94-CH
DATE OF BUILD	1980
YARD No. AND TYPE OF VESSEL	130/Seis. Reasearch vessel/"Trosvik-Class"
YARD BUILT	Trosvik Verksted A/S , Brevik Norway
DATE CONVERTED / POWER UPGRADED	March 1995 / June 2000
YARD CONVERTED	Mjelllem & Karlsen, Bergen
CLASSIFICATION SOCIETY AND CLASS	Det Norske Veritas/DNV+ 1A1 EO Helideck
CLASS ID No.	12505
CLASSIFICATION MACHINERY SYSTEM	Planned Maintenance System (PMS)
CLASS APPROVED MAINTENANCE SYSTEM	1 of Electronic plan/rec.Rast OM 3.81
INTERNATIONAL SAFETY MANAGEMENT, (ISM) CODE COMPLIANCE	In compliance with the code. Interim Safety Management Certificate Dated 18.04.01
SAFE MANNING CERTIFICATE (MINIMUM)	11 Maritime crew members (Galley dep. Not included)

PRINCIPAL PARTICULARS

GROSS TONNAGE (GRT)	4404 metric ton.
(GRT) NATIONAL & INTERNATIONAL	4404 metric ton.
GROSS TONNAGE (GRT) SUEZ CANAL	4777.86 metric ton
NET. REG.TON (NRT) PANAMA CANAL	1322 metric ton
(NRT) NATIONAL & INTERNATIONAL	1322 metric ton
NET. REG. TON (NRT) SUEZ CANAL	3670.51 metric ton
LIGHTSHIP DISPLACEMENT	2995 metric ton
DEAD WEIGHT	
LENGTH OVER ALL (LOA)	92.3 MTRS
LENGTH BETWEEN PERPENDICULARS	83.75 MTRS
BREADTH (MOULDED)	19.6 MTRS
BREADTH (EXTREME)	22.5 MTRS
DEPTH (MOULDED)	8.59 MTRS
DRAFT (MAX)	7.2 MTRS
DRAFT (MEAN)	6.4 MTRS
AIR DRAFT (TO HIGEST ANTENNA)	27 MTRS
HELICOPTER DECK RATING	Sikorsky S-61 and Super Puma
HELICOPTER DECK DIAMETER (D-VALUE)	22.2 MTRS
HELICOPTER DECK MARKINGS STANDARD	CAA/ Helicopter Service

6. List of Key Personnel

2.1 Onboard Personnel

POSITION	CREW 1	CREW 2
Party Manager	Alan Gladding	Mike Martin
Captain	Richard Westwood	Robert Wilson
Chief Engineer	Tim McRae	Gordon Sanders
Acq. Supervisor	Donny Isdaryanto	Arlen Roldan
Acq. Shiftleader	Andrew Stagg	Alasdair Fleming Larry DeGuzman
Pos. Supervisor	Johnny Olsen	Jevie DeGuzman
Pos. Shiftleader	Paul Farrell Annas Jaafar	Joel Pederick Stuart Flowers
Handling Superviso	Oskar Rosvoll	Marcus Kay
Shiftleader Mechani :	Paul Hollingsworth Ian Hunter	Andy Burrell Aldrin Flores
Trilogy QC Leader	Justine Rouse	Andrew McMahon
OBP Group Leader	Peter Carver	Pham Quoc Hung

2.2 Office Support Personnel

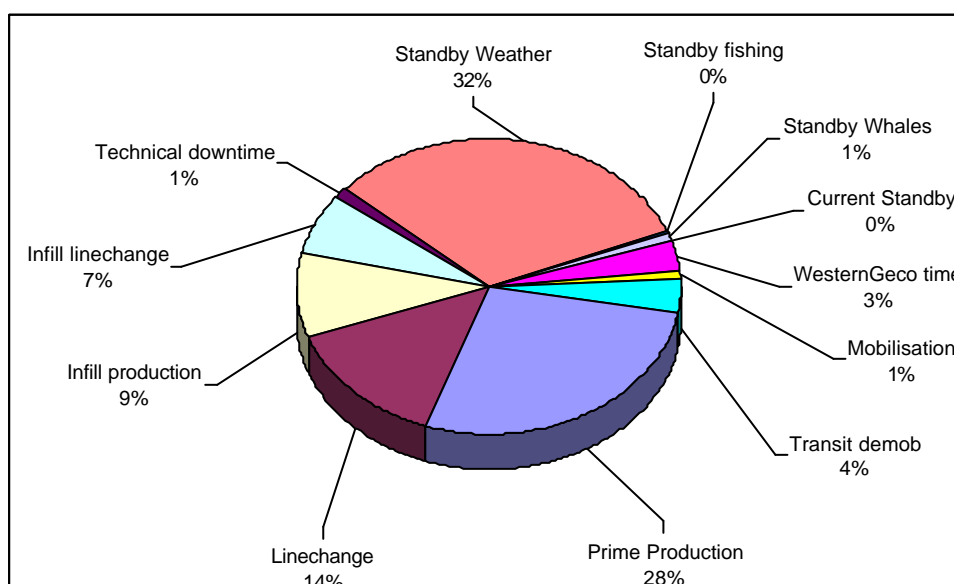
POSITION	NAME	OFFICE
Operation Manager	Jeff Mayville	Kuala Lumpur
Operation Supervisor	Terry Leighton	Perth
Maritime Superint.	Bo Hansen	Oslo
Instrument Support	PDN, Global Operations Support	Oslo
Navigation Support	PDN, Global Operations Support	Oslo
Mechanical Support	PDN, Global Operations Support	Oslo
Trilogy QC Support	PDN, Global Operations Support	Oslo
OBP Supervisor	Allen Rodeghiero	Kuala Lumpur

3. Field Information and Observations

3.1 Production Statistics

Production Km		
CMP Prime Traverse Kms	43250.17500 Kms	
CMP Infill Traverse Kms	13157.10000 Kms	30.4%
Total CMP Traverse Kms	56407.27500 Kms	

Time Distribution (Hours)		
Prime Production	331.801 Hours	27.6%
Linechange	169.849 Hours	14.1%
Infill production	108.584 Hours	9.0%
Infill linechange	81.451 Hours	6.8%
Technical downtime	14.916 Hours	1.2%
Standby Weather	387.599 Hours	32.3%
Standby fishing	1.917 Hours	0.2%
Standby Whales	9.900 Hours	0.8%
Current Standby	1.467 Hours	0.1%
WesternGeco time	41.250 Hours	3.4%
Mobilisation	7.417 Hours	0.6%
Transit demob	44.500 Hours	3.7%
Total Survey Time	1200.650 Hours	100.0%



3.2 Daily Summary

Time zone GMT +10:00hrs. Introspection PC Log in GMT.

Day starts 10:00 local time.

August 8th

On completion for BSOC the Beta headed south across the shipping separation zone and turned onto an easterly course towards the BHP survey.

August 9th

Traverse 125.5125 km

The workboat was launched in order to perform streamer maintenance enroute to the BHP survey. Due to very heavy currents from the northwest the streamers came very close together. Both depth and inline adjustments were made to avoid a tangle before the streamers were stabilised once again at operating depth. Acquisition commenced at 0446 UTC heading 018 degrees. A feather angle of 13.6 degrees to starboard was experienced at the start of line, which repeated itself on sequence 3 confirming a tidal plan acquiring 4 lines per day would be optimal. At the end of the day prime line acquisition continued on sequence 4, the vessel speed having been reduced to enable the shark fishing vessel 'Starfire' time to recover her gear. Nocturnal whale watching has now been setup together with a searchlight sweep of the arrays prior to soft starting the guns.

August 10th

Traverse 141.7313 km

A good days prime line production in the east of the survey area. High feather angles continue to be experienced in the south, but with a tidal acquisition regime in progress this has not caused any major problems with missing coverage. There were two helicopters on 10th August. 1028-1038 & 1246-1254.

August 11th

Traverse 77.4563 km

Prime line production continued until the completion of sequence 10. Due to the worsening weather conditions from the southwest which are forecasted for the next few days a decision was made to continue heading south for the shelter of Flinders Island. All guns were recovered at 1529 UTC. A fire drill was held simulating an incident in the galley. An operations / QSC meeting was undertaken attended by all vessel senior crew and BHP representatives. BHP auditor Larry Williams presented his plan for the forthcoming audit of the operation. At the end of the day the vessel had reached the northern part of Flinders Island proceeding on a southeasterly course parallel to the coast.

August 12th

Standing by for weather in a holding pattern to the east of Flinders Island. Wind and sea conditions still very poor on the prospect area with southwesterly winds gusting 45 knots and 4 - 5 metre swells.

August 13th

The vessel headed back to the prospect, clearing the lee of Flinders Island. On arrival at the survey area the heavy sea conditions prevented the deployment of guns. The vessel headed across the prospect monitoring the swell noise. The fishing vessel 'Starfire' had deployed long lines across the eastern swath. The positions of these lines were taken and plotted. At the end of the day Beta was heading south through the prospect making ready to deploy the gun arrays. An LPT committee meeting was held at 0300 UTC.

August 14th

Traverse 77.3625 km

The first part of sequence 11 was missed due to a problem with gun array 5. On recovery it was found to be a failure on the Ultrabox takeout on position 1. An extremely heavy swell from the southeast gave major problems with noise and streamer stability throughout the day.

During the linechange prior to sequence 12 streamers 4 came to the surface due to the poor sea conditions. After a minor tangle with the tailend of streamer 3 the situation was controlled by altering depths and inline offsets. After this incident a decision was made to widen the turns to 6km diameter while the seastate was so poor. Sequence 12 was a part line acquired heading south after the streamers had stabilized. At the end of the day a heavy southeasterly swell still predominated across the survey area.

August 15th

Traverse 111.9188 km

The heavy southeasterly swell persisted throughout the day giving rise to high levels of swell noise on the streamers. The first part Sequence 14 was scratched due to a compressor failure. The compressor shutdown was caused by the preferential trip operating because of generator number 4 shutting down. The fault on generator 4 was found to be low fuel pressure. This was soon resolved with all systems back online. At the end of the day production continued in the east of the survey area.

August 16th

Traverse 135.300 km

The southeasterly swell slowly abated during the day. Significant amounts of swell noise was recorded on all sequences. An emergency response exercise 'Mariners Plight' was conducted with BHPBP and Westerngeco contingency groups involved. The scenario being an activist vessel causing problems to the operation and escalating into a medivac exercise. An operations meeting was held which also included the close out for the recently performed BHP audit conducted by Larry Williams. A helicopter arrived at 2207 UTC with Larry Williams BHP, Mark Stanley BHP and WW Heath Doodie departing. Inpex client Wataru Sekiguchi and WW Edward Berry arrived.

August 17th

Traverse 108.3563 km

Continued prime line acquisition in the east of the area. The workboat was launched on one occasion in order to change two birds on streamer 8. Increased fishing vessel activity but good communications produced no conflicts with the towed equipment.

August 18th

Traverse 138.3375 km

Good weather conditions prevailed for the day as acquisition continued on the easternmost swaths. A general muster was held attended by all available personnel. The workboat was launched on one occasion to check birds on streamer 4. On investigation it was found that bird S4C8 was missing, assumed lost during the recent session of bad weather. Bird S4C4 was found hanging only on its front collar and was ok once relocated. At the end of the day the first infill line was being acquired with sequence 29.

August 19th

Traverse 126.7313 km

Mainly infill lines acquired during the day as the vessel tidied up the easternmost swaths. The chase vessel 'Total Voyager' departed the prospect at 1030 UTC and headed into BBMT for crew change, bunkers, provisions and shipments.

August 20th

Traverse 132.000 km

Moved across to the next two swaths of the survey. During sequence 35 an autofire from gun 5 arrays 2 caused a shutdown. On further investigation the fault was found to be a broken shuttle. The vessel continued along the line while repairs were made to ensure a continuation of the tidal shooting plan. Report received from shore that the 'Total Voyager' had been refused permission to take bunkers or load stores at BBMT due to a contractual issue.

August 21st

Traverse 118.3313 km

Continued with prime line acquisition. Sequence 38 heading south was terminated early in order to time the vessels position at the northern end of the prospect for first light and

bunkering operations. Sequence 39 heading north commenced when the streamers were straight. On completion of sequence 39 all guns were recovered to enable the vessel a greater turn of speed during bunkering manoeuvres. The medic gave two very informative talks on cardiovascular topics. The 'Total Voyager' was alongside at 2130 UTC. At the end of the day bunkering and provisions transfers were underway.

August 22nd

Traverse 0.000 km

The day started with bunkering and provision transfers underway from the 'Total Voyager'. Attempts were made to turn back to the prospect during bunkering but due to the sea conditions and the inability of the 'Total Voyager' to reduce speed it was necessary to maintain a steady course. Eventually at 0520 UTC it was possible to make a slow turn back to the prospect as excellent weather conditions made it possible for the Voyager to shutdown her engines and be towed fully by the Beta. All loading was completed at 0725 UTC and the 'Total Voyager' was cast off. A total of 583 cubic metres of MGO being received. Guns were deployed at 1406 UTC with production commencing at 1525 UTC. The weather rapidly deteriorated from the southwest with 35 knot winds and 4 metre seas. A decision was made to recover the guns and run for the shelter of Wilson's Promontory. At the end of the day the vessel was heading west towards shelter in rough sea conditions.

August 23rd

Traverse 35.6438 km

The southwesterly wind and sea slowly abated with the vessel turning back towards the prospect area at 0649 UTC. All guns were deployed at 1715 UTC with production commencing at 1905 UTC on a northerly prime line.

August 24th

Traverse 143.5313 km

Prime Line production continued throughout the day. The weather conditions improved although a heavy southeasterly swell predominated throughout the area. Received information from the platform 'Kingfish B' that diving works would be performed over the next few days. An agreement was made with the diving superintendent to call the platform when the vessel approached the 10km zone to enable the divers to clear the water before Beta reached 8 km distant from the platform. An Operations / QSC meeting was held attended by all vessel senior personnel and client representative. At the end of the day the vessel was on a line change in the south of the area with the MOB boat deployed to change birds and investigate noisy traces.

August 25th

Traverse 123.750 km

The Triacq recording system failed during sequence 45 due to the lack of aim point message from the Trinav. After rebooting all systems the fault was cured but resulted in a large hole in the coverage, which will require reshooting at a later date. The workboat was launched at the end of sequence 47 in order to change a holed section (Shark / seal bite) on streamer 5. A fire drill was held simulating an oil fire in the exhaust stack and was attended by all available personnel. Heavy currents persisted during the day causing high feather angles and reduced acquisition speed.

August 26th

Traverse 142.125 km

The start of sequence 48 was delayed due to changing active 44 on streamer 5 which had been holed due to a shark / seal bite. A loose retriever on streamer 4 which had been causing noisy channels was also reconnected. Good weather conditions prevailed. At the end of the day acquisition continued with re-shoots in the centre swaths.

August 27th

Traverse 138.1688 km

The workboat was launched on one occasion in order to install a power bubble on streamer 4, change acoustic pod F7T1 and bird S3C4. Production continued throughout the day on the

centre two swaths. Weather conditions deteriorated slightly during the night but had no noticeable effect on data quality.

August 28th

Traverse 144.2063 km

Prime line production continued throughout the day. During sequence 58 main engine numbers 4 failed due to a blocked fuel filter. The loss of power caused the preferential trip system to operate which shut down the compressors. Shotpoints 1131 - 1077 were lost and will require re-shooting at a later date.

August 29th

Traverse 93.600 km

Completed one prime and two infill runs on the centre swaths. The client decided that sequence 15 which was acquired in poor weather conditions would be reshot. An extended linechange was required to setup for the reshoot in the eastern swath. A helicopter arrived in the afternoon with Tom Meyer WesternGeco and Brian Starkey BHPBP to undertake an investigation of the recent electrical hazard identified with the workboat. A shipment of 10 birds also arrived.

August 30th

Traverse 100.7625 km

Weather conditions deteriorated as a mild low-pressure system passed the area but had improved once again by the end of the day. The external investigation into the electrical hazard with the workboat was completed. Due to poor weather conditions the vessel had to turn fair seas to enable a helicopter to land. This resulted in weather downtime while the Beta setup for the next line after the helicopter departed. The investigation team Tom Meyer and Brian Starkey departed, the whale watchers crew changed and WG mechanic Ricardo Calixto returned. An airleak on Joy compressor 4th stage output required the pulsation chamber to be removed. This chamber was sent ashore for repair and testing.

August 31st

Traverse 133.2563 km

Acquisition continued in good weather conditions throughout the day with both prime and infill runs in the centre swaths.

September 1st

Traverse 94.5750 km

During sequence 72 a problem with Triacq recording occurred. After fault finding it was determined that the problem was with the true time card in the streamer interface. The line continued when repairs were made. On the same line the LMF compressor stopped for a short period due to overheating on the 3rd stage. This created a loss of 17 shotpoints. During sequence 73 the Trisor gun controller locked up for 10 shotpoints. No fault was found with the system continuing normal operation. At the end of the day the vessel continued on the second part of an Infill line heading north. A full ships muster was held in the morning followed by instruction on the emergency collision kit. A general QHSE meeting was held attended by all available crew.

September 2nd

Traverse 36.3375 km

Acquired two infill and a single reshoot line before recovering the guns and heading for shelter due to the forecasted bad weather approaching from the west. At first light the weather had abated slightly but slowly deteriorated once again. At the end of the day the vessel was preparing to turn back towards Wilson's Promontory for shelter in rough weather conditions.

September 3rd

Traverse 17.4938 km

Turned back towards the prospect at 0835 UTC as the wind and sea conditions improved. All guns deployed and production commenced at 1930 UTC with a 3 part infill line to the north.

The weather conditions at the end of the day were winds of 20 - 25 knots and seas 2.5 metres from the southwest.

September 4th

Traverse 39.6563 km

On completion of sequence 77 infill run the weather turned for the worse once again with the wind and seas increasing from the south west as the next low pressure system arrived. The vessel turned into the weather and recovered the guns. Later in the day conditions improved once again and Beta headed back towards the prospect area. Acquisition commenced at 1750 UTC with an infill run to the south in the centre swath. At the end of the day the vessel was in production on the shorter lines in the western swath.

September 5th

Traverse 104.4188 km

Continued prime line acquisition on the shorter lines in the western swaths. Good weather conditions prevailed which was interrupted by squall type conditions on occasions. Sequence 83 was started late due to a problem with Joy compressor number 2 electrical control system. A total of 81 shotpoints were lost.

September 6th

Traverse 51.6375 Km

Prime line acquisition was halted at 10:06 to allow recovery of guns ahead of a poor forecast of approaching gale force winds. The vessel headed towards the shelter of Wilson's Promontory. By morning the wind increased to gale force but the lee enabled a WesternGeco crew change to be underway with the first three of four helicopter flights out of West sale landing before the end of the UTC day.

September 7th

The WesternGeco helicopter crew change was completed. The vessel remained sheltering from Westerly gale force winds, all streamers deployed, in the lee to the east of Wilson's Promontory.

A slight moderation is expected early tomorrow before the next approaching front and associated deep low to the south bring further gale force NW/West winds on Monday. It is unlikely the vessel will be able to leave the shelter in the next 24hrs.

September 8th

Beta continued to shelter along the coast to the east of Wilson's Promontory. Weather conditions deteriorated during the day, SW-NW winds increasing to 45kts and seas rising to 4m. Problems were encountered with the depth control of streamer 6 which occasionally surfaced.

A storm warning was issued by the Victorian Met Office for east Bass Strait waters.

September 9th

The severe westerly gale force winds eased during the day to near gale and seas slowly dropped from 4m to 2.5m. Beta ran with the weather for the first half of the day, running NE parallel to the coast, turning in the evening to head back on the reciprocal course. At the end of the day Beta had altered course towards the prospect and was about 4 hours from start of line. Inner lead-in support paravanes were removed and the crews were waiting for sea conditions to improve to permit gun deployment.

September 10th

Gun deployment commenced at the start of the day but had to be aborted due to an increase in the wind back to WSW 30kts. As the vessel turned away from the prospect to run west, north of the shipping lane, the port streamers were hit by a current that took streamer 5 down to 35m. The port streamers closed and number 5 crossed under 6. Depths and lengths were staggered but as the vessel cleared the current the tail buoys came clear. The wind remained near gale force in the evening and the vessel continued on a safe course to the west heading

into the sea. The vessel turned in the lee of the coast in the morning and at the end of the day was heading back to the prospect in rapidly improving sea conditions.

September 11th

Traverse 61.05000 Km

Sea conditions improved and gun deployment commenced at 03:35z on the transit back to the prospect. Prime line production resumed at 0938z, the swell noise 15uB and improving. The currents were strong affecting the quality of the coverage with some coverage lost on sequence 87. From sequence 86 to 87 the time for a teardrop linechange was additionally increased in time whilst running in against a 1.7Kt current.

September 12th

Traverse 103.66875 Km

Improved weather and sea conditions permitted three deployments of the workboat. On the first trip three faulty birds were replaced and on the second trip, to investigate a heavy section on streamer 1, the crew found a suspect shark bite behind a retriever on section 18. The hole was patched and kerosene added to the section.

Prime line production continued in the west but strong currents of up to 1.7degrees affected the coverage; the large feathers resulted in overlapping groups. Infill is thus predicted to be high in the western swathes.

September 13th

Traverse 83.30625 Km

Prime line production continued on the western swathes until the last sequence of the day had to be aborted on the run-in due to the loss of communication with gun array 4. The problem was identified as failure of a FCON in the bullhead and the second optic link was also bad. At the end of the day faultfinding was completed, the failure of the second optic link was due to a kink in the bulkhead, this was repaired array 4 deployment was in progress.

Very strong currents up to 2.5kts setting SE were encountered. The strong currents continue to slow vessel speed and will result in extra infill due to large feathers

The workboat was deployed; a shark bit on active 23, streamer 4 was patched.

A fire drill took place; scenario was fire in the sauna room.

September 14th

Traverse 106.23750 Km

The Total Marine services crew change was completed by two helicopter flights out of West Sale. The vessel was unable to turn due to helicopter operations and 1.8hrs was logged for crew change at sea.

Production resumed after the optic links were repaired in array 4, prime and infill continued on the western swathes. Infill lines were required to account for steering for coverage on adjacent line. Currents up to 2Kts and resulting large feathers are badly affecting the coverage and increasing the expect infill. Completion is now estimated 19th to 20th September.

Beta now has 362m3 of fuel remaining; normal safe margin of fuel to remain onboard is 200m3. In production consumption is 28m3 per day so the vessel only has 5.5days of fuel available for production. The fuel situation for the end of job is therefore critical as the vessel will need to refuel on Friday 19th if job completion is set back. The current plan is for Total Voyager to refuel in Eden on Tuesday 17th and have fuel available for Beta on her return.

September 15th

Traverse 102.18750 km

Infill and prime line production continued in the west, strong currents continued to make line matching very difficult and generating infill. Winds increased briefly to 30kts on sequence 106

but production continued and sea conditions remained fair. The forecast is for strengthening NW winds Tuesday night and reaching gale force by Wednesday afternoon. A muster was held in the morning to check all new crew were aware of their duties.

September 16th

Traverse 105.93750 km.

Production continued on prime and infill lines on western swathe. The weather was variable during the day with squally showers and strong to near gale WSW winds at times. Sea conditions were moderate and although swell noise was evident on the records levels were acceptable and streamer control maintained.

At 0200z Total Voyager departed the prospect to head for Eden for crew change.

September 17th

Traverse km 19.27500 Km

The weather deteriorated rapidly after completion of line sequence 113. The next line attempt at 0700z was aborted on the run-in as the swell noise increased to 46micro Bar and streamer depth control was becoming unstable. Streamers were dived and after the Beta crossed the shipping lane at ninety degrees another turn was made to head into the westerly sea and permit the safe recovery of the gun arrays. The wind increased to westerly gale force.

The weather forecast is poor and Gale Force WSW'ly winds are expected to persist for most of Thursday before easing. Beta is heading to shelter to the east of Wilson's Promontory.

Total Voyager was reported to have departed Eden 05:00z after loading 100m3 and was on route to rendezvous with Beta.

September 18th

The wind increased to storm force 10 today as a deep low passed south of Tasmania. Beta safely turned at 04:30 east of Wilson's Promontory and then had to continue to run NE as the seas increased 5 to 7m. Streamer control was unstable but the crew was able to avoid any tangle by adjusting streamer lengths. At the end of the day the vessel was turning in the lee of the coast off Lakes Entrance to head back SW.

Total Voyager was back on station at 14:00z.

September 19th

The severe weather and 5m seas gradually abated, the wind dropping below 30kts at 14:00z. Recovery of streamers commenced at 17:15z with only 220m3 of fuel remaining on board, the Masters safety limit set at 200m3. Sea conditions forecast did not look ideal for offshore supply and if bunkering cannot take place underway the plan is for the vessel to anchor in Waterloo Bay for the transfer.

Recovery started on the port side as soon as sea conditions permitted as the depth rope to mono-wing number 3 was observed to have parted at 07:46z. This meant that the wing was hanging on the safety chain and had to be recovered as soon as possible. Streamer 5 was fully recovered at 22:20z. Sea conditions permitted dual streamer recover to commence at 20:32z

At the end of the GMT day recovery of streamers 6 and 4 was in progress. The time for streamer recovery agreed as non-chargeable time.

September 20th

Streamer recovery was hindered by a huge amount of slime on the streamers but recovery was still achieved in good time with all equipment onboard at 12:05. (Recovery time 18h50m). The broken depth rope on mono-wing 3 was found to have parted midway.

Sea and swell conditions improved during the day but were not deemed suitable for Supply boat operations; the wind and choppy sea conditions were also not suitable for fender deployment. After dark as the vessel reached the lee of Wilson's Promontory the wind eased

and sea state was calm, however by daybreak the approach of the next cold front was already starting to bring strong winds. The vessel anchored in Waterloo Bay at 18:32z, (04:32local). The plan to deploy the fenders at first light was hindered by the wind gusting from the NW to 50Kts. With the anchor starting to drag the vessel weighed anchored and moved slightly to the west, close under the shelter of the cliffs, and dropped anchor at 2210z. Total Voyager maneuvered alongside with the first line across at 23:24z, all fast 23:38z (9:38 local). At the end of the day preparations were in progress for bunkering operations to commence.

All timing for today was logged as weather downtime. Without the recent spell of severe weather the survey program would have been completed without the need to take on bunkers. Time for streamer recovery agreed as non-chargeable time.

September 21st

Bunkering was completed at 03:55z, 190m3 of fuel received and Total Voyager cast off at 04:30z. Beta weighed anchored and once clear of the Waterloo Bay streamer deployment commenced at 06:38z, 1638 local.

The starboard side streamers were fully deployed at 21:35z. Whilst deployment continued on streamer 4 the workboat was deployed to change malfunctioning bird 16 on streamer 2 and birds 13 and 10 on streamer 3. At the end of the day streamer deployment was nearing completion with the distance rope about to be attached to last streamer to be deployed number 4.

The weather conditions were excellent for deployment with a light westerly wind and low swell.

September 22nd

Traverse 83.88750 km.

The six streamer deployment was completed at 00:49z, (18h11m deployment time) and after turning towards the prospect gun deployment commenced. The workboat was deployed to replace malfunctioning bird 3 on streamer 3 on the run-in to line. Production resumed at 06:07 with the acquisition of two infill lines in the center swathe before heading to continue acquisition on the western swathes. Western most prime line 2232P0116 had to be aborted at the southern end due to a shark fishing vessel with nets down.

September 23rd

Traverse 110.04375 km.

Acquisition continued on the prime and infill lines in the west. Time was lost due to Humpback whale sightings, resulting in the loss of the start of line 2064P119 in the afternoon and then requiring a change of shooting plan and extended line change in the morning.

At fire drill was held, scenario; lithium battery fire.

Leakage spikes were observed on streamer 3 whilst on line at midnight GMT.

September 24th

Traverse 73.48125 km

Production was disrupted today with numerous shutdowns for Humpback whale sightings. The whales seemed to be very inquisitive of the operation, coming close to the vessel. The main infill and re-shoots lines in the west were completed and with a gale forecast for tomorrow the decision was taken to steam to the west and complete the 2D tie line. Infill then resumed in the central swathe but acquisition was limited due to shut downs for the whales.

The workboat was deployed at the start of the day to investigate leakage on streamer 3. The streamer was found holed by a suspect shark bite and the section was successfully changed.

September 25th

Traverse 67.96875 km

Production was interrupted at the start of the day due to whale sightings. Production then continued on small infill segments in the center swathes. The workboat had to be deployed to change active 29 on streamer 3, another sea creature bite. The weather deteriorated rapidly on line sequence 133, the swell noise affecting 25-35% of traces, 30-40µB RMS at end of line.

The run-in to next line sequence 134 was aborted at 17:11z, wind westerly force 8, seas 3-4 metres, swell SW 2-3 metres. At the end of the day the vessel was, heading west, in sea conditions too poor for recovery.

The medic held two training sessions on head injuries.

September 26th

At 01:30z BHP Billiton advised the onboard Client that due to the bad weather acquisition of the remaining small infill program was terminated and the job considered complete. With the wind easing and swell slowly decreasing gun recovery was commenced. All guns were onboard at 02:56z and streamer recovery commenced. All streamers were onboard at 20:55z. Once equipment was secured speed was increased to commence the transit to Melbourne.

September 27th

The Melbourne pilot was onboard at 11:00z and Beta was all fast, Victoria Warf, berth 24 at 22:20z, (06:20 local). End of transit and demobilization time agreed with Client at 22:00z.

September 28th

A close out meeting took place in Beta's conference room at 10:30 local 28th September.

From BHBP, Ron Seitz, Karl Bauer and John Thornton attended as did

Clients Representatives Paul Round and Bruce Calderbank.

From WesternGeco, Captain Bob Wilson, Party Manager Mike Martin, Chief Mechanic Marcus Kay, Vessel Supervisor Terry Leighton and Sales manager Alistair Fenwick.

END of JOB 9277.

3.3 Field Information and Encountered Problems

3.3.1. Obstructions / Installations on the Field

There were no platforms or obstruction on the prospect. To the north of the area were the platforms Mackerel, Kingfish B, Kingfish A and west Kingfish. Diving activity on Kingfish A and Mackerel occurred during the survey. Good communications were established with the diving superintendent who ensured the divers surfaced prior to the Beta entering the 10km zone.

3.3.2. Traffic / Shipping Lanes

The main shipping separation zone was located across the prospect area. The main traffic was transiting between the east and west coasts of Australia. Prior to the survey the separation boundaries of the zone were officially widened allowing vessels to deviate further due to the proposed drilling activity planned when the seismic data had been interpreted. This change in zone boundaries proved to be extremely useful when the Beta was shooting across the survey area, enabling vessels to be directed clear of the towed equipment without being restricted for space to navigate. It was interesting to note that although most vessels had updated their charts it was obvious that a number of merchant ships did not have the revised separation zone positions. Most vessels responded to calls on VHF channel 16 although on a few occasions assistance was requested from other ships to make contact. Although directed to clear the towed seismic equipment by two miles external propeller noise was evident on the records on numerous occasions, although not affecting the data to any significant degree.

3.3.3. Fishing Activity

At the start of the survey on the eastern swaths both long line and trawling activity were noted although not to any great degree. Dialogue between the fishing vessels and the Beta was established with good co-operation received throughout. Only one line, on 22nd September, had to be terminated when a shark fishing boat with net deployed overnight in the south-western edge of the prospect was not prepared to recover. The fishing boat did clear the area for Beta to transit the following morning.

3.3.4. Environmental Obstacles

Shooting time on the long lines in the east matched the tidal cycle with a tidal regime predominating it was possible to feather match adjacent lines with a reasonable accuracy, thus minimizing on the required infill. At times the current changed very rapidly sometimes up to 15 degrees in 10 minutes. With these huge changes in such a short time it was impossible to compensate by steering the vessel across line rapidly enough. This of course resulted in the inevitable holes in the coverage and infill requirements. It should be noted that the worst area for heavy current swings was in the west and was probably caused by the large deep steep trench located in that position within the survey area. The line length in the west was shorter and five lines per day could be acquired, feather matching was difficult, as the tidal pattern could not easily be matched. Currents were heavily influenced by strong winds and by the passage of frontal systems and peaked at over 2.5kts on the neap tide around September 13th.

The streamer shape was observed to be affected by areas of down welling; this would be manifested by all streamers being pulled into the center of the spread. An extreme example on line occurred on line GP021536K132 on 25th September.

Towards the end of the survey observed marine activity increased, sea bird flocks and numerous cetacean sightings. Shark bites attributed to only 2.5hrs of lost time but on recovery of streamers 5 sections were found holed, probably by sea creatures. In addition 3 sections were changed at sea. A shark bite on the tail of streamer 5, 1st September, caused a

short period of downtime while a section was replaced by the workboat crew. The workboat crew replaced two more sections, on the 24th and 25th September.

Whale watching throughout the survey continued during acquisition with two dedicated watchers from NSR observing the area from atop the bridge. A nocturnal watch was also established utilizing the night vision binoculars.

Eleven confirmed sightings of humpback whales were observed for the period 22/9/02 to 26/9/02, two of the sightings observed at least two individual whales. Parameters influencing cetacean observation were largely favorable for this period with the Beaufort Sea State at around 4 (ranging between 2 and 5) and viewing conditions were mostly good to excellent. 7.4 hours standby time to whales was recorded. 5 shut downs of the guns occurred, the vessel delayed or slowed down for whales on three line changes.

The weather conditions at the start of the survey were excellent enabling the first ten sequences to be acquired without noise problems. On the 11th of August with poor weather from the southwest the vessel headed down to the shelter of Flinders Island. Production commenced once again on the 14th of August although in extremely marginal weather conditions. Heavy streamer swell noise was experienced during acquisition until the 17th of August when the sea conditions improved. Good weather then prevailed until the 2nd of September when a series of cold fronts and gales passing through the area from the southwest enabled only sporadic production to be achieved until the end of the survey. On the 18th September the winds reach storm force and wave height 7m.

For the passage of gales Beta recovered guns and sheltered to the east of Wilson's Promontory from the initial NW winds. As the winds back to the southwest and turning became hazardous for the streamers, Beta then ran with the SW wind astern, heading NE'ly along the coast. It was usually observed that by the time Beta had passed through the Gippsland Oil Field to the north of Whiting platform the gales had abated sufficiently for the Beta to turn and head back toward the prospect.

3.3.5. Operational Observations

Contact with the fishing cooperatives based out of Lakes entrance should be of prime importance to any future surveys to enable a good relationship to be made with the local community.

The adjustment made to the separation zone was of great benefit to the survey enabling merchant vessels to give a wider berth to the seismic operation. The density of shipping traffic was heavy but no time was lost. Most vessels were co-operative and gave the Beta a wide clearance. No line segments were scratched due to ship noise but some edits were required and are documented on in the QC section.

Technical downtime was very low and the performance of the seismic equipment was excellent. A failure of a mono-wing depth rope was attributed to the extreme weather after riding out force 10 storms on the 18th September. The wing was supported by the safety chain until recovery took place. As recovery was planned for bunkering no downtime was incurred.

The main technical downtime was recorded as a result of a cracked air gun shuttle, Trisor FCON failure, Triacq interface card failure, shut down of generator number 4 and LMF compressor shut down. Technical downtime:

Hours	
4.00	Gun tow cable – FCON failure (optical link)
3.32	Autofire gun, cracked shuttle.
0.88	Trisor gun controller
0.03	Trisor modules
0.45	Triacq - Streamer interface card
3.75	Triacq - Software related

0.283 Compressor shutdown, preferential trip due to generator No 4 shutdown.
2.083 LMF compressor shut down, overheating 3rd stage.
0.117 Joy compressor No2 electrical problem

Total Voyager was Geco Beta's new support vessel for this contract. Unfortunately her minimum speed was 5.5kts, too fast to maneuver alongside Beta with all the gear deployed. Therefore extra time was lost in bunkering on the 26th August as Beta had to recover guns to increase water speed. Total Voyager also joined Beta with less fuel than planned, fuel onboard when she departed Melbourne prior to the survey was only 623m3 - this was only just over half the number initially quoted. This had ramifications later on in the job when weather downtime extended the duration of the prospect. Total Voyager had to be released from the prospect to proceed to Eden to load extra fuel whilst crew changing on the 14th September.

Contaminated fuel was received from Total Voyager. RACOR filters fitted on Beta's engines 1,2, &3, during Beta's last port call in July coped with the contamination. It should be noted that at completion of the survey adjustments were made to Total Voyagers minimum speed and extensive tank cleaning work was completed.

With the run of bad weather in September Beta had to recover streamers on the 20th September to refuel. Bunkering took place at anchor in the shelter of Waterloo Bay, Wilson's Promontory. Following bunkering on the 21st only six streamers was deployed to complete the survey. This decision to deploy only six streamers was taken to save overall time for the completion of the survey. In theory it can be expected to save 12 to 15hrs in deploying 6 rather than 8 streamers. As well as too fewer streamers more importantly it meant two less mono-wings to deploy. The remaining coverage was mostly infill that was acquired with only one run with 6 streamers. Production resumed only 23.5hrs from the start of six-streamer deployment.

4. HSE Summary

The survey was conducted in a safe and efficient manner with no injuries taking place. Eleven accidents were reported, eight of the events concerned damage to active streamer sections, possibly holed by a bite from a sea creature. One equipment failure, a Trisor optic link, was deemed serious due to the time lost for repair of 4.0hrs.

One Near Accident, Electric shock from hydraulic coupling, was deemed serious and Representatives from BHPBP and WesternGeco conducted an investigation into the incident on the Geco Beta on the 29th and 30th August.

Investigation Team:

Brian Starkey, Environment and Community Coordinator, BHP Billiton Petroleum.

Paul Round, BHPBP Client Representative, EDRH.

Tom J Meyer, Shore Administrator, WesternGeco.

Tim McRae, Chief Engineer (Geco Beta), WesternGeco.

Justine Rouse, Quality Assurance Supervisor (LPT Leader), WesternGeco.

Iain MacKenzie, Principle Electrical/Instrument Engineer, BHP Billiton Petroleum.

A new section of seismic streamer had been spooled on to the winch of the Geco Beta workboat. The hydraulic hoses from Geco Beta to the winch were disconnected. When the hydraulic hoses were disconnected the Junior Positioning Specialist who was performing the work received an electrical shock and required assistance from colleagues to break his grip on the hoses. The Junior Positioning Specialist was examined by the Geco Beta onboard medic and was found to have suffered no physical injury. Medic assessed patient for pain, burns or other obvious injuries, but none found. Vital signs were checked and all normal. There was no damage to equipment.

The electrocution was determined to be a fault in the workboat engine electric heater. The electrical heater had a galvanic connection to the metal braiding in the hydraulic hoses via the winch and inboard engine. The electrical impedance in the path did not cause the protection (fuse) to trip on the Geco Beta 220 V supply. When this path to earth was separated the operator got a voltage across his body. Remedial actions were implemented as recommended. The accident investigation report compiled by Brian Starkey was received onboard on the 30th August.

Proactive Measures as specified in the vessels 2002 QHSE plan continued to be implemented for the duration of the prospect. The measures included;

Active use of Job Safety Analysis.

Creating and updating work Instructions.

Reviewing Hazard Data sheets with updates as required.

Introduction of a structured Tag Out System.

Toolbox Meetings.

HSE award scheme

JSA's added to Points award scheme.

Identifying the root cause of accidents as the key to preventing reoccurrence.

The focus also remained on Geco Beta's Top 5 QHSE Operations;

Maintenance of Equipment

SHL – (Pre-Conditions)

In Sea Maintenance

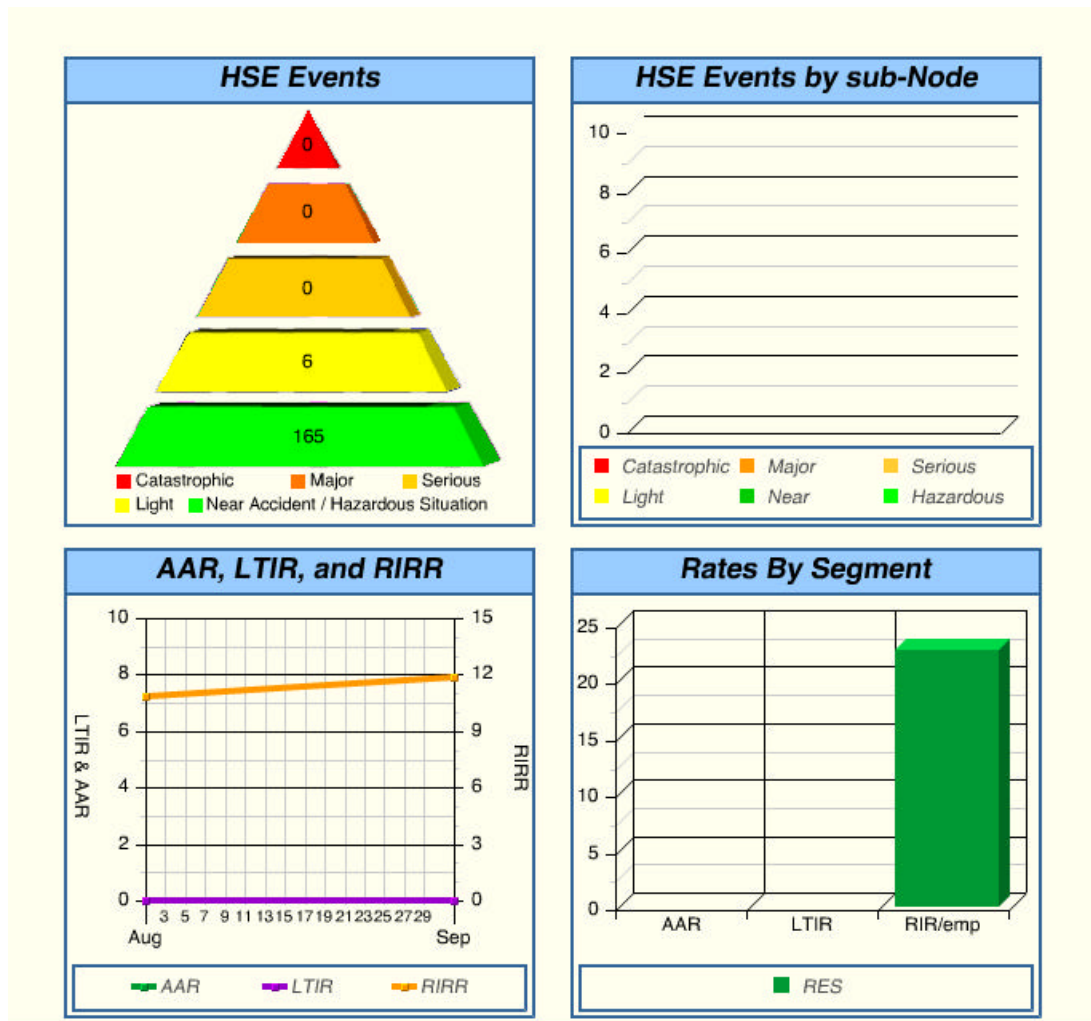
Re-fuelling / storing at sea

Back deck / streamer work

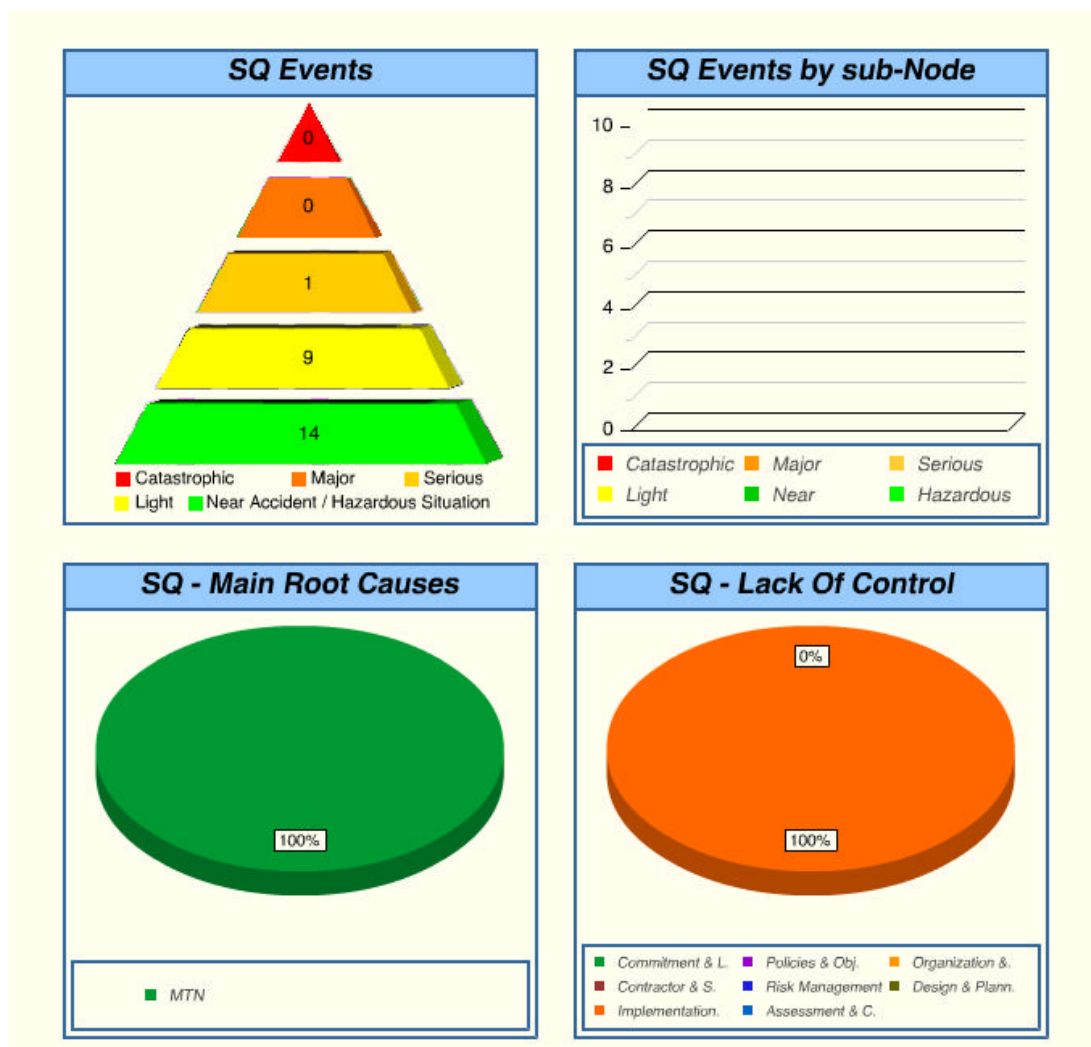
**GECO BETA - WEEKLY QHSE SUMMARY
FOR DURATION OF BHPBP CONTRACT**

Activity	32	33	34	35	36	37	38	39	Job
Mob-boat launches	0		1			1			2
Work-boat launches	2	2	2	2		4		5	17
Life-boat drill/launches	1			1	1	1	1		5
Mob-drill		1							1
Fire drill	1		1			1		1	4
General QHSE meeting				1		1			2
HSE brief tour/induction		1			5	3			9
QSC /Operation meeting	1	1	1				1		4
LPT meeting	1							1	2
Tool box meeting	9	13	12	11	12	9	10		76
First Aid training		1	2	2		1		2	8
Helicopter operations	3	1		2	4	2			12
STOP cards (not in Quest)		2	2	1					5
GO/SQM not in Quest									0
RIR Quest reports	15	26	17	22	17	18	22	47	184
SQM not in Quest									0
MQSMS meeting	1	1	1	1		1	1	1	7
MQSMS/ISM training/instruction	1	1	2	1		2	1		8
Other ER drills:									
JSA or procedures reviewed			1	1			1		3
Oil Pollution	1								1
ER drill according to Contract plan		1							1
Internal audit/inspection							1		1
External HSE audit		1		1					2
EM response		1							1
EM steering								1	1
Black out/Propulsion loss								1	1
Towing drill	1								1
Abandon Ship			1						1
Piracy			1						1
Best Practice				1					1
M/Hours - Total	64	92	88		20	63	33	19	378

HSE Consolidation Report from QUEST (8th August to 30 Sept)



SQ (Service Quality) Consolidation Report from QUEST (8th August to 30 Sept)



RISK IDENTIFICATION REPORTS, HSE AND SQ (SERVICE QUALITY)

Reporting during the BHPBP survey utilised the WesternGeco QUEST system. Below is a list of 184 reports issued during the survey.

Description	Event Date	Category	Severity
Digicourse bird 5011 lost at sea	Aug 18, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 12, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 13, 2002	Accident/Failure	Light
Loss of production Trisor FCON failure	Sep 14, 2002	Accident/Failure	Serious
GPS antenna caught on workboat painter line	Sep 22, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 21, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 21, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 23, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 23, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 21, 2002	Accident/Failure	Light
Holed Section (shark bite?)	Sep 24, 2002	Accident/Failure	Light
Streamers Crossing in Heavy Seas	Aug 14, 2002	Near Accident	
Rough weather break monitor's base plate	Aug 14, 2002	Near Accident	
Floor tile gave way under foot	Aug 19, 2002	Near Accident	
Hit head on low sea water pipe	Aug 22, 2002	Near Accident	
Head struck door stop	Aug 22, 2002	Near Accident	
Crewmember Hit By Headache Ball	Aug 23, 2002	Near Accident	
Electric shock from hydraulic coupling.	Aug 26, 2002	Near Accident	
Safety stop left on davit.	Sep 12, 2002	Near Accident	
Monowing 3 Depth rope snapped	Sep 20, 2002	Near Accident	
Plane ticket issued in wrong name	Sep 06, 2002	Near Accident	
stepping on loose tile	Sep 24, 2002	Near Accident	
no cleanup procedure for tmp dirs in place	Sep 24, 2002	Near Accident	
Liferaft not secure	Aug 10, 2002	Hazardous Sit.	
Person on upper deck during helicopter ops.	Aug 10, 2002	Hazardous Sit.	
STOP - Spooling block on the mezzanine deck	Aug 10, 2002	Hazardous Sit.	
Sea Fire life vest hang on the floatation chamber	Aug 10, 2002	Hazardous Sit.	
Fuel leak at engine #3	Aug 10, 2002	Hazardous Sit.	
STOP - Cylinder secured with a rag.	Aug 12, 2002	Hazardous Sit.	
Stop, Slipway safety rope not replaced.	Aug 12, 2002	Hazardous Sit.	
Stop Boathook handle rusted away.	Aug 12, 2002	Hazardous Sit.	
Stop Oi ol spill on gundeck.	Aug 12, 2002	Hazardous Sit.	
Stop Gunshack crew lists missing.	Aug 12, 2002	Hazardous Sit.	
STOP - MOB crew list not updated	Aug 12, 2002	Hazardous Sit.	
Watertight door left open.	Aug 12, 2002	Hazardous Sit.	
Water tight door left open	Aug 13, 2002	Hazardous Sit.	
RobTrack Display Illumination Inoperative	Aug 13, 2002	Hazardous Sit.	
Paper cutting blade left open	Aug 13, 2002	Hazardous Sit.	
GO - Crew Member using correct PPE	Aug 14, 2002	Hazardous Sit.	
JSA Completed	Aug 14, 2002	Hazardous Sit.	
STOP - Loops of cable and bucket behind ins. rack	Aug 14, 2002	Hazardous Sit.	
UAA/Stop assessment - Incinerator	Aug 15, 2002	Hazardous Sit.	
Disposed cracked cutting disk.	Aug 13, 2002	Hazardous Sit.	
Several wraps on weak links.	Aug 11, 2002	Hazardous Sit.	
Watertight door not secured.	Aug 15, 2002	Hazardous Sit.	

Cylinders not secured.	Aug 15, 2002	Hazardous Sit.	
Preferential trip of compressors	Aug 15, 2002	Hazardous Sit.	
JSA for monowing deployment completed	Aug 15, 2002	Hazardous Sit.	
Door in tech store instr room swinging	Aug 15, 2002	Hazardous Sit.	
Descending stairs with boot laces untied	Aug 15, 2002	Hazardous Sit.	
QC plot server down	Aug 14, 2002	Hazardous Sit.	
MOB Crewlist Includes All Experience Nav Personnel	Aug 17, 2002	Hazardous Sit.	
Safe act observed.	Aug 18, 2002	Hazardous Sit.	
PTW expired.	Aug 18, 2002	Hazardous Sit.	
Rubbish blowing around deck.	Aug 18, 2002	Hazardous Sit.	
Watch Found on Floor	Aug 19, 2002	Hazardous Sit.	
No sign for MOB alarm.	Aug 19, 2002	Hazardous Sit.	
Decaying fruit left on instrument room desk	Aug 18, 2002	Hazardous Sit.	
Positive STOP-completed lead-in fairing safely	Aug 17, 2002	Hazardous Sit.	
Electric lead not plugged in.	Aug 20, 2002	Hazardous Sit.	
Sauna left on	Aug 20, 2002	Hazardous Sit.	
Lifting Technique	Aug 21, 2002	Hazardous Sit.	
To long shoelaces nearly causing fall	Aug 20, 2002	Hazardous Sit.	
STOP-Gas bottle not safely stowed	Aug 21, 2002	Hazardous Sit.	
STOP- Valve location needs marking	Aug 21, 2002	Hazardous Sit.	
STOP- Guard rails required in thrusters room	Aug 21, 2002	Hazardous Sit.	
Coffee spilt on stairs	Aug 19, 2002	Hazardous Sit.	
Water tight door swinging open	Aug 12, 2002	Hazardous Sit.	
Door left open.	Aug 21, 2002	Hazardous Sit.	
JSA BET-0068 completed	Aug 22, 2002	Hazardous Sit.	
STOP/UAA - Reviewed of Hazard Data Sheet	Aug 22, 2002	Hazardous Sit.	
Door Left Open Unattended	Aug 24, 2002	Hazardous Sit.	
STOP - Person not wearing correct PPE	Aug 24, 2002	Hazardous Sit.	
Door left open	Aug 22, 2002	Hazardous Sit.	
Hose not correctly Coiled	Aug 25, 2002	Hazardous Sit.	
Tap Water Left Running	Aug 26, 2002	Hazardous Sit.	
RIR - Yokohama fender cracked chain.	Aug 24, 2002	Hazardous Sit.	
MSDS file not updated.	Aug 25, 2002	Hazardous Sit.	
RIR - Safety stops on FRC use stenhouse slips.	Aug 25, 2002	Hazardous Sit.	
Hazard review - Lifting complete	Aug 26, 2002	Hazardous Sit.	
STOP - JSA Completed	Aug 27, 2002	Hazardous Sit.	
Door left open and unsecured	Aug 25, 2002	Hazardous Sit.	
RIR - Antifreeze drum stored with AFFF drums.	Aug 25, 2002	Hazardous Sit.	
No power bubble installed on streamer four	Aug 27, 2002	Hazardous Sit.	
Trolley rolling around.	Aug 28, 2002	Hazardous Sit.	
Safe act observed.	Aug 28, 2002	Hazardous Sit.	
GO - Swinging door in instrument room fixed.	Aug 29, 2002	Hazardous Sit.	
STOP - Salad bar hygiene	Aug 28, 2002	Hazardous Sit.	
Fuel filter clogging causes compressor trip	Aug 29, 2002	Hazardous Sit.	
RIR - VHF in workboat not working.	Aug 29, 2002	Hazardous Sit.	
Stop Mob Safety chain found with damaged link.	Aug 29, 2002	Hazardous Sit.	
Stop Light not working.	Aug 29, 2002	Hazardous Sit.	
Stop Water inside light fitting.	Aug 29, 2002	Hazardous Sit.	
Stop Leadins not covered up.	Aug 29, 2002	Hazardous Sit.	
HP compressor, cracked pulsation chamber	Aug 30, 2002	Hazardous Sit.	
Clip-hooks for Sala fall arrest seized.	Aug 30, 2002	Hazardous Sit.	

Fan on twin deck not secured.	Aug 30, 2002	Hazardous Sit.	
New Compass/Bird fails test	Aug 30, 2002	Hazardous Sit.	
Subarray power on during retrieval.	Aug 30, 2002	Hazardous Sit.	
JSA BET-0069 completed	Aug 31, 2002	Hazardous Sit.	
Sharp edge lead to minor cut to finger.	Sep 01, 2002	Hazardous Sit.	
RIR - Handle corroded - sharp edges.	Sep 01, 2002	Hazardous Sit.	
Extension cord damaged.	Sep 01, 2002	Hazardous Sit.	
Vessel entered oil rig exclusion zone	Sep 02, 2002	Hazardous Sit.	
Misleading wiring of monitor.	Sep 02, 2002	Hazardous Sit.	
RIR - Rope slings without certificates.	Sep 03, 2002	Hazardous Sit.	
Cargo straps removed.	Sep 03, 2002	Hazardous Sit.	
Welding Machine left on	Sep 01, 2002	Hazardous Sit.	
Guns Deployed in a Safe and efficient manner	Sep 03, 2002	Hazardous Sit.	
Rags left on welding bench	Sep 02, 2002	Hazardous Sit.	
Clear face shields badly scratched	Sep 04, 2002	Hazardous Sit.	
Chemical cannot mark.	Sep 05, 2002	Hazardous Sit.	
Power loss to HP compressor (production loss)	Sep 06, 2002	Hazardous Sit.	
Water in fuel	Sep 06, 2002	Hazardous Sit.	
Grinder Wrongly Labelled	Sep 06, 2002	Hazardous Sit.	
A sharp burr was found on a metal handrail.	Sep 06, 2002	Hazardous Sit.	
papers on top of power transformer - fire hazard	Sep 07, 2002	Hazardous Sit.	
Non-Standard Type luggage	Sep 07, 2002	Hazardous Sit.	
STOP - Poorly Secured Footwear	Aug 10, 2002	Hazardous Sit.	
Damaged airline.	Sep 09, 2002	Hazardous Sit.	
Stop tool in unsafe condition	Sep 11, 2002	Hazardous Sit.	
Paperwork blown out of hand.	Sep 11, 2002	Hazardous Sit.	
STOP - Person Not Using Eye Protection	Sep 08, 2002	Hazardous Sit.	
STOP - Hose connector cracked	Sep 13, 2002	Hazardous Sit.	
Power transformer size not adequate.	Sep 14, 2002	Hazardous Sit.	
STOP observation, array fault finding.	Sep 14, 2002	Hazardous Sit.	
Slipping Hazard	Sep 13, 2002	Hazardous Sit.	
STOP - Smoking in Unauthorised area	Sep 14, 2002	Hazardous Sit.	
Nail extruding from wooden beading	Sep 14, 2002	Hazardous Sit.	
MOB boat restraining wire rope incorrectly secured	Sep 14, 2002	Hazardous Sit.	
Oily spill water accumulates on Mezzanine deck.	Sep 15, 2002	Hazardous Sit.	
Davit Shackles MOB/Workboat	Sep 15, 2002	Hazardous Sit.	
Hazardous Situation/Stop	Sep 15, 2002	Hazardous Sit.	
Sheared bolt on dog-locking handles	Sep 14, 2002	Hazardous Sit.	
Cow-gate on twin deck swings inwards.	Sep 15, 2002	Hazardous Sit.	
Pallet truck not properly stored.	Sep 15, 2002	Hazardous Sit.	
Twin deck floor brackets blocking the drain ports	Sep 15, 2002	Hazardous Sit.	
Faulty remote handpiece on handheld VHF.	Sep 15, 2002	Hazardous Sit.	
STOP observation of gun recovery in bad weather	Sep 18, 2002	Hazardous Sit.	
Unsafe wiring	Sep 18, 2002	Hazardous Sit.	
Sea water ingress in steering flat	Sep 18, 2002	Hazardous Sit.	
STOP - Outside door left open	Sep 20, 2002	Hazardous Sit.	
STOP - Flares left in survival suit	Sep 20, 2002	Hazardous Sit.	
Lifeline found snapped.	Sep 21, 2002	Hazardous Sit.	
Lighting not working.	Sep 21, 2002	Hazardous Sit.	
Retriever unit off collars and wrapped around bird	Sep 21, 2002	Hazardous Sit.	
Reviewed and update JSA BET-0054	Sep 21, 2002	Hazardous Sit.	

Reviewed and updated Work instruction	Sep 21, 2002	Hazardous Sit.	
Slip hazard	Sep 22, 2002	Hazardous Sit.	
Lack of illumination	Sep 21, 2002	Hazardous Sit.	
STOP observation, mono-wing deployment.	Sep 21, 2002	Hazardous Sit.	
Frozen dog on fire door.	Sep 18, 2002	Hazardous Sit.	
Hazard - Slipped while spooling streamer	Sep 22, 2002	Hazardous Sit.	
Stop - Excessive slim on deck	Sep 22, 2002	Hazardous Sit.	
Over tightened and seized set screws	Sep 22, 2002	Hazardous Sit.	
STOP: Transfer of tail stretch postponed.	Sep 22, 2002	Hazardous Sit.	
Battery cover O-Ring missing	Sep 22, 2002	Hazardous Sit.	
Recovery winch connector caught	Sep 22, 2002	Hazardous Sit.	
Air-condition for OBP Computer Room not stable	Sep 22, 2002	Hazardous Sit.	
STOP, over packed container.	Sep 21, 2002	Hazardous Sit.	
STOP - Section flushing stopped d/t ruptured skin	Sep 22, 2002	Hazardous Sit.	
STOP - Person not wearing full PPE	Sep 22, 2002	Hazardous Sit.	
Radio with broken antenna placed back on charge.	Sep 22, 2002	Hazardous Sit.	
Sonardyne units placed incorrectly on streamer	Sep 22, 2002	Hazardous Sit.	
Keyboard/monitor too close together	Sep 23, 2002	Hazardous Sit.	
Slippery Gun deck.	Sep 23, 2002	Hazardous Sit.	
STOP Safety glasses not worn on back-deck	Sep 22, 2002	Hazardous Sit.	
STOP - Uncontrolled release of L/P air	Sep 23, 2002	Hazardous Sit.	
Stop - incorrect exercise techniques observed	Sep 23, 2002	Hazardous Sit.	
Escape hatch obstructed	Sep 23, 2002	Hazardous Sit.	
Foreign object found in washing machine	Sep 23, 2002	Hazardous Sit.	
Emergency light not working.	Sep 23, 2002	Hazardous Sit.	
Line #6 open circuit: NAP-4B-9806-180-005F	Sep 21, 2002	Hazardous Sit.	
Tools left out.	Sep 21, 2002	Hazardous Sit.	
Electric cord being crushed.	Sep 19, 2002	Hazardous Sit.	
Fluorescent tube left on deck in alleyway.	Sep 20, 2002	Hazardous Sit.	
Person working wrong side of barrier	Sep 25, 2002	Hazardous Sit.	
O/C line 13 in Bubble 03-1213 Ex 5-1	Sep 24, 2002	Hazardous Sit.	
Weak Channel on Active Section	Sep 24, 2002	Hazardous Sit.	
Bad transmission line in section	Sep 24, 2002	Hazardous Sit.	
Big bubble in skin on active section 9808-190-006F	Sep 24, 2002	Hazardous Sit.	
Workboat Hydraulic leak	Sep 25, 2002	Hazardous Sit.	
Rapid clogging of fuel filters	Sep 26, 2002	Hazardous Sit.	

5. Shipment List

	Date	Consignee	Description
BET 02129OD-MEL	28-Aug-02	WesternGeco Melbourne Office	Processed tapes for Seq017
BET 02130PD-EXT	29-Aug-02	EDR Hydrosearch, Perth	Test tape P1 & P2 for seq 011 & seq 015
BET 02136PD-EXT	3-Sep-02	EDR Hydrosearch, Perth	P190 Data for Datum Conversion (Seq001-050)
BET 02142PD-EXT	7-Sep-02	EDR Hydrosearch, Perth	P190 test data for seq 023 & 062
BET 02145AD-EXT	7-Sep-02	Kestral, Welshpool	Job 9227 original seismic data tapes
BET 02146AD-EXT	*	Kestral, Sunshine	Job 9227 copy seismic data tapes
BET 02156PD-KUL	29-Sep-02	WG Kuala Lumpur Office (Nav)	Job9227 Copy Nav Data to ASA Data Archive
BET 02157PD-EXT	29-Sep-02	Kestral, Sunshine	Job9227 Original Nav Data to Client
BET 02158PD-EXT	*	Kestral, Welshpool	Job9227 Copy Nav Data to Client
BET 02159AD-EXT	29-Sep-02	BHP, Melbourne	TQC plots, wb & segy stacks on 3590
BET 02161PD-EXT	29-Sep-02	EDR Hydrosearch, Perth	P190 Data for Datum Conversion (Seq051-133)

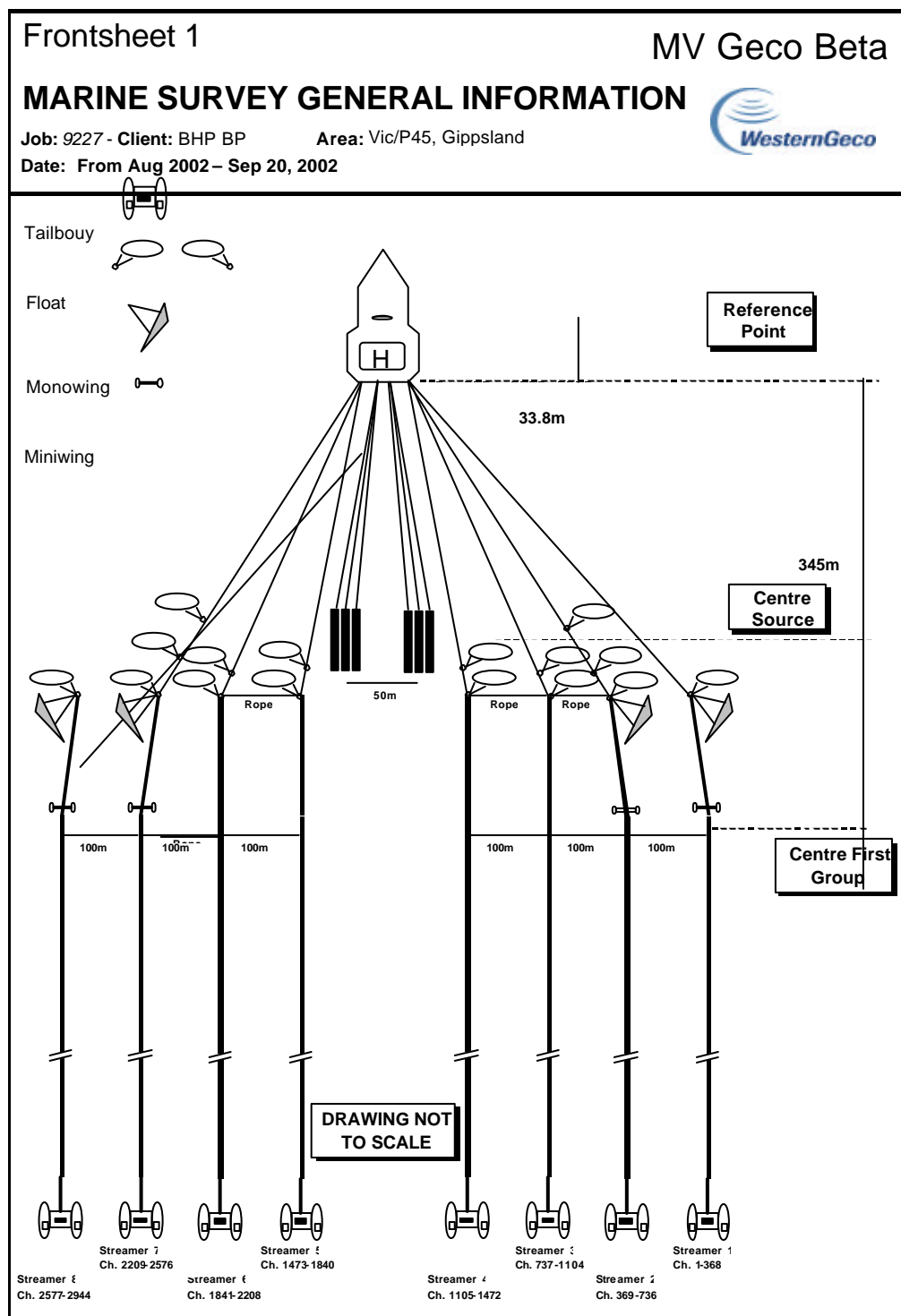
* Copy data remaining on board Geco Beta 1st October until safe receipt of original data update this as necessary

6. Logs

For acquisition production reports and acquisition tape reports (both originals and copies) see sections 7.1 through 7.3 (Appendices 1 through 3) of this report.

11. Towing Configuration

6.1 Towing System Layout



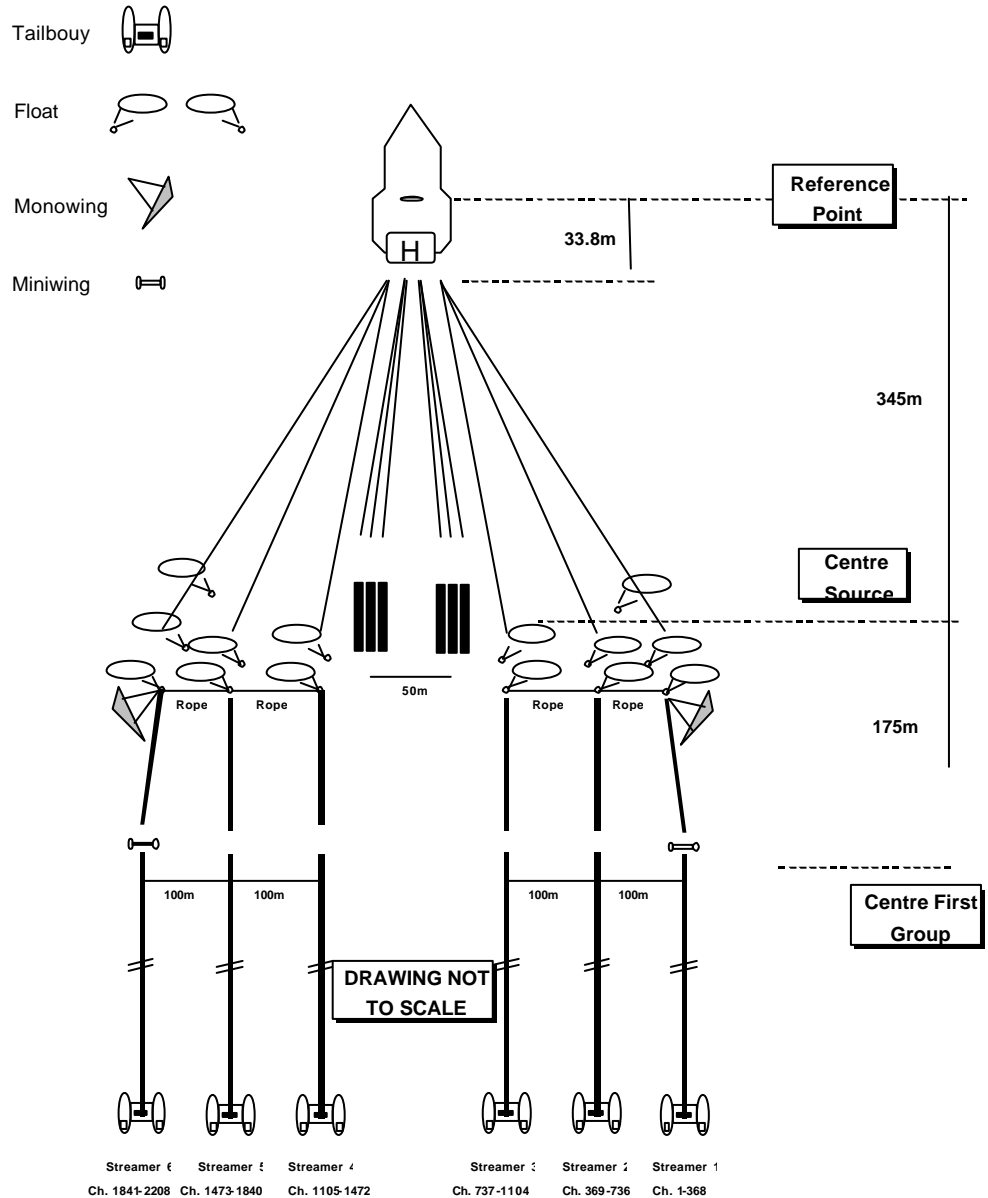
Frontsheet 2

MV Geco Beta

MARINE SURVEY GENERAL INFORMATION

Job: 9227 - Client: BHP BP
Date: From Sep 23 2002 -

Area: Vic/P45, Gippsland



Front sheet 3 – Configuration differs only with the array source. Dual sources are defined on configuration with only port source firing, all guns on starboard array are disabled. The set-up was used only on sequence 128 for 2d Tie Line.

12. Streamer Configuration

12.1. Streamer System Description

Streamer System Parameters	
Number of Streamers	8
Type of streamer	Digital NIII ASSI / NIV Sections
Streamer length	4600m
Groups per streamer	368
Group intervals	12.5 m
Outside diameter	54mm
Jacket (type-thickness)	Polyurethane, 3.5 mm
Breaking strength	90 kN
Ballast fluid (fluid-quantity)	Isopar M, 125 litres
Connectors (diameter-length)	Max. Dia 68 mm, length 251 mm
Channels per module	16
Data transmission link	Differential twisted pair
Power	60 – 300 V AC
Leakage	> 1 Mohm
Active group lengths	14.86 m
Nearest offset available	150 m
Streamer depth	8 m
Streamer separation	100 m
Number of stretch sections	
in front of each streamer	2
end of each streamer	1
No of compasses per streamer	18
No of depth transducers per streamer	18

Table 12.1.a – Frontsheet 1 only

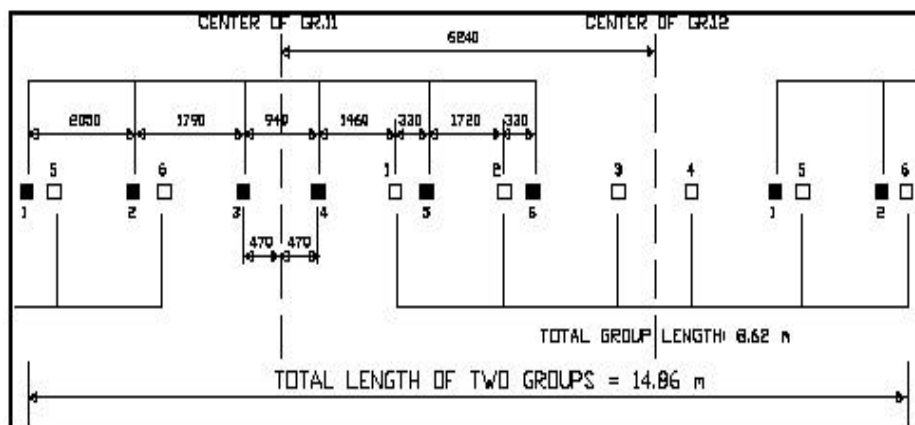
Trace allocation (example for 8 streamers)	Location	Near	Far
Streamer 1	Starboard Outer	1	368
Streamer 2	Starboard Middle (outermost)	369	736
Streamer 3	Starboard Middle (innermost)	737	1104
Streamer 4	Starboard Inner	1105	1472
Streamer 5	Port Inner	1473	1840
Streamer 6	Port Middle (innermost)	1841	2208
Streamer 7	Port Middle (outermost)	2209	2576
Streamer 8	Port Outer	2577	2944

Table 12.1.b – Frontsheet 2 & 3 only


Trace allocation (example for 8 streamers)	Location	Near	Far
Streamer 1	Starboard Outer	1	368
Streamer 2	Starboard Middle	369	736
Streamer 3	Starboard Inner	737	1104
Streamer 4	Port Inner	1105	1472
Streamer 5	Port Middle	1473	1840
Streamer 6	Port Outer	1841	2208

Trace allocation (example for 8 streamers)	Location	Near	Far
Streamer 1	Starboard Outer	1	368
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Streamer 4	Starboard Inner	1105	1472
Streamer 5	Port Inner	1473	1840
Streamer 6	Port Middle (innermost)	1841	2208
Streamer 7	Port Middle (outermost)	2209	2576
Streamer 8	Port Outer	2577	2944

Hydrophone Parameters	
Detector type	Benthos Geopoint, I/O
Group interval	12.5m
Detectors per group	12
Group length	14.86 m
No of groups per section	8
Hydrophones spacing	See diagram
Operating temperature range	0-49 °C
Displacement	0.49 cu.in
Mechanical resonance	Lowest in oil: 4.2 kHz
Maximum operating depth	1000 feet
Group sensitivity (at 7m depth)	20 V/bar



12.2. Streamer Layout

Frontsheet 1				MV Geco Beta			
MARINE SURVEY GENERAL INFORMATION							
Job: 9227 - Client: BHP BP		Area: Vic/P45					
Date: Aug 2002 – Sep 2002							
Description	Bird #	Channel #	Length				
Lead in							
Optical adapter			1.2	(Streamers 1 & 8 only)			
Optical bubble			0.52	(Streamers 1 & 8 only)			
Monowing adaptor			16m	(Streamers 1,2,7 & 8 only)			
Tow adaptor			1.2m				
Stretch section			23m				
Repeater bubble			0.52m				
Stretch section			50m				
Miniwing adaptor			1.2m	(Streamers 1,2,7 & 8 only)			
				continued....			
1/2 group		1	15m				
Active 1	Bird 1	1 - 8	100m				
Bubble 1			0.52m				
Active 2	Bird 2	9 - 16	100m				
Active 3		17 - 24	100m				
Bubble 2			0.52m				
Active 4		25 - 32	100m				
Active 5	Bird 3	33 - 40	100m				
Bubble 3			0.52m				
Active 6		41 - 48	100m				
Active 7		49 - 56	100m				
Bubble 4			0.52				
Active 8	Bird 4	57 - 64	100m				
Active 9		65 - 72	100m				
Bubble 5			0.52m				
Active 10		73 - 80	100m				
Active 11	Bird 5	81 - 88	100m				
Bubble 6			0.52m				
Active 12		89 - 96	100m				
Active 13		97 - 104	100m				
Bubble 7			0.52m				
Active 14	Bird 6	105 - 112	100m				
Active 15		113 - 120	100m				
Bubble 8			0.52m				
Active 16		121 - 128	100m				
Active 17	Bird 7	129 - 136	100m				
Bubble 9			0.52m				
Active 18		137 - 144	100m				
Active 19		145 - 152	100m				
Bubble 10			0.52m				
Active 20	Bird 8	153 - 160	100m				
Active 21		161 - 168	100m				
Bubble 11			0.52m				
Active 22		169 - 176	100m				
Active 23	Bird 9	177 - 184	100m				
Bubble 12			0.52m				
Active 24		185 - 192	100m				
Active 25		193 - 200	100m				
Bubble 13			0.52				
Active 26	Bird 10	201 - 208	100m				
continued...							
Description	Bird #	Channel #	Length				
Active 27		209 - 216	100m				
Bubble 14			0.52m				
Active 28		217 - 224	100m				
Active 29	Bird 11	225 - 232	100m				
Bubble 15			0.52m				
Active 30		233 - 240	100m				
Active 31		241 - 248	100m				
Bubble 16			0.52				
Active 32	Bird 12	249 - 256	100m				
Active 33		257 - 264	100m				
Bubble 17			0.52m				
Active 34		265 - 272	100m				
Active 35	Bird 13	273 - 280	100m				
Bubble 18			0.52m				
Active 36		281 - 288	100m				
Active 37		289 - 296	100m				
Bubble 19			0.52				
Active 38	Bird 14	297 - 304	100m				
Active 39		305 - 312	100m				
Bubble 20			0.52m				
Active 40		313 - 320	100m				
Active 41	Bird 15	321 - 328	100m				
Bubble 21			0.52m				
Active 42		329 - 336	100m				
Active 43		337 - 344	100m				
Bubble 22			0.52				
Active 44	Bird 16	345 - 352	100m				
Active 45		353 - 360	100m				
Bubble 23			0.52m				
Active 46	Bird 17	361 - 368	100m				
Power bubble			0.52m				
Tail stretch	Bird 18		75m				
Tailbuot adpt.			12m				

MARINE SURVEY GENERAL INFORMATION

Area: Vic/P45

[illegible]

continued...

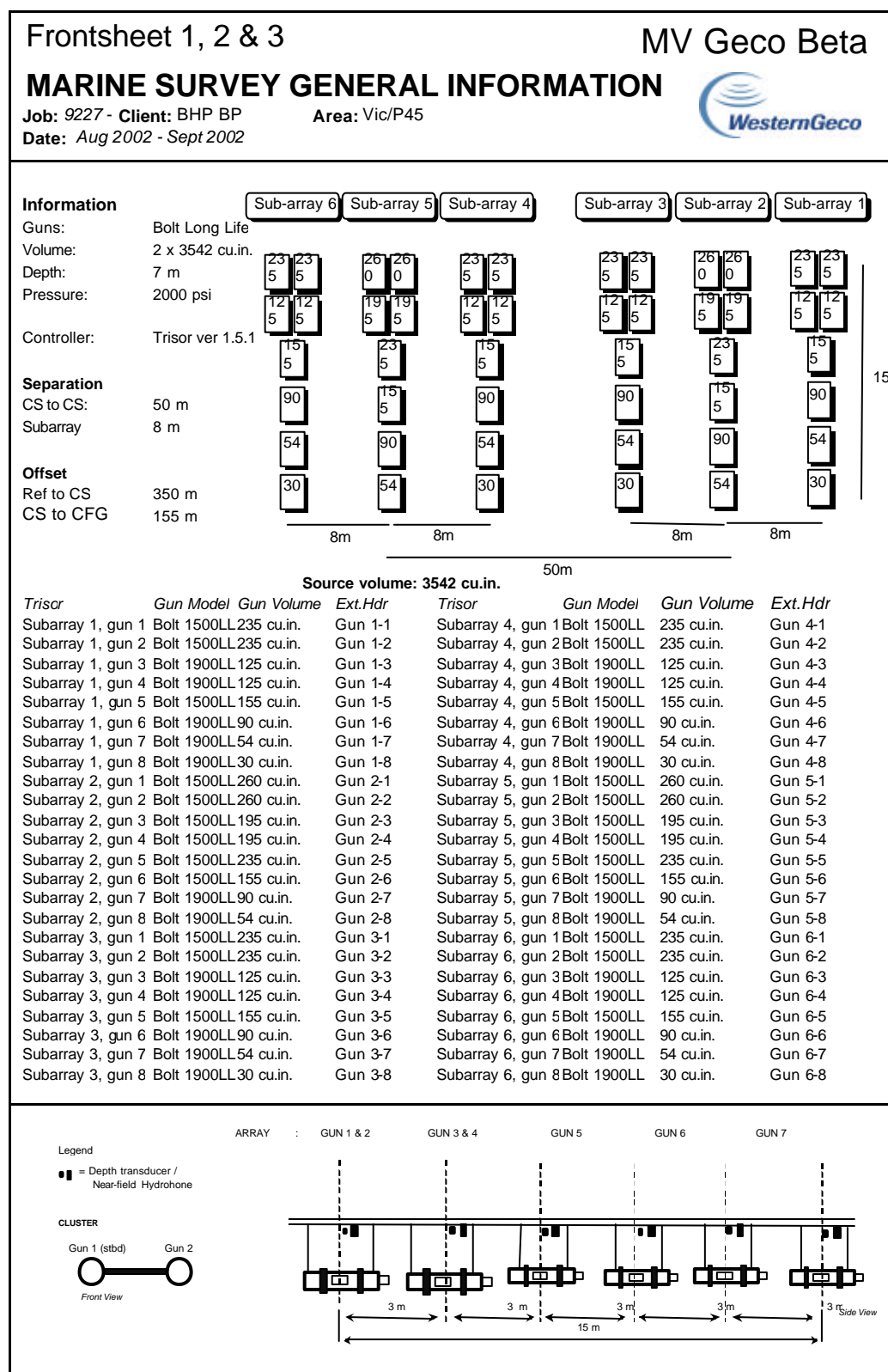
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13. Source Configuration

13.1. Source System Description

Source Parameters	
Number of source arrays	2
Array separation	50 m
Array length	15 m
Array width	16 m
Number of strings/array	3
Separation from centre track	25 m
Source volume	3542 cubic inches
Number of hydrophones per array	6
Number of depth transducers per array	6
Number of guns per array	24
Number of clusters per array	6
Airgun type	Bolt 1900 LL & 1500 LL
Operating pressure	2000 psi
Depth of guns	7 m
Peak to Peak amplitude	110.2 bar/m
Primary to Bubble ratio	24.2

13.2. Source Layout



13.3. Pulse Response

Frontsheet set 1, 2 & 3

MV Geco Beta

MARINE SURVEY GENERAL INFORMATION

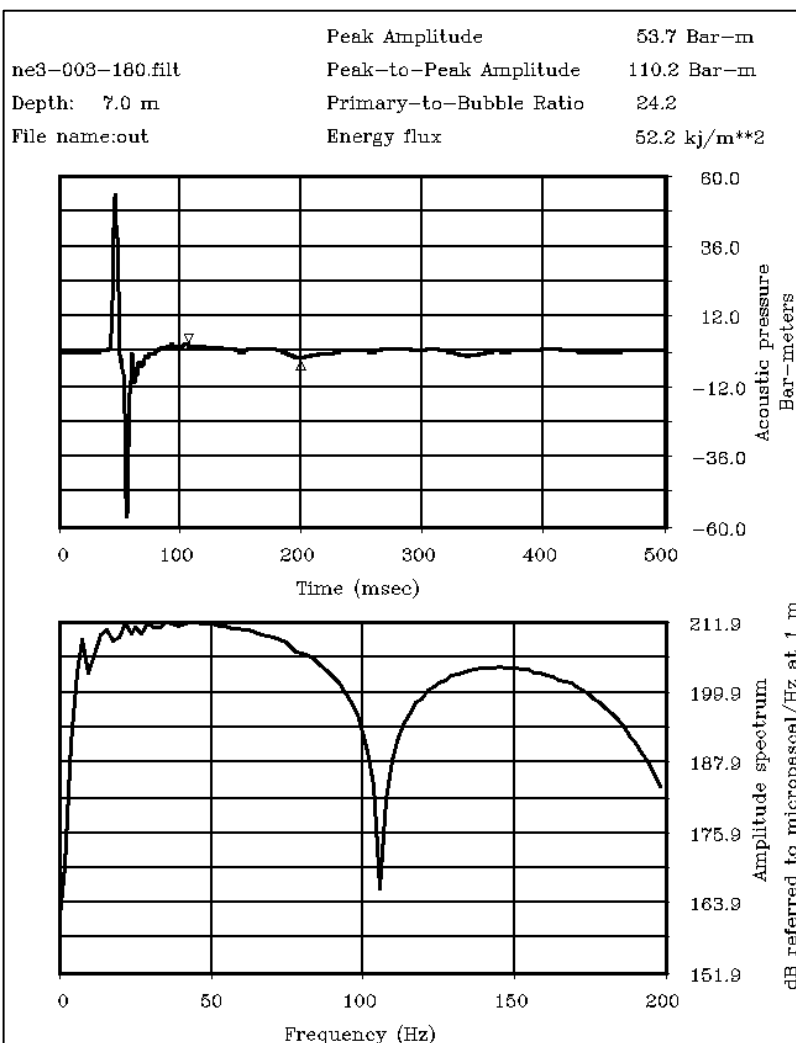
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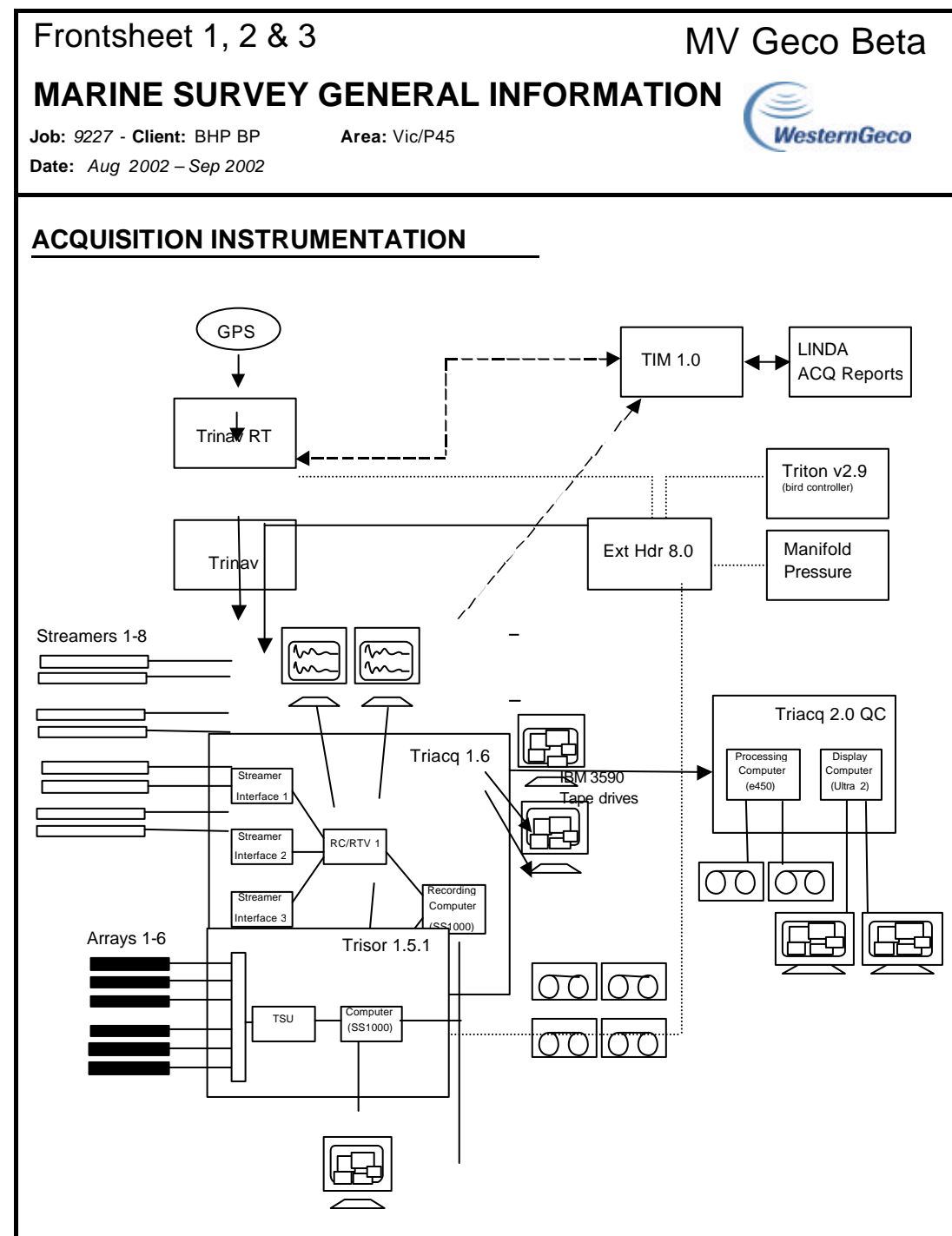
Area: Vic/P45, Gippsland Basin

Date: Aug 2002 - Sep 2002

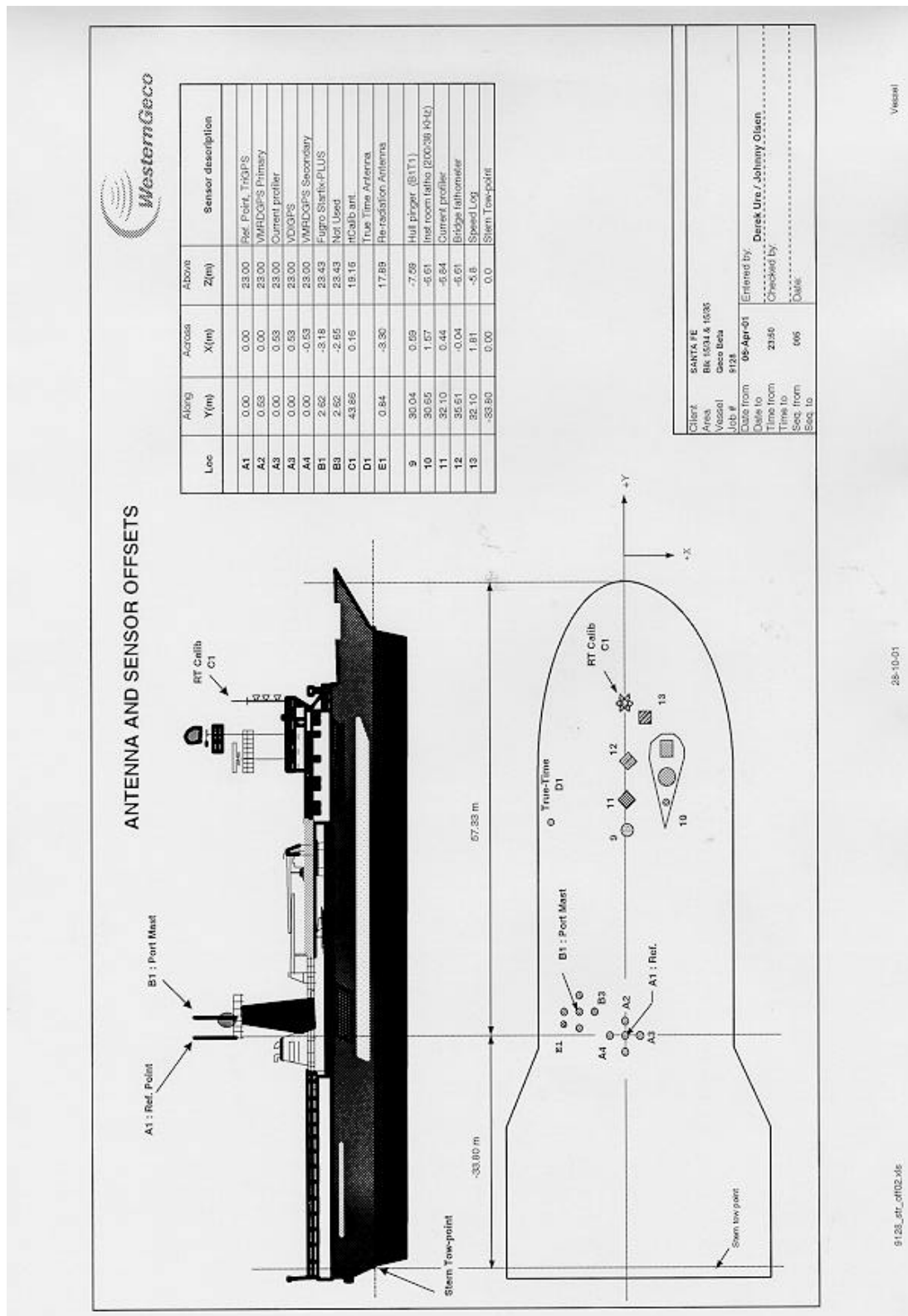


Modelled Gun signature of 3542 cu in





15. Equipment Offset Diagram



7. Navigation and Positioning System Description

7.1 System Configuration

16.1.1. Navigation Hardware and Software

System	Hardware (Type and Serial No.)	Software Version
TRINAV External Header Acoustic System TS-meter Echo Sounder Current Meter	TRINAV RT EXT HDR SIPS 1 Valeport TS Meter Series 600 MK II Probe S/N 5619 Simrad EA500 S/N 226 RDI Narrowband (300 KHz)	Version 2.6.0 Patch Level 19 Ver. 7.9 Version 7.00.7-T Ver 1.11

16.1.2. System Timing

TRINAV issued closures to the recording/source firing system 640 milliseconds before the predicted time of peak pressure. All TRINAV system positions are at the time of predicted peak pressure.

7.2 Survey Positioning Method Used

This 3D survey was carried out using WesternGeco's standard mode of operation for 8 streamers and dual source.

Positioning of the vessel was by differential GPS, utilizing TRINAV GPS, Thales MULTIFIX 3 and C&C Technology's' GNAV system using Wide area Correction Transform (WCT) correction service. Delivery of differential correction data to TRINAV GPS and MULTIFIX 3 in RTCM SC104 format was by Thales SKYFIX.

The center near group of each streamer and the sources were positioned relative to the vessel using a network consisting of 6 rGPS system units mounted on each source (8 units total), 132 SIPS 1 acoustic ranges and 8 compass azimuths.

The center last group of each streamer was positioned using a network consisting of 8 TRINAV GPS tailbuoy mounted rGPS system units, streamer mounted compass heading units and SIPS 1 acoustics.

The mid streamer network consisted of 104 ranges between 8 acoustic transceivers mounted 2162.82 and 2262.01 meters from the center first group of each streamer.

The streamer shape was modelled by 144 Digicourse/Syntron series 5000 combined streamer depth control and magnetic compass units.

Least squares condition equations for each streamer assuming circular arcs between compasses and relating the tracking nodes, compasses, tension corrected distances between compasses, rotation bias and scale were used to compute scale, rotation and individual compass corrections. The streamer shape was then computed by the circular arc method.

Sequence 114 to sequence 133 were acquired using WesternGeco's standard mode of operation for 6 streamers and dual source.

The 2D tie-line which runs over well heads Melville-1 and Archer-1 was acquired using 6 streamer configuration. The line was acquired using streamer#4 and the Port source. The vessel was steered at DC=+37.5 to attain a theoretical Mid-Point along the pre-plotted 2D tie-line.

7.3 Surface Positioning

16.3.1.Vessel Navigation

- System 1:** TRINAV GPS
RTCM Delivery Systems
Thales Skyfix SF via Inmarsat-B (POR)
DGPS Stations: Adelaide (205), Sydney (206), Melbourne (208)
- System 2:** Thales Multifix 3 (VMFIX3A)
RTCM Delivery Systems
Thales Skyfix SF via Inmarsat-B (POR)
DGPS Stations: Adelaide (205), Sydney (206), Melbourne (208)
- System 3:** C&C Technology C-NAV dual frequency system using Wide area Correction Transform (WCT) Australia correction service.
- System 4:** C&C Technology C-NAV dual frequency system using Real Time Gypsy (RTG) Global correction service.
- System 5:** Trimble 4000DS receiver with Direct Injection of RTCM
Thales Skyfix (SF) corrections from Melbourne (208)

Primary vessel positioning was provided by TRINAV GPS.

TRINAV GPS is a multiple reference station DGPS system with the capability to be used in dual frequency mode when required, and tailored for the specific needs of seismic surveying. State-of-the-art algorithms combine reference station data and pseudo range measurements into the best position estimates.

By employing an exclusive correlation model for weighting the multiple range corrections in a least squares estimation process, the optimum pseudo-range corrections are obtained. W-testing and F-testing techniques detect and reject correction outliers.

Pseudo-range observations undergo comprehensive checks of validity and consistency before they are used in the fix algorithm. Carrier smoothing reduces the random noise effects on the pseudo ranges, and aids in multi-path detection.

Integrity checking is a fundamental part of the processing philosophy: a Fault Detection, Isolation and Correction (FDIC) algorithm checks the consistency of the fix, detects and rejects any outliers, and re-computes the solution. Wtesting and F-testing are used to give the best protection against erroneous observations.

Quality control is based upon UKOOA's recommended DGPS quality indicators - the precision and reliability of the fix are displayed as an Error Ellipse and Marginally Detectable Errors (MDE).

Secondary vessel positioning was provided by the third party multi-reference positioning product, Thales Multifix 3.

The independent sources of corrections were transmitted to and received onboard the vessel by independent means thereby providing a high degree of redundancy to ensure continuous vessel positioning.

- **Further information about these systems is given in Navigation Exhibit 1.**

Although Selective Availability was turned off in May 2000 differential corrections are still required to provide a continuous high quality vessel position. Less frequent updates are required however.

16.3.2.Float Navigation

Float (both tailbuoy and source) surface navigation was provided by TRINAV GPS. The in-sea units incorporated a GPS receiver and interfacing for direct data transmission of the raw satellite pseudo-range data through the seismic streamer, the source cabling or by conventional UHF telemetry radio.

On board the vessel, the raw pseudo-range data from the float unit was matched with simultaneously received data at the vessel's GPS receiver to compute a vector describing the location of the float unit relative to the vessel from which the float position was derived. Relative positioning was better than 2m.

7.4 Streamer and Source Positioning

16.4.1.Acoustics-

Acoustic data in the front, mid and tail networks was provided by Sonardyne's **Seismic Integrated Positioning System (SIPS 1)**. This system comprises a rack mounted Controller, Processor and Graphical Display Unit which are located in the instrument room. HGPS (Hull and Gun Positioning System) transceivers mounted on the hull and on each source provide vessel relative source positioning. XSRS (Cross Streamer Ranging System) transceivers mounted on the streamer and tailbuoys provide vessel and tailbuoy relative streamer positioning.

16.4.2.Streamer Compasses

18 series 5000 Digibird combined magnetic compass and streamer depth controllers were attached to each streamer.

Compass Sampling Rate	=	1 second
Averaging constant	=	7 seconds

Compass performance was monitored on a line to line basis throughout the acquisition phase of the survey.

16.4.3.Gyro Compass

The gyrocompasses used during the survey were:

Instrument Room Gyro	- Gyro 1: Arma Brown MK10, S/N 3890
Ships Gyro	- Gyro 2: SG Brown, S/N 1029

The gyro correction values as computed by RTCalib from previous surveys were as follows:

Instrument Room Gyro	- Plus 0.42 degrees
Ships Gyro	- minus 0.50 degrees

16.4.4.Velocity of Sound in Water

The following type of TS-meter has been used to determine the speed of sound in water.

□ **Type: Valeport Series 600 MKII**

Valeport Series 600 MKII is a direct Reading Meter temperature / salinity probe which outputs measurements of depth/pressure, salinity/conductivity and temperature to a control display unit. Measurements are manually recorded when the probe is deployed at each depth. The user computes the speed of sound from the readings taken.

□ **Type: Mk12 Ocean Data Acquisition System (Sippican Probe).**

Mk12 Ocean Data Acquisition System (Sippican Probe) is disposable. The velocity is used for deep-water velocity profiles for depth reduction (2000m). The probe is a profiler allowed to free-fall and is not recovered; data is transmitted back via a thin copper wire and an interface card fitted to a PC. The PC computes speed of sound.

16.4.5.Echo Sounder

The echo sounder speed of sound was set to 1500 m/s. A draught correction of zero was entered in the echo sounder. The speed of sound for the total water column was derived on the prospect area using the temperature salinity device. The computed speed of sound, draught value, draught measurements taken during the survey and tide corrections were used to produce water depth corrected P190s.

7.5 Auxiliary Navigation Sensors

16.5.1.Current Meter

Data from an Acoustic Doppler Current Profiler, or Current Meter, was acquired throughout the survey. This data was used to assist the survey planning throughout the operation and so reduce the infill. The sensor used was a RDI Narrow Band Acoustic Doppler Current Profiler operating at 300 Hz.

16.5.2.Gravity

Gravity acquisition was not a requirement for this survey.

8. Navigation Systems Verification and Monitoring

8.1 Echo Sounder Verification

The pre-survey calibration was carried out to determine the draught of the transducer in use and to compute a correction for the scale error. This verification was undertaken at Wharf 24, Victoria Docks, Melbourne on the 22nd of July 2002. A post-survey verification was undertaken in the same location on the 28th of September 2002.

- **The calibration results are in Navigation Exhibit 2**

8.2 Gyro Monitoring

Continuous monitoring of the vessel gyros was performed using TRINAV's rtCalib utility program and a GPS baseline.

The gyro correction estimates provided by this program have been monitored and compared with previous dockside verification values and previous surveys.

Pre-survey dockside verification was performed in one direction only at Wharf 24, Victoria Docks, Melbourne on the 22nd of July 2002.

Post-survey dockside verification was performed in one direction only in the same location on the 28th of September 2002.

- **The gyro verification results are in Navigation Exhibit 3**

8.3 GPS Monitoring

Health checks onshore were carried out to verify that the installation was satisfactorily operational (data reception, transmission, processing and logging were verified) and that operational settings were correct. Each system used, including duplicates, was verified.

DGPS Health check onshore using the Integrity Monitor was carried out.

DGPS Health Check using Shore Control was carried out to verify datum shift parameters and antenna offsets were correctly entered in TRINAV. Satisfactory performance of the hardware was also verified.

- **The onshore Health Check results are in Navigation Exhibit 3.**

8.4 Current Meter Monitoring

To confirm that the Acoustic Doppler Current Profiler ADCP is operating correctly, with optimum configuration and, in so doing, providing a high quality data set for real-time and post-survey use, a test data set was sent every second week to an external contractor, Fugro GEOS. This process provided the onboard operation with a high level of confidence in the validity of the data being gathered, thereby increasing its value for survey planning.

In addition a comparison between predicted currents and actual currents measured were done by a spreadsheet onboard.

18. Navigation Processing

18.1. The TRINAV System

TRINAV consists of a network of SUN SPARC workstations, external mass-data storage and hard-copy facilities running WesternGeco proprietary software on the UNIX operating system. Positioning sensors are interfaced to TRINAV through two VME sub systems.

The positions for each vessel/float are passed through a Kalman filter, where they may be integrated with speed and heading inputs. The output of the primary vessel Kalman filter is used for predicting the time when the first CMP position will be at the required distance along the preplot line. Relays are closed a fixed time prior to the estimated time of peak pressure. The raw, decoded data strings, and computed positions are stored to disk/tape.

The raw sensor data and Kalman filtered surface positions are passed from the Real Time acquisition system (TRINAV RT) to a near real time source and receiver positioning system (TRINAV QCPR). TRINAV QCPR computes positions online and provides facilities for any post processing required.

The data received by QCPR is immediately stored in a Techra relational database with directories for raw, filtered and processed data. Front, middle and tail networks are solved by least square adjustment at every shot-point. In-sea measurements are 'clipped' to remove large spikes. Statistical models are used to test the results of the adjustment, by detection of outliers. If the first iteration fails then the adjustment is repeated after the largest outlier has been removed. This routine is repeated until a satisfactory adjustment is achieved.

The quality of the data is then evaluated with the TRINAV application Diagnostics, against a set of standard criteria. WesternGeco's PAC, or **P**osition **A**cceptance **C**riteria, comprises a set of tolerances on specified statistics, which allow this objective assessment of the positioning quality to be made.

The resulting node positions are then smoothed using Kalman filters. From the source node, the center of source position is computed. The streamer cable shapes are computed from filtered compass data in order to establish positions for all the receiver groups. Wherever possible, the results of the real-time source and receiver positioning were used to make the final positioning data set. When the results from the online solution exceed the PAC additional processing was carried out on the 'off-line' system.

Final and raw navigation data in UKOOA standard formats was generated directly from the database on the off-line system. Available media are 3480 cartridges, 3590 cartridges and 8mm Exabyte cartridges.

The technique for these is described in **WesternGeco's Navigation systems – a Technical Introduction**, which is available upon demand.

18.1.1. Shot Editor

The Shot Editor was available for use on all lines as follows:

- Editing of non-production shot-points at the start and end of each line.
- Interpolation of missing shot-points.

18.1.2. Gun Editor

The Gun Editor was available for use on all lines as follows:

- The Gun Editor was used on shot-points interpolated by the Shot Editor to generate the missing gun mask. The gun mask is normally relayed to TRINAV via the External Header.
- The Gun Editor was used to change the status of the sources to non-firing for any NTBP sections of the lines.

18.1.3. Recompute

The vessel system position was computed and the positions saved at one second intervals to disk/tape by TRINAV RT. The positions of all objects at the predicted time of peak pressure were passed to TRINAV QCPR and stored in the database online.

Diagnostics was used on each line to decide if the real time Kalman filtered positions were acceptable. If the positions were not acceptable, the Recompute program was used to select different positions for each object or to merge different DGPS systems for parts of the line.

If new positions were selected in the Recompute these were Kalman filtered in the Smoother program using a forward backward Kalman filter.

The following plots were available for examination and comparison of the positioning systems:

- User selected track plot display of color-coded positions.
- Inline and Crossline time series shot to shot plots for selected positions.
- Inline and Crossline time series difference plot between selected positions and a reference position.
- Time series plots giving stochastic analysis of position quality for selected positions.

18.1.4. Smoother

The Smoother program is used for smoothing of surface positions offline and for smoothing of tracking nodes both online and offline.

When QCPR is acquiring data online the tracking node positions are smoothed using a forward Kalman filter. If the tracking node positions exceeded the PAC tolerances, they were re-smoothed offline using a Forward-Backward Kalman Filter. If new positions were selected in the Recompute program these were smoothed and time adjusted to shot time using the Kalman Forward-Backward filter.

□ Kalman filter

This filter assumes that between any two shot points there will be zero average acceleration but some oscillation (noise) around the average.

□ Forward-Backward (FB) Kalman Filter

All smoothing in post processing was performed using a Forward-Backward Kalman filter. This is essentially the weighted average of the raw data and two individual Kalman filters running in opposite directions through the data set.

This filter has the same acceleration parameters as the online Kalman filter but has separate rejection window parameters (for X and Y) thus enabling the user to model the expected motions independently. The FB Kalman filter for surface positions works in the area relative co-ordinate frame, while the FB Kalman and Kalman filters applied to the tracking nodes work in a vessel relative coordinate frame.

The quality of the smoothing was checked using the following difference plots:

- Difference between smoothed and un-smoothed data was checked to see the effect of the filter settings applied.
- Velocity cross-line and in-line plots indicate the amount of noise in the smoothed position.
- Variance Factor plot indicates the fit between the predicted and raw positions.

18.1.5.Filtering

□ Compass Processing

The compasses were filtered online using two successive Kalman filters to avoid introducing any lag in the data. The difference between the predicted compass reading and the actual compass reading is tested at each shot. If the residual exceeds twice the standard deviation for two successive shots the online compass filtering was flagged as requiring post processing. If the online compass filtering failed, the data was analysed by viewing time-series plots of raw and filtered data. Filter parameters were chosen to remove spikes and noise from the compasses. In the first instance the Kalman filter parameters were tuned to match the specific data set. If this did not achieve the desired result the following filters were used: -

For front compasses a median filter or a combination of median and mean filters.

Mid streamer and tail filters normally required a longer median depending on noise and movement.

Thirty additional shots are included at the start and ten at the end of the line to ensure that the compass filters were stable for the first and last chargeable shot points.

□ Gyro Filtering

No gyro filtering was carried out.

□ Acoustic Filtering

The acoustic networks were designed with maximum redundancy to ensure that positioning specifications could be maintained in case of range dropouts due to mechanical or electrical failure, noise or interference. All acoustic data was investigated using time-series plots.

The survey program is designed to identify by means of statistical testing where spikes and reflected ranges are corrupting the data as long as there is sufficient redundancy. On occasions it was necessary to apply clipping filters to remove large spikes, which tended to degrade the solution of the tracking nodes.

18.1.6.Reprocessing

The source and receiver position computation is divided into a number of discrete steps. These steps are executed automatically online. If post processing is required the operator is able to change parameters and examine the output between steps.

The processes are:

- Least Squares solution of front and tail networks.
- Kalman/Kalman FB smoothing of front and tail network tracking nodes
- Computation of the streamer shape: receiver group lengths and sensor offsets are modified using a streamer tension model. Least squares condition equations are then used to compute corrections to the receiver group intervals and compasses in order to best fit the front and tail tracking nodes. The amount of stretch/compression permissible is user specified. The computation of positions and estimation of variances of the mid streamer network nodes is included in this process.
 - Least squares solution of the mid streamer network
 - Smoothing of the mid streamer tracking nodes

- Step (3) is repeated using the front, middle and tail tracking nodes.

The least squares solutions include statistical testing and automatic rejection of outliers on a shot by shot basis.

18.2. Quality Control

Navigation post-processing was carried out on-board through to UKOOA P1/90 and P2/94 tape production.

18.2.1. First Line Test Data

After the first line was shot and processed, a test line was sent electronically to an external contractor, ECL. The data sent comprised:

1. All offset diagrams (vessel, streamer, source and float)
2. Offset spreadsheets
3. Velocity Profile Spreadsheet,
4. 100 shot points of P1 and P2 data
 - ASCII file of Diagnostics for this line
5. ASCII file of LAF for this line
6. ASCII files of Surface and Insea Survey Definitions
7. Tide correction data
8. Job Book (as supplied from the supporting office)
9. Minutes from Start-up meeting (if relevant)
10. PFM Magnetic Variation Spreadsheet

A thorough QC of this test line was undertaken. The following checks were carried out:

- Strict compliance with published UKOOA P1 and P2 header and data format and generation of Format Check Reports.
- Graphical display of source and receiver towing geometry and comparison with WesternGeco office and vessel generated diagrams/documentation.
- Full vessel Configuration Report, as defined in the P2 header.
- Check P2 header defined Tow Points, Geodetic Parameters, etc. against WesternGeco Job Book and/or published values.
- List P2 header differences from a prior line sequence (if required).
- Raw data display and analysis
- Automated and manual (if required) data conditioning.
- Data processing to independently resolve vessel, source and receiver co-ordinates.
- Full position comparison report with WesternGeco P1/90 co-ordinates.
- Investigation of unacceptable position comparison results.
- Data Check and Statistics Report for compliance testing with survey contractual standards and specifications.
- Generation of statistics, error reports, test results, displays etc. as deemed necessary to highlight problem areas.
- Generation of QCPro P1/90 file, if desired.
- Check P2 file compliance with WesternGeco standard survey definition naming conventions.
- Check P1/90 and P2 file data compliance with WesternGeco standard numbering conventions.
- Comparison of vessel survey definitions with supplied offset spreadsheet and diagrams.
- Conduct Parameter Confirmation following the Parameter Confirmation Check Lists, MWWD/F012 and MWWD/F013.
- Other Survey Start-Up tests and checks as required and directed by WesternGeco.

When all the checks were performed a feedback report was published on ECL's secure

web site. Any corrections required were made by the vessel. The Supporting Office and ECL then received a confirmation from the vessel that all updates had been completed.

➤ **The FLQC results are in Navigation Exhibit 8.**

18.2.2.Initial QC

The post-processing procedures included the following checks:

- QC checks on all survey parameters.
- Generation of correct survey definitions.
- Completion of shot point edits.
- P2/94 production.
- Completion of gun edits.
- QC of system position and recomputed if required.
- Smoothing of the vessel and buoy positions if required.
- Selective check and filtering if required, of the observations including:
 - Acoustic ranges.
 - Compass bearings.
 - Gyro heading.
- Least squares adjustment of front and tail network if required.
- Smoothing of source/streamer tracking nodes if required.
- Cable shaping to determine final source/receiver positions if required.
- Final QC of all lines
- P1/90 production.

The following documentation was produced for onboard QC:

- Navigation reports detailing information about the survey parameters, calibrations and continuing daily logs.
- A series of statistics and plots from on-line data acquisition:
 - Navigation line logs detailing performance and parameters used for the surface positioning, acoustics and compasses for each line.
 - Seismic observer's logs detailing gun information.
 - Edits list from the seismic observers detailing gun information.

18.2.3.Final QC

The post network solution QC plots and statistical printouts detailed in the previous section were examined and compared to WesternGeco specifications. In addition, trend analysis plots were created and analysed every 20 lines to ensure consistency throughout the data set.

18.3. Water Depth Processing

Water depth processing was done on the raw water depth data onboard the vessel.

The water depth data was reduced to Mean Sea Level and then:

- corrected for draught
- filtered to de-spike and interpolate missing data
- corrected for tide
- corrected for measured sound velocity in water

The tidal predictions from BHP Bass Strait model were supplied by Client

➤ **The C-O values used are contained in the Job Book located in Section 1 of the Final Field Operations Report.**

The final data was dispatched on 3590 tape direct from the vessel.

19. Observations

19.1. Navigation Summary

All systems performed well, however during acquisition the below systems required further detail.

- Trip 1 – Crew 1** 09th August to 07th September. Sequence 001 to 085.
Acquired the eastern side of the prospect.
- Trip 2 – Crew 2** 07th September to 17th September. Sequence 086 to 113. Lines were acquired using 8 streamer configuration.
22nd September to 25th September. Sequence 114 to 133. Lines were acquired using 6 streamer configuration. Acquired more infill on the western side of the prospect.
24th September. Sequence 128 which is a 2D tie-line was acquired.

19.1.1. TRINAV RT/QCPR

Trip 1 – Crew 1

No problems were experienced for the duration of the trip.

Trip 2 – Crew 2

No problems were experienced for the duration of the trip.

19.1.2. TRINAV GPS (Primary)

Trip 1 – Crew 1

No problems were experienced for the duration of the trip

Trip 2 – Crew 2

No problems were experienced for the duration of the trip.

19.1.3. Thales MULTIFIX 3 (Secondary)

Trip 1 – Crew 1

No problems were experienced for the duration of the trip.

Trip 2 – Crew 2

No problems were experienced for the duration of the trip.

19.1.4. C&C Technology C-NAV (Tertiary)

Trip 1 – Crew 1

The WCT system input to the Primary Estimator performed without fault for the duration of the trip. The standby RTG system was not used in real time.

Trip 2 – Crew 2

No problems were experienced for the duration of the trip.

19.1.5. DIGPS (Tertiary)

Trip 1 – Crew 1

The direct injection system was interfaced using Thales SF station Melbourne (208). As the station was approximately 300 kilometres away, data was somewhat noisier but acceptable as only a single reference station. As an average the DIGPS position was within 2m of the other systems used.

Trip 2 – Crew 2

No problems were experienced for the duration of the trip.

19.1.6. TRINAV GPS Integrity Monitor**Trip 1 – Crew 1**

The Integrity Monitor station at SALE was operational for the duration of the trip. As IM data was not a contract obligation for this prospect, the station was only monitored during line changes in order to build a historical reference of performance.

Trip 2 – Crew 2

The Integrity Monitor station at SALE was operational for the duration of the trip. As IM data was not a contract obligation for this prospect, the station was only monitored during line changes in order to build a historical reference of performance.

19.1.7. rGPS (Tailbuoys and Source Mounted)**Trip 1 – Crew 1**

Tailbuoy 4 was out from the start of the survey, as current and time did not permit for repair before start of sequence 1. However, the 27th of August, after seq 053, the float was back in action.

Tailbuoy 8 became a bit intermittent after seq 65, but functioned reasonably well, and still added strength to the tail network.

No major problems seen with tailbuoy or source-mounted rGPS for the duration of the trip.

Trip 2 – Crew 2

Tailbuoy 7 was not operational from seq 086 to seq 113. Problem was attributed to a bad tailbuoy adapter. Rectifying the problem was not operationally viable due to deteriorating weather condition.

Tailbuoy 5 was not operational from seq 125 to seq 133.

19.1.8. Acoustics**Trip 1 – Crew 1**

No major problems were encountered with acoustics during the job. However, F7T1 became intermittent and after sequence 053 it died. This was most likely due to the transceiver slipping and not making contact with the coil.

Trip 2 – Crew 2

F6T1 tail acoustic unit on streamer 6 was not operational from seq 086 to seq 113. There were several attempts made to fix the problem. The problem was pin pointed to a bad tailbuoy adapter on streamer 6. Since this adapter is attached to the tailbuoy and in order to change it we need to swap this tailbuoy with a new tailbuoy rigged up onboard the vessel. This task was not carried out because it was not operationally viable due to deteriorating weather condition.

F5T1 was not operational on seq 094.

F1T1 was not operational from seq 115 to seq 125.

S5T5 was not operational from seq 114 (part) to seq 133.

19.1.9. Compasses**Trip 1 – Crew 1**

Several individual compasses were seen to be bad during online acquisition. These units were set passive and changed out for good units when logistically possible.

Trip 2 – Crew 2

Several compass changes took place during this period due to low batteries and bad depth controller.

A communication problem was experienced on bird S03C03 from seq 118 to seq128 and from seq 131 to seq 133.

An intermittent communications was seen on bird S03C10 from seq 118 to seq 128 and from seq 131 to seq 133.

Both problems were attributed to bad sections in the streamer caused by shark bites.

19.1.10.Gyro

Trip 1 – Crew 1

The gyros performed without incident throughout the survey. The Instrument room gyro was the only one used during the survey for computing antenna laybacks and the layback to the stern towpoint.

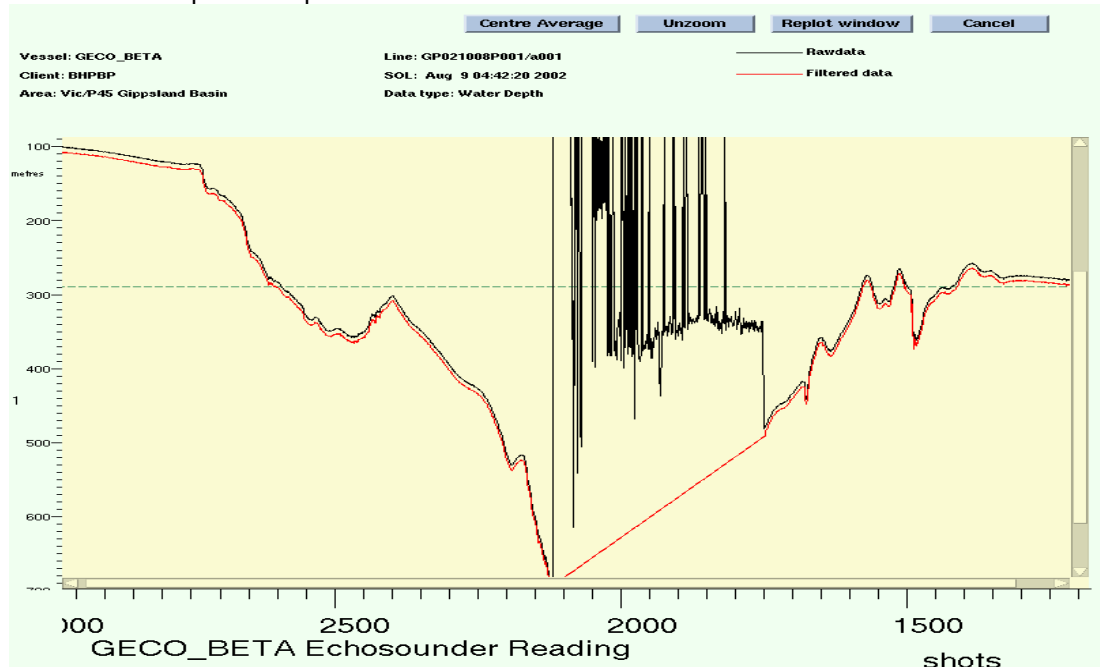
Trip 2 – Crew 2

The gyro performed well during this period.

19.1.11.Echo Sounder

Trip 1 – Crew 1

The average depth over the survey area varied from 65 to over 700m. There was a deep ravine in the far eastern part of the prospect, and the echosounder was not able to gather returns through this part. This affected the following sequences 001, 003, 005, and 007. The problem got less, as we were moving further to the west. An intouch was raised in addition to trying out the advices found from previous intouch cases. This did not improve the signal. See the graph of sequence 001 as an example of the problem.



Trip 2 – Crew 2

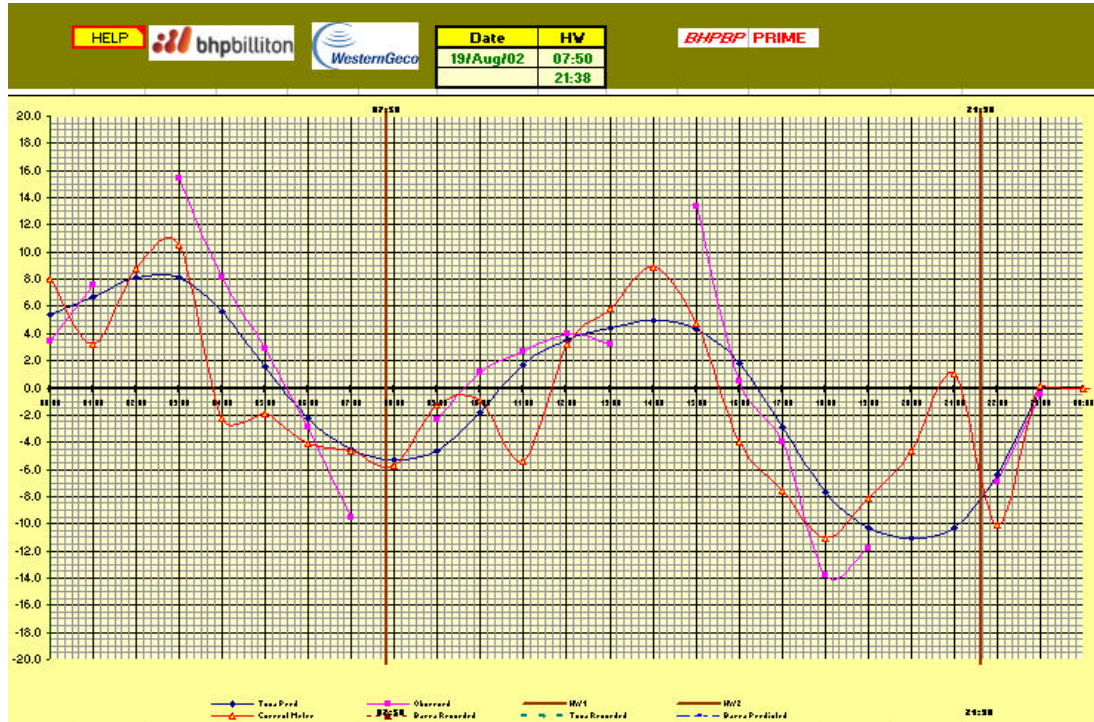
Minimal spikes on the Echosounder data were seen during marginal weather during this period.

19.1.12.Current Meter

Trip 1 – Crew 1

No data for independent checking was rendered during the trip, but observed current was seen to correlate quite closely with predicted tidal stream data. An onboard developed spreadsheet took the predicted currents onto a graph, where it was closely checked towards observed currents and feathering. **The spreadsheet containing this data is included in Navigation Exhibit 9.**

See typical example of one date below



For the center swaths of the prospect large variations were seen, and several times we experienced a 90 degree 1.5 knot current change within 10 minutes.

Trip 2 – Crew 2

Current data sources are the following:

- Kingfish Platform current predictions
- Tidal data
- Onboard current meter

Each day the supplied current prediction data was imported into an excel spreadsheet and plotted graphically. These plots were then used in line planning in order to achieve the best possible feather matching. Actual feather and currents observed during online acquisition were recorded and overlaid with the prediction data.

What was observed is that the observed current direction tends to follow the Kingfish platform predicted current data. But there is a big difference on the magnitude of the observed current compared to Kingfish platform predicted current data especially when there was disturbance on the weather.

Based on the observation the observed current correlate quite closely with the ADCP current meter data.

19.2. Processing and QC Summary

Trip 1 – Crew 1

An external QC was carried out by ECL Ltd as per WesternGeco procedures on sequence 001. No major problem was encountered during this QC of the data set.

Trip 2 – Crew 2

An external QC was carried out by ECL Ltd as per WesternGeco procedures on the first line acquired after crew change. No major non-conformances were found during the QC.

Another external QC was carried out by ECL Ltd as per WesternGeco procedures on the first line acquired after reconfiguring from 8 streamers to 6streamer job. No major non-conformances were found during the QC

19.3. Conclusions

The job went very well without any incidents.

The current meter again proved very valuable for determining shooting plans and warnings about rip currents.

In addition we were supplied with Bass Strait predicted currents from the client for the duration of the survey. Logged currents agreed closely to predicted, except when the weather deteriorated. The disturbance in the weather resulted in higher feather magnitudes but with almost the same direction compared to the predicted currents. For some of the infill runs the predictions saved quite a bit of time as we could go for them based on planning instead of waiting for the right currents.

Due to the job being shot at 18.75m shot interval acoustics at times were limited to every second shot. This was caused by following currents pushing the vessel speed above the time needed for acquisition of ranges every shot. However, the acoustic solution was solid even on these lines.

There were very few problems that were encountered with other shipping or fishing activities in the area. Fishing boats were handled effectively by bridge crew in cooperation with the chase boats during the entire survey, and very seldom represented a serious problem.

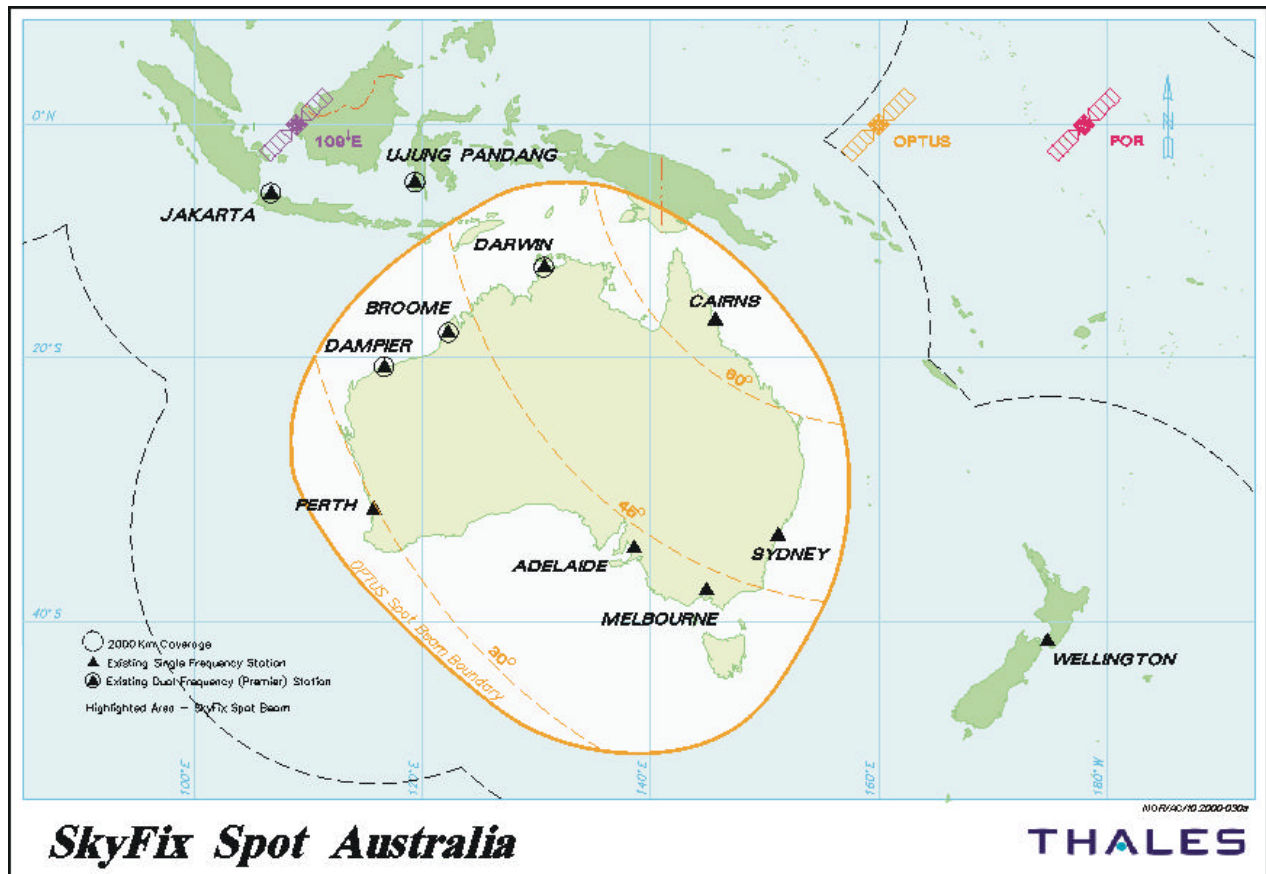
Marine animals, particularly whales, did present some problems near the end of the survey. Nevertheless, a soft start procedure was implemented to minimize the impact on the animals.

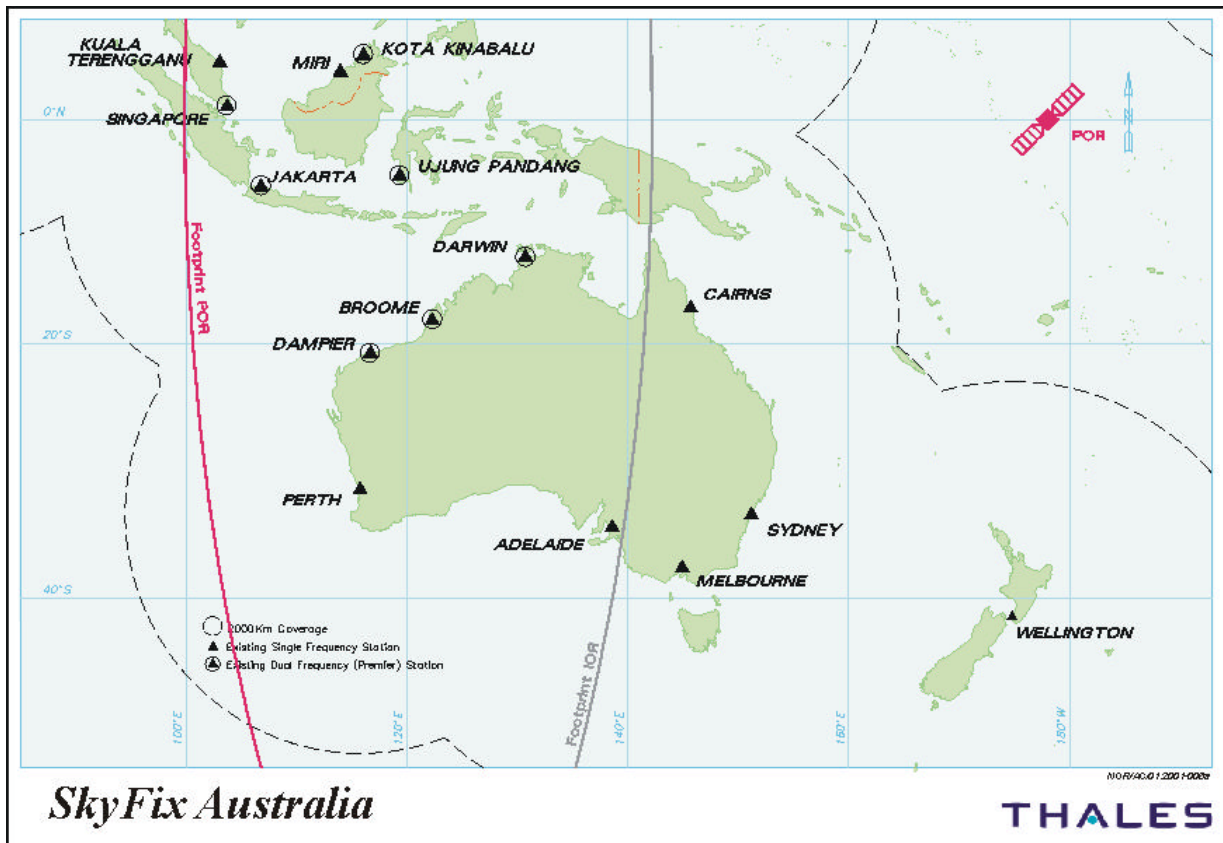
Shark bites on the streamers were experienced during the last phase of the survey.

20. Navigation Exhibits

Exhibit 1 : Navigation System

- DGPS Coverage Maps for RTCM Sources





□

□ **GPS System Installation Forms**

VESSEL: Geco Beta	SHEET: 1 OF 1
	DATE: 24 Jul 2002

GPS		VESSEL UNIT	SPARE UNIT	RTCA/IR UNIT
GPS receiver	type	Novatel Millenium	Novatel Millenium	Leica MX 9400
	serial no.	NGY00250012	NGY00250005	585
	no. channels	12	12	12
	software version	4.503	4.503	1.59A
	firmware version	N/A	N/A	N/A
GPS Antenna	type	Novatel GPS 600	Novatel GPS 600	Sensor Systems
	serial No.	TPM00250028	TPM00250026	
	Clear of obstructions Y/N	Yes	Not Mounted	Yes
	location/type of obstruction		N/A	
	Checked for potential multipath problems Y/N	Yes	N/A	Yes
Cables	max length recommended	100	N/A	
	actual length	90	N/A	
	type	Andrews Cable	N/A	RG-213
	line amps installed (type)	Yes	N/A	No
	splitters installed (type)	No	N/A	Yes
	joints checked	Yes	N/A	Yes
	Visual inspection of installation Y/N	Yes		Yes
TRINAV GPS Software version		Trinav 2.60 Patch 19		
Manuals onboard or access to WWW Y/N		Yes		

Radio Links – Satel				
Antennas have vertical separation	Y/N	Yes		
ODUs mounted securely	Y/N	Yes		
ODUs close to radio	Y/N	Yes < 2 metres		
Frequencies separated	Y/N	Yes		
Frequencies Used	Link 1	458.975 MHz		
	Link 2	458.775 MHz		
	Link 3	458.600 MHz		
	Link 4	N/A		

ReRadiation Antenna		
Split from vessel antenna	Y/N	No, Dual Frequency antennas are not compatible with other GPS equipment
Mounted to minimise multipath effects	Y/N	No, slight obstruction from Norsat Dome.
Voltage observed at reradiation antenna		5.5 volts

	Name (Print)	Signature
Installed by:	Joel Pederick	_____
Positioning Supervisor:	Tom Copeland	_____

VESSEL: BETA	SHEET: 1 OF 1
DGPS SYSTEM: C-NAV	
DATE: 20/07/02	

CHECK	ACTIVE UNIT	SPARE UNIT
GPS display unit type	C-NAV	C-NAV
serial no.	042202-02	042202-09
no. channels	10	10
software	V12	V12
firmware	V1.2	V1.2
GPS type Antenna/Receiver	C-NAV	C-NAV
serial no.	264050	264058
Cables max. recommended length	100 feet (without RS244)	100 feet (without RS422)
actual length	100 feet with RS 422	100 feet with RS422
type	8 core comms cable	8 core comms cable
line amps installed	Y	Y
Y/N		
joints checked	Y	Y
Y/N		
Satellite link Correct antenna splitter Y/N	Inmarsat used	N/a
demodulator serial	N/a	N/a
number		
demodulator frequency	N/a	N/a
demodulator expiry	N/a	N/a
date		
Radio link frequency	N/a	N/a
Raydome blind spots relative to ship's head	N/a	N/a
Contractor computer type	N/a	N/a
serial no.	N/a	N/a
program version	N/a	N/a
Virus Check Y/N	N/a	N/a
program version	N/a	N/a
result	N/a	N/a
Visual inspection installation Y/N	Y	Y
Units securely mounted Y/N	Y	Y
Power on check Y/N	Y	Y
Manuals onboard Y/N	Y	Y

DGPS software name, version	N/a	N/a												
Data output format to RT	NEMEA (WCT Corrns)	NEMA (RTG Corrns)												
Interfaced to RT	Y	Y												
Satellite selection mode	All in view	All in view												
Position calculation mode fixed/constrained	Auto	Auto												
Antenna height above MSL	23.0m	23.0m												
Geoid-spheroid separation	N/a	N/a												
Std dev of antenna height input	N/a	N/a												
PDOP limit	20	20												
Elevation mask	8 deg	8 deg												
SV Sync time	1 sec	1 sec												
Max age corrections	150 sec	150 sec												
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;"></td> <td style="width: 35%; text-align: center;">Name (Print)</td> <td style="width: 35%; text-align: center;">Signature</td> </tr> <tr> <td>Installed by:</td> <td>Stefan Simpson_____</td> <td>_____</td> </tr> <tr> <td>Company</td> <td>WG_____</td> <td>_____</td> </tr> <tr> <td>Positioning Supervisor:</td> <td>Tom Copeland_____</td> <td>_____</td> </tr> </table>				Name (Print)	Signature	Installed by:	Stefan Simpson_____	_____	Company	WG_____	_____	Positioning Supervisor:	Tom Copeland_____	_____
	Name (Print)	Signature												
Installed by:	Stefan Simpson_____	_____												
Company	WG_____	_____												
Positioning Supervisor:	Tom Copeland_____	_____												

❑ **TRINAV GPS Integrity Monitor Station Description**

GPS INTEGRITY MONITOR		
Country: Australia	Area/Region: South East Asia / ASA	Station name: SALE
Telephone connection: Not available		
SINET connection : Yes		
Co-ordinates:		
Ellipsoid:		WGS-84
Semi Major axis:		6378137.0 m
Inverse flattening:		1/298.257 223 563
Datum:		WGS-84
Latitude:		38° 06' 06.273" S
Longitude:		147° 05' 21.199" E
Ellipsoidal height:		21.44m
Description of station: The Station is located at the Schlumberger OFS Office at Raglan Street, Sale, Victoria AUSTRALIA		
Antenna: The antenna in use is a Model 502 L1/L2 GPS Dual Frequency Antenna from Novatel. The antenna is mounted on a pole giving a height above ground of approximately 10m.		
Receiver unit: The unit in use at the Integrity Monitor is a Novatel Power Pak II dual frequency receiver. Installation was on the 10 May 2002		
Observation and Processing method: The Antenna Position was Surveyed by Kluge Jackson consultants using standard survey methods. Height was derived through measurement in AHD (15.64m) and addition of AUSGEOID98 Model Geoidal Separation value (5.8m).		
Date of survey: 10th May 2002		
<i>Please contact Matthew Boyall for technical issues.</i>		

Exhibit 2 : Echo Sounder Calibration

Pre Survey Echosounder Check

Echo Sounder Check (In Port)



Vessel: M/V "Geco Beta"

Client: BHPBP

Job no. 9227

Location: Wharf 24, Victoria Quay, Melbourne

E/S type: Simrad EA500

Serial no: 145

Date : 22-07-02

Check started (GMT): 15:30

Check ended (GMT): 15:55

E/S draught: 6.61 m

Vertical offset keel to E/S: 0.00 m

Bridge E/S reading

Observed				
Draught (m)			Lead Line Depth (m)	
Bow	Mid-ships	Stern	Stbd (1)	Port (2)
5.20		7.30	12.05	12.10
Draught at E/S			LL Depth at E/S	
5.73			12.08	

Echo Sounder Readings	
Freq 1 (m)	Freq 2 (m)
38 MHz	200MHz
6.10	6.00
6.10	6.00
6.10	5.90
6.20	6.00
6.20	6.00
6.14	5.98
0.00	0.00
5.73	5.73
11.87	11.71

Average =
+ vertical offset keel to E/S transducer
+ draught (keel to sea surface)
Total water depth (m)

Observed - Echo Sounder = 0.20 m

Freq 1

Observed - Echo Sounder = 0.36 m

Freq 2

Sounder Settings Check:

RangeA

Absorption coefficient

Transmit power

Transducer Depth

Speed of sound

two way beam angle

Transducer gain

Sample distance

Factory Defaults (from manual)

xx.xx

10 dB

2000 U

0.00

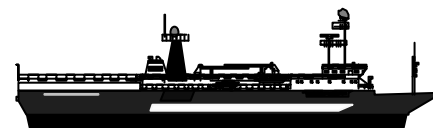
1500 m/s

-20.6 dB

26.5 dB

0.10m

Check

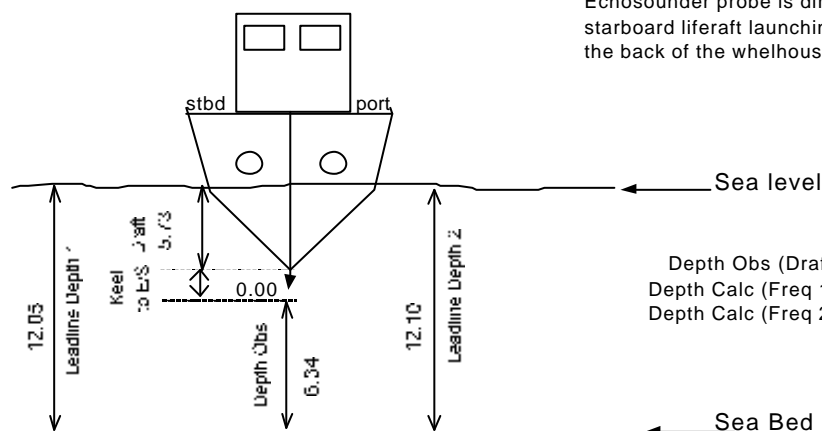


-33.80
Stern draft
Marks

30.65
E/S Probe

52.60
Fwd Draft
Marks

Offsets above are relative to VRP
Echosounder probe is directly below the
starboard liferaft launching davit - just behind
the back of the wheelhouse.



Depth Obs (Draft) = 6.34
Depth Calc (Freq 1) = 6.14
Depth Calc (Freq 2) = 5.98

Post Survey Echosounder Check

Echo Sounder Check (In Port)



Vessel: M/V "Geco Beta"

Client: bhpBP

Job no. 9227

Location: Wharf 24, Victoria Quay, Melbourne

E/S type: Simrad EA500

Serial no: 145

Date : 28-09-02

Check started (GMT): 16:45

Check ended (GMT): 17:00

E/S draught: 6.61 m

Vertical offset keel to E/S: 0.00 m

Bridge E/S reading xx.xx

Observed				
Draught (m)			Lead Line Depth (m)	
Bow	Mid-ships	Stern	Stbd (1)	Port (2)
3.80		7.90	10.76	11.70
Draught at E/S			4.84	11.23

Echo Sounder Readings	
Freq 1 (m)	Freq 2 (m)
38 MHz	200MHz
6.60	6.40
6.60	6.40
6.60	6.40
6.60	6.60
Average =	6.60
+ vertical offset keel to E/S transducer	0.00
+ draught (keel to sea surface)	4.84
Total water depth (m)	11.44
	11.29

Observed - Echo Sounder = -0.21 m Freq 1

Observed - Echo Sounder = -0.06 m Freq 2

Sounder Settings Check:

RangeA

Absorption coefficient

Transmit power

Transducer Depth

Speed of sound

two way beam angle

Transducer gain

Sample distance

Factory Defaults (from manual)

xx.xx

10 dB

2000 U

0.00

1500 m/s

-20.6 dB

26.5 dB

0.10m

Check ☐

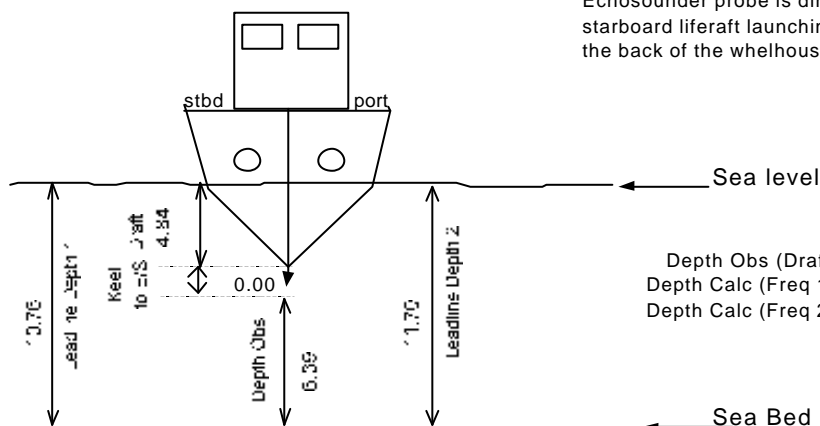


-33.80
Stern draft
Marks

30.65
E/S Probe

52.60
Fwd Draft
Marks

Offsets above are relative to VRP
Echosounder probe is directly below the
starboard liferaft launching davit - just behind
the back of the wheelhouse.



Depth Obs (Draft) = 6.39
Depth Calc (Freq 1) = 6.60
Depth Calc (Freq 2) = 6.45

Exhibit 3 : GPS and Gyro Calibration

□ Offshore Calibration Report

OFFSHORE CALIBRATION REPORT

Table of Contents

I.	Introduction and Abstract of Results
II.	Differential GPS Verification
III.	RGPS Verification
IV.	Gyro Calibration
V.	Conclusions and Comments on Data Quality
VI.	Secondary and Tertiary GPS System Differences to TRINAV GPS
VII.	Line by Line Results from RT Calib for Gyros and Integrity Monitor

I. Introduction and Abstract of Results

During the seismic survey undertaken by M/V Geco Beta for BHPBP from 09th August 2002 to 28th September 2002 on the Vic/P45, Gippsland Basin, Australia prospect (WesternGeco job number 9227), the DGPS, rGPS and Gyro positioning systems were monitored continuously throughout acquisition. This allowed C-O values to be computed, monitored and modified, if necessary, whilst offshore. These offshore calibration techniques have been developed by WesternGeco – the principal components comprise:

- The Integrity Monitor, one of several shore reference stations where a GPS receiver and data link are established at a known co-ordinated point allowing comparisons of the vessel GPS receiver performance against the reference receiver.
- The Re-radiation Kit, which enables rGPS systems to be fed the same GPS signal as the vessel receiver, thus allowing performance evaluation to be undertaken by means of a zero baseline test.
- The RT Calib system that uses the Primary vessel GPS together with a second GPS installation at a predetermined point on the vessel to determine a heading vector against which the vessels Gyros may be calibrated.

The technique for these is described in **WesternGeco's Navigation systems – a Technical Introduction**, which is available upon demand.

The report presents the observations and results from these offshore calibrations.

Abstract of Results

Value		C-O	SD
Gyro 1 (mean)		0.49	0.17
Gyro 2 (mean)		-0.42	0.17
TRIGPS vs. SYSTEM	Radial	0.50	0.28
MFIX3A vs SYSTEM	Radial	0.52	0.33
VCNAVWCT vs SYSTEM	Radial	0.76	0.34
VCNAVRTG vs SYSTEM	Radial	1.09	0.45

II. Differential GPS Verification

M/V Geco Beta utilised the following DGPS systems throughout the survey: a Novatel Millennium Dual Frequency GPS receiver providing raw pseudo range data to WesternGeco's TRINAV GPS 2.6 for Primary vessel positioning with Trinav GPS.
RTCM corrections delivered by Skyfix Inmarsat, and Skyfix Optus.

Secondary vessel positioning was provided by Thales Multifix with Skyfix corrections delivered via Inmarsat and Optus.

Third vessel positioning was provided by CNAV system with the CNAVWCT system

Tertiary vessel positioning was provided by CNAV system with CNAVRTG system.

Tertiary vessel positioning was provided by a Trimble 4000 DGPS with direct injection of Skyfix RTCM corrections delivered by Thales via Inmarsat. Melbourne was used for this

Data transfer between the vessel and the Integrity Monitor Receiver was achieved using the vessel's VSAT satellite data link.

Method used

Refer to **WesternGeco's Navigation systems – a Technical Introduction**, DGPS Calibrations Integrity Monitor section.

Results

Chapter VI contains a summary of the statistics taken from the diagnostics files and derived from the data logged by rtDisplay.

Chapter VII contains numerical data from rtcalib for the integrity monitor.

Figure 1 shows the average misclosure of the integrity monitor station in graphical form (separated into northing and easting misclosures) for all the sequences acquired. For ease of interpretation, separate displays are also included to allow any line heading dependency of the GPS positioning to be ascertained.

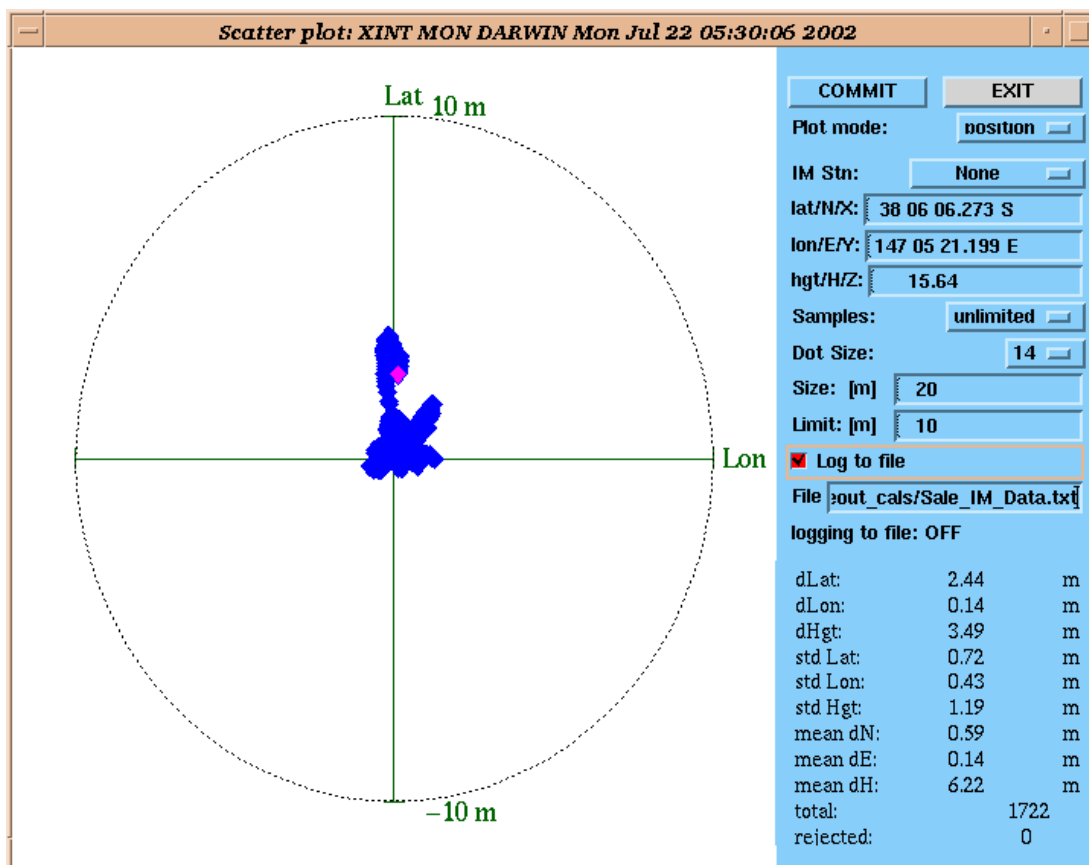


Figure 1: Integrity Monitor Plot Trends to demonstrate GPS quality during the calibrations. This plot is from the calibration done in Melbourne the 22nd of July. Due to hardcoded in Trinav it is referred to as Darwin, but is actually Sale.

III. rGPS Verification

M/V Geco Beta utilised WesternGeco's TRINAV GPS 2.6 rGPS system throughout this survey for Float and Source positioning. The GPS signal received by the main TRINAV GPS vessel receiver is split using a purpose designed GPS splitter from WR systems inc. It is then used by both the main vessel receiver and transferred to a re-radiating antenna on the back deck, allowing use of a near identical GPS signal by float and vessel receivers simultaneously.

Method used

Refer to **WesternGeco's Navigation systems – a Technical Introduction**, rGPS Calibrations section.

Results

The table below shows a summary of the statistics taken from plots within TRINAV GPS for all float units. This table contains collated data from the re-radiation tests done at the start and end of the survey.

9227 BHPBP - Pre/Post Survey rGPS Re-Rad Checks

RGPS Re-radiation Verification

System	Unit	Date	Obs	mean dN	mean dE	mean dH	StdN	StdE	StdH
Float	F002	24-Jul-02	6415	0.17	1.13	2.54	1.99	1.30	2.59
Float	F006	24-Jul-02	6501	0.24	0.80	4.81	1.28	1.12	2.28
Float	F001	24-Jul-02	104	0.20	-0.44	-0.44	0.59	1.01	1.48
Float	F002	24-Jul-02	204	0.81	0.10	-1.05	0.86	0.82	2.09
Float	F003	24-Jul-02	228	0.88	-0.34	-0.61	1.44	0.64	2.27
Float	F004	24-Jul-02	112	-0.41	-0.59	3.26	0.72	0.61	1.87
Float	F005	24-Jul-02	329	-0.29	0.26	-0.50	0.91	0.68	2.26
Float	F006	24-Jul-02	250	0.39	-0.73	5.50	1.35	0.64	1.60
Float	F007	24-Jul-02	201	0.55	0.19	-0.91	1.27	0.99	2.05
Float	F008	24-Jul-02	323	-0.35	0.17	-0.54	0.92	1.25	2.79
Gun1	SE_02	25-Jul-02	896	-0.33	1.08	-6.82	1.70	1.17	3.05
Gun2	SE_03	25-Jul-02	628	-1.27	1.07	-5.62	0.62	1.04	2.30
	SE_04	25-Jul-02	672	-0.13	0.16	-4.45	1.92	1.46	3.40
Gun3	SE_05	25-Jul-02	728	0.17	0.92	-3.12	1.40	1.28	3.06
	SE_06	25-Jul-02	685	-0.58	-0.69	-1.75	2.13	1.30	3.88
Gun4	SE_07								
	SE_08								
Gun5	SE_09								
	SE_10	25-Jul-02	628	0.85	0.13	-7.44	0.92	0.85	0.83
Gun6	SE_12								
Averages				0.06	0.20	-1.07	1.25	1.01	2.36

Table 1: rGPS verification test data from re-radiation tests

IV. Gyro Calibration

M/V Geco Beta is fitted with two gyrocompasses, a main survey gyro of type Arma Brown MK10 and a secondary gyro of type SG Brown for comparison and backup use. TRINAV GPS is used to determine the heading vector, for comparison with the Gyro headings. This utilises the standard vessel receiver as described above and a second receiver, of the Leica MX9400 type. The second receiver's antenna is mounted 43.86m ahead of the primary receiver's, with the minimum practicable difference in height. The positions of all antennas used in the Gyro calibration process

are determined during a high precision Offset Measurement Survey, performed by an independent contractor, whilst the Vessel is in dock or alongside.

Method used

Refer to **WesternGeco's Navigation systems – a Technical Introduction**, Gyro Calibrations section.

Results

Results from RT Calib are available in several formats, both graphical and tabular. Figure 2 shows the average C-O for each of the gyros in graphical form for all the sequences acquired. For ease of interpretation, separate displays are also included to allow any line heading dependency of the gyro performance to be ascertained. The earlier TRINAV GPS Integrity Monitor trend plot (Figure 1) is useful to confirm the GPS positioning when the gyro quality shows interesting trends.

Numerical results for RT Calib are shown in chapter VII.

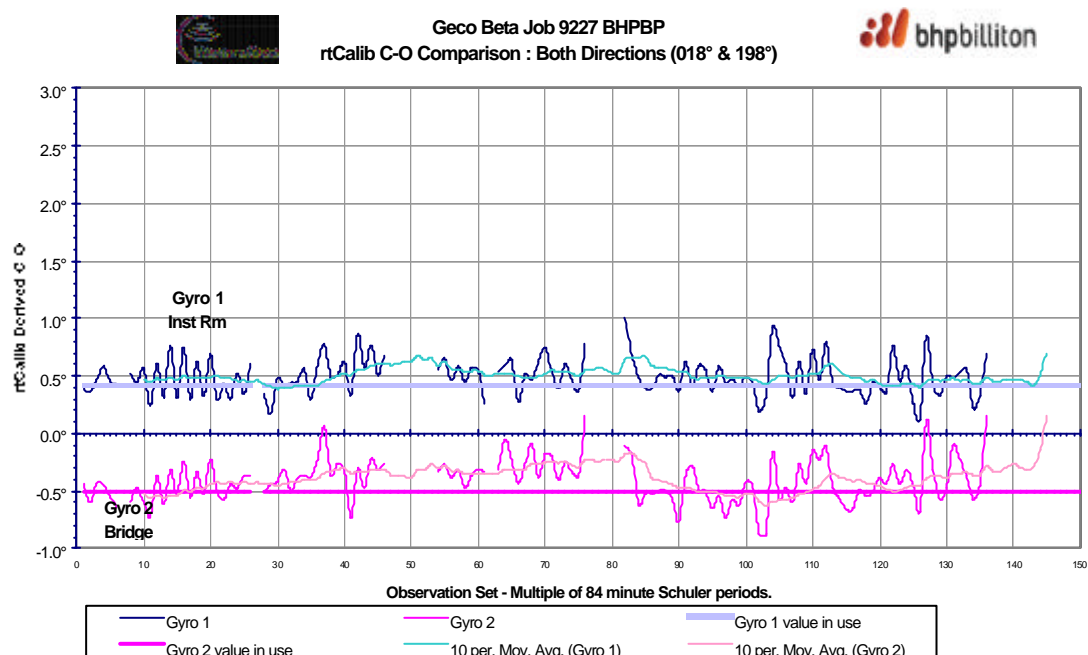


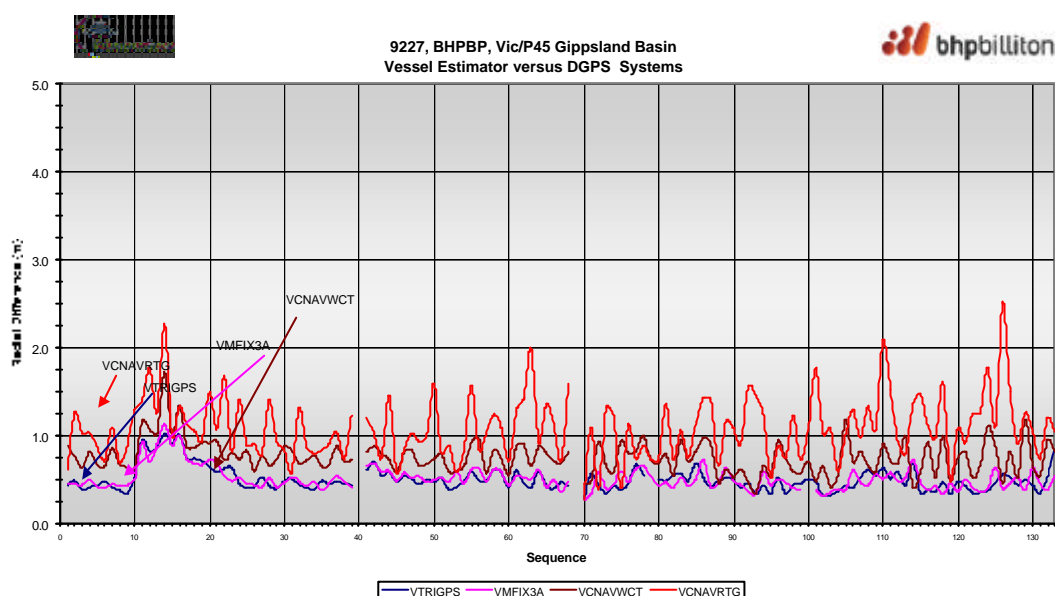
Figure 2: Gyro Calib Trends

V. Conclusions and Comments on Data Quality

All systems performed well throughout the survey. However, Gyro 2 calibration value was seen to be -0.5 . This was most likely due to power loss before the survey started and the repeater was not realigned. Gyro2 was never used during the survey, it is secondary and to be used for backup only. However, the calibration values for Gyro 2 were stable around -0.5 and could have been used if needed.

VI. Secondary & Tertiary DGPS System Differences to System

The following table contains a summary of the statistics taken from the diagnostics files and derived from the data logged by rtDisplay.



9227, BHPBP, Vic/P45 Gippsland Basin, Australia

Diff Vessel Positioni versus GPS - Radial Difference (m)						Diff Vessel Positioni versus GPS - Radial Difference (m)					
Line	Seq	Primary system VTRIGPS	Secondary system VMFIX3A	Tertiary system VCNAVWCT	Tertiary System VCNAVRTG	Line	Seq	Primary system VTRIGPS	Secondary system VMFIX3A	Tertiary system VCNAVWCT	Tertiary System VCNAVRTG
GP021008P001	001	0.44	0.45	0.89	0.61	GP021520K068	068	0.43	0.49	0.81	1.60
GP021216P002	002	0.49	0.45	0.77	1.26						
GP021024P003	003	0.38	0.44	0.63	1.03	GP021552A070	070	0.27	0.27	0.45	0.27
GP021232P004	004	0.42	0.50	0.82	1.03	GP021824A071	071	0.56	0.34	0.48	1.09
GP021040P005	005	0.43	0.42	0.67	0.87	GP021632P072	072	0.44	0.58	0.94	0.38
GP021248P006	006	0.48	0.41	0.65	0.72	GP021632J073	073	0.35	0.40	0.66	1.32
GP021056P007	007	0.41	0.45	0.86	1.10	GP021536J074	074	0.43	0.45	0.58	1.22
GP021264P008	008	0.38	0.43	0.68	0.70	GP021632A075	075	0.39	0.60	0.94	0.40
GP021072P009	009	0.35	0.44	0.64	0.89	GP021664J076	076	0.46	0.48	0.80	1.12
GP021280P010	010	0.53	0.51	0.63	1.29	GP021488K077	077	0.67	0.62	0.83	0.74
GP021088P011	011	0.95	0.93	1.17	1.40	GP021952P078	078	0.55	0.65	0.99	0.89
GP021296P012	012	0.83	0.70	1.07	1.76		079				
GP021104P013	013	0.87	0.90	1.02	1.26	GP022032P080	080	0.51	0.43	0.68	0.72

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VII. Line by Line Results from RT Calib for Gyros

Available Gyros: GY01 Surveydef Corr: 0.42 deg
GY02 Surveydef Corr: -0.50 deg

Gyro Calibration Results:

Geco Beta Job 9227 BHPBP rtCalib C-O Comparison : Both Directions (018° & 198°)

Line Name	Obs Set	Minutes Used	Start Hdg	End Hdg	Name	C-O [deg]	Std [deg]	No. samp.	Percent Rejected	Name	C-O [deg]	Std [deg]	No. samp.	Percent Rejected
GP021008P001	001	231	2	15	GY01	0.39	0.21	13666	4.0	GY02	-0.43	0.21	13666	4.4
GP021216P002	002	237	193	207	GY01	0.36	0.14	14015	4.7	GY02	-0.60	0.15	14015	5.0
GP021024P003	003	240	4	11	GY01	0.47	0.23	14223	5.8	GY02	-0.43	0.25	14223	4.7
GP021232P004	004	232	194	214	GY01	0.58	0.17	13754	6.3	GY02	-0.45	0.19	13754	5.3
GP021040P005	005	248	6	12	GY01	0.45	0.21	14705	9.1	GY02	-0.56	0.20	14705	8.1
GP021248P006	006	231	205	198	GY01	0.42	0.24	13703	5.9	GY02	-0.64	0.22	13703	8.1
	007													
GP021264P008	008	232	205	214	GY01	0.52	0.24	13739	4.6	GY02	-0.59	0.25	13739	4.4
GP021072P009	009	252	3	4	GY01	0.44	0.23	14884	5.4	GY02	-0.47	0.23	14874	4.6
GP021280P010	010	245	214	204	GY01	0.56	0.19	14485	5.6	GY02	-0.60	0.21	14485	5.7
GP021088P011	011	252	6	17	GY01	0.24	0.29	14439	5.0	GY02	-0.72	0.41	14437	5.3
GP021296P012	012	099	189	194	GY01	0.61	0.15	5896	4.3	GY02	-0.37	0.21	5896	4.4
GP021104P013	013	248	5	19	GY01	0.32	0.31	14528	4.4	GY02	-0.62	0.37	14528	5.1
GP021296A014	014	137	194	196	GY01	0.76	0.18	8137	4.9	GY02	-0.32	0.23	8137	5.1
GP021120P015	015	245	1	9	GY01	0.31	0.23	14505	5.0	GY02	-0.53	0.33	14515	5.4
GP021312P016	016	242	196	209	GY01	0.75	0.22	14401	4.5	GY02	-0.24	0.27	14401	4.9
GP021136P017	017	246	359	6	GY01	0.30	0.25	14556	4.4	GY02	-0.55	0.33	14554	4.9
GP021328P018	018	234	193	206	GY01	0.63	0.17	13830	2.9	GY02	-0.34	0.19	13830	3.6
GP021152P019	019	232	3	9	GY01	0.32	0.22	13760	4.5	GY02	-0.52	0.31	13760	4.9
GP021344P020	020	240	194	211	GY01	0.69	0.18	14219	4.3	GY02	-0.22	0.19	14219	4.6
GP021168P021	021	247	11	8	GY01	0.29	0.23	14650	4.0	GY02	-0.51	0.24	14652	5.0
GP021360P022	022	237	197	206	GY01	0.44	0.22	14082	3.2	GY02	-0.58	0.22	14082	4.0
GP021088A023	023	241	1	11	GY01	0.30	0.16	14147	4.0	GY02	-0.44	0.20	14179	4.9
GP021376P024	024	087	200	205	GY01	0.52	0.25	5140	1.9	GY02	-0.48	0.25	5140	2.3
GP021184P025	025	247	10	10	GY01	0.35	0.33	14622	6.4	GY02	-0.37	0.30	14628	6.3
GP021392P026	026	237	204	206	GY01	0.60	0.22	14055	6.1	GY02	-0.37	0.24	14056	5.3
	027													
GP021408P028	028	238	207	200	GY01	0.34	0.26	14101	3.3	GY02	-0.51	0.26	14101	2.7
GP021200J029	029	251	10	7	GY01	0.17	0.39	14863	5.2	GY02	-0.44	0.28	14863	5.9
GP021424P030	030	252	212	210	GY01	0.48	0.22	14918	3.8	GY02	-0.42	0.23	14918	3.7
GP021200K031	031	225	12	7	GY01	0.42	0.17	13357	4.3	GY02	-0.31	0.20	13357	4.9
GP021424J032	032	242	206	199	GY01	0.44	0.20	14387	6.1	GY02	-0.50	0.22	14387	4.9
GP021088J033	033	179	11	5	GY01	0.45	0.35	10644	0.2	GY02	-0.39	0.27	10644	2.0
GP021440P034	034	252	211	199	GY01	0.56	0.17	14911	4.6	GY02	-0.36	0.16	14911	4.0
GP021680P035	035	252	10	343	GY01	0.29	0.15	14934	4.3	GY02	-0.38	0.18	14919	5.3
GP021584P036	036	252	204	211	GY01	0.61	0.22	14916	4.5	GY02	-0.22	0.17	14916	3.7
GP021696P037	037	247	350	10	GY01	0.77	0.21	14622	4.7	GY02	0.06	0.26	14605	4.1
GP021600P038	038	215	201	210	GY01	0.49	0.16	12694	4.3	GY02	-0.36	0.23	12694	3.7
GP021664P039	039	252	357	15	GY01	0.51	0.24	14914	2.8	GY02	-0.26	0.28	14910	2.8
GP021456P040	040	094	211	207	GY01	0.62	0.23	5600	5.4	GY02	-0.32	0.29	5600	5.4
GP021808P041	041	252	11	26	GY01	0.33	0.23	14924	4.8	GY02	-0.73	0.27	14924	5.0
GP021456A042	042	252	192	204	GY01	0.87	0.31	14922	4.1	GY02	-0.31	0.24	14922	4.7
GP021792P043	043	252	27	14	GY01	0.57	0.23	14958	4.5	GY02	-0.47	0.25	14958	4.8
GP021616P044	044	252	205	177	GY01	0.77	0.32	14942	2.8	GY02	-0.22	0.25	14942	3.8
GP021776P045	045	174	5	6	GY01	0.51	0.16	10266	4.4	GY02	-0.32	0.20	10266	5.1
GP021568P046	046	252	200	193	GY01	0.68	0.19	14197	4.1	GY02	-0.26	0.22	14197	4.7
	047													
	048													
	049													

	050														
	051														
	052														
	053														
GP021744P054	054	252	10	18	GY01	0.56	0.25	14772	5.4	GY02	-0.33	0.27	14772	5.0	
GP021520P055	055	252	188	195	GY01	0.65	0.18	14952	4.0	GY02	-0.27	0.22	14952	4.7	
GP021760P056	056	252	11	25	GY01	0.46	0.27	14950	4.9	GY02	-0.38	0.25	14950	5.2	
GP021472P057	057	252	192	207	GY01	0.58	0.22	14912	4.6	GY02	-0.32	0.20	14913	4.7	
GP021824P058	058	252	29	24	GY01	0.45	0.18	14957	4.6	GY02	-0.47	0.23	14957	5.3	
GP021488P059	059	252	200	191	GY01	0.57	0.27	14930	3.4	GY02	-0.37	0.32	14930	4.6	
	060														
GP021520J061	061	252	211	182	GY01	0.55	0.24	14933	4.4	GY02	-0.31	0.26	14934	4.4	
GP021120A062	062	247	1	9	GY01	0.25	0.25	14636	2.8	GY02	-0.34	0.27	14628	3.5	
	063														
GP021488J064	064	252	210	198	GY01	0.54	0.24	14925	3.7	GY02	-0.32	0.26	14926	3.9	
	065														
GP021504P066	066	252	213	199	GY01	0.64	0.23	14422	5.1	GY02	-0.22	0.26	14422	4.9	
GP021760K067	067	218	11	13	GY01	0.27	0.22	12898	6.5	GY02	-0.43	0.20	12901	6.1	
GP021520K068	068	252	191	186	GY01	0.51	0.15	14933	4.7	GY02	-0.28	0.20	14933	4.0	
GP021648P069	069	252	358	23	GY01	0.47	0.38	14948	1.4	GY02	-0.09	0.33	14948	1.4	
	070														
	071														
GP021632P072	072	252	194	185	GY01	0.54	0.39	14957	2.8	GY02	-0.2	0.33	14957	3	
GP021632J073	073	252	21	13	GY01	0.39	0.33	8573	5.6	GY02	-0.4	0.33	8573	5.6	
GP021536J074	074	121	195	190	GY01	0.61	0.16	7178	4.1	GY02	-0.25	0.18	7178	4.9	
GP021680J076	076	152	312	261	GY01	0.37	0.28	9062	5.1	GY02	-0.37	0.28	9062	6.2	
	077														
	078														
	079														
	080														
	081														
	082														
GP022288P083	083	128	202	212	GY01	1	0.74	6077	4.3	GY02	-0.11	0.82	6165	4.7	
GP021936P084	084	148	0	9	GY01	0.68	0.46	8759	0.3	GY02	-0.2	0.44	8747	1.5	
GP022112P085	085	161	200	197	GY01	0.48	0.23	9507	4.8	GY02	-0.62	0.25	9507	4.3	
	086														
	087														
GP022224P088	088	159	217	202	GY01	0.51	0.23	9428	6	GY02	-0.5	0.24	9430	6.5	
GP021856P089	089	168	26	23	GY01	0.49	0.17	9960	4.1	GY02	-0.5	0.19	9961	4.6	
GP022240P090	090	84	204	206	GY01	0.5	0.18	4975	4.8	GY02	-0.57	0.18	4975	4.9	
GP022048P091	091	84	20	30	GY01	0.37	0.14	4989	4.4	GY02	-0.77	0.16	4990	4.9	
GP022304P092	092	110	192	201	GY01	0.62	0.2	6545	3.2	GY02	-0.36	0.15	6545	4.2	
GP021968P093	093	155	358	10	GY01	0.41	0.29	9182	4.4	GY02	-0.28	0.2	9195	4.6	
GP022160P094	094	84	199	189	GY01	0.59	0.12	4976	4.8	GY02	-0.49	0.11	4976	4.9	
GP021872P095	095	84	18	18	GY01	0.55	0.28	4977	3.1	GY02	-0.5	0.22	4977	4.2	
GP022256P096	096	84	201	196	GY01	0.37	0.17	4978	3.5	GY02	-0.65	0.13	4978	4	
GP022000P097	097	84	23	23	GY01	0.58	0.22	4970	6.5	GY02	-0.54	0.18	4971	5.5	
GP021872J098	098	20	30	30	GY01	0.44	0.21	953	8	GY02	-0.74	0.2	953	8.7	
GP022192P099	099	126	194	214	GY01	0.47	0.16	7462	5	GY02	-0.57	0.14	7462	4.6	
GP021920P100	100	84	10	22	GY01	0.41	0.15	4993	4.9	GY02	-0.63	0.2	4994	3.6	
GP022160J101	101	119	185	191	GY01	0.49	0.15	7019	5.7	GY02	-0.42	0.13	7019	4.2	
GP021968J102	102	168	13	9	GY01	0.44	0.18	9951	2.9	GY02	-0.44	0.17	9953	4.1	
GP022256J103	103	133	207	187	GY01	0.19	0.16	7876	4.5	GY02	-0.88	0.22	7876	4.2	
GP022000J104	104	107	23	20	GY01	0.31	0.23	6284	3.7	GY02	-0.88	0.16	6352	4.8	
GP022176P105	105	84	199	197	GY01	0.92	0.38	4964	1	GY02	-0.16	0.35	4964	1.4	
GP021888P106	106	84	27	27	GY01	0.76	0.29	4974	4.8	GY02	-0.57	0.25	4974	5.7	
GP022272P107	107	120	207	218	GY01	0.6	0.2	7094	5.2	GY02	-0.47	0.2	7094	5.3	
GP021904P108	108	149	6	12	GY01	0.31	0.2	7392	3.5	GY02	-0.6	0.25	7392	3.5	
GP022096P109	109	84	197	209	GY01	0.63	0.26	4962	2.5	GY02	-0.27	0.26	4963	4.3	
GP021984P110	110	84	3	4	GY01	0.35	0.23	4988	2.7	GY02	-0.43	0.2	4989	5.1	
GP022256K111	111	136	201	201	GY01	0.73	0.18	8040	4.3	GY02	-0.15	0.2	8040	4.7	
GP021904J112	112	168	15	3	GY01	0.46	0.2	9930	4.6	GY02	-0.23	0.24	9911	5.6	
GP022256L113	113	168	217	205	GY01	0.79	0.16	9960	5.4	GY02	-0.11	0.19	9960	5.2	
GP021568J114	114	84	206	201	GY01	0.38	0.19	4960	6.5	GY02	-0.49	0.2	4960	5.5	
GP021776K115	115	37	21	21	GY01	0.26	0.12	2182	6	GY02	-0.55	0.17	2182	6.3	
GP022320P116	116	84	197	176	GY01	0.44	0.16	4970	4.7	GY02	-0.5	0.13	4970	4.5	
GP021888J117	117	84	6	13	GY01	0.4	0.2	4967	3.6	GY02	-0.39	0.2	4967	5	
GP022160K118	118	84	199	198	GY01	0.36	0.11	4978	3.7	GY02	-0.44	0.13	4978	4.2	
GP022064P119	119	84	21	19	GY01	0.76	0.36	4989	1.6	GY02	-0.27	0.38	4989	2.7	
GP022320J120	120	84	204	202	GY01	0.46	0.18	4956	4.9	GY02	-0.44	0.16	4956	5.1	
GP022000K121	121	84	13	26	GY01	0.59	0.22	4970	4.6	GY02	-0.32	0.14	4970	5.2	
GP022080P122	122	84	185	194	GY01	0.28	0.2	4990	4.5	GY02	-0.44	0.2	4990	4.4	

C. Control Point for Tailbuoy Check

Datum: WGS84

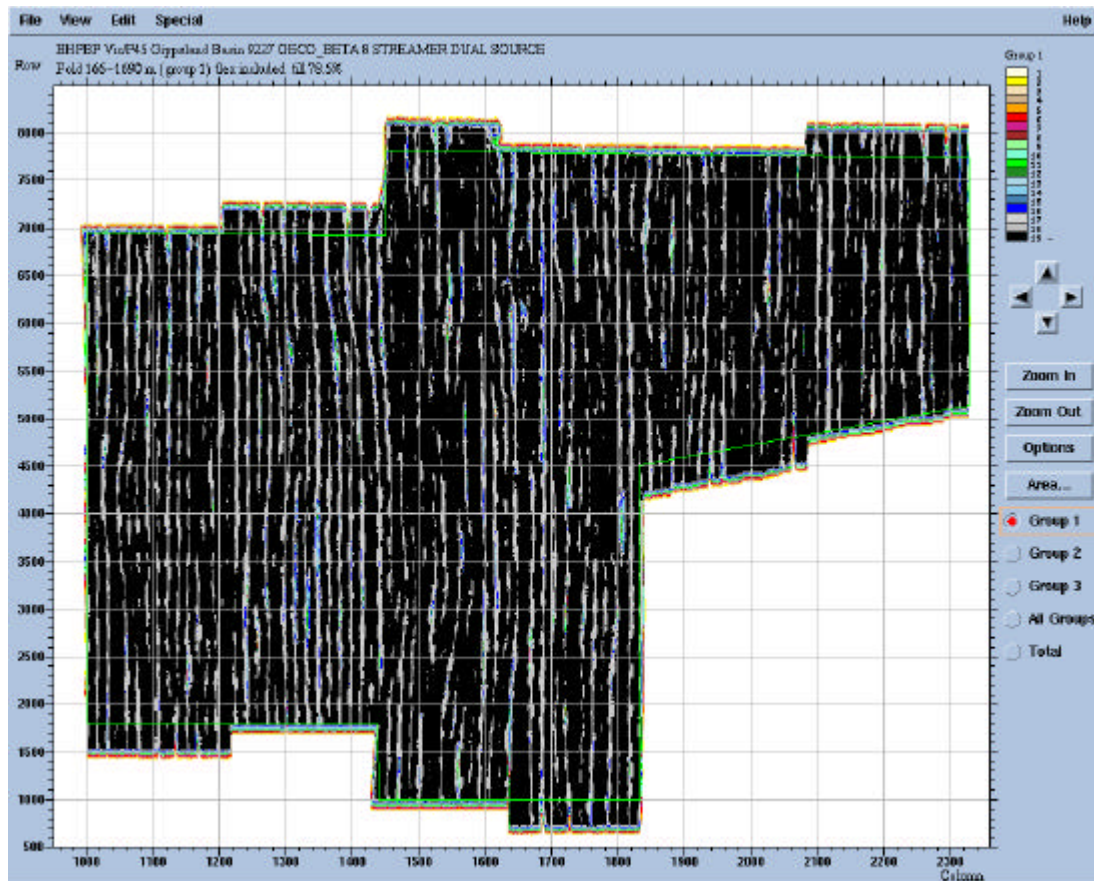
Latitude: 37° 49' 04.480" South
Longitude: 144° 55' 42.158" East

Projection: UTM Zone 55 South, C.M. 147° East

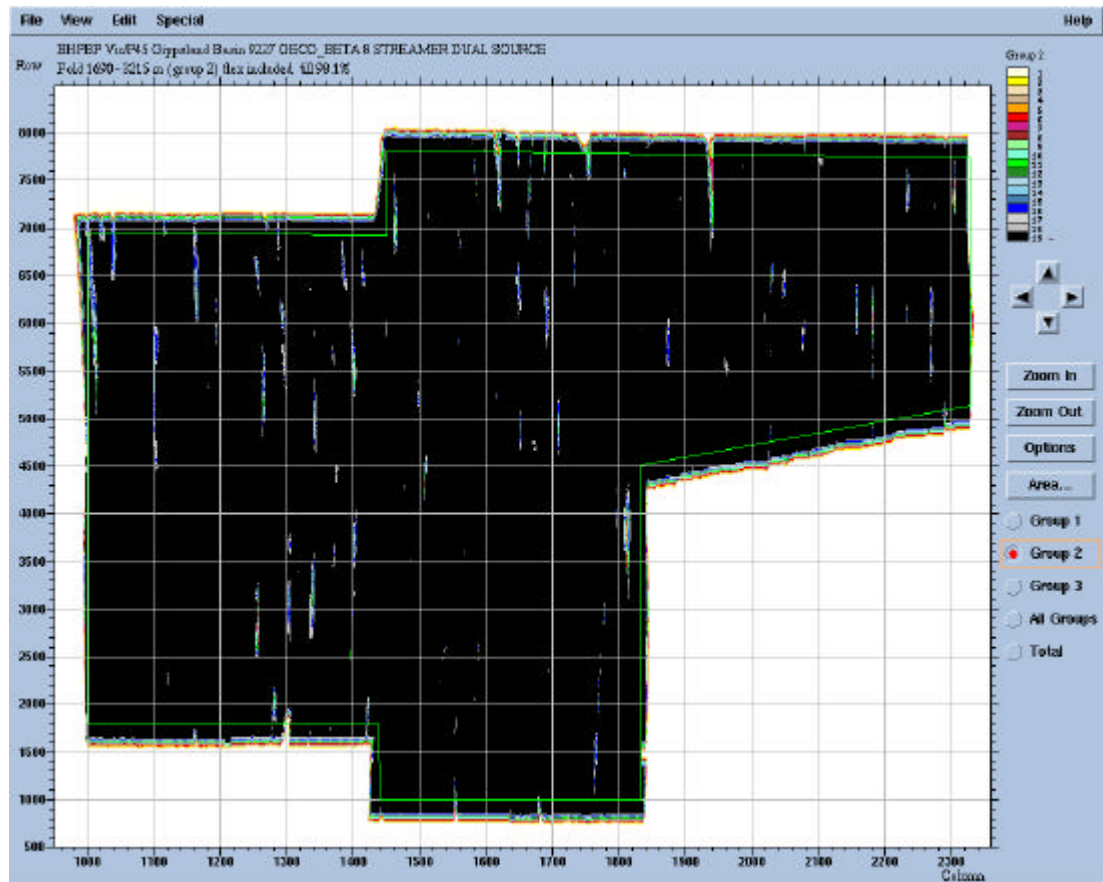
Easting: 317 658.29m
Northing: 5 812 366.08m

Exhibit 4 : Coverage Maps

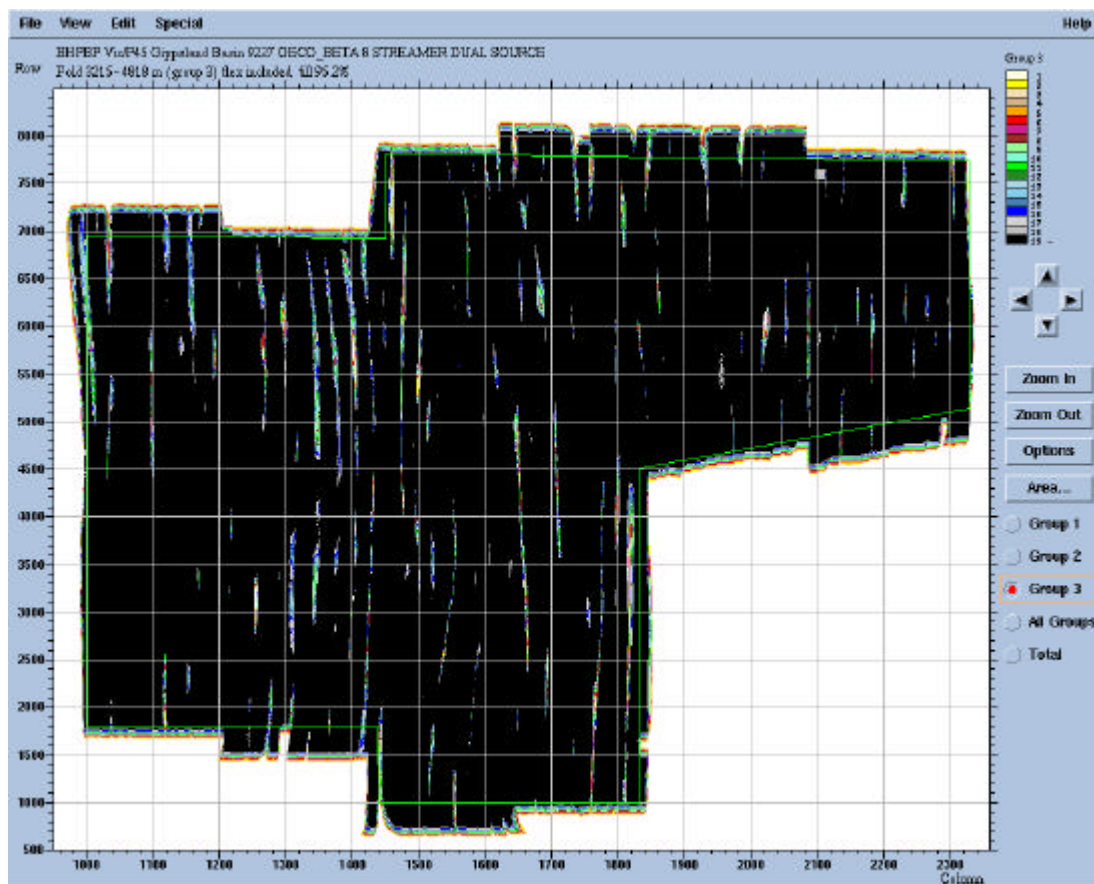
Flex Group1



Flex Group2



Flex Group3



Flex Total

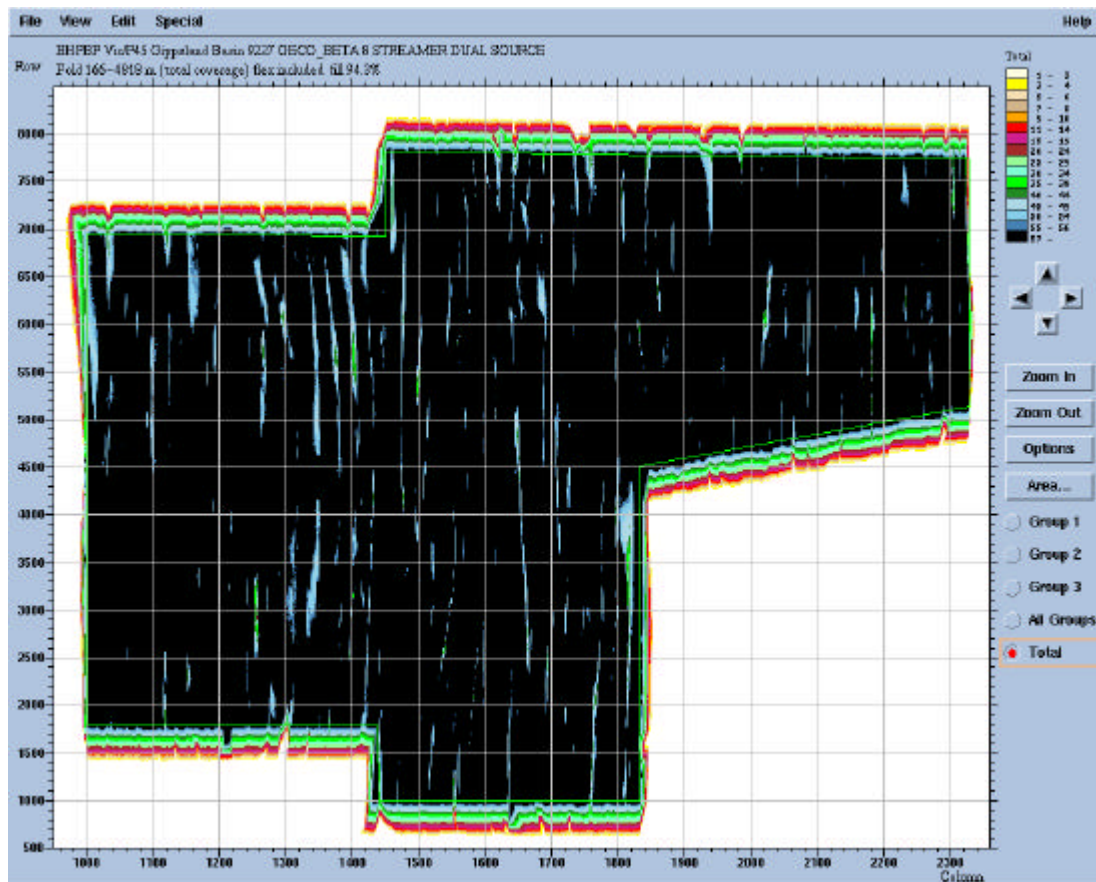
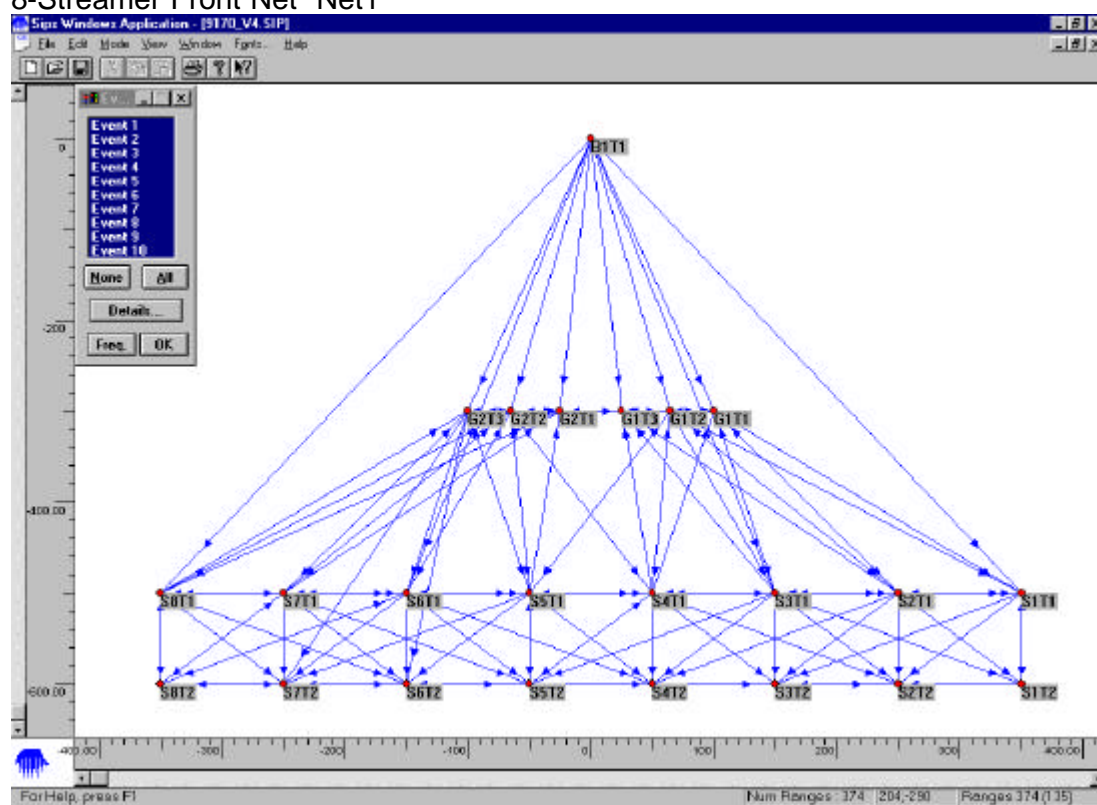
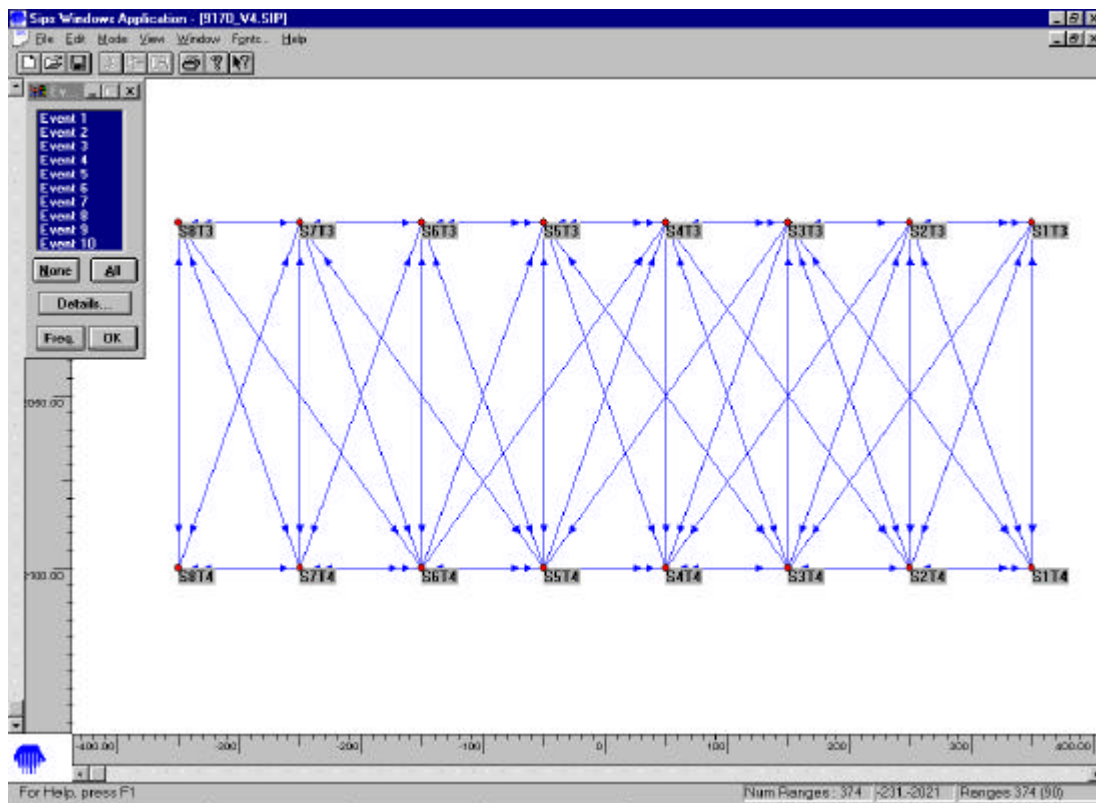


Exhibit 5 : Acoustic Range System

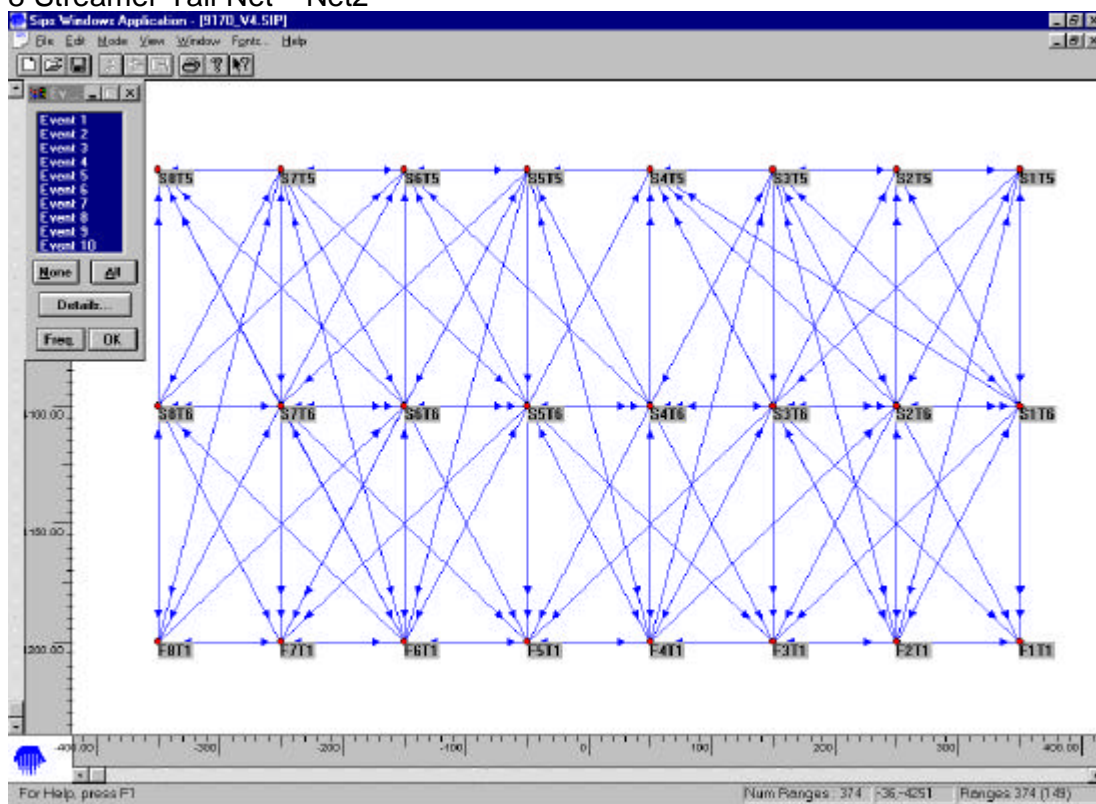
8-Streamer Front Net Net1



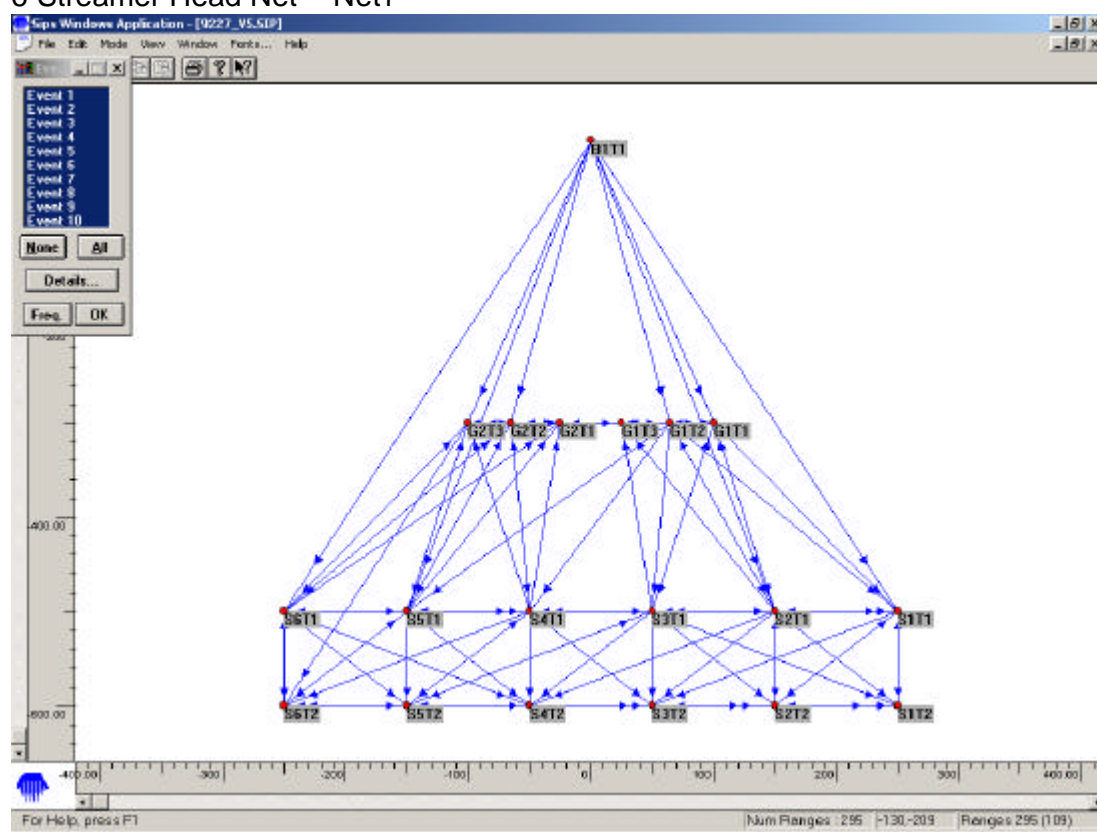
8-Streamer Mid Net – Net3



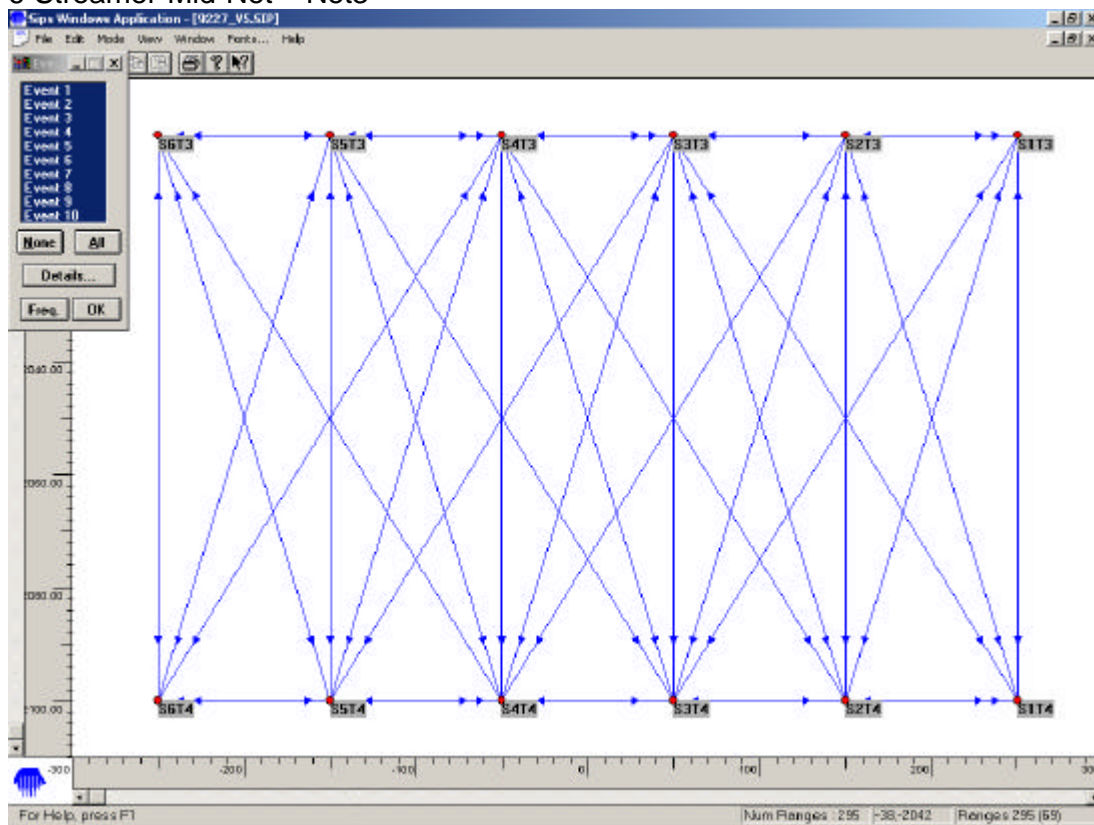
8-Streamer Tail Net – Net2



6-Streamer Head Net – Net1



6-Streamer Mid Net – Net3



6-Streamer Tail Net – Net2

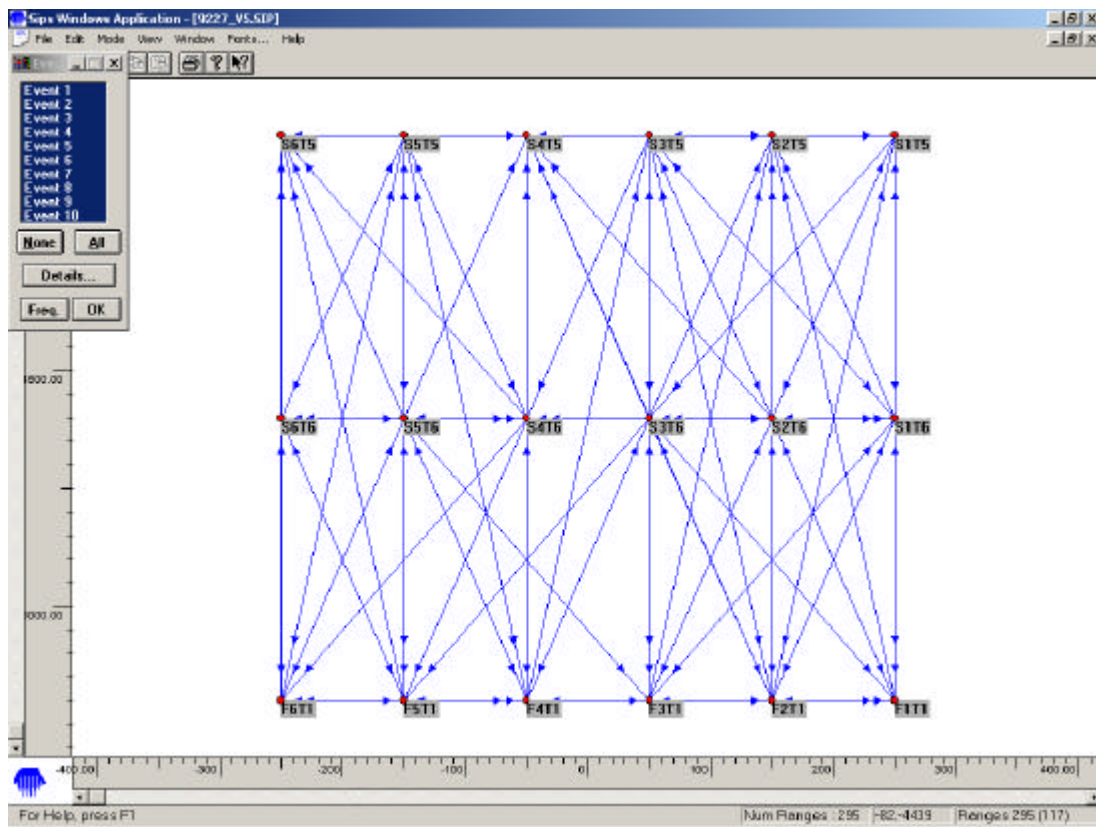


Exhibit 6 : Survey Definition Changes Summary

9. Client

10. BHP BP

11. Vessel Geco Beta

Area

12. Vic/P45

Start Date

09th August 2002

Job No.

9227

End Date

25th August 2002

Date	Surdef in use	From Seq	To	Offset	Description
			13. Seq	14. Database	
09-08-02	Mas9227_01	001	010	9227_off01	Start of Survey
14-08-02	Mas9227_02	011	021	9227_off01	Corrections from FLQC VCNNAVWCT, VCNNAVRTG 'Software Description' Was TRINAV 2.6.0/FEB/2002/Patch 19 Now C-Nav Ver. 1.0.7 VCNNAVRTG 'Above reference point' was 0.00 Now 23.00 VCNNAVRTG 'Diff System Operator' was C & C Technologies Now C&C Technologies Tail Stretch Streamer #7 Was 81.88m Now 92.18m Offsets for S2T1, S8T1 Changed Was 8.81m Now 6.24m Definitions of Baselines in P2 Headers(in Linelog Comments) G02D07 Becomes G02D01 G02D10 Becomes G02D04 G02D08 Becomes G02D02 G02D11 Becomes G02D05 G02D09 Becomes G02D03 G02D12 Becomes G02D06 ALL CORRECTIONS APPLIED TO P294 FILES BUT NOT BACKDATED IN SURDEFS
17-08-02	Mas9227_03	022	025	9227_off01	Two new birds S8C6 was 10415 now 18653 S8C3 was 15875 now 19133
18-08-02	Mas9227_04	026	044	9227_off01	TS Dip Bet_02_TS entered – Speed of Sound acoustics now 1507.74 S4C8 was 16758 now 11185 S3C17 was 20187 now 12542
25-08-02	Mas9227_05	045	052	9227_off01	New Birds S5C16 was 14846 now 10415 S5C5 was 10199 now 13484 S1C6 was 17273 now 20421
26-08-02	Mas9227_06	053	053	9227_off01	New TS_dip_03 samples entered New Speed of Sound (operating depth) = 1507.77m/s
27-08-02	Mas9227_07	054	068	9227_off01	New Birds S3C4 was 14079 now 17273
31-08-02	Mas9227_08	069	085	9227_off01	New GPS receiver entered into Surdef – SE01 and SE11
06-09-02	Mas9227_09	086	088	9227_off01	New TS DIP 04 samples entered New Speed of Sound (operating depth) = 1499.40m/s New Speed of Sound (Whole water column) = 1501.00m/s
12-	Mas9227_10	089	094	9227_off01	New Birds

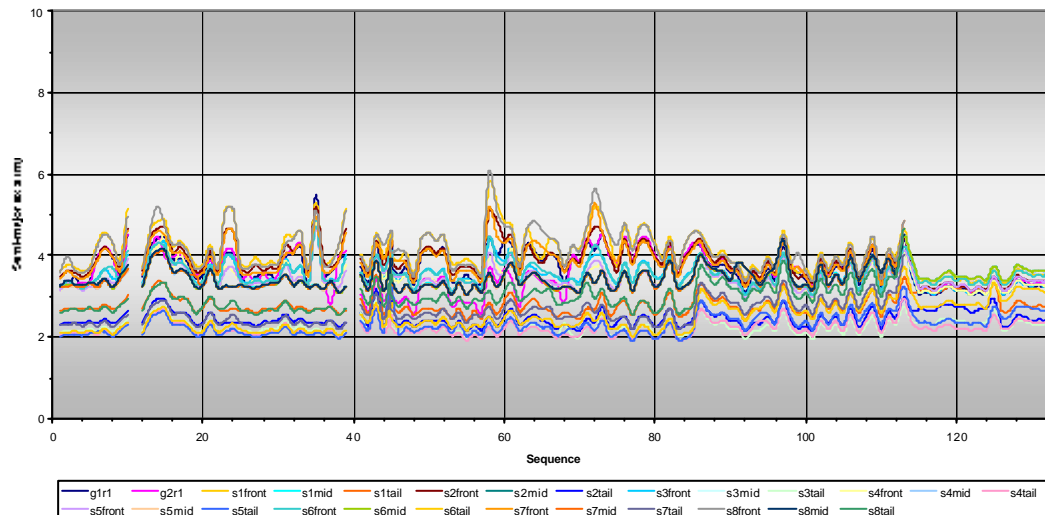
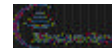
09-02					S1C18 was 14424, now is 10199 S2C16 was 12659, now is 10647 S6C3 was 22099, now is 18957
13-09-02	Mas9227_11	095	104	9227_off01	New Bird S4C9 was 13497, now is 16775
15-09-02	Mas9227_12	105	113	9227_off01	New TS DIP 05 samples entered New Speed of Sound (operating depth) = 1507.79m/s New Speed of Sound (Whole water column) = 1506.55m/s
21-09-02	Mas9227_13	114	119	9227_off02	Start of 6 streamer configuration New TS DIP 06 samples entered
23-09-02	Mas9227_14	120	133	9227_off02	New Speed of Sound (operating depth) = 1500.48m/s New Speed of Sound (Whole water column) = 1500.34m/s
24-09-02	Mas9227_15	128	128	9227_off02	Special surdef for 2D tie line, changed area rotation, origin, and source firing sequence.

Exhibit 7 : Trend Analysis

□ Tracking Node Error Ellipse Semi-major Axis (95%)



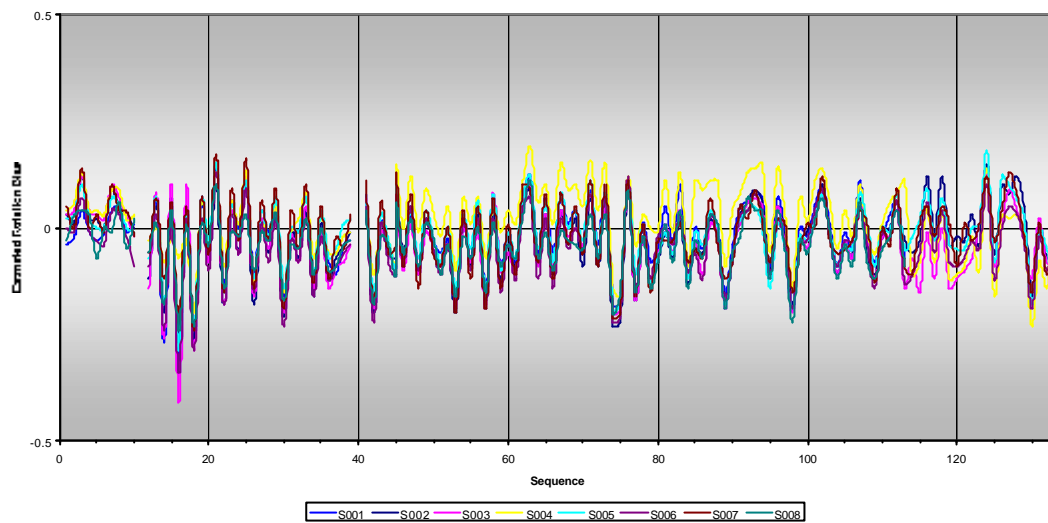
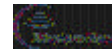
9227 BHP Billiton
Tracking Node Error Ellipses Semi-major 95 %



☐ **Estimated Rotation Bias**



9227 BHP Billiton
Streamer Separations Cross-Line

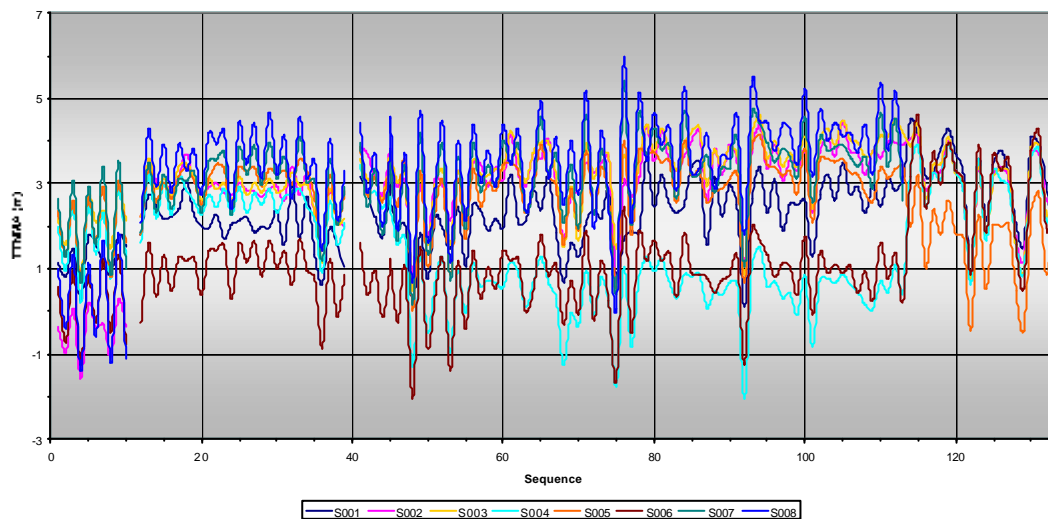
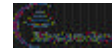


15.

☐ **Tail Tracking Node Misclosure Along**

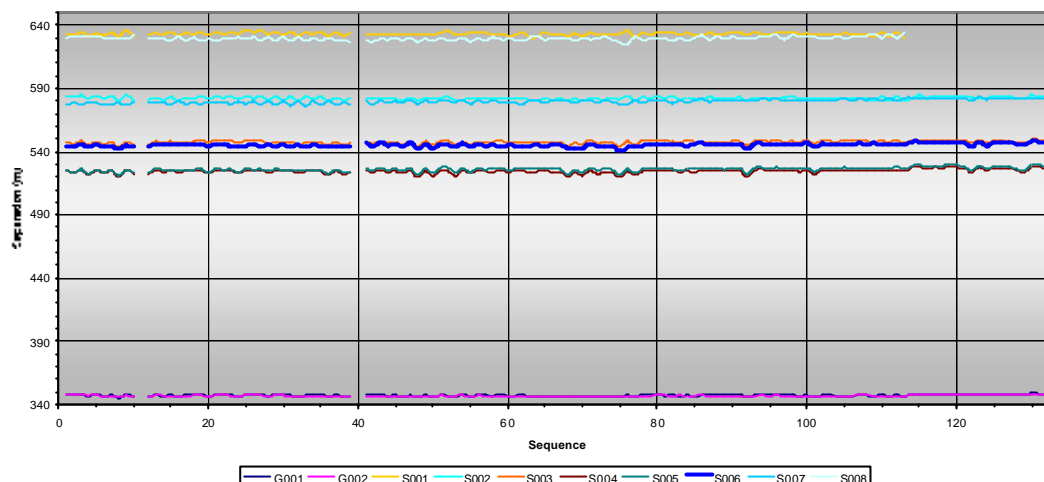
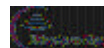


9227 BHP Billiton
Tail Tracking Node Misclosure Along



16.

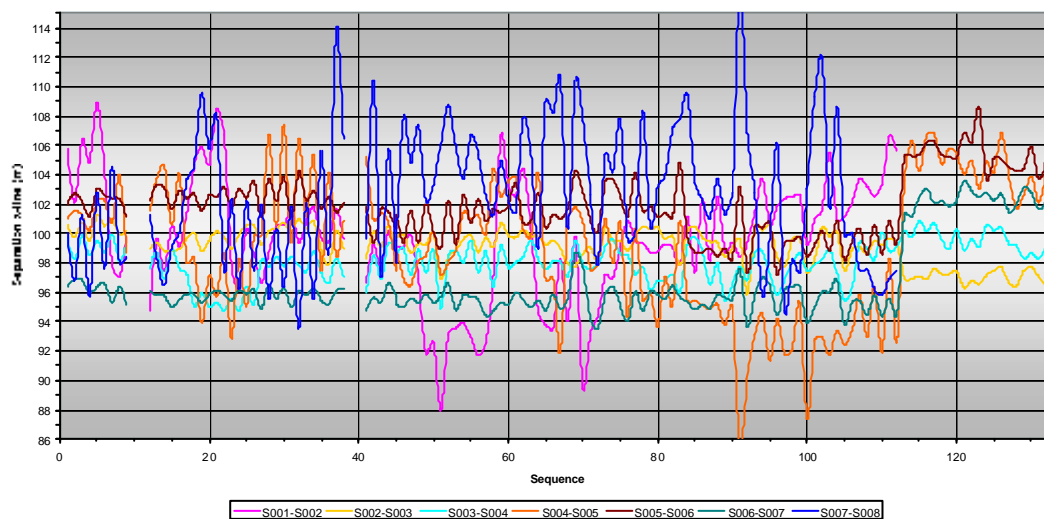
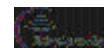
☐ **Radial Separation (Vessel to all streamers and sources)**



17.

18.

☐ **Cross Separation (All streamers to front, middle and tail)**

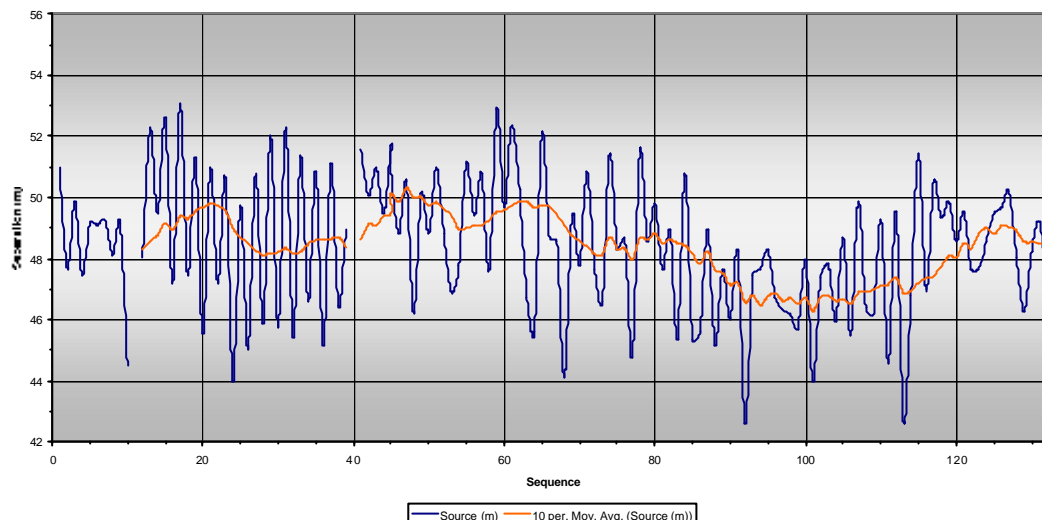
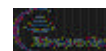


19.

☐ Cross Separation (Sources)



9227 BHP Billiton
Source Separations Cross-Line



☐ Shotpoint interval distance



9227 BHP Billiton
Average Shot Interval

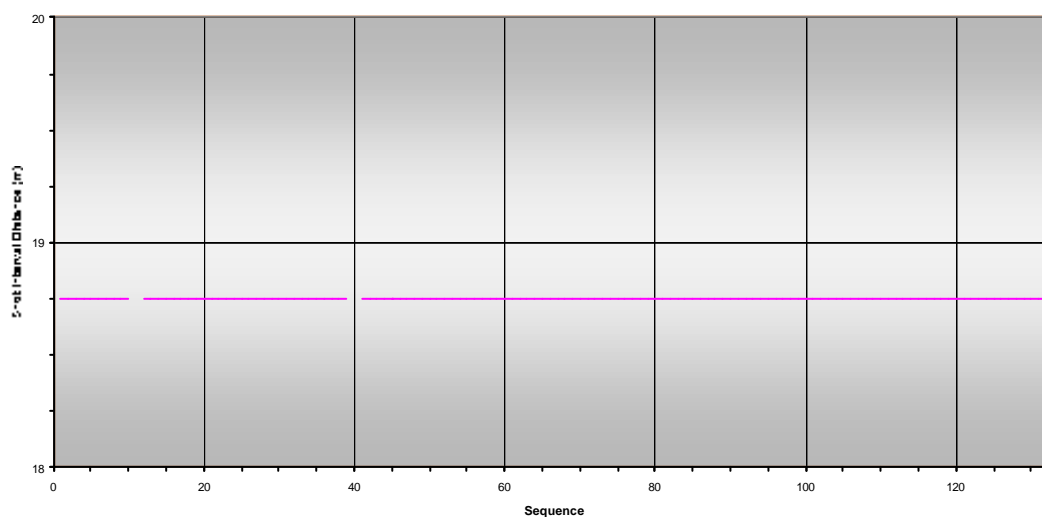


Exhibit 8 FLQC Responses

Crew 1

Sent: Wednesday, August 14, 2002 2:24 PM

Subject: FLQC BET_20020811_seq0001_4

Hi Beta Nav 1,

A '3D Standard' FLQC check has been conducted on BET_20020811.

Note:

FLQC checks of the gyro, laser, and compass calibrations, are not currently required.

Checks of the raw GPS data in the P2, and GPS/dGPS reference station data do not form part of the FLQC service.

SOL/EOL coordinates in the P2 have been checked against the preplot listing.

Sirius results are available at <http://www.ecl.com.au/~BET>

A. Items not adhering to PFM Work Instructions (effective date 1 April 2002):

a1. It is noted that the vessel GPS elevation is set to 8 degrees (as opposed to 5 deg as per the TWI) - however we note that this is a client request as per the memo enclosed with the FLQC data. No response required.

B. Items not adhering to UKOOA P2/P1 Format:

b1. No major UKOOA format errors found.

C. Discrepancies with Seismic Work Order (SWO/JB):

c1. We have noted that the line naming convention is not as per the JB, but as per client request - thus JB requires correcting?

D. Miscellaneous Discrepancies and Errors (differences in Offset Database, diagrams, etc.):

d1. The CNAV s/w descriptions in the SSD should be something other than 'TRINAV....' ?

Name.....: VCNVWCT	Name.....:
VCNAVRTG	
Descr.....: CNAV WCT local corrections	Descr.....: CNAV
RTG worldwide corrections	
Software descr.....: TRINAV 2.6.0/FEB/2002/Patch19	Software
descr.....: TRINAV 2.6.0/FEB/2002/Patch19	
Diff. syst. operator.....: C&C Technologies	Diff. syst. operator.....: C &
C technologies	

d2. A minor point - the mag dec date in the ISD/P2 is as per the JB (20/8/02) however the coordinates and values are as per the NOAA values submitted with the FLQC which are dated 8/8/02 ?

d3. The streamer #7 tail stretch in the ISD/P2 is 81.88m - it should be 92.18m as per the 'Offset Database' ?

d4. From observation of acoustic range data in the P2, acoustic nodes s01t01, s02t01 and s08t01 should have along offsets of 6.24m defined in the ISD/P2, however only s01t01 seems to have been defined correctly ? This may have a small effect on CNG positioning as these latter units are defined as tracking nodes ?

	o.	Name	Id.	ref.	Along	Across	Above	Type
1	s01t01	40541	S001		6.24	0.00	0.00	rel
8	s02t01	41141	S002		8.81	0.00	0.00	rel
15	s03t01	41541	S003		8.81	0.00	0.00	rel
22	s04t01	42141	S004		8.81	0.00	0.00	rel
51	s05t01	42541	S005		8.81	0.00	0.00	rel
57	s06t01	43141	S006		8.81	0.00	0.00	rel
64	s07t01	43541	S007		8.81	0.00	0.00	rel
71	s08t01	44141	S008		8.81	0.00	0.00	rel

d5. The VNAVRTG antenna height in the SSD/P2 is zero - it should be 23.0 as per the 'Antenna and Sensor Offsets' diagram ?

Name.....: VCNVWCT
Along.....: 0.00
Across.....: -0.53
Above.....: 0.00

d6. The P2 header comments wrt to baselines/directions do not match the ISD (now that the GPS nodes have been named correctly) ?

C0001BAS_ALONG SD 2.0 DEFINED BETWEEN G01D02-G01T01, G01D03-G01R01,
C0001G01D04-G01T02, G01D06-G01T03, G02D08-G02T01, G02D09-G02R01.
C0001G02D10-G02T02 AND G02D12-G02T03
C0001BAS_ACROSS SD 2.0 DEFINED BETWEEN G01D02-G01T01, G01D03-G01R01,
C0001G01D04-G01T02, G01D06-G01T03, G02D08-G02T01, G02D09-G02R01.
C0001G02D10-G02T02 AND G02D12-G02T03
C0001BASELINES SD 3.5 DEFINED BETWEEN G01D01-G01T01, G01R01-G01T02,
C0001G01D05-G01T03, G02D07-G02T01, G02R01-G02T02 AND G02D11-G02T03
C0001BASELINE SD 5.0 DEFINED BETWEEN G01R01-G01D01, G01R01-G01D05,
C0001G02R01-G02D07, G02R01-G02D11

d7. There are no P2 header comments detailing GPS reference station 4.

E. Other Errors (Typos, General Observations, etc.):

e1. Just an observation - we have noted that some vessels are using
TRINAV 2.6.0/JUL/2002/Patch21 whilst you are using TRINAV 2.6.0/FEB/2002/Patch19 ?

e2. Just a typo/minor inconsistency C&C and C & C appear in the SSD/P2?

Name.....: VCNVWCT	Name.....:
VCNAVRTG	
Descr.....: CNAV WCT local corrections	Descr.....: CNAV
RTG worldwide corrections	
Software descr.....: TRINAV 2.6.0/FEB/2002/Patch19	Software descr.....:
TRINAV 2.6.0/FEB/2002/Patch19	
Diff. syst. operator.....: C&C Technologies	Diff. syst. operator.....: C & C
technologies	

e3. A reasonable P1 comparison was obtained. However, note that we used the 'incorrect'
s02t01 and s08t01 offsets (as per the P2).

Crew 2

Sent: Friday, September 13, 2002 5:44 PM
To: Geco Beta
Subject: FLQC BET_20020912_seq0086

A '3D Standard' FLQC check has been conducted on BET_200208912 within the turnaround
required.

Note:
FLQC checks of the gyro, laser, and compass calibrations, are not currently required. Checks of
the raw GPS data in the P2, and GPS/dGPS reference station data do not form part of the FLQC
service.

SOL/EOL coordinates in the SSD/P2 have been checked against the preplot listing.

Sirius results are available at <http://www.ecl.com.au/~BET>.

A. Items not adhering to PFM Work Instructions (effective date 1 April 2002):

a1. No discrepancies to report.

B. Items not adhering to UKOOA P2/P1 Format:

b1. No major UKOOA format errors found.

C. Discrepancies with Seismic Work Order (SWO/JB):

c1. **C/F** - We have noted that the line naming convention is not as per the JB, but as per client request - thus JB requires correcting?

Previous crew response: Mailed Kumara, and job book has been updated.

Further FLQC comment: I'm afraid the copy (Ver 6, 8 August 2002) submitted for this FLQC, still has the HGP2002A prefix defined.

c2. The Spec Coverage parameters for the three defined offset groups are 19 / 19 / 19, but 18 / 16 / 14 in the JB. The Group offsets in the binning_flex_120902.txt file could not be verified from the JB.

D. Miscellaneous Discrepancies and Errors (differences in Offset Database, diagrams, etc.):

d1. **C/F** - A minor point - the mag dec date in the ISD/P2 is as per the JB (20/8/02) however the coordinates and values are as per the NOAA values submitted with the FLQC which are dated 8/8/02 ?

Previous crew response: Corrected.

Further FLQC comment: This is unchanged in the ISD, and still seems to be a combination of two sources - i.e. the date, mag.var., and secular change are from the Job Book, but the position is not.

d2. **C/F** - There is no P2 header comment for GPS reference station 4 (Wellington).

Previous crew response: There is now.

FLQC: Sorry, but it's still not there.

E. Other Errors (Typos, General Observations, etc.):

e1. A comparison of your P1 E record waterdepths and my corrected waterdepths gave a mean residual difference of -0.03m for the FLQC segment. This residual is obtained by applying the calibrated propagation velocity, draft, delta-draft (0.0m) and the interpolated tidal correction for JD254 11h45m to the P2 waterdepth, and then comparing this to the waterdepth taken from the P1 "E" record. I observed that the tidal corrections are very small, and often less than the precision of the waterdepth in the P1.

e2. The following comment isn't strictly accurate. You could say something like "based on TS-Dip04 and agreed with client". Just a suggestion.

C0002VALUE OF 1501.00 M/S FROM TS_DIP_04 ON 06 SEPT. 2002 USED FOR ECHO SOUNDER

e3. An acceptable P1 comparison was obtained.

Crew 2 No.2

From: Geomatics Division ECL [mailto:Geomatics@ecl.com.au]

Sent: Tuesday, September 24, 2002 4:53 PM

A '3D Standard' FLQC check has been conducted on BET_200208922 within the turnaround required.

Note:

FLQC checks of the gyro, laser, and compass calibrations, are not currently required. Checks of the raw GPS data in the P2, and GPS/dGPS reference station data do not form part of the FLQC service.

SOL/EOL coordinates in the SSD/P2 have been checked against the preplot listing.

Sirius results are available at <http://www.ecl.com.au/~BET>.

A. Items not adhering to PFM Work Instructions (effective date 1 April 2002):

a1. No discrepancies to report.

B. Items not adhering to UKOOA P2/P1 Format:

b1. No major UKOOA format errors found.

C. Discrepancies with Seismic Work Order (SWO/JB):

c1. The Spec Coverage parameters for the three defined offset groups are 18 / 16 / **11** in the binning.txt file, but 18 / 16 / **14** in the JB. The The Group offsets in the binning.txt file could not be verified from the JB.

D. Miscellaneous Discrepancies and Errors (differences in Offset Database, diagrams, etc.):

d1. Nothing to report.

E. Other Errors (Typos, General Observations, etc.):

e1. A comparison of your P1 E record waterdepths and my corrected waterdepths gave a mean residual difference of -0.14m for the FLQC segment. This residual is obtained by applying the calibrated propagation velocity, draft, delta-draft (0.0m) and the interpolated tidal correction for JD265 06h 47m to the P2 waterdepth, and then comparing this to the waterdepth taken from the P1 "E" record. I observed that the tidal corrections are very small, and often less than the precision of the waterdepth in the P1.

e2. The date in the following comments should be **14 SEPT. 2002** according to the spreadsheet. Technically the format is now YYYYMMDD for all dates in the P2 comments.
C0002VALUE OF 1507.79 M/S FROM TS_DIP_05 ON **15 SEPT. 2002** USED FOR ACOUSTICS
C0002VALUE OF 1506.55 M/S FROM TS_DIP_05 ON **15 SEPT. 2002** USED FOR ECHO
SOUNDER

e3. An acceptable P1 comparison was obtained.

Exhibit 9: Current and Feather Spreadsheet.

Date	Time	Predicted Current AL	Predicted Current XL	Predicted Feather	Feather observed east positive	Current direction	Current strength	Current IL Calc	Current XL Calc	Current Meter FX calc.	Forecast Current Along	Forecast Current XL	Predicted Feather
8/8/2002	100	-0.74	0.04	0.7		69	0.23	0.14	0.18	2.5			
8/8/2002	200	-0.48	0.27	4.4		91	0.37	0.11	0.35	4.9			
8/8/2002	300	-0.14	0.38	5.6		65	0.67	0.46	0.49	6.3			
8/8/2002	400	0.1	0.48	6.7		54	0.72	0.58	0.42	5.3			
8/8/2002	500	0.27	0.54	7.2		47	0.99	0.87	0.48	5.6			
8/8/2002	600	0.43	0.45	5.8		46	1.2	1.06	0.56	6.4			
8/8/2002	700	0.5	0.26	3.3		30	1.13	1.11	0.23	2.6			
8/8/2002	800	0.46	0.03	0.4		24	0.77	0.77	0.08	1.0			
8/8/2002	900	0.35	-0.18	-2.4		0	0.6	0.57	-0.19	-2.3			
8/8/2002	1000	0.18	-0.32	-4.4		327	0.46	0.29	-0.36	-4.8			
8/9/2002	0	-0.77	-0.54	-9.5		228	0.88	-0.76	-0.44	-7.7			
8/9/2002	100	-0.84	-0.29	-5.2		196	0.92	-0.92	0.03	0.6			
8/9/2002	200	-0.75	0.03	0.5		160	1.44	-1.13	0.89	17.2			
8/9/2002	300	-0.44	0.25	4.0		121	1.42	-0.32	1.38	20.6			
8/9/2002	400	-0.08	0.37	5.4		94	1.86	0.45	1.80	22.1			
8/9/2002	500	0.13	0.5	6.9	19	84	1.17	0.48	1.07	13.4			
8/9/2002	600	0.28	0.57	7.6	8.3	76	0.07	0.04	0.06	0.8			
8/9/2002	700	0.45	0.5	6.4	2.3	112	0.31	-0.02	0.31	4.4			
8/9/2002	800	0.54	0.3	3.8	4.6	139	0.37	-0.19	0.32	4.8			
8/9/2002	900	0.5	0.04	0.5	2.8	127	0.32	-0.10	0.30	4.4			
8/9/2002	1000	0.36	-0.21	-2.8		276	0.12	-0.02	-0.12	-1.7			
8/9/2002	1100	0.14	-0.38	-5.2	-1.2	265	0.5	-0.20	-0.46	-6.9			
8/9/2002	1200	-0.08	-0.41	-6.0	-6	270	0.6	-0.19	-0.57	-8.5			
8/9/2002	1300	-0.2	-0.31	-4.7	-7.7	251	0.49	-0.29	-0.39	-6.0			
8/9/2002	1400	-0.23	-0.06	-0.9	-1.4	145	0.47	-0.28	0.38	5.8			

8/9/2002	1500	-0.15	0.2	3.0		112	1.09	-0.08	1.09	15.5			
8/9/2002	1600	0.09	0.35	4.9	16.2	86	0.68	0.25	0.63	8.4			
8/9/2002	1700	0.35	0.4	5.3	4.5	238	0.34	-0.26	-0.22	-3.3			
8/9/2002	1800	0.46	0.37	4.7	-0.5	152	0.63	-0.44	0.45	7.2			
8/9/2002	1900	0.47	0.25	3.2	4.7	159	0.33	-0.26	0.21	3.2			
8/9/2002	2000	0.42	0.05	0.6	1.3	186	0.34	-0.33	0.07	1.1			
8/9/2002	2100	0.25	-0.2	-2.7		206	0.35	-0.35	-0.05	-0.8			
8/9/2002	2200	-0.01	-0.43	-6.2	-3.4	257	0.61	-0.31	-0.52	-8.1			
8/9/2002	2300	-0.31	-0.6	-9.2	-5.2	255	0.61	-0.33	-0.51	-7.9			
8/10/2002	0	-0.58	-0.67	-11.1	-6.4	249	0.75	-0.47	-0.58	-9.4			
8/10/2002	100	-0.78	-0.59	-10.4	-8.7	192	1.06	-1.05	0.11	2.2			
8/10/2002	200	-0.87	-0.32	-5.8		145	1.36	-0.82	1.09	18.8			
8/10/2002	300	-0.74	0.01	0.2	16.2	108	0.87	0.00	0.87	12.3			
8/10/2002	400	-0.38	0.24	3.8	12.4	123	0.53	-0.14	0.51	7.5			
8/10/2002	500	-0.03	0.37	5.3	5.6	149	0.72	-0.47	0.54	8.8			
8/10/2002	600	0.13	0.52	7.2	7.9	138	0.84	-0.42	0.73	11.5			
8/10/2002	700	0.29	0.62	8.2	8.2	107	0.56	0.01	0.56	7.9			
8/10/2002	800	0.5	0.56	7.1		112	0.59	-0.04	0.59	8.5			
8/10/2002	900	0.61	0.34	4.2	13.6	117	0.64	-0.10	0.63	9.2			
8/10/2002	1000	0.54	0.03	0.4	3.9	121	0.64	-0.14	0.62	9.2			
8/10/2002	1100	0.35	-0.27	-3.6	-1.3	282	0.21	-0.02	-0.21	-3.0			
8/10/2002	1200	0.08	-0.46	-6.4	-4.2	251	0.89	-0.54	-0.71	-11.6			
8/10/2002	1300	-0.17	-0.5	-7.4	-6.4	211	0.97	-0.95	-0.22	-4.1			
8/10/2002	1400	-0.32	-0.37	-5.7		183	0.65	-0.63	0.17	2.9			
8/10/2002	1500	-0.35	-0.07	-1.1	8.4	149	0.54	-0.35	0.41	6.4			
8/10/2002	1600	-0.19	0.22	3.3	5.3	187	0.62	-0.61	0.12	2.0			
8/10/2002	1700	0.12	0.36	5.0	-2.7	211	0.61	-0.59	-0.14	-2.3			
8/10/2002	1800	0.36	0.41	5.4	5.3	162	0.62	-0.50	0.36	5.9			
8/10/2002	1900	0.42	0.41	5.3	6.1	130	0.43	-0.16	0.40	5.9			
8/10/2002	2000	0.45	0.33	4.2		133	0.36	-0.15	0.33	4.8			
8/10/2002	2100	0.44	0.14	1.8	9.8	151	0.51	-0.35	0.37	5.8			
8/10/2002	2200	0.29	-0.15	-2.0	-1.9	270	0.37	-0.11	-0.35	-5.2			
8/10/2002	2300	0.02	-0.43	-6.1	-5.1	255	0.61	-0.33	-0.51	-7.9			
8/11/2002	0	-0.28	-0.63	-9.6	-12.3	227	1.42	-1.24	-0.69	-14.0			

8/11/2002	100	-0.56	-0.71	-11.7	-10.6	197	1.52	-1.52	0.03	0.6			
8/11/2002	200	-0.79	-0.62	-10.9		169	1.38	-1.21	0.67	13.5			
8/11/2002	300	-0.88	-0.33	-6.0	11.4	174	1.07	-0.98	0.44	8.2			
8/11/2002	400	-0.69	0.02	0.3	6.4	200	0.68	-0.68	-0.02	-0.4			
8/11/2002	500	-0.3	0.24	3.7	1.2	162	0.59	-0.48	0.35	5.6			
8/11/2002	600	0	0.39	5.6	9.4	151	0.79	-0.54	0.58	9.5			
8/11/2002	700	0.14	0.56	7.7	6.8	170	0.4	-0.35	0.19	2.9			
8/11/2002	800	0.33	0.69	9.1		117	0.69	-0.11	0.68	9.9			
8/11/2002	900	0.59	0.63	7.8	12.3	149	0.94	-0.62	0.71	11.8			
8/11/2002	1000	0.7	0.35	4.3	1.8	255	0.23	-0.13	-0.19	-2.8			
8/11/2002	1100	0.58	-0.04	-0.5	-3.2	330	0.69	0.46	-0.51	-6.6			
8/11/2002	1200	0.32	-0.38	-5.0	-7	246	0.92	-0.62	-0.68	-11.4			
8/11/2002	1300	0	-0.58	-8.3	-8.2	243	0.94	-0.66	-0.66	-11.3			
8/11/2002	1400	-0.28	-0.6	-9.2	15.9	73	1.15	0.66	0.94	11.4			
8/11/2002	1500	-0.44	-0.42	-6.7	1.9	342	0.37	0.30	-0.22	-2.9			
8/14/2002	200	0.11	-0.38	-5.3		248	0.97	-0.62	-0.74	-12.4			
8/14/2002	300	-0.16	-0.6	-8.9		252	1.64	-0.96	-1.33	-23.6			
8/14/2002	400	-0.45	-0.66	-10.5		244	1.42	-0.99	-1.02	-18.7			
8/14/2002	500	-0.66	-0.47	-8.0		153	0.87	-0.62	0.62	10.3			
8/14/2002	600	-0.6	-0.11	-1.9	13.9	118	0.81	-0.14	0.80	11.7			
8/14/2002	700	-0.3	0.17	2.6	9.5	150	0.5	-0.33	0.37	5.8			
8/14/2002	800	0.01	0.3	4.3	5.1	167	0.7	-0.60	0.36	6.1			
8/14/2002	900	0.16	0.49	6.7	1.5	200	0.53	-0.53	-0.02	-0.3			
8/14/2002	1000	0.33	0.72	9.4	-1.2	232	0.42	-0.35	-0.23	-3.7			
8/14/2002	1100	0.64	0.77	9.4		188	0.47	-0.46	0.08	1.3			
8/14/2002	1300	0.72	-0.01	-0.1		262	0.51	-0.22	-0.46	-6.9			
8/14/2002	1500	-0.02	-0.77	-10.9	-8.5	269	0.7	-0.23	-0.66	-10.0			
8/14/2002	1600	-0.4	-0.88	-13.7	-12.3	233	1.1	-0.90	-0.63	-11.5			
8/14/2002	1900	-0.69	-0.02	-0.3	9.9	119	0.96	-0.18	0.94	13.9			
8/14/2002	2000	-0.34	0.22	3.4	10.5	133	0.65	-0.27	0.59	9.0			
8/14/2002	2100	-0.05	0.34	4.9	6	171	0.55	-0.49	0.25	4.1			
8/14/2002	2200	0.06	0.52	7.3	2.1	188	0.32	-0.32	0.06	0.9			
8/14/2002	2300	0.22	0.67	9.0	-0.1	254	0.14	-0.08	-0.12	-1.7			
8/15/2002	200	0.39	-0.05	-0.7	-8.2	306	0.74	0.23	-0.70	-9.4			

8/15/2002	300	0.17	-0.37	-5.1	-7.7	281	0.57	-0.07	-0.57	-8.2			
8/15/2002	400	-0.1	-0.56	-8.2		246	0.72	-0.48	-0.54	-8.6			
8/15/2002	500	-0.37	-0.57	-8.9		215	1.09	-1.04	-0.32	-6.1			
8/15/2002	600	-0.52	-0.36	-5.9		200	0.75	-0.75	-0.03	-0.5			
8/15/2002	700	-0.42	-0.03	-0.5	8.1	137	0.85	-0.41	0.74	11.7			
8/15/2002	800	-0.13	0.2	3.0	13.1	110	0.71	-0.02	0.71	10.1			
8/15/2002	900	0.12	0.33	4.6	7.3	153	0.62	-0.44	0.44	7.0			
8/15/2002	1000	0.25	0.52	7.0	5.5	134	0.11	-0.05	0.10	1.4			
8/15/2002	1100	0.42	0.7	9.0	2.6	76	0.3	0.16	0.25	3.5			
8/15/2002	1200	0.68	0.65	7.9		171	0.55	-0.49	0.25	4.1			
8/15/2002	1300	0.77	0.3	3.6		52	0.35	0.29	0.20	2.6			
8/15/2002	1400	0.56	-0.2	-2.5	-1.1	345	0.92	0.77	-0.50	-6.0			
8/15/2002	1500	0.19	-0.62	-8.4	-11.6	294	0.67	0.07	-0.67	-9.3			
8/15/2002	1600	-0.22	-0.85	-12.7	-9.9	279	0.84	-0.13	-0.83	-12.1			
8/15/2002	1700	-0.59	-0.9	-14.8	-10.5	247	1.22	-0.80	-0.92	-16.1			
8/15/2002	1800	-0.84	-0.74	-13.2	-9.2	209	1.06	-1.04	-0.20	-3.9			
8/15/2002	1900	-0.92	-0.36	-6.7		177	0.78	-0.73	0.28	4.9			
8/15/2002	2000	-0.73	0.04	0.7		129	1.08	-0.39	1.01	15.6			
8/15/2002	2100	-0.34	0.25	3.9	17.8	111	1.12	-0.06	1.12	15.8			
8/15/2002	2200	-0.06	0.38	5.5	13	148	0.8	-0.51	0.61	10.0			
8/15/2002	2300	0.07	0.57	8.0	6.9	161	0.62	-0.50	0.37	6.1			
8/16/2002	0	0.27	0.71	9.4	1.9	157	0.23	-0.17	0.15	2.3			
8/16/2002	100	0.5	0.62	7.8	-2.5	112	0.33	-0.02	0.33	4.7			
8/16/2002	200	0.56	0.31	3.9		62	0.39	0.28	0.27	3.6			
8/16/2002	300	0.42	-0.07	-0.9	4.4	135	0.41	-0.19	0.37	5.5			
8/16/2002	400	0.21	-0.36	-4.9	-8.3	302	0.58	0.14	-0.56	-7.7			
8/16/2002	500	-0.04	-0.5	-7.2	-9.2	281	0.8	-0.10	-0.79	-11.5			
8/16/2002	600	-0.28	-0.48	-7.4	-7.3	262	0.9	-0.39	-0.81	-12.6			
8/16/2002	700	-0.38	-0.26	-4.1	-3.5	210	0.68	-0.67	-0.14	-2.4			
8/16/2002	800	-0.25	0.02	0.3		108	0.96	0.00	0.96	13.5			
8/16/2002	900	0.01	0.21	3.0	11	112	0.94	-0.07	0.94	13.4			
8/16/2002	1000	0.22	0.34	4.6	11.3	139	0.56	-0.29	0.48	7.4			
8/16/2002	1100	0.32	0.51	6.7	5.9	144	0.41	-0.24	0.33	5.0			
8/16/2002	1200	0.48	0.61	7.8	1.9	88	0.66	0.23	0.62	8.3			

8/16/2002	1300	0.66	0.49	6.0	5.5	131	0.66	-0.26	0.61	9.2			
8/16/2002	1400	0.64	0.12	1.5									
8/16/2002	1500	0.37	-0.36	-4.7		355	0.57	0.52	-0.22	-2.8			
8/16/2002	1600	-0.02	-0.71	-10.1	-7	315	1	0.45	-0.89	-11.3			
8/16/2002	1700	-0.42	-0.87	-13.7	-15	293	0.93	0.08	-0.93	-12.8			
8/16/2002	1800	-0.74	-0.85	-14.6	-14.4	253	1.32	-0.76	-1.08	-18.4			
8/16/2002	1900	-0.94	-0.64	-11.8	-13.9	202	0.99	-0.99	-0.07	-1.3			
8/16/2002	2100	-0.7	0.12	2.1	14	135	0.98	-0.44	0.87	13.8			
8/16/2002	2200	-0.29	0.31	4.8	11	150	0.51	-0.34	0.38	5.9			
8/16/2002	2300	-0.01	0.44	6.3	3.5	145	0.47	-0.28	0.38	5.8			
8/17/2002	0	0.12	0.62	8.6	2.5	141	1.12	-0.61	0.94	15.5			
8/17/2002	100	0.33	0.72	9.4	12.1	141	0.78	-0.42	0.65	10.4			
8/17/2002	200	0.55	0.59	7.4		111	0.43	-0.02	0.43	6.2			
8/17/2002	300	0.57	0.26	3.3		130	0.31	-0.12	0.29	4.2			
8/17/2002	400	0.42	-0.1	-1.3	5.3	355	0.19	0.17	-0.07	-1.0			
8/17/2002	500	0.22	-0.35	-4.7	-3.6	325	0.52	0.31	-0.42	-5.5			
8/17/2002	600	-0.01	-0.45	-6.4	-9.9	292	0.7	0.05	-0.70	-9.8			
8/17/2002	700	-0.21	-0.4	-6.0	-9.1	260	0.58	-0.27	-0.51	-7.8			
8/17/2002	800	-0.25	-0.2	-3.1	-2.1	139	0.37	-0.19	0.32	4.8			
8/17/2002	900	-0.12	0.06	0.9		107	0.52	0.01	0.52	7.4			
8/17/2002	1000	0.11	0.24	3.3	12.3	76	0.69	0.37	0.59	7.6			
8/17/2002	1100	0.28	0.35	4.7	1.1	188	0.3	-0.30	0.05	0.8			
8/17/2002	1200	0.37	0.47	6.1	4.2	144	0.95	-0.56	0.77	12.6			
8/17/2002	1300	0.49	0.5	6.4	13	131	1.02	-0.40	0.94	14.6			
8/17/2002	1400	0.59	0.33	4.1	9.9	133	0.43	-0.18	0.39	5.8			
8/17/2002	1500	0.49	-0.04	-0.5		42	0.17	0.16	0.07	1.0			
8/17/2002	1600	0.2	-0.47	-6.4	-1.6	315	0.55	0.25	-0.49	-6.6			
8/17/2002	1700	-0.19	-0.76	-11.3	-7.6	322	1.06	0.59	-0.88	-10.8			
8/17/2002	1800	-0.56	-0.83	-13.6	-14.8	277	1.13	-0.22	-1.11	-16.3			
8/17/2002	1900	-0.83	-0.76	-13.5	-18.9	214	1.23	-1.18	-0.34	-6.9			
8/17/2002	2200	-0.62	0.19	3.2	13	156	1.13	-0.84	0.76	13.5			
8/17/2002	2300	-0.2	0.35	5.3	1.4	211	0.37	-0.36	-0.08	-1.3			
8/18/2002	0	0.05	0.47	6.6	6.1	146	1.16	-0.71	0.91	15.5			
8/18/2002	100	0.18	0.63	8.6	10.1	132	1.02	-0.41	0.93	14.6			

8/18/2002	200	0.39	0.68	8.8		81	0.47	0.21	0.42	5.7			
8/18/2002	300	0.56	0.52	6.5		105	0.43	0.02	0.43	6.1			
8/18/2002	400	0.54	0.19	2.4	4.6	73	0.37	0.21	0.30	4.1			
8/18/2002	500	0.4	-0.14	-1.8	-1.7	308	0.51	0.17	-0.48	-6.5			
8/18/2002	600	0.2	-0.34	-4.6	-4.7	323	0.56	0.32	-0.46	-6.1			
8/18/2002	700	-0.01	-0.4	-5.7	-7.3	267	1.03	-0.37	-0.96	-14.8			
8/18/2002	800	-0.16	-0.35	-5.2	-3.7	134	0.27	-0.12	0.24	3.6			
8/18/2002	900	-0.17	-0.15	-2.2		99	0.56	0.09	0.55	7.7			
8/18/2002	1000	-0.05	0.09	1.3	6.7	91	0.47	0.14	0.45	6.2			
8/18/2002	1100	0.15	0.25	3.4	-4.7	309	0.19	0.07	-0.18	-2.5			
8/18/2002	1200	0.3	0.34	4.5	2.4	135	0.88	-0.40	0.78	12.3			
8/18/2002	1300	0.38	0.41	5.3	7.3	106	0.47	0.02	0.47	6.7			
8/18/2002	1400	0.48	0.41	5.2		118	0.51	-0.09	0.50	7.3			
8/18/2002	1500	0.52	0.22	2.8	9.8	78	0.25	0.13	0.22	3.0			
8/18/2002	1600	0.38	-0.15	-2.0	0.2	333	0.59	0.42	-0.42	-5.4			
8/18/2002	1700	0.08	-0.53	-7.4	-8.5	304	0.83	0.23	-0.80	-10.7			
8/18/2002	1800	-0.29	-0.74	-11.3	-14.8	256	1.34	-0.71	-1.14	-19.1			
8/18/2002	1900	-0.63	-0.75	-12.5	-14.8	234	0.97	-0.78	-0.57	-10.1			
8/18/2002	2000	-0.85	-0.65	-11.7		185	0.88	-0.86	0.20	3.6			
8/18/2002	2100	-0.95	-0.42	-7.8	6.5	182	1.28	-1.23	0.35	7.3			
8/18/2002	2200	-0.86	-0.05	-0.9	5.5	232	0.58	-0.48	-0.32	-5.3			
8/18/2002	2300	-0.52	0.24	3.9	-4.2	182	0.31	-0.30	0.09	1.3			
8/19/2002	0	-0.12	0.37	5.4	3.4	156	0.73	-0.54	0.49	8.0			
8/19/2002	100	0.1	0.48	6.7	7.6	170	0.43	-0.38	0.20	3.2			
8/19/2002	200	0.23	0.6	8.1		139	0.66	-0.34	0.57	8.8			
8/19/2002	300	0.42	0.63	8.1	15.4	111	0.74	-0.04	0.74	10.6			
8/19/2002	400	0.54	0.45	5.7	8.1	0.75	0.61	0.58	-0.18	-2.3			
8/19/2002	500	0.5	0.12	1.5	2.9	0.35	0.49	0.47	-0.15	-1.9			
8/19/2002	600	0.36	-0.17	-2.2	-2.9	345	0.59	0.49	-0.32	-4.1			
8/19/2002	700	0.17	-0.33	-4.5	-9.5	323	0.42	0.24	-0.34	-4.6			
8/19/2002	800	-0.02	-0.37	-5.3		279	0.4	-0.06	-0.40	-5.7			
8/19/2002	900	-0.13	-0.31	-4.6	-2.3	322	0.11	0.06	-0.09	-1.3			
8/19/2002	1000	-0.13	-0.12	-1.8	1.1	1	0.24	0.23	-0.07	-1.0			
8/19/2002	1100	-0.03	0.12	1.7	2.7	302	0.4	0.10	-0.39	-5.4			

8/19/2002	1200	0.14	0.26	3.6	4	147	0.28	-0.18	0.22	3.3			
8/19/2002	1300	0.29	0.33	4.4	3.2	94	0.43	0.10	0.42	5.8			
8/19/2002	1400	0.38	0.38	5.0		124	0.62	-0.17	0.60	8.8			
8/19/2002	1500	0.46	0.34	4.4	13.3	101	0.34	0.04	0.34	4.8			
8/19/2002	1600	0.47	0.14	1.8	0.5	342	0.53	0.43	-0.31	-4.0			
8/19/2002	1700	0.31	-0.22	-2.9	-4	331	0.83	0.57	-0.61	-7.6			
8/19/2002	1800	0.02	-0.54	-7.7	-13.8	276	0.77	-0.16	-0.75	-11.1			
8/19/2002	1900	-0.33	-0.67	-10.3	-11.8	228	0.92	-0.80	-0.46	-8.2			
8/19/2002	2000	-0.63	-0.66	-11.1		216	0.84	-0.80	-0.26	-4.6			
8/19/2002	2100	-0.81	-0.58	-10.3		195	1	-1.00	0.05	1.0			
8/19/2002	2200	-0.89	-0.35	-6.4	-6.9	239	0.9	-0.68	-0.59	-10.1			
8/19/2002	2300	-0.79	0	0.0	-0.5	197	0.55	-0.55	0.01	0.2			
8/20/2002	0	-0.44	0.26	4.2	4	176	0.71	-0.66	0.27	4.6			
8/20/2002	100	-0.07	0.36	5.2	4.8	169	0.66	-0.58	0.32	5.3			
8/20/2002	200	0.11	0.46	6.4		152	0.48	-0.33	0.35	5.4			
8/20/2002	300	0.24	0.57	7.7		145	0.35	-0.21	0.28	4.2			
8/20/2002	400	0.42	0.57	7.3	9.6	133	0.9	-0.38	0.82	12.7			
8/20/2002	500	0.51	0.38	4.8	8.1	172	0.33	-0.30	0.14	2.2			
8/20/2002	600	0.47	0.07	0.9	0.1	46	0.32	0.28	0.15	2.0			
8/20/2002	700	0.34	-0.18	-2.4	-1.5	4	0.44	0.43	-0.11	-1.4			
8/20/2002	800	0.15	-0.31	-4.3	-2.6	128	0.46	-0.16	0.43	6.4			
8/20/2002	900	-0.02	-0.34	-4.9		258	0.59	-0.30	-0.51	-7.9			
8/20/2002	1000	-0.1	-0.29	-4.3		211	0.44	-0.43	-0.10	-1.6			
8/20/2002	1100	-0.13	-0.1	-1.5	3.2	120	0.82	-0.17	0.80	11.8			
8/20/2002	1200	-0.07	0.12	1.7	8.5	104	0.37	0.03	0.37	5.2			
8/20/2002	1300	0.09	0.26	3.6	8.7	113	0.3	-0.03	0.30	4.3			
8/20/2002	1400	0.26	0.32	4.3	2.9	147	0.36	-0.23	0.28	4.2			
8/20/2002	1500	0.38	0.36	4.7	4.4	103	0.62	0.05	0.62	8.7			
8/20/2002	1600	0.45	0.3	3.9		62	0.88	0.63	0.61	7.5			
8/20/2002	1700	0.43	0.09	1.2		136	0.4	-0.19	0.35	5.3			
8/20/2002	1800	0.28	-0.23	-3.1	2	178	0.24	-0.23	0.08	1.2			
8/20/2002	1900	0	-0.49	-7.0	-6.3	299	1.25	0.24	-1.23	-16.1			
8/20/2002	2000	-0.31	-0.59	-9.1	-17.2	268	1.07	-0.37	-1.01	-15.5			
8/20/2002	2100	-0.58	-0.6	-10.0	-13.2	240	1.33	-0.99	-0.89	-16.5			

8/20/2002	2200	-0.75	-0.54	-9.4	-9.8	188	1.22	-1.20	0.21	4.3			
8/20/2002	2300	-0.83	-0.31	-5.6	8.8	171	0.86	-0.77	0.39	6.9			
8/21/2002	200	-0.07	0.33	4.8	21	120	1.41	-0.29	1.38	20.4			
8/21/2002	300	0.1	0.44	6.1	17.3	112	1.23	-0.09	1.23	17.4			
8/21/2002	400	0.24	0.54	7.3	13.4	136	0.76	-0.36	0.67	10.4			
8/21/2002	500	0.41	0.54	7.0	6	153	0.74	-0.52	0.52	8.6			
8/21/2002	600	0.5	0.35	4.4	7.9	132	0.79	-0.32	0.72	11.1			
8/21/2002	700	0.47	0.06	0.8	10.2	158	0.82	-0.63	0.53	8.9			
8/21/2002	800	0.35	-0.18	-2.4		200	0.61	-0.61	-0.02	-0.4			
8/21/2002	900	0.17	-0.29	-4.0	-1.8	189	0.66	-0.65	0.10	1.8			
8/21/2002	1000	0.01	-0.34	-4.8	4.2	211	0.96	-0.94	-0.22	-4.0			
8/21/2002	1100	-0.09	-0.3	-4.4	-8.7	234	0.72	-0.58	-0.42	-7.1			
8/21/2002	1200	-0.17	-0.13	-1.9	-4.9	205	0.2	-0.20	-0.02	-0.4			
8/21/2002	1300	-0.16	0.09	1.3	1.2	118	0.81	-0.14	0.80	11.7			
8/21/2002	1400	0.02	0.24	3.4		110	0.78	-0.03	0.78	11.1			
8/21/2002	1500	0.23	0.32	4.3	13	102	0.7	0.07	0.70	9.7			
8/21/2002	1600	0.36	0.35	4.6	16.5	102	0.82	0.09	0.82	11.3			
8/21/2002	1700	0.42	0.27	3.5	3.6	40	0.12	0.11	0.04	0.6			
8/21/2002	1800	0.4	0.08	1.0	-3.5	312	0.84	0.34	-0.77	-10.0			
8/21/2002	1900	0.26	-0.19	-2.6	-7.8	300	0.17	0.04	-0.17	-2.4			
8/21/2002	2000	0.02	-0.42	-6.0		225	0.8	-0.71	-0.36	-6.3			
8/22/2002	1300	-0.26	-0.18	-2.8		187	0.34	-0.33	0.06	1.0			
8/22/2002	1400	-0.26	0.05	0.8		124	0.25	-0.07	0.24	3.5			
8/22/2002	1600	0.21	0.31	4.2	7	178	0.74	-0.70	0.25	4.4			
8/22/2002	1700	0.32	0.32	4.2	5.8	259	0.17	-0.08	-0.15	-2.2			
8/23/2002	1900	0.3	0.28	3.7	0.8	119	0.65	-0.12	0.64	9.3			
8/23/2002	2000	0.34	0.16	2.1	6.9	174	0.27	-0.25	0.11	1.7			
8/23/2002	2100	0.27	-0.07	-0.9	-2.7	249	0.72	-0.45	-0.56	-9.0			
8/23/2002	2200	0.07	-0.3	-4.2	-10.9	242	1.39	-1.00	-0.97	-17.8			
8/23/2002	2300	-0.19	-0.44	-6.6	-13	235	1.49	-1.19	-0.90	-17.7			
8/24/2002	0	-0.43	-0.51	-8.1	-12.5	236	1.6	-1.26	-0.99	-19.8			
8/24/2002	100	-0.65	-0.47	-8.0	-8.9	228	1.2	-1.04	-0.60	-11.5			
8/24/2002	200	-0.8	-0.28	-5.0		221	1.58	-1.45	-0.62	-13.6			
8/24/2002	300	-0.69	-0.03	-0.5		215	0.9	-0.86	-0.26	-4.8			

8/24/2002	400	-0.36	0.18	2.8	-0.7	199	1.08	-1.08	-0.02	-0.4			
8/24/2002	500	-0.08	0.36	5.2	6.7	166	0.93	-0.79	0.49	8.7			
8/24/2002	600	0.08	0.52	7.3	11.1	125	1.06	-0.31	1.01	15.4			
8/24/2002	700	0.29	0.61	8.1	11.3	98	0.92	0.16	0.91	12.3			
8/24/2002	800	0.52	0.58	7.3	15.8	84	0.95	0.39	0.87	11.2			
8/24/2002	900	0.67	0.37	4.5		62	0.92	0.66	0.64	7.8			
8/24/2002	1000	0.65	0.05	0.6		124	0.22	-0.06	0.21	3.1			
8/24/2002	1100	0.46	-0.22	-2.8	1.5	231	0.63	-0.53	-0.34	-5.6			
8/24/2002	1200	0.22	-0.41	-5.5	-6.1	234	1.44	-1.16	-0.85	-16.6			
8/24/2002	1300	-0.01	-0.54	-7.7	-8.5	236	1.55	-1.22	-0.95	-19.0			
8/24/2002	1400	-0.28	-0.51	-7.8	-11.2	225	0.78	-0.69	-0.35	-6.1			
8/24/2002	1500	-0.47	-0.29	-4.7	1.3	199	0.8	-0.80	-0.01	-0.2			
8/24/2002	1600	-0.36	-0.01	-0.2	4.7	181	0.79	-0.76	0.23	4.1			
8/24/2002	1700	-0.05	0.17	2.5		183	0.66	-0.64	0.17	2.9			
8/24/2002	1800	0.13	0.26	3.6		191	0.74	-0.73	0.09	1.6			
8/24/2002	1900	0.19	0.31	4.2	4.9	136	0.7	-0.33	0.62	9.6			
8/24/2002	2000	0.26	0.32	4.3	10.3	102	0.58	0.06	0.58	8.1			
8/24/2002	2100	0.33	0.2	2.6	2.5	220	0.2	-0.19	-0.07	-1.1			
8/24/2002	2200	0.28	-0.04	-0.5	-13.5	257	0.9	-0.46	-0.77	-12.3			
8/24/2002	2300	0.09	-0.27	-3.8	-9.6	241	0.89	-0.65	-0.61	-10.3			
8/25/2002	200	-0.64	-0.45	-7.6	-5.2	218	1.86	-1.75	-0.64	-15.8			
8/25/2002	300	-0.76	-0.26	-4.6	-0.6	204	1.97	-1.96	-0.21	-5.8			
8/25/2002	400	-0.6	0	0.0	3.1	200	1.37	-1.37	-0.05	-1.0			
8/25/2002	500	-0.28	0.22	3.4	8	162	1.4	-1.13	0.82	16.0			
8/25/2002	600	-0.04	0.4	5.8	15.5	163	1.17	-0.96	0.67	12.4			
8/25/2002	700	0.12	0.56	7.7	7.6	146	1.06	-0.65	0.84	14.0			
8/25/2002	800	0.35	0.64	8.4	6.3	156	0.9	-0.67	0.60	10.2			
8/25/2002	900	0.59	0.59	7.3		134	0.69	-0.30	0.62	9.5			
8/25/2002	1000	0.71	0.33	4.0	4.5	165	0.41	-0.34	0.22	3.5			
8/25/2002	1100	0.63	-0.02	-0.2	2.7	231	0.63	-0.53	-0.34	-5.6			
8/25/2002	1200	0.39	-0.3	-3.9	-8.3	237	0.78	-0.61	-0.49	-8.2			
8/25/2002	1300	0.12	-0.49	-6.8	-7.8	238	1.07	-0.82	-0.69	-12.2			
8/25/2002	1400	-0.13	-0.61	-9.0	-15.4	248	1.08	-0.69	-0.83	-14.1			
8/25/2002	1500	-0.39	-0.54	-8.5									

8/25/2002	1600	-0.52	-0.28	-4.6									
8/25/2002	1700	-0.33	0	0.0	1.8	174	0.66	-0.60	0.27	4.5			
8/25/2002	1800	-0.05	0.17	2.5	12	152	1.01	-0.70	0.73	12.4			
8/25/2002	1900	0.09	0.28	3.9	7.7	131	0.93	-0.36	0.86	13.2			
8/25/2002	2000	0.14	0.36	5.0	9.7	107	0.58	0.01	0.58	8.2			
8/25/2002	2100	0.26	0.36	4.8	2.7	168	0.23	-0.20	0.12	1.7			
8/25/2002	2200	0.34	0.23	3.0	5.9	115	0.8	-0.10	0.79	11.5			
8/25/2002	2300	0.28	-0.03	-0.4									
8/26/2002	0	0.08	-0.25	-3.5									
8/26/2002	100	-0.15	-0.4	-5.9									
8/26/2002	200	-0.39	-0.48	-7.6	-16.5	239	1.56	-1.18	-1.02	-19.9			
8/26/2002	300	-0.6	-0.43	-7.2	-15.3	208	1.41	-1.39	-0.24	-5.4			
8/26/2002	400	-0.67	-0.22	-3.8	4.1	194	1.38	-1.38	0.10	2.1			
8/26/2002	500	-0.47	0.04	0.6	9.4	160	1.3	-1.02	0.80	15.1			
8/26/2002	600	-0.18	0.25	3.7		115	1.27	-0.15	1.26	18.2			
8/26/2002	700	0.01	0.44	6.3		130	0.99	-0.37	0.92	14.2			
8/26/2002	800	0.18	0.59	8.0	11.9	123	1.22	-0.32	1.18	17.7			
8/26/2002	900	0.43	0.65	8.3	15.9	120	0.83	-0.17	0.81	12.0			
8/26/2002	1000	0.63	0.53	6.5	5.6	154	0.13	-0.09	0.09	1.3			
8/26/2002	1100	0.67	0.22	2.7	-3.4	3	0.68	0.66	-0.18	-2.2			
8/26/2002	1200	0.52	-0.15	-1.9	0.7	134	0.58	-0.25	0.52	7.9			
8/26/2002	1300	0.24	-0.4	-5.4	4	164	0.41	-0.34	0.23	3.6			
8/26/2002	1400	-0.02	-0.57	-8.2		182	0.57	-0.55	0.16	2.6			
8/26/2002	1500	-0.26	-0.64	-9.7	-1.9	208	0.94	-0.93	-0.16	-3.0			
8/26/2002	1600	-0.48	-0.51	-8.2	6	217	1.3	-1.23	-0.42	-8.7			
8/26/2002	1700	-0.52	-0.22	-3.6	-13	212	1.16	-1.13	-0.28	-5.6			
8/26/2002	1800	-0.28	0.05	0.8	7	146	0.81	-0.50	0.64	10.3			
8/26/2002	1900	-0.03	0.22	3.2	12.7	114	1.2	-0.13	1.19	17.1			
8/26/2002	2000	0.06	0.34	4.8									
8/26/2002	2100	0.15	0.42	5.8									
8/26/2002	2200	0.29	0.39	5.2									
8/26/2002	2300	0.35	0.21	2.8	-3	234	0.46	-0.37	-0.27	-4.3			
8/27/2002	0	0.26	-0.05	-0.7	-10.2	262	1.43	-0.63	-1.29	-20.9			
8/27/2002	100	0.07	-0.27	-3.8									

8/27/2002	200	-0.15	-0.41	-6.1	-5.7	246	1.85	-1.24	-1.37	-26.5			
8/27/2002	300	-0.38	-0.47	-7.4	-15	224	1.43	-1.29	-0.63	-13.0			
8/27/2002	400	-0.54	-0.38	-6.3	-3.1	189	0.85	-0.84	0.13	2.4			
8/27/2002	500	-0.53	-0.15	-2.5									
8/27/2002	600	-0.31	0.08	1.2		125	1.16	-0.34	1.11	16.9			
8/27/2002	700	-0.08	0.28	4.1	13.7	141	0.86	-0.47	0.72	11.5			
8/27/2002	800	0.07	0.47	6.6	13.2	153	0.73	-0.52	0.52	8.4			
8/27/2002	900	0.26	0.6	8.0	7.9	107	1.1	0.02	1.10	15.3			
8/27/2002	1000	0.49	0.59	7.5	12.6	117	0.85	-0.13	0.84	12.2			
8/27/2002	1100	0.62	0.39	4.8	7.3	140	0.56	-0.30	0.47	7.3			
8/27/2002	1200	0.55	0.04	0.5		185	0.99	-0.96	0.22	4.2			
8/27/2002	1300	0.34	-0.29	-3.8		208	0.39	-0.38	-0.07	-1.1			
8/27/2002	1400	0.05	-0.49	-6.9									
8/27/2002	1500	-0.19	-0.61	-9.1									
8/27/2002	1600	-0.38	-0.61	-9.6	-6.7	222	1.58	-1.44	-0.64	-14.1			
8/27/2002	1700	-0.53	-0.41	-6.7	-8.5	209	1.32	-1.30	-0.25	-5.3			
8/27/2002	1800	-0.47	-0.11	-1.8	7.4	142	0.87	-0.49	0.72	11.6			
8/27/2002	1900	-0.21	0.14	2.1									
8/27/2002	2000	-0.01	0.31	4.4									
8/27/2002	2100	0.07	0.43	6.0	12.5	106	0.48	0.02	0.48	6.8			
8/27/2002	2200	0.19	0.47	6.4	2.3	111	0.84	-0.04	0.84	12.0			
8/27/2002	2300	0.33	0.39	5.1	8.5	81	0.28	0.13	0.25	3.5			
8/28/2002	0	0.34	0.17	2.2	-1.9	158	0.44	-0.34	0.28	4.4			
8/28/2002	100	0.23	-0.1	-1.4	-0.2	234	0.67	-0.54	-0.39	-6.5			
8/28/2002	200	0.04	-0.31	-4.4		251	0.71	-0.43	-0.57	-9.0			
8/28/2002	300	-0.17	-0.43	-6.4		238	0.68	-0.52	-0.44	-7.2			
8/28/2002	400	-0.36	-0.45	-7.0	-5.7	235	0.57	-0.46	-0.34	-5.5			
8/28/2002	500	-0.45	-0.3	-4.8	-0.2	230	0.71	-0.60	-0.38	-6.3			
8/28/2002	600	-0.36	-0.08	-1.3	-3.5	159	0.74	-0.58	0.47	7.7			
8/28/2002	700	-0.16	0.13	1.9	8.9	144	0.88	-0.52	0.71	11.6			
8/28/2002	800	0.02	0.32	4.6	13.5	104	1.26	0.09	1.26	17.1			
8/28/2002	900	0.15	0.5	6.9		100	1.13	0.16	1.12	15.1			
8/28/2002	1000	0.35	0.57	7.5		75	0.69	0.38	0.58	7.5			
8/28/2002	1100	0.53	0.47	5.9	1.4	34	0.11	0.11	0.03	0.4			

8/28/2002	1200	0.54	0.19	2.4	3.8	154	0.62	-0.45	0.43	6.9			
8/28/2002	1300	0.38	-0.16	-2.1	-1.3	225	0.77	-0.69	-0.35	-6.0			
8/28/2002	1400	0.13	-0.43	-5.9	-6.2	229	1.08	-0.93	-0.56	-10.3			
8/28/2002	1500	-0.14	-0.56	-8.3	-9.6	245	1.08	-0.74	-0.79	-13.6			
8/28/2002	1600	-0.33	-0.62	-9.6	-10.1	232	1.44	-1.19	-0.81	-16.0			
8/28/2002	1700	-0.47	-0.53	-8.5	-7.4	215	1.22	-1.17	-0.36	-7.2			
8/28/2002	1800	-0.53	-0.27	-4.4		215	1.07	-1.02	-0.31	-6.0			
8/28/2002	1900	-0.4	0.03	0.5		185	0.74	-0.72	0.17	2.9			
8/28/2002	2000	-0.14	0.25	3.7	8.1	149	0.65	-0.43	0.49	7.8			
8/28/2002	2100	0.02	0.41	5.8	10.6	117	0.93	-0.15	0.92	13.4			
8/28/2002	2200	0.12	0.51	7.1	14	95	1.14	0.26	1.11	14.6			
8/28/2002	2300	0.26	0.49	6.6	11.5	71	0.91	0.55	0.73	9.1			
8/29/2002	0	0.35	0.35	4.6	3.4	86	0.27	0.10	0.25	3.5			
8/29/2002	100	0.31	0.1	1.3									
8/29/2002	200	0.18	-0.17	-2.3		278	0.97	-0.17	-0.96	-14.0			
8/29/2002	300	0	-0.36	-5.1	-5.5	229	0.97	-0.83	-0.50	-9.0			
8/29/2002	400	-0.19	-0.43	-6.4	-1	223	1.01	-0.92	-0.43	-7.9			
8/29/2002	500	-0.33	-0.38	-5.9	-5	217	0.99	-0.94	-0.32	-6.0			
8/29/2002	600	-0.33	-0.2	-3.1	-0.7	203	0.77	-0.77	-0.07	-1.2			
8/29/2002	700	-0.21	0	0.0	-1.1	179	0.69	-0.65	0.22	3.8			
8/29/2002	800	-0.03	0.19	2.7	4.3	173	0.71	-0.64	0.30	5.1			
8/29/2002	900	0.1	0.38	5.3		144	0.92	-0.54	0.74	12.1			
8/29/2002	1000	0.24	0.52	7.0	9.5	114	0.61	-0.06	0.61	8.8			
8/29/2002	1100	0.43	0.49	6.3	8.9	91	0.42	0.12	0.40	5.6			
8/29/2002	1200	0.52	0.28	3.5	3.7	57	0.4	0.31	0.25	3.3			
8/29/2002	1300	0.42	-0.04	-0.5	-3.7	328	0.35	0.22	-0.27	-3.6			
8/29/2002	1400	0.2	-0.34	-4.6	-10.5	268	0.46	-0.16	-0.43	-6.4			
8/29/2002	1500	-0.06	-0.54	-7.8	-6.6	266	1.03	-0.39	-0.95	-14.8			
8/29/2002	1600	-0.3	-0.61	-9.4									
8/29/2002	1700	-0.45	-0.58	-9.3									
8/29/2002	1800	-0.53	-0.4	-6.6	9.9	144	0.78	-0.46	0.63	10.1			
8/29/2002	1900	-0.51	-0.11	-1.8	7.3	168	0.36	-0.31	0.18	2.8			
8/29/2002	2000	-0.32	0.16	2.5	3	117	0.5	-0.08	0.49	7.2			
8/29/2002	2100	-0.08	0.36	5.2	4.2	99	0.49	0.08	0.48	6.8			

8/29/2002	2200	0.07	0.5	7.0	4.5	105	0.53	0.03	0.53	7.5			
8/29/2002	2300	0.18	0.56	7.6									
8/30/2002	0	0.32	0.47	6.2	11	103	0.41	0.04	0.41	5.8			
8/30/2002	100	0.36	0.26	3.4	0.7	8	0.53	0.52	-0.09	-1.2			
8/30/2002	200	0.27	0	0.0									
8/30/2002	300	0.14	-0.25	-3.5									
8/30/2002	400	-0.04	-0.39	-5.6		358	0.26	0.24	-0.09	-1.2			
8/30/2002	500	-0.21	-0.4	-6.0		306	0.82	0.25	-0.78	-10.4			
8/30/2002	600	-0.27	-0.28	-4.3									
8/30/2002	700	-0.21	-0.09	-1.4									
8/30/2002	800	-0.08	0.09	1.3		202	0.2	-0.20	-0.01	-0.2			
8/30/2002	900	0.07	0.27	3.8	3.3	70	0.68	0.42	0.54	6.9			
8/30/2002	1000	0.18	0.44	6.0	8.2	101	0.65	0.08	0.65	9.0			
8/30/2002	1100	0.33	0.51	6.7	1.3	40	0.68	0.63	0.25	3.1			
8/30/2002	1200	0.47	0.36	4.6	5.6	30	0.76	0.74	0.16	1.9			
8/30/2002	1300	0.46	0.07	0.9	-4.2	355	0.56	0.52	-0.22	-2.8			
8/30/2002	1400	0.28	-0.24	-3.2	-5.3	314	0.65	0.28	-0.58	-7.8			
8/30/2002	1500	0.03	-0.49	-6.9		273	0.76	-0.20	-0.73	-10.9			
8/30/2002	1600	-0.23	-0.62	-9.3									
8/30/2002	1700	-0.44	-0.62	-9.9	-10.3	219	0.89	-0.83	-0.32	-5.7			
8/30/2002	1800	-0.54	-0.5	-8.2	-0.6	214	0.98	-0.94	-0.27	-5.0			
8/30/2002	1900	-0.57	-0.26	-4.3	3.8	189	0.88	-0.87	0.14	2.5			
8/30/2002	2000	-0.48	0.03	0.5	6.6	178	1.09	-1.02	0.37	7.1			
8/30/2002	2100	-0.25	0.27	4.1	6.2	165	1.02	-0.86	0.56	10.0			
8/30/2002	2200	-0.02	0.44	6.3	13.6	110	1.32	-0.05	1.32	18.5			
8/30/2002	2300	0.12	0.57	7.9									
8/31/2002	0	0.25	0.56	7.5									
8/31/2002	100	0.37	0.4	5.2	15	57	1.41	1.10	0.89	9.9			
8/31/2002	200	0.36	0.15	2.0	7.5	323	0.46	0.26	-0.38	-5.1			
8/31/2002	300	0.24	-0.11	-1.5	-3.5	140	0.2	-0.11	0.17	2.5			
8/31/2002	400	0.11	-0.32	-4.5	-11	283	1.13	-0.10	-1.13	-16.1			
8/31/2002	500	-0.06	-0.39	-5.7	-6.8	243	0.52	-0.37	-0.37	-5.8			
8/31/2002	600	-0.2	-0.33	-5.0		201	0.58	-0.58	-0.03	-0.5			
8/31/2002	700	-0.21	-0.18	-2.7		157	0.52	-0.39	0.34	5.4			

8/31/2002	800	-0.11	0.02	0.3		109	0.49	-0.01	0.49	7.0			
8/31/2002	900	0.02	0.19	2.7	7.2	89	0.73	0.24	0.69	9.3			
8/31/2002	1000	0.14	0.36	5.0	9.4	129	0.74	-0.27	0.69	10.5			
8/31/2002	1100	0.25	0.48	6.4	4.9	55	0.29	0.23	0.17	2.4			
8/31/2002	1200	0.39	0.45	5.9	0.4	53	1.35	1.11	0.77	8.6			
8/31/2002	1300	0.47	0.21	2.7		41	0.68	0.63	0.27	3.3			
8/31/2002	1400	0.38	-0.11	-1.4	-0.5	350	1.05	0.93	-0.49	-5.7			
8/31/2002	1500	0.14	-0.4	-5.5	-14.7	302	0.93	0.22	-0.90	-12.1			
8/31/2002	1600	-0.12	-0.6	-8.8	-13	246	1.08	-0.72	-0.80	-13.8			
8/31/2002	1700	-0.37	-0.65	-10.2	-10.5	221	1.54	-1.42	-0.60	-13.1			
8/31/2002	1800	-0.55	-0.58	-9.5	-6.6	210	1.76	-1.72	-0.37	-9.1			
8/31/2002	1900	-0.62	-0.4	-6.7									
8/31/2002	2000	-0.6	-0.13	-2.2									
8/31/2002	2100	-0.45	0.15	2.4									
8/31/2002	2200	-0.18	0.35	5.2	13.6	116	1	-0.14	0.99	14.4			
8/31/2002	2300	0.04	0.5	7.1	11.1	94	1.05	0.25	1.02	13.5			
9/1/2002	0	0.17	0.59	8.1	13.2	91	1.05	0.31	1.00	13.1			
9/1/2002	100	0.32	0.52	6.9	15.8	83	0.66	0.28	0.60	8.0			
9/1/2002	200	0.42	0.3	3.9	14.4	89	0.84	0.27	0.79	10.5			
9/1/2002	300	0.37	0.04	0.5		215	0.71	-0.68	-0.21	-3.6			
9/1/2002	400	0.24	-0.21	-2.8		333	0.67	0.47	-0.47	-6.0			
9/1/2002	500	0.1	-0.36	-5.0		340	1.11	0.87	-0.68	-8.0			
9/1/2002	600	-0.07	-0.37	-5.4		291	0.99	0.05	-0.99	-13.7			
9/1/2002	700	-0.17	-0.26	-3.9		247	1.03	-0.68	-0.78	-13.2			
9/1/2002	800	-0.13	-0.08	-1.2		189	1.13	-1.12	0.18	3.5			
9/1/2002	900	-0.02	0.12	1.7		190	1.11	-1.10	0.15	3.0			
9/1/2002	1000	0.1	0.28	3.9		205	0.73	-0.72	-0.09	-1.6			
9/1/2002	1100	0.2	0.42	5.7		195	0.73	-0.73	0.04	0.7			
9/1/2002	1200	0.3	0.48	6.4	3.6	143	0.91	-0.52	0.75	12.1			
9/1/2002	1300	0.42	0.36	4.7	6	91	0.43	0.13	0.41	5.7			
9/1/2002	1400	0.44	0.07	0.9	4.1	296	0.56	0.08	-0.55	-7.7			
9/1/2002	1500	0.28	-0.25	-3.3	-8	271	0.69	-0.20	-0.66	-9.9			
9/1/2002	1600	0.01	-0.52	-7.4	-17.3	246	1.37	-0.92	-1.02	-18.3			
9/1/2002	1700	-0.25	-0.65	-9.8									

9/1/2002	1800	-0.49	-0.64	-10.3									
9/1/2002	1900	-0.65	-0.51	-8.7	0.6	197	1.94	-1.94	0.03	0.9			
9/1/2002	2000	-0.68	-0.3	-5.2	2	200	1.61	-1.61	-0.06	-1.3			
9/1/2002	2100	-0.61	-0.02	-0.3	4.1	181	1.28	-1.22	0.37	7.7			
9/1/2002	2200	-0.4	0.24	3.8	22.2	142	1.6	-0.89	1.33	23.1			
9/1/2002	2300	-0.12	0.41	6.0	20	142	1.4	-0.78	1.16	19.8			
9/2/2002	0	0.08	0.53	7.4	15.2	130	1.13	-0.42	1.05	16.3			
9/2/2002	100	0.22	0.57	7.7	11.6	137	1.13	-0.55	0.99	16.0			
9/2/2002	200	0.39	0.45	5.9	12.2	134	0.93	-0.41	0.84	13.1			
9/2/2002	300	0.46	0.2	2.6		102	0.51	0.05	0.51	7.1			
9/2/2002	400	0.37	-0.06	-0.8	14.8	78	0.14	0.07	0.12	1.7			
9/2/2002	500	0.23	-0.27	-3.7	0	215	0.42	-0.40	-0.12	-2.0			
9/2/2002	600	0.09	-0.37	-5.2	-4.5	226	0.65	-0.57	-0.31	-5.1			
9/2/2002	700	-0.08	-0.33	-4.8	-7.7	218	0.95	-0.89	-0.32	-6.0			
9/2/2002	800	-0.14	-0.2	-3.0									
9/2/2002	900	-0.07	0	0.0									
9/2/2002	1000	0.04	0.2	2.8									
9/2/2002	1100	0.14	0.35	4.8									
9/2/2002	1200	0.23	0.44	5.9									
9/2/2002	1300	0.33	0.44	5.8									
9/2/2002	1400	0.43	0.27	3.5									
9/2/2002	1500	0.41	-0.04	-0.5									
9/2/2002	1600	0.2	-0.36	-4.9									
9/2/2002	1700	-0.08	-0.58	-8.4									
9/2/2002	1800	-0.35	-0.65	-10.1									
9/2/2002	1900	-0.58	-0.58	-9.6									
9/2/2002	2000	-0.71	-0.44	-7.6									
9/2/2002	2100	-0.71	-0.22	-3.8									
9/2/2002	2200	-0.59	0.07	1.2									
9/2/2002	2300	-0.35	0.31	4.9									
9/3/2002	0	-0.06	0.44	6.4									
9/3/2002	100	0.12	0.53	7.3									
9/3/2002	200	0.27	0.53	7.1									
9/3/2002	300	0.44	0.38	4.9									

9/3/2002	400	0.47	0.12	1.5									
9/3/2002	500	0.36	-0.13	-1.7									
9/3/2002	600	0.22	-0.31	-4.2									
9/3/2002	700	0.07	-0.37	-5.2									
9/3/2002	800	-0.09	-0.31	-4.5									
9/3/2002	900	-0.13	-0.16	-2.4									
9/3/2002	1000	-0.04	0.06	0.9									
9/3/2002	1100	0.06	0.26	3.7									
9/3/2002	1200	0.15	0.38	5.2									
9/3/2002	1300	0.25	0.44	5.9									
9/3/2002	1400	0.36	0.4	5.2									
9/3/2002	1500	0.45	0.2	2.6									
9/3/2002	1600	0.38	-0.12	-1.6									
9/3/2002	1700	0.14	-0.41	-5.7									
9/3/2002	1800	-0.15	-0.58	-8.6									
9/3/2002	1900	-0.41	-0.6	-9.5									
9/3/2002	2000	-0.62	-0.53	-8.9	-3.2	215	1.47	-1.41	-0.43	-9.4			
9/3/2002	2100	-0.73	-0.39	-6.8	-1.1	199	1.37	-1.37	-0.02	-0.5			
9/3/2002	2200	-0.72	-0.16	-2.8	0.4	173	1.12	-1.02	0.47	9.0			
9/3/2002	2300	-0.57	0.14	2.3	8.9	152	1.14	-0.79	0.82	14.3			
9/4/2002	0	-0.3	0.34	5.3	12.3	125	0.81	-0.24	0.77	11.6			
9/4/2002	100	-0.02	0.43	6.2									
9/4/2002	200	0.15	0.5	6.9									
9/4/2002	300	0.31	0.49	6.5									
9/4/2002	400	0.46	0.33	4.2									
9/4/2002	500	0.47	0.07	0.9									
9/4/2002	600	0.34	-0.16	-2.1									
9/4/2002	700	0.19	-0.32	-4.4									
9/4/2002	800	0.03	-0.35	-5.0									
9/4/2002	900	-0.11	-0.29	-4.3									
9/4/2002	1000	-0.12	-0.13	-1.9									
9/4/2002	1100	-0.04	0.09	1.3									
9/4/2002	1200	0.05	0.29	4.1									
9/4/2002	1300	0.15	0.39	5.4									

9/4/2002	1400	0.28	0.42	5.6									
9/4/2002	1500	0.42	0.37	4.8									
9/4/2002	1600	0.48	0.15	1.9									
9/4/2002	1700	0.37	-0.16	-2.1									
9/4/2002	1800	0.12	-0.42	-5.8	-12	266	0.98	-0.37	-0.91	-14.0			
9/4/2002	1900	-0.17	-0.55	-8.2	-12.1	236	1.4	-1.10	-0.86	-16.6			
9/4/2002	2000	-0.42	-0.56	-8.9	-12.2	221	1.81	-1.67	-0.71	-16.9			
9/4/2002	2100	-0.63	-0.51	-8.6									
9/4/2002	2200	-0.73	-0.39	-6.8									
9/4/2002	2300	-0.71	-0.13	-2.3	2.3	187	0.78	-0.77	0.15	2.6			
9/5/2002	0	-0.55	0.16	2.7	3.8	182	1.25	-1.20	0.34	7.0			
9/5/2002	100	-0.26	0.33	5.0	5.8	160	1.06	-0.84	0.65	11.7			
9/5/2002	200	0	0.4	5.7		128	1.1	-0.38	1.03	15.9			
9/5/2002	300	0.17	0.48	6.6		61	1.31	0.96	0.89	10.2			
9/5/2002	400	0.33	0.48	6.3	10.1	46	1.16	1.02	0.54	6.2			
9/5/2002	500	0.46	0.31	4.0	5.9	35	1.09	1.04	0.32	3.6			
9/5/2002	600	0.44	0.06	0.8	0.6	5	0.8	0.78	-0.18	-2.2			
9/5/2002	700	0.31	-0.17	-2.3		336	0.97	0.72	-0.65	-7.8			
9/5/2002	800	0.17	-0.31	-4.3		308	0.74	0.25	-0.70	-9.3			
9/5/2002	900	-0.01	-0.35	-5.0	-8.1	299	0.57	0.11	-0.56	-7.8			
9/5/2002	1000	-0.15	-0.29	-4.3	-6.8	257	0.35	-0.18	-0.30	-4.5			
9/5/2002	1100	-0.15	-0.13	-1.9	-3.5	296	0.22	0.03	-0.22	-3.1			
9/5/2002	1200	-0.09	0.1	1.5		138	0.45	-0.23	0.39	5.9			
9/5/2002	1300	0	0.3	4.3	5.2	45	0.78	0.69	0.35	4.3			
9/5/2002	1400	0.15	0.39	5.4	6.2	41	0.92	0.85	0.36	4.2			
9/5/2002	1500	0.34	0.42	5.5	5.8	42	0.79	0.72	0.32	3.9			
9/5/2002	1600	0.48	0.35	4.5									
9/5/2002	1700	0.5	0.13	1.7									
9/5/2002	1800	0.37	-0.15	-2.0	-3.5	223	0.48	-0.44	-0.20	-3.3			
9/5/2002	1900	0.12	-0.38	-5.3	-0.1	217	0.86	-0.81	-0.28	-5.0			
9/5/2002	2000	-0.15	-0.5	-7.4	-7.4	242	1.19	-0.86	-0.83	-14.7			
9/5/2002	2100	-0.4	-0.54	-8.5									
9/5/2002	2200	-0.61	-0.53	-8.9									
9/5/2002	2300	-0.72	-0.41	-7.1	2.4	282	0.49	-0.05	-0.49	-7.0			

9/6/2002	0	-0.71	-0.14	-2.4	3.9	176	0.29	-0.27	0.11	1.7			
9/6/2002	100	-0.54	0.15	2.5	5.6	93	0.55	0.14	0.53	7.3			
9/6/2002	200	-0.24	0.29	4.4		105	0.89	0.05	0.89	12.4			
9/6/2002	300	0.01	0.38	5.4	14.5	127	1.14	-0.37	1.08	16.5			
9/6/2002	400	0.17	0.48	6.6	11.9	114	0.97	-0.10	0.96	13.9			
9/6/2002	500	0.34	0.49	6.4	7.9	93	0.7	0.18	0.68	9.2			
9/6/2002	600	0.46	0.33	4.2		74	0.95	0.53	0.79	9.9			
9/6/2002	700	0.44	0.08	1.0		26	1.05	1.04	0.15	1.7			
9/6/2002	800	0.32	-0.15	-2.0	-1.8	348	0.82	0.71	-0.41	-5.0			
9/6/2002	900	0.15	-0.3	-4.1	-5.5	314	0.6	0.26	-0.54	-7.2			
9/6/2002	1000	-0.05	-0.37	-5.4	-7.4	290	0.6	0.02	-0.60	-8.5			
9/6/2002	1100	-0.19	-0.33	-5.0									
9/6/2002	1200	-0.21	-0.17	-2.6									
9/6/2002	1300	-0.19	0.08	1.2									
9/6/2002	1400	-0.07	0.3	4.4									
9/6/2002	1500	0.17	0.4	5.5									
9/6/2002	1600	0.4	0.43	5.6									
9/6/2002	1700	0.5	0.35	4.4									
9/6/2002	1800	0.5	0.16	2.0									
9/6/2002	1900	0.38	-0.09	-1.2									
9/6/2002	2000	0.16	-0.31	-4.3									
9/6/2002	2100	-0.1	-0.46	-6.7									
9/6/2002	2200	-0.36	-0.55	-8.6									
9/6/2002	2300	-0.58	-0.58	-9.6									
9/9/2002	200	0.3	-0.2	-2.7									
9/9/2002	300	0.3	0	0.0									
9/9/2002	400	0.4	0.2	2.6									
9/9/2002	500	0.5	0.4	5.1									
9/9/2002	600	0.7	0.7	8.5									
9/9/2002	700	0.9	0.9	10.4									
9/9/2002	800	1.1	0.8	8.9									
9/9/2002	900	1.3	0.6	6.5									
9/9/2002	1000	1.4	0.4	4.2									

9/9/2002	1100	1.2	0.2	2.2									
9/9/2002	1200	1	0	0.0									
9/9/2002	1300	0.8	-0.1	-1.2									
9/9/2002	1400	0.6	0	0.0									
9/9/2002	1500	0.5	0.2	2.5									
9/9/2002	1600	0.5	0.4	5.1									
9/9/2002	1700	0.6	0.6	7.4									
9/9/2002	1800	0.7	0.8	9.7									
9/9/2002	1900	0.8	0.9	10.6									
9/9/2002	2000	1	0.9	10.2									
9/9/2002	2100	1.2	0.8	8.7									
9/9/2002	2200	1.3	0.5	5.4									
9/9/2002	2300	1.1	0.2	2.2									
9/10/2002	0	1	-0.2	-2.3									
9/10/2002	100	0.6	-0.3	-3.7									
9/10/2002	200	0.3	-0.2	-2.7									
9/10/2002	300	0	-0.1	-1.4									
9/10/2002	400	0	0.1	1.4									
9/10/2002	500	0.1	0.4	5.6									
9/10/2002	600	0.3	0.6	7.9									
9/10/2002	700	0.6	0.8	9.9									
9/10/2002	800	0.8	1	11.8									
9/10/2002	900	1	0.9	10.2									
9/10/2002	1000	1.2	0.6	6.6									
9/10/2002	1100	1	0.4	4.6									
9/10/2002	1200	0.8	0.1	1.2									
9/10/2002	1300	0.6	-0.1	-1.2									
9/10/2002	1400	0.4	-0.1	-1.3									
9/10/2002	1500	0.2	0	0.0									
9/10/2002	1600	0	0.1	1.4									
9/10/2002	1700	0.1	0.2	2.8									
9/10/2002	1800	0.2	0.4	5.4									
9/10/2002	1900	0.4	0.6	7.8									
9/10/2002	2000	0.6	0.8	9.9									

9/10/2002	2100	0.8	0.9	10.6									
9/10/2002	2200	0.9	0.8	9.3									
9/10/2002	2300	0.8	0.6	7.1		345	0.25	0.21	-0.14	-1.9			
9/11/2002	0	0.8	0	0.0		269	0.54	-0.18	-0.51	-7.6			
9/11/2002	100	0.5	-0.3	-3.8		247	0.98	-0.64	-0.74	-12.4			
9/11/2002	200	0.2	-0.4	-5.4									
9/11/2002	300	-0.7	-0.7	-12.0									
9/11/2002	400	-0.9	-0.5	-9.2									
9/11/2002	500	-0.8	-0.1	-1.8									
9/11/2002	600	-0.3	0.2	3.1									
9/11/2002	700	0	0.3	4.3		79	0.76	0.37	0.66	8.7			
9/11/2002	800	0.2	0.5	6.8		83	0.72	0.30	0.65	8.6			
9/11/2002	900	0.4	0.6	7.8		90	1.04	0.32	0.99	12.9			
9/11/2002	1000	0.6	0.5	6.2		42	0.65	0.59	0.26	3.3			
9/11/2002	1100	0.6	0.2	2.5		31	0.71	0.69	0.16	1.9			
9/11/2002	1200	0.5	-0.1	-1.3		300	0.48	0.10	-0.47	-6.5			
9/11/2002	1300	0.2	-0.6	-8.1		271	1.2	-0.35	-1.15	-17.5			
9/11/2002	1400	-0.2	-0.8	-11.9		243	1.63	-1.15	-1.15	-22.0			
9/11/2002	1500	-0.6	-0.9	-14.8		246	1.68	-1.12	-1.25	-23.5			
9/11/2002	1600	-0.9	-0.9	-16.2		240	1.54	-1.14	-1.03	-19.8			
9/11/2002	1700	-1	-0.7	-13.1	-8.2	191	1.34	-1.33	0.16	3.5			
9/11/2002	1800	-0.7	-0.3	-5.2	14.1	183	1.13	-1.09	0.29	5.7			
9/11/2002	1900	-0.3	0	0.0		154	1	-0.72	0.69	12.0			
9/11/2002	2000	0	0.2	2.9		137	0.7	-0.34	0.61	9.5			
9/11/2002	2100	0.1	0.3	4.2	13	97	1.3	0.25	1.28	16.7			
9/11/2002	2200	0.2	0.3	4.1	12.8	60	1.06	0.79	0.71	8.4			
9/11/2002	2300	0.3	0.3	4.0	6.8	34	0.91	0.87	0.25	2.9			
9/12/2002	0	0.4	0.2	2.6		344	0.73	0.61	-0.41	-5.1			
9/12/2002	100	0.2	-0.2	-2.7		283	0.81	-0.07	-0.81	-11.6			
9/12/2002	200	-0.2	-0.6	-9.0		273	1.17	-0.30	-1.13	-17.0			
9/12/2002	300	-0.5	-0.9	-14.4	-12.2	289	0.98	0.02	-0.98	-13.7			
9/12/2002	400	-0.9	-0.9	-16.2	-2.1	222	1.1	-1.00	-0.45	-8.5			
9/12/2002	500	-1	-0.6	-11.3	-3.3	218	1.12	-1.05	-0.38	-7.4			
9/12/2002	600	-1	0	0.0		214	1.3	-1.25	-0.36	-7.4			

9/12/2002	700	-0.2	0.2	3.0		207	0.3	-0.30	-0.05	-0.7			
9/12/2002	800	0.1	0.3	4.2	11.6	200	0.81	-0.81	-0.03	-0.5			
9/12/2002	900	0.3	0.3	4.0	16.9	74	1.15	0.64	0.95	11.6			
9/12/2002	1000	0.4	0.3	3.9	11.1	60	1.21	0.90	0.81	9.4			
9/12/2002	1100	0.4	0.2	2.6		40	1.06	0.98	0.40	4.6			
9/12/2002	1200	0.3	0	0.0		5	0.59	0.57	-0.13	-1.7			
9/12/2002	1300	0.2	-0.2	-2.7	-8.1	282	0.76	-0.08	-0.76	-10.9			
9/12/2002	1400	-0.2	-0.7	-10.4	-8.5	244	1.31	-0.91	-0.94	-17.0			
9/12/2002	1500	-0.7	-0.9	-15.3		246	1.59	-1.06	-1.18	-21.9			
9/12/2002	1600	-1.1	-1	-19.0		237	1.56	-1.21	-0.98	-19.4			
9/12/2002	1700	-1.3	-0.9	-18.4	-8	213	1.6	-1.55	-0.41	-9.6			
9/12/2002	1800	-1.4	-0.6	-13.0	5.4	201	1.05	-1.05	-0.05	-1.1			
9/12/2002	1900	-1.2	-0.2	-4.1		162	0.91	-0.74	0.53	9.3			
9/12/2002	2000	-0.7	0.1	1.7	14.5	122	1.66	-0.40	1.61	24.1			
9/12/2002	2100	-0.1	0.3	4.4	21	121	1.28	-0.29	1.25	18.6			
9/12/2002	2200	0.1	0.3	4.2	17.2	105	1.22	0.06	1.22	16.7			
9/12/2002	2300	0.3	0.3	4.0		60	0.8	0.59	0.54	6.6			
9/13/2002	0	0.4	0.4	5.2		53	0.6	0.49	0.34	4.4			
9/13/2002	100	0.4	0	0.0	0.3	359	0.2	0.19	-0.07	-0.9			
9/13/2002	200	0.3	-0.4	-5.3	-1.9	292	0.43	0.03	-0.43	-6.1			
9/13/2002	300	0	-0.8	-11.3	-8.8	265	0.9	-0.35	-0.83	-12.8			
9/13/2002	400	-0.4	-0.9	-14.0		250	1.2	-0.74	-0.95	-16.2			
9/13/2002	500	-0.9	-0.8	-14.5	-18.3	219	1.07	-1.00	-0.38	-7.3			
9/13/2002	600	-1.2	-0.6	-12.1	1.2	208	0.85	-0.84	-0.15	-2.7			
9/13/2002	700	-1	-0.2	-3.8	4.3	204	1.03	-1.02	-0.11	-2.1			
9/13/2002	800	-0.4	0.2	3.2	0.4	206	0.77	-0.76	-0.11	-1.9			
9/13/2002	900	0	0.3	4.3		113	0.87	-0.08	0.87	12.5			
9/13/2002	1000	0.2	0.1	1.4		50	0.84	0.71	0.45	5.4			
9/13/2002	1100	0.3	0.3	4.0	3.7	71	0.67	0.40	0.54	6.9			
9/13/2002	1200	0.3	0.2	2.7	0.6	42	0.63	0.58	0.26	3.2			
9/13/2002	1300	0.2	-0.3	-4.1	-3.7	356	0.56	0.52	-0.21	-2.7			
9/13/2002	1400	-0.2	-0.6	-9.0		265	0.83	-0.32	-0.76	-11.7			
9/13/2002	1500	-0.7	-0.8	-13.6	-12	223	1.28	-1.16	-0.54	-10.8			
9/13/2002	1600	-1.1	-0.9	-17.2	-7.2	236	1.89	-1.49	-1.16	-24.9			

9/13/2002	1700	-1.4	-0.8	-17.1	-17	232	2.6	-2.16	-1.45	-38.2			
9/13/2002	1800	-1.5	-0.4	-9.1	-12	226	2.37	-2.09	-1.11	-30.3			
9/13/2002	1900	-1.4	0	0.0		223	1.7	-1.54	-0.72	-16.3			
9/13/2002	2000	-1	0.5	9.5		188	0.7	-0.69	0.12	2.1			
9/13/2002	2100	-0.6	0.3	5.0	12.8	172	0.97	-0.87	0.43	7.7			
9/13/2002	2200	0	0.4	5.7		108	0.64	0.00	0.64	9.1			
9/13/2002	2300	0.1	0.5	7.0		98	1.35	0.23	1.33	17.4			
9/14/2002	0	0.48	0.81	10.2		79	1.1	0.53	0.96	12.0	0.2	0.6	8.1
9/14/2002	100	0.7	0.63	7.6		24	0.6	0.60	0.06	0.8	0.4	0.4	5.2
9/14/2002	200	0.68	0.25	3.1		33	0.28	0.27	0.07	1.0	0.3	0.2	2.7
9/14/2002	300	0.51	-0.15	-1.9	1.2	260	0.32	-0.15	-0.28	-4.2	0.2	-0.2	-2.7
9/14/2002	400	0.26	-0.45	-6.0	-7.8	262	1.12	-0.49	-1.01	-16.0	-0.1	-0.3	-4.4
9/14/2002	500	-0.03	-0.58	-8.3	-9.6	251	1.62	-0.97	-1.29	-23.2	-0.4	-0.4	-6.3
9/14/2002	600	-0.26	-0.51	-7.8		263	0.82	-0.35	-0.74	-11.5	-0.8	-0.4	-7.1
9/14/2002	700	-0.32	-0.25	-3.9		255	0.6	-0.33	-0.50	-7.8	-0.7	-0.2	-3.5
9/14/2002	800	-0.18	0.03	0.4	4.2	220	0.74	-0.69	-0.28	-4.8	-0.2	0.2	3.0
9/14/2002	900	0.05	0.21	3.0	6.1	105	0.51	0.03	0.51	7.2	0	0.4	5.7
9/14/2002	1000	0.2	0.36	4.9		105	1.11	0.06	1.11	15.3	0.1	0.3	4.2
9/14/2002	1100	0.3	0.51	6.8		94	1.45	0.35	1.41	17.9	0.2	0.4	5.4
9/14/2002	1200	0.46	0.54	6.9	11.2	73	0.69	0.40	0.57	7.3	0.3	0.4	5.3
9/14/2002	1300	0.55	0.34	4.3		238	0.4	-0.31	-0.26	-4.0	0.3	0.2	2.7
9/14/2002	1400	0.42	-0.07	-0.9	-6.1	241	0.54	-0.39	-0.37	-5.8	0.1	-0.1	-1.4
9/14/2002	1500	0.11	-0.49	-6.8		272	0.08	-0.02	-0.08	-1.1	-0.2	-0.4	-6.0
9/14/2002	1600	-0.27	-0.76	-11.5	-15	254	1.4	-0.78	-1.16	-19.8	-0.6	-0.5	-8.4
9/14/2002	1700	-0.62	-0.85	-14.1	-19.3	233	1.64	-1.34	-0.94	-19.5	-1	-0.6	-11.3
9/14/2002	1800	-0.87	-0.77	-13.8		210	1.48	-1.45	-0.31	-6.9	-1.2	-0.4	-8.1
9/14/2002	1900	-1	-0.46	-8.7		185	1.45	-1.41	0.33	7.2	-1.4	0	0.0
9/14/2002	2000	-0.88	-0.04	-0.7	9.9	174	1.29	-1.18	0.52	10.5	-1.2	0.4	8.1
9/14/2002	2100	-0.48	0.26	4.2	10.8	163	1.38	-1.13	0.79	15.4	-0.6	0.2	3.4
9/14/2002	2200	-0.07	0.39	5.7	13.4	156	1.4	-1.04	0.94	17.6	0	0.3	4.3
9/14/2002	2300	0.12	0.54	7.5	10	145	0.91	-0.55	0.73	11.9	0.1	0.4	5.6
9/15/2002	0	0.27	0.71	9.4		98	0.94	0.16	0.93	12.5	0.2	0.4	5.4
9/15/2002	100	0.51	0.74	9.3	35.1	71	0.71	0.43	0.57	7.3	0.3	0.4	5.3

9/15/2002	200	0.66	0.52	6.4	7.3	24	0.32	0.32	0.03	0.4	0.4	0.3	3.9
9/15/2002	300	0.61	0.13	1.6	-1.2	356	0.25	0.23	-0.09	-1.3	0.3	0.2	2.7
9/15/2002	400	0.43	-0.24	-3.1		262	0.29	-0.13	-0.26	-3.9	0.1	-0.2	-2.8
9/15/2002	500	0.19	-0.46	-6.3		242	0.77	-0.55	-0.53	-8.8	0.2	-0.3	-4.1
9/15/2002	600	-0.06	-0.53	-7.7	-3.9	233	1.09	-0.89	-0.63	-11.4	-0.4	-0.4	-6.3
9/15/2002	700	-0.23	-0.43	-6.5	-4.3	233	1	-0.82	-0.57	-10.2	-0.5	-0.3	-4.9
9/15/2002	800	-0.24	-0.18	-2.7	-4.4	237	0.92	-0.71	-0.58	-10.0	-0.4	0	0.0
9/15/2002	900	-0.1	0.09	1.3		120	0.62	-0.13	0.61	8.9	-0.2	0.4	6.0
9/15/2002	1000	0.11	0.25	3.5		167	0.78	-0.67	0.40	6.9	0.1	0.2	2.8
9/15/2002	1100	0.24	0.37	5.0		12	0.03	0.03	0.00	0.0	0.2	0.4	5.4
9/15/2002	1200	0.33	0.46	6.1	5.2	96	0.55	0.11	0.54	7.4	0.2	0.4	5.4
9/15/2002	1300	0.43	0.43	5.5	4	58	0.52	0.40	0.33	4.3	0.3	0.3	4.0
9/15/2002	1400	0.46	0.21	2.7		121	0.3	-0.07	0.29	4.3	0.2	0.2	2.7
9/15/2002	1500	0.3	-0.17	-2.3	-	227	0.21	-0.18	-0.10	-1.5	0	0	0.0
9/15/2002	1600	-0.01	-0.53	-7.6	-9.4	233	1.18	-0.97	-0.68	-12.6	-0.2	-0.2	-3.0
9/15/2002	1700	-0.35	-0.72	-11.2	-	251	1.55	-0.93	-1.24	-22.0	-0.6	-0.4	-6.7
9/15/2002	1800	-0.65	-0.75	-12.6	-14	248	2	-1.29	-1.53	-29.4	-0.8	-0.5	-8.9
9/15/2002	1900	-0.84	-0.62	-11.1	-	226	1.81	-1.60	-0.85	-19.5	-1	-0.4	-7.6
9/15/2002	2000	-0.91	-0.32	-5.9		201	1.4	-1.40	-0.07	-1.6	-1	0	0.0
9/15/2002	2100	-0.74	0.06	1.1		180	1.45	-1.38	0.45	9.7	-0.9	0.5	9.2
9/15/2002	2200	-0.33	0.29	4.5	7	187	0.5	-0.49	0.10	1.6	-0.3	0.2	3.1
9/15/2002	2300	0.02	0.4	5.7	7.4	121	1.18	-0.27	1.15	17.1	-0.1	0.4	5.9
9/16/2002	0	0.16	0.52	7.1		88	1.33	0.45	1.25	15.7	-0.15	0	0.0
9/16/2002	100	0.29	0.65	8.6	-	87	1.27	0.46	1.19	14.9	-0.18	0.1	1.5
9/16/2002	200	0.49	0.63	8.0	15.9	73	1.15	0.66	0.94	11.4	-0.11	0.1	1.5
9/16/2002	300	0.58	0.39	4.9	1.9	342	0.37	0.30	-0.22	-2.9	0.02	0.1	1.4
9/16/2002	400	0.5	0.02	0.3	2.2	82	0.45	0.20	0.40	5.5	0.2	0	0.0
9/16/2002	500	0.33	-0.29	-3.8		39	0.19	0.18	0.07	0.9	0.38	-0.1	-1.3
9/16/2002	600	0.11	-0.44	-6.1		302	0.68	0.16	-0.66	-9.0	0.53	-0.2	-2.5
9/16/2002	700	-0.09	-0.46	-6.7	-9	291	1.09	0.06	-1.09	-15.0	0.58	-0.3	-3.7
9/16/2002	800	-0.19	-0.35	-5.2	-3.3	219	1.32	-1.23	-0.47	-9.7	0.53	-0.4	-5.0

9/16/2002	900	-0.18	-0.1	-1.5		69	0.07	0.04	0.05	0.8	0.38	-0.2	-2.6
9/16/2002	1000	-0.05	0.14	2.0		132	0.62	-0.25	0.57	8.6	0.16	0	0.0
9/16/2002	1100	0.14	0.29	4.0		92	0.71	0.20	0.68	9.2	-0.1	0.2	2.9
9/16/2002	1200	0.26	0.36	4.8	9	81	0.77	0.35	0.69	9.0	-0.35	0.3	4.7
9/16/2002	1300	0.34	0.4	5.3	1.2	348	0.24	0.21	-0.12	-1.6	-0.53	0.4	6.6
9/16/2002	1400	0.41	0.34	4.4		49	1.24	1.06	0.64	7.2	-0.6	0.4	6.7
9/16/2002	1500	0.39	0.11	1.4	17	359	1.11	1.05	-0.36	-4.1	-0.57	0.3	5.0
9/16/2002	1600	0.22	-0.24	-3.3	-4.7	280	0.32	-0.04	-0.32	-4.6	-0.45	0.2	3.2
9/16/2002	1700	-0.07	-0.54	-7.8	-7.1	281	0.48	-0.06	-0.48	-6.9	-0.27	0	0.0
9/16/2002	1800	-0.38	-0.66	-10.3		220	1.3	-1.21	-0.49	-9.9	-0.06	-0.3	-4.4
9/16/2002	1900	-0.63	-0.64	-10.8		207	0.67	-0.66	-0.10	-1.8	0.12	-0.5	-6.9
9/16/2002	2000	-0.78	-0.5	-8.8	-4.1	217	0.76	-0.72	-0.25	-4.3	0.23	-0.5	-6.7
9/16/2002	2100	-0.82	-0.21	-3.8	0	207	0.73	-0.72	-0.11	-2.0	0.23	-0.4	-5.4
9/16/2002	2200	-0.62	0.12	2.0	2	174	0.78	-0.71	0.32	5.5	0.16	-0.2	-2.8
9/16/2002	2300	-0.23	0.3	4.5	7.2	118	0.56	-0.10	0.55	8.0	0.04	0.2	2.8
9/17/2002	0	0.05	0.38	5.4		91	0.69	0.20	0.66	8.9	-0.1	0.4	5.9
9/17/2002	100	0.16	0.48	6.6		82	0.75	0.33	0.67	8.9	-0.2	0.6	9.0
9/17/2002	200	0.28	0.57	7.6	12.8	64	0.93	0.65	0.67	8.2	-0.22	0.7	10.5
9/17/2002	300	0.45	0.52	6.7		82	0.25	0.11	0.22	3.1	-0.14	0.8	11.7
9/17/2002	400	0.5	0.28	3.6		261	0.68	-0.31	-0.61	-9.3	0.01	0.8	11.3
9/17/2002	500	0.41	-0.06	-0.8		0.53	168	160.25	-50.43	-17.1	0.21	0.7	9.4
9/17/2002	600	0.26	-0.3	-4.0		281	0.55	-0.07	-0.55	-7.9	0.41	0.6	7.7
9/17/2002	700	0.06	-0.4	-5.6							0.56	0.4	5.0
9/17/2002	800	-0.1	-0.39	-5.7							0.61	0.3	3.7
9/17/2002	900	-0.16	-0.27	-4.0							0.54	0.2	2.5
9/17/2002	1000	-0.15	-0.04	-0.6							0.36	0.2	2.6
9/17/2002	1100	-0.04	0.19	2.7							0.11	0.3	4.2
9/17/2002	1200	0.14	0.3	4.1							-0.17	0.4	6.0
9/17/2002	1300	0.26	0.34	4.6							-0.42	0.5	8.0
9/17/2002	1400	0.34	0.35	4.6							-0.58	0.6	10.0
9/17/2002	1500	0.39	0.26	3.4							-0.63	0.7	11.7
9/17/2002	1600	0.36	0.04	0.5							-0.56	0.7	11.5
9/17/2002	1700	0.18	-0.28	-3.8							-0.4	0.6	9.5

9/17/2002	1800	-0.08	-0.52	-7.6						-0.19	0.3	4.5
9/17/2002	1900	-0.37	-0.58	-9.1						0.04	-0.1	-1.4
9/17/2002	2000	-0.58	-0.54	-9.0						0.22	-0.3	-4.1
9/17/2002	2100	-0.72	-0.42	-7.3						0.29	-0.4	-5.3
9/17/2002	2200	-0.73	-0.15	-2.6						0.26	-0.4	-5.4
9/17/2002	2300	-0.53	0.14	2.3						0.15	-0.2	-2.8
9/20/2002	300	0.02	0.32	4.6						0.2	0.1	1.4
9/20/2002	400	0.16	0.44	6.0						0.4	0.2	2.6
9/20/2002	500	0.33	0.49	6.5						0.6	0.2	2.5
9/20/2002	600	0.47	0.39	5.0						0.7	0.2	2.4
9/20/2002	700	0.51	0.16	2.0						0.8	0.1	1.2
9/20/2002	800	0.44	-0.1	-1.3						0.8	-0.1	-1.2
9/20/2002	900	0.26	-0.27	-3.6						0.5	-0.2	-2.5
9/20/2002	1000	0.06	-0.35	-4.9						0.2	-0.2	-2.7
9/20/2002	1100	-0.08	-0.39	-5.7						-0.1	-0.2	-2.9
9/20/2002	1200	-0.24	-0.3	-4.6						-0.2	-0.1	-1.5
9/20/2002	1300	-0.36	-0.09	-1.4						-0.2	0	0.0
9/20/2002	1400	-0.26	0.11	1.7						-0.2	0.1	1.5
9/20/2002	1500	0.01	0.22	3.1						0	0.2	2.9
9/20/2002	1600	0.2	0.27	3.7						0.3	0.3	4.0
9/20/2002	1700	0.27	0.26	3.5						0.4	0.3	3.9
9/20/2002	1800	0.31	0.2	2.7						0.5	0.2	2.5
9/20/2002	1900	0.29	0.05	0.7						0.4	0	0.0
9/20/2002	2000	0.19	-0.15	-2.1						0.2	-0.2	-2.7
9/20/2002	2100	-0.02	-0.31	-4.5						0	-0.3	-4.3
9/20/2002	2200	-0.25	-0.39	-5.9						-0.2	-0.4	-6.0
9/20/2002	2300	-0.43	-0.4	-6.4						-0.4	-0.4	-6.3
9/21/2002	0	-0.58	-0.3	-5.0						-0.6	-0.3	-5.0
9/21/2002	100	-0.63	-0.09	-1.5						-0.6	0	0.0
9/21/2002	200	-0.46	0.09	1.5						-0.5	0.1	1.6
9/21/2002	300	-0.18	0.22	3.3						-0.2	0.1	1.5
9/21/2002	400	0.04	0.35	5.0						0	0.2	2.9

9/21/2002	500	0.2	0.47	6.4							0.2	0.2	2.7
9/21/2002	600	0.38	0.5	6.5							0.4	0.2	2.6
9/21/2002	700	0.51	0.39	4.9							0.5	0.1	1.3
9/21/2002	800	0.56	0.15	1.9							0.6	0.1	1.2
9/21/2002	900	0.47	-0.12	-1.5							0.5	-0.1	-1.3
9/21/2002	1000	0.25	-0.3	-4.0							0.4	-0.2	-2.6
9/21/2002	1100	0.04	-0.41	-5.8							0.2	-0.3	-4.1
9/21/2002	1200	-0.14	-0.47	-6.9							0.1	-0.2	-2.8
9/21/2002	1300	-0.36	-0.37	-5.8							0	0	0.0
9/21/2002	1400	-0.48	-0.14	-2.3							0	0.2	2.9
9/21/2002	1500	-0.31	0.08	1.2							0.1	0.3	4.2
9/21/2002	1600	0	0.21	3.0							0.2	0.4	5.4
9/21/2002	1700	0.17	0.27	3.7		40	0.6	0.56	0.22	2.8	0.4	0.5	6.5
9/21/2002	1800	0.23	0.29	3.9		40	0.6	0.56	0.22	2.8	0.6	0.5	6.2
9/21/2002	1900	0.28	0.25	3.3		35	0.63	0.60	0.18	2.3	0.7	0.4	4.9
9/21/2002	2000	0.3	0.12	1.6							0.8	0.3	3.6
9/21/2002	2100	0.22	-0.08	-1.1							0.8	0.2	2.4
9/21/2002	2200	0.03	-0.26	-3.7		259	0.35	-0.17	-0.31	-4.6	0.6	0	0.0
9/21/2002	2300	-0.19	-0.36	-5.4		292	0.38	0.03	-0.38	-5.4	0.4	-0.1	-1.3
9/22/2002	0	-0.39	-0.38	-6.0		278	0.29	-0.05	-0.29	-4.1	0.1	-0.1	-1.4
9/22/2002	100	-0.55	-0.29	-4.8							-0.1	-0.1	-1.5
9/22/2002	200	-0.6	-0.11	-1.9							-0.1	-0.1	-1.5
9/22/2002	300	-0.42	0.07	1.1							-0.1	0.1	1.5
9/22/2002	400	-0.14	0.24	3.6		193	0.2	-0.20	0.02	0.3	0	0.2	2.9
9/22/2002	500	0.07	0.39	5.5		102	0.72	0.08	0.72	10.0	0.1	0.4	5.6
9/22/2002	600	0.24	0.49	6.6	5.9	140	0.59	-0.31	0.50	7.7	0.2	0.5	6.8
9/22/2002	700	0.41	0.5	6.5		42	0.63	0.58	0.26	3.2	0.4	0.5	6.5
9/22/2002	800	0.55	0.38	4.8	2	2	0.28	0.27	-0.08	-1.0	0.5	0.4	5.1
9/22/2002	900	0.57	0.12	1.5		250	0.29	-0.18	-0.23	-3.4	0.6	0.1	1.2
9/22/2002	1000	0.44	-0.17	-2.2		229	0.4	-0.34	-0.21	-3.2	0.4	-0.1	-1.3
9/22/2002	1100	0.19	-0.37	-5.0	-8.9	252	0.9	-0.53	-0.73	-11.8	0.2	-0.1	-1.4
9/22/2002	1200	-0.04	-0.5	-7.2	-7.4	226	0.7	-0.62	-0.33	-5.6	0	-0.2	-2.9
9/22/2002	1300	-0.25	-0.54	-8.2		174	0.61	-0.56	0.25	4.1	-0.1	-0.2	-2.9
9/22/2002	1400	-0.49	-0.41	-6.7	4	267	0.43	-0.15	-0.40	-6.0	-0.3	-0.2	-3.1

9/22/2002	1500	-0.55	-0.15	-2.5		270	0.3	-0.09	-0.29	-4.2	-0.3	-0.1	-1.5
9/22/2002	1600	-0.29	0.09	1.4		90	0.42	0.13	0.40	5.5	-0.2	0	0.0
9/22/2002	1700	0.02	0.23	3.3		90	0.6	0.19	0.57	7.8	-0.1	0.1	1.5
9/22/2002	1800	0.15	0.31	4.3	7.5	105	0.65	0.03	0.65	9.1	0	0.1	1.4
9/22/2002	1900	0.21	0.35	4.8	3.2	128	0.27	-0.09	0.25	3.7	0.1	0.1	1.4
9/22/2002	2000	0.3	0.33	4.4		42	0.66	0.60	0.27	3.3	0.1	0.1	1.4
9/22/2002	2100	0.34	0.18	2.4	2.9	17	0.45	0.45	-0.01	-0.1	0.1	0	0.0
9/22/2002	2200	0.26	-0.05	-0.7		281	0.35	-0.04	-0.35	-5.0	0.1	-0.1	-1.4
9/22/2002	2300	0.08	-0.25	-3.5		260	0.45	-0.21	-0.40	-6.0	0	-0.2	-2.9
9/23/2002	0	-0.15	-0.36	-5.3		257	0.87	-0.45	-0.75	-11.9	-0.3	-0.2	-3.1
9/23/2002	100	-0.35	-0.39	-6.1		191	0.84	-0.83	0.10	1.9	-0.3	-0.2	-3.1
9/23/2002	200	-0.52	-0.31	-5.1	-3.6	223	1.05	-0.95	-0.44	-8.3	-0.3	-0.1	-1.5
9/23/2002	300	-0.54	-0.13	-2.2	-3.9	238	0.88	-0.67	-0.57	-9.7	-0.2	0	0.0
9/23/2002	400	-0.34	0.07	1.1		181	0.24	-0.23	0.07	1.1	-0.3	0.2	3.1
9/23/2002	500	-0.08	0.26	3.8		118	0.34	-0.06	0.33	4.9	-0.1	0.3	4.4
9/23/2002	600	0.1	0.42	5.8	6.6	73	0.74	0.42	0.61	7.8	0.1	0.3	4.2
9/23/2002	700	0.26	0.5	6.7	6.1	58	1.01	0.77	0.65	7.7	0.3	0.3	4.0
9/23/2002	800	0.44	0.49	6.3		42	0.63	0.58	0.26	3.2	0.4	0.3	3.9
9/23/2002	900	0.55	0.34	4.3	1.1	36	0.2	0.19	0.06	0.8	0.6	0.2	2.5
9/23/2002	1000	0.53	0.04	0.5	-2.1	254	0.41	-0.23	-0.34	-5.2	0.5	0	0.0
9/23/2002	1100	0.34	-0.26	-3.4		274	0.52	-0.13	-0.50	-7.4	0.3	-0.1	-1.3
9/23/2002	1200	0.07	-0.45	-6.3		272	0.61	-0.17	-0.59	-8.7	0.1	-0.1	-1.4
9/23/2002	1300	-0.16	-0.57	-8.4	-9.3	238	1.04	-0.80	-0.67	-11.8	-0.2	-0.2	-3.0
9/23/2002	1400	-0.38	-0.57	-8.9	-7.7	227	1.1	-0.96	-0.53	-10.0	-0.3	-0.2	-3.1
9/23/2002	1500	-0.58	-0.39	-6.5		202	0.62	-0.62	-0.04	-0.7	-0.4	-0.1	-1.6
9/23/2002	1600	-0.54	-0.1	-1.7		139	0.77	-0.40	0.66	10.4	-0.3	0	0.0
9/23/2002	1700	-0.22	0.14	2.1	29.3	134	0.72	-0.32	0.65	10.0	-0.2	0.1	1.5
9/23/2002	1800	0.04	0.29	4.1	8	135	0.66	-0.30	0.59	9.0	-0.1	0.2	2.9
9/23/2002	1900	0.13	0.38	5.3	4.5	135	0.65	-0.30	0.58	8.9	0	0.2	2.9
9/23/2002	2000	0.22	0.44	6.0		168	0.39	-0.34	0.20	3.0	0.1	0.2	2.8
9/23/2002	2100	0.34	0.39	5.1		90	0.1	0.03	0.10	1.4	0.2	0.2	2.7
9/23/2002	2200	0.39	0.2	2.6		179	0.2	-0.19	0.07	1.0	0.2	0.1	1.4
9/23/2002	2300	0.3	-0.07	-0.9	-2.4	245	0.62	-0.42	-0.45	-7.2	0.2	0	0.0
9/24/2002	0	0.1	-0.27	-3.8		230	1	-0.85	-0.53	-9.5	0.1	-0.2	-2.8

9/24/2002	100	-0.12	-0.38	-5.6		227	1.29	-1.13	-0.63	-12.3	-0.2	-0.4	-6.0
9/24/2002	200	-0.32	-0.42	-6.5		239	0.62	-0.47	-0.41	-6.6	-0.5	-0.4	-6.5
9/24/2002	300	-0.47	-0.32	-5.2		185	0.88	-0.86	0.20	3.6	-0.8	-0.3	-5.4
9/24/2002	400	-0.45	-0.12	-1.9	6.3	174	0.92	-0.84	0.37	6.8	-0.8	-0.1	-1.8
9/24/2002	500	-0.24	0.1	1.5		189	0.75	-0.74	0.12	2.1	-0.3	0.1	1.5
9/24/2002	600	-0.02	0.29	4.2		117	0.4	-0.06	0.40	5.7	0	0.2	2.9
9/24/2002	700	0.12	0.44	6.1		82	0.54	0.24	0.49	6.5	0.1	0.3	4.2
9/24/2002	800	0.28	0.5	6.7		165	0.4	-0.34	0.22	3.4	0.2	0.3	4.1
9/24/2002	900	0.45	0.46	5.9		139	0.2	-0.10	0.17	2.5	0.3	0.2	2.7
9/24/2002	1000	0.52	0.25	3.2	-0.6	344	0.4	0.33	-0.22	-3.0	0.3	0.1	1.3
9/24/2002	1100	0.43	-0.08	-1.0		330	0.44	0.29	-0.33	-4.4	0.2	-0.2	-2.7
9/24/2002	1200	0.19	-0.37	-5.0		325	0.37	0.22	-0.30	-4.0	-0.1	-0.3	-4.4
9/24/2002	1300	-0.09	-0.53	-7.7		250	0.57	-0.35	-0.45	-7.0	-0.4	-0.4	-6.3
9/24/2002	1400	-0.3	-0.61	-9.4		270	0.6	-0.19	-0.57	-8.5	-0.6	-0.4	-6.7
9/24/2002	1500	-0.5	-0.55	-8.9		275	0.74	-0.17	-0.72	-10.7	-0.8	-0.3	-5.4
9/24/2002	1600	-0.62	-0.3	-5.1		210	1.1	-1.08	-0.23	-4.5	-0.9	-0.2	-3.7
9/24/2002	1700	-0.46	-0	0.0		178	0.9	-0.85	0.31	5.6	-0.6	0	0.0
9/24/2002	1800	-0.14	0.22	3.3		168	0.52	-0.45	0.26	4.2	-0.2	0.2	3.0
9/24/2002	1900	0.06	0.38	5.3		148	0.66	-0.42	0.51	8.0	0.1	0.3	4.2
9/24/2002	2000	0.14	0.48	6.6		113	0.61	-0.05	0.61	8.8	0.2	0.3	4.1
9/24/2002	2100	0.26	0.51	6.8							0.3	0.3	4.0
9/24/2002	2200	0.4	0.41	5.3							0.4	0.2	2.6
9/24/2002	2300	0.42	0.17	2.2		280	0.65	-0.09	-0.64	-9.3	0.4	0.1	1.3
9/25/2002	0	0.3	-0.12	-1.6		270	0.75	-0.23	-0.71	-10.7	0.4	-0.1	-1.3
9/25/2002	100	0.1	-0.32	-4.5		249	0.68	-0.43	-0.53	-8.4	0.2	-0.2	-2.7
9/25/2002	200	-0.12	-0.43	-6.3		213	0.84	-0.81	-0.22	-3.9	-0.1	-0.3	-4.4
9/25/2002	300	-0.31	-0.43	-6.6		233	1.02	-0.84	-0.59	-10.5	-0.3	-0.3	-4.6
9/25/2002	400	-0.4	-0.29	-4.6		221	0.88	-0.81	-0.34	-6.2	-0.4	-0.2	-3.2
9/25/2002	500	-0.33	-0.08	-1.2	0.1	198	1.12	-1.12	0.00	0.0	-0.3	0	0.0
9/25/2002	600	-0.13	0.13	1.9		205	0.81	-0.80	-0.10	-1.8	-0.1	0.2	2.9
9/25/2002	700	0.03	0.32	4.5		145	0.99	-0.60	0.79	13.1	0	0.3	4.3
9/25/2002	800	0.16	0.45	6.2		137	0.52	-0.25	0.45	6.9	0.2	0.3	4.1
9/25/2002	900	0.32	0.49	6.5		86	0.26	0.10	0.24	3.4	0.3	0.3	4.0
9/25/2002	1000	0.46	0.38	4.9		12	0.24	0.24	-0.03	-0.3	0.3	0.2	2.7

9/25/2002	1100	0.45	0.1	1.3	1.2	3	0.18	0.17	-0.05	-0.6	0.3	0.1	1.3
9/25/2002	1200	0.28	-0.24	-3.2		265	0.24	-0.09	-0.22	-3.2	0.2	-0.2	-2.7
9/25/2002	1300	0.01	-0.48	-6.8		178	0.53	-0.50	0.18	3.0	0	-0.3	-4.3
9/25/2002	1400	-0.25	-0.59	-8.9		167	0.62	-0.53	0.32	5.3	-0.2	-0.3	-4.5
9/25/2002	1500	-0.43	-0.6	-9.5	8	179	0.26	-0.25	0.08	1.3	-0.3	-0.3	-4.6
9/25/2002	1600	-0.58	-0.46	-7.7		217	0.65	-0.61	-0.21	-3.6	-0.3	-0.2	-3.1
9/25/2002	1700	-0.59	-0.17	-2.9	-11	210	0.47	-0.46	-0.10	-1.6	-0.3	0	0.0
9/25/2002	1800	-0.36	0.12	1.9		97	0.47	0.09	0.46	6.4	-0.2	0.2	3.0
9/25/2002	1900	-0.07	0.33	4.8		76	0.8	0.42	0.68	8.7	0.1	0.3	4.2
9/25/2002	2000	0.08	0.48	6.7		108	0.92	0.00	0.92	13.0	0.2	0.3	4.1
9/25/2002	2100	0.17	0.57	7.8							0.4	0.3	3.9
9/25/2002	2200	0.34	0.55	7.2							0.5	0.3	3.8
9/25/2002	2300	0.45	0.38	4.9							0.6	0.2	2.5
9/26/2002	0	0.42	0.09	1.2							0.2	0.1	1.4
9/26/2002	100	0.28	-0.2	-2.7							0.1	-0.1	-1.4
9/26/2002	200	0.07	-0.39	-5.5							0	-0.2	-2.9
9/26/2002	300	-0.14	-0.46	-6.8							-0.1	-0.3	-4.4
9/26/2002	400	-0.29	-0.4	-6.2							-0.2	-0.3	-4.5
9/26/2002	500	-0.32	-0.22	-3.4							-0.2	-0.1	-1.5
9/26/2002	600	-0.2	-0.01	-0.2							-0.1	0	0.0
9/26/2002	700	-0.03	0.18	2.6							0	0.1	1.4
9/26/2002	800	0.08	0.36	5.0							0.1	0.2	2.8
9/26/2002	900	0.21	0.48	6.5							0.2	0.3	4.1
9/26/2002	1000	0.38	0.44	5.7							0.3	0.3	4.0
9/26/2002	1100	0.45	0.23	3.0							0.3	0.2	2.7
9/26/2002	1200	0.34	-0.1	-1.3							0.2	0	0.0
9/26/2002	1300	0.11	-0.4	-5.6							0	-0.2	-2.9
9/26/2002	1400	-0.17	-0.57	-8.5							-0.1	-0.3	-4.4
9/26/2002	1500	-0.4	-0.62	-9.8							-0.2	-0.3	-4.5
9/26/2002	1600	-0.54	-0.56	-9.2							-0.3	-0.3	-4.6
9/26/2002	1700	-0.62	-0.34	-5.7							-0.3	-0.2	-3.1
9/26/2002	1800	-0.54	-0.02	-0.3							-0.3	0	0.0
9/26/2002	1900	-0.26	0.24	3.7							-0.2	0.2	3.0
9/26/2002	2000	-0.01	0.42	6.0							0	0.3	4.3

9/26/2002	2100	0.1	0.57	7.9							0.1	0.3	4.2
9/26/2002	2200	0.24	0.63	8.5							0.2	0.3	4.1
9/26/2002	2300	0.42	0.53	6.8							0.3	0.2	2.7

21. Instrumentation and QC System Description

System	Hardware	Software
Recording Tape drives Plotter	Triacq Recording System: SS1000E, 6 CPU's, 60MHz, 1GB RAM. 4 IBM 3590 drives. 1 OYO 22" GS-622 Plotter.	TRIACQ Version 1.6c
Onboard QC Tape drives Plotter	TQC machine 1 Sun Ultra Enterprise 450: 4 x 300 MHz CPU's, 2GB RAM 16 x 18Gbyte internal hard disks 2 x 36Gbyte internal hard disks TQC Display host 1 Sun Ultra 60 Creator 3D: 2 x 360 MHz CPU's, 1,5GB RAM 2 x 9 GB hard disks 2 Creator3D video cards 2 x Exabyte drives, 1 CD-ROM drive 2 IBM 3590 drives 1 OYO 22" GS-622 Plotter	TQC Version 2.1
Trilogy Information Manager (TIM)	TIM host 1 Sun Ultra 2: Sun Ultra 2, 2 x 300MHz	TIM Version 1.0
Source Controller	Trisor Gun Controller: Sun Ultra-2, 2 x 300MHz CPU's, 256 MB RAM 2 x 4.2 GB internal hard disks 9 GB external hard disk Exabyte and CD-ROM drives	TRISOR Version 1.5
External Header Tension Monitor Bird Controller	STM Triton Bird Controller.	Version 8.0 Version 4.7 Version 2.8

22. Instrumentation and QC Tests

22.1. Start-up Tests

The monthly test performed on the 8th August 2002, the result showed 2 random traces failed on the noisy analysis test, one trace (#30) failed on cross-feed test, one trace (#220) failed Harmonic Distortion test.

Date	NA	PS	PR	CF	HD
8.8.2002	760 & 2576			30 (-84dB) (spec= -85dB)	File 22: 220 (-69 dB (Spec = -70dB)) File 30: 404, 1078 (-63/62 dB (Spec = -64dB)) File 31: 1078 (-53 dB (Spec = -54dB))

22.2. Additional Client Tests

There was no additional test performed during this job.

22.3. Daily and Monthly Tests

The daily test will produce 10 files and the Monthly test 28 files.

Abbreviations used for test names in the test sequence tables:

- NA Noise Analysis
- PS Preamplifier Sensitivity
- PR Pulse Response
- CF Cross Feed
- HD Harmonic Distortion
- NC Noise with Calibration line
- CS Current Setting indicates that the current survey definition setting will be used for this parameter.

20. Daily Test

Date	Accepted by Client	Comment
10.8.2002		2 chns. Failed on RMS
11.8.2002		22 chns. Failed on RMS
14.8.2002		7 chns. Failed on RMS
15.8.2002		38 chns. Fail on RMS
16.8.2002		35 chns. Failed on RMS
17.8.2002		30 chns. Failed on RMS
18.8.2002		21 chns. Failed on RMS
19.8.2002		31 chns. Failed on RMS

20.8.2002		22 chns. Failed on RMS
21.8.2002		8 chns. Failed on RMS
22.8.2002		5 chns. Failed on RMS
23.8.2002		23 chns. Failed on RMS
25.8.2002		22 chns. Failed on RMS
26.8.2002		16 chns. Failed on RMS
28.8.2002		5 chns. Failed on RMS
29.8.2002		26 chns. Failed on RMS
30.8.2002		19 chns. Failed on RMS
31.8.2002		61 chns. Failed on RMS
01.9.2002		21 chns. Failed on RMS
02.9.2002		27 chns. Failed on RMS
03.9.2002		27 chns. Failed on RMS
05.9.2002		61 chns. Failed on RMS
06.9.2002		8 chns. Failed on RMS
09.9.2002		20 chns. Failed on RMS
13.9.2002		81 chns. Failed on RMS
15.9.2002		10 chns. Failed on RMS
16.9.2002		28 chns. Failed on RMS
17.9.2002		24 chns. Failed on RMS
18.9.2002		1 chns. Failed on RMS
22.9.2002		6 chns. Failed on RMS, 1 THD
24.9.2002		5 chns. Failed on RMS

22.4. End of Job Test

21. Monthly Test

Date	NA	PS	PR	CF	HD
26.9.2002	754, 1521,1522, 1523, 524, 1525, 1526,1527,1528, 1529, 530,1531, 1532,1533,1534, 1536,2196, 2208			229 (-84dB) 1841-1856 (spec= -85dB)	

22.5. Online Brute Stack

For each sail line a different source-streamer combination was used to generate a brute stack for one subsurface cmp line. Paper plots of the raw and filtered stacks were produced at the end of the line.

22. Processing sequence:

Input 1 cmp line per sail line:	368 traces
Data reduction:	Resample to 4ms sample rate
Velocities applied:	Velocity function supplied by Client
Gain recovery:	Spherical divergence correction plus exponential gain of 3.0 dB/s, 0-6000ms
Normal moveout correction	
Pre-stack mute with offset/time pairs: (Provided by BHPBP)	Outer trace mute – 400, 115 450, 350 820, 650 1650, 1400 3150, 2500 4720, 4000 Inner trace mute – 195, 1000 1180, 2200 1220, 6144
Stack Root N scaling:	61 fold
Output:	To disk file, online InDA display

23. Raw Brute Stack

- Select every second CMP
- Constant amplitude scaling
- Display: Scale 1: 25,000 7 cm/sec

22.6. Shots and FK Spectral Analysis

Every shot from the chosen subsurface line was displayed online in the shot and FK domain. This helped to identify noise sources, and to QC data outside the windows used for attribute analysis. The FK analysis was performed over every 41st full raw shot record and the result was output to disk for offline visual inspection in InDA.

22.7. RMS Online Analysis

22.7.1. Ambient RMS Window

An overview of the ambient noise distribution during a line was produced by calculating average RMS values above the first break (from trace 268 to 368 for each streamer) in a time window from 0 to 500 ms.

24. Processing Sequence

Data Input:	All shots, last 100 traces of each streamer, window 0-500ms
Scaling:	By 1000 to convert amplitudes to microbars.
RMS analysis:	One trace was output for each shot containing the RMS amplitude over the given window for each channel. An average RMS value for each streamer, and for the whole shot, is also calculated. These values are appended to the each trace.
Output:	To Aqua Database
Online display:	Using Pro and ATV display package.

22.7.2. Deep RMS Window

RMS values from the last 500 ms of the record were calculated for every trace, each shot. These values were displayed online for identification of noise sources and noisy traces. Average RMS values for each cable and each shot were also calculated. Applying a bandpass filter prior to the RMS calculation produced filtered shot vs. trace RMS values, which were also stored in the Aqua database and displayed in Pro.

25. Processing Sequence

Data Input:	All shots, all channels, window 5500-6000 ms.
Scaling:	By 1000 to convert amplitudes to microbars.
RMS Analysis:	One trace was output for each shot containing the RMS amplitude over the window for each channel.
Output:	To Aqua Database.
Online display:	Using Pro and ATV display package.
Bandpass Filter:	5 - 60 Hz
RMS analysis:	One trace was output for each shot containing the RMS amplitude over the given window for each channel, for each filter band.
Output:	To Aqua Database.
Online display:	Using Pro and ATV display package.

22.8. Navigation QC Displays

Near trace data from all streamers and both sources (all combinations) were displayed and annotated with direct arrival times calculated from processed navigation offsets at the end of each line. This allowed direct comparison of recorded and calculated direct arrival times and acted as navigation QC prior to the production of the near trace cube.

□ **Processing sequence:**

Store near traces online:	Based on common offset.
Merge seismic data with processed navigation data:	Use the centre-source to centre-first-group range from the navigation data to calculate a theoretical time for the direct arrival using a water velocity of 1500 m/s.
Display:	Window 150 - 250 ms (outer streamers) 100 - 200 ms (mid streamers) 60 – 160 ms (inner streamers) Horizontal scale 10 traces/cm, Vertical scale 20 cm/sec

22.9. Attributes, Online Analysis

22.9.1.Header Information

The seismic header information for every shot was transferred to Triacq QC Aqua Database. The following Header attributes were used for online QC:

- Streamer depth: Min, mean and max value for each streamer
- Water depth:
- Parity error count: For each streamer
- Gyro Heading of the Vessel:
- Individual Gun timing errors: For both sources
- Individual Gun depths: For both sources, all arrays
- Gun manifold pressure:
- RMS source comparison: Average RMS of first 15 traces of inner streamers for each source.
- Average RMS of all streamers: Split into frequencies, high, mid, low, and total background noise, and ambient noise
- Average RMS values: For individual streamers

Values were displayed versus shot point online, and GIF files were posted on the SuperVision web site for QC and archiving purposes.

22.10. Seismic Cubes

All cubes are referenced to the following grid origin (centre of cell 1,1):

X = 658710.5382
Y = 5736073.0756

22.10.1.Near Trace Cube

Near traces from each streamer were collected online to produce a near trace cube. The seismic and navigation data were merged with the near traces after final navigation data was available. The x / y source and receiver positions were written to the trace headers. This information was then used to grid the near traces and assign true offsets for each near trace.

A velocity function provided by the Client was used for NMO correction over the entire cube. The main purpose of this QC tool was to check for erroneous positioning. Some slight shifts at the water bottom can be seen but these are attributed to the fact that no tidal statics were applied.

26. Parameters

Inlines	: 988 - 2340	Incr: 1
Crosslines	: 601 - 3672	Incr: 1
Cell Size	: 25.00 x 18.75	
Rotation	: 1231200263.3970	
Data Input	: Based on common radial offset 400 – 460 m	
Data Length	: 4000ms	
Sample Rate	: 4ms	

Inlines were equivalent to CMP lines, and crosslines were equivalent to shot point number.

27. Processing Sequence

Input - Edit bad traces:	Input traces. (As above)
Merge with processed navigation data:	Merge based on time of day
NMO:	Using supplied velocity function.
Scale:	Data independent scaling
Output:	Data written to Charisma cube.

23. Data Quality / Observations

23.1. Quality Control Summary

The RMS values, shot and External Header data were displayed online versus shot point using the Pro display tool. The RMS and shot attribute displays, when used in conjunction with the online brute-stack and the RMS shot versus trace display allowed rapid and accurate delineation of noise types and their associated effects on data quality.

The RMS values, shot and SSE attributes and the External Header data could also be viewed in an areal sense, using the ATV display tool. This method of displaying the data was very useful for visualizing trends in both the in-line and cross-line directions.

The predominant noise types during the survey were swell noise, ship noise, monowing wash and current noise. In the eastern end of the survey in the deep water there was very strong water bottom multiples evident on the data.

23.1.1.Noise Types Encountered

28. Swell Noise

Low frequency, high amplitude swell noise was the most commonly encountered, and caused several sequences to be scratched.

29. Monowing Wash

Monowing wash was observed on some sequences, but usually only affected a range of about 25 shots and between 50 and 100 traces per streamer, and mainly on the outer streamers i.e. streamers 1,2 & 7,8. The affected traces were logged and placed as warnings in the Acquisition Report.

The noise from monowing wash was generally high amplitude but low frequency (less than 10hz). Associated with this was the loss of depth control in the same area. If a bird changed depth by more than 3 metres, for more than 5 consecutive shots, traces before and after the particular bird were marked as an edit.

30. Cable bend noise

Several SOL noise records contained cable bend noise in the last half of the streamer. This occurred because the SOL noise tests were run around 1.5km prior to line start – when the cables were sometimes still partially bent due to tight line changes. This led to some slight turn noise at the start of some sequences. Strong currents were also prevalent in the area, causing low frequency noise moving down the length of the cables. Such noise was noted as a warning in the Acquisition Reports.

□ Ship noise

High frequency ship noise was seen often, due to the close proximity of a shipping lane to the prospect. Where such noise was affecting the seismic data, shotpoint ranges were logged in the Acquisition Report as warnings.

23.1.2.Observation on the QC Products

The Raw RMS areal map showed all external noise events, and was used as the basis for the noise analysis of the survey. All the noise events observed in this map are catalogued in Table 1. See Acquisition Reports for further details.

Table 1: noise events observed in raw RMS areal-map

Seq	Type of noise observed
003	Ship noise SP 1772 – 1861, Monowing wash Strm 7 and 8
005	Monowing wash SP 2847 - 2837
009	Ship noise SP 2175 - 1785
010	Moderate swell noise toward EOL
013	High swell noise throughout line
014	High swell noise throughout line
015	High swell noise throughout line
016	High swell noise throughout line

017	High swell noise throughout line
018	Moderate swell noise throughout line
019	Moderate swell noise throughout line
020	Mild swell noise throughout line
021	Moderate swell noise decreasing throughout line
025	Current noise SP 1975 - 1895
026	Current noise SP 1602 - 1814
027	Current noise SP 2499 - 2329
028	Current noise SP 1750 - 1680
032	Slight swell noise at SOL
034	Ship noise SP 1454 - 2040, Current noise SP 3003 - 3097
036	Ship noise 1880 - 2150, Current noise SP 1420 - 1540
037	Parity error Strm 8, SP 2156 - 2127
039	Current noise SP 3000 - 2860, 1570 - 1300
041	Moderate swell noise decreasing throughout line
042	Ship noise SP 2827 - 3015
044	Ship noise SP 3050 - 3200, Current noise SP 2360- 2600
046	Ship noise SP 1860 - 2200, Monowing wash Strm 8 SP 1853 - 1951, 1853 - 1899
047	Current noise SP 1300 - 1170, Monowing wash Strm 8 SP 1740 - 1530
049	Ship noise SP 2169 - 2096, Monowing wash Strm 8 SP 2862 - 2831, 2425 - 2348
050	Turn noise SOL - SP 1067, Current noise SP 1850 - 2108
052	Monowing wash Strm 8 SP 2465 - 2450
055	Mild swell noise decreasing to EOL
056	Monowing wash Strm 8 SP 2131 - 1992, 1876 - 1834, 1195 - 1165
059	Mild swell noise
060	Ship noise SP 2190 - 2091
061	Turn noise SOL - SP 1070, Monowing wash Strm 1 and 2 SP 3018 - 3039, 3243 - 3265
062	Turn noise SOL - SP 2896
063	Turn noise SOL - SP 1458
064	Mild swell noise
065	Ship noise SP 2300-2000, Monowing wash Strm 1 + 2 SP 2628-2604, 1547-1532, 1227-1196
066	Current noise SP 1390 - 1555, 2330 - 2532
067	Ship noise SP 1582 - 1359, Current noise SP 997 - 878
068	Ship noise SP 1171 - 1062
072	Current noise SP 1749 - 1947, 2350 - 2500
074	Ship noise SP 1679 - 1753, Current noise 2309 - 2500
076	Ship noise SP 2500 - 2500
077	Ship noise SP 2780 - 2941, Mild swell noise
078	Mild swell noise
080	Ship noise SP 3000-2891
085	Mild swell noise towards EOL
086	Mild swell noise
087	Turn noise SP 2765-2640
088	Ship noise SP 3050 - 3265
089	Turn noise SP 2753 - 2684
093	Monowing wash Strm 8 SP 3195-3187, 3165-3161, 3147-3140, 3125-3105, 3092-3084, 2930-2917, 2894-2882, 2211-2205
095	Monowing wash Strm 8 SP 2317-2304, 2281-2275
096	Ship noise SP 2346-2463
097	Turn noise SP 3195-3165, Monowing wash Strm 8 SP 3001-2985, 2913-2895, 2888-2880, 2672-2650
099	Ship noise SP 2500-2700
101	Turn noise SP 2306 - 2335

102	Ship noise SP 2800 - 2545
103	Ship noise SP 3220-3300
105	Monowing wash SP 2403-2433
107	Turn noise SP 2570-2630
108	Turn noise SP 2315-2220, Swell noise SP SOL - 2500 30uB
109	Swell noise at EOL
112	Swell noise throughout line
113	Swell noise throughout line
116	Monowing wash on Strm 6
124	Earth Leakage Strm 3
133	Swell noise towards EOL

23.2. Instrument Summary

NESSIE 3/4 Streamer and Triacq recording

Faulty channels due to spiking, noise, weak or dead were annotated in the individual Acquisition Reports. These traces however were few and condition of the streamer was quite good.

Types of noise appearing on individual line sequences were noted down on the observer logs. Summaries were listed on the data quality assurance section.

TRISOR Source

The dual trisor source performed well. Generally the gun timing was well within the specified ± 1.0 ms. Necessary source repairs and maintenance was carried out at regular intervals.

31. Appendix 1: Acquisition Tape Reports (Original Tapes)



Tape Report Survey 9227 Original Tapes



Client	BHPBP	First Sequence	0001 SOL at 04:46:00utc 09-Aug-2002
Area	Vic/P45 Gippsland Basin	Last Sequence	0133 EOL at 15:48:31utc 25-Sep-2002
Vessel	GECO_BETA		
JobNumber	9227		
Survey Type	3D, Dual source, 8/6 Streamers		

Tape List ¹

Seq	Reel	FSP-LSP	FFILE-LFILE	OS	Dev	Media	Box	Remark	Missing shots
1	1	02996-02567	02996-02567	1	1	3590	1		
	2	02566-02137	02566-02137	1	2	3590	1		
	3	02136-01707	02136-01707	1	1	3590	1		
	4	01706-01277	01706-01277	1	2	3590	1		
	5	01276-01143	01276-01143	1	1	3590	1		
2	6	01254-01683	01254-01683	1	1	3590	1		
	7	01684-02113	01684-02113	1	2	3590	1		
	8	02114-02543	02114-02543	1	1	3590	1		
	9	02544-02973	02544-02973	1	2	3590	1		
	10	02974-03106	02974-03106	1	1	3590	1		
3	11	02996-02567	02996-02567	1	2	3590	1		
	12	02566-02137	02566-02137	1	1	3590	1		
	13	02136-01707	02136-01707	1	2	3590	1		
	14	01706-01277	01706-01277	1	1	3590	1		
	15	01276-01144	01276-01144	1	2	3590	1		
4	16	01254-01683	01254-01683	1	2	3590	1		
	17	01684-02113	01684-02113	1	1	3590	1		
	18	02114-02543	02114-02543	1	2	3590	1		
	19	02544-02973	02544-02973	1	1	3590	1		
	20	02974-03104	02974-03104	1	2	3590	1		
5	21	02995-02566	02995-02566	1	1	3590	1		
	22	02565-02136	02565-02136	1	2	3590	1		
	23	02135-01706	02135-01706	1	1	3590	1		

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	24	01705-01276	01705-01276	1	2	3590	1
	25	01275-01143	01275-01143	1	1	3590	1
6	26	01254-01683	01254-01683	1	1	3590	1
	27	01684-02113	01684-02113	1	2	3590	1
	28	02114-02543	02114-02543	1	1	3590	1
	29	02544-02973	02544-02973	1	2	3590	1
	30	02974-03104	02974-03104	1	1	3590	1
7	31	02995-02566	02995-02566	1	1	3590	2
	32	02565-02136	02565-02136	1	2	3590	2
	33	02135-01706	02135-01706	1	1	3590	2
	34	01705-01276	01705-01276	1	2	3590	2
	35	01275-01144	01275-01144	1	2	3590	2
8	36	01254-01683	01254-01683	1	1	3590	2
	37	01684-02113	01684-02113	1	2	3590	2
	38	02114-02543	02114-02543	1	1	3590	2
	39	02544-02973	02544-02973	1	2	3590	2
	40	02974-03103	02974-03103	1	1	3590	2
9	41	02994-02565	02994-02565	1	1	3590	2
	42	02564-02135	02564-02135	1	2	3590	2
	43	02134-01705	02134-01705	1	1	3590	2
	44	01704-01275	01704-01275	1	2	3590	2
10	45	01274-01143	01274-01143	1	1	3590	2
	46	01254-01683	01254-01683	1	2	3590	2
	47	01684-02113	01684-02113	1	1	3590	2
	48	02114-02543	02114-02543	1	2	3590	2
	49	02544-02973	02544-02973	1	1	3590	2
	50	02974-03103	02974-03103	1	1	3590	2
11	51	02994-02242	02994-02242	1	2	3590	2
	52	02241-01812	02241-01812	1	1	3590	2
	53	01811-01382	01811-01382	1	1	3590	2
	54	01381-01142	01381-01142	1	2	3590	2
12	55	02288-02717	02288-02717	1	1	3590	2
	56	02718-03103	02718-03103	1	2	3590	2
13	57	02990-02565	02990-02565	1	1	3590	2
	58	02564-02135	02564-02135	1	2	3590	2
	59	02134-01705	02134-01705	1	1	3590	2
	60	01704-01275	01704-01275	1	2	3590	2
	61	01274-01143	01274-01143	1	1	3590	3
14	62	01254-01683	01254-01683	1	2	3590	3
	63	01684-02113	01684-02113	1	1	3590	3
	64	02114-02311	02114-02311	1	2	3590	3
15	65	02993-02564	02993-02564	1	1	3590	3
	66	02563-02134	02563-02134	1	2	3590	3

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	67	02133-01704	02133-01704	1	1	3590	3
	68	01703-01274	01703-01274	1	2	3590	3
	69	01273-01142	01273-01142	1	1	3590	3
16	70	01254-01683	01254-01683	1	1	3590	3
	71	01684-02113	01684-02113	1	2	3590	3
	72	02114-02543	02114-02543	1	1	3590	3
	73	02544-02973	02544-02973	1	2	3590	3
	74	02974-03102	02974-03102	1	1	3590	3
17	75	02993-02564	02993-02564	1	2	3590	3
	76	02563-02134	02563-02134	1	1	3590	3
	77	02133-01704	02133-01704	1	2	3590	3
	78	01703-01274	01703-01274	1	1	3590	3
	79	01273-01143	01273-01143	1	2	3590	3
18	80	01253-01682	01253-01682	1	1	3590	3
	81	01683-02112	01683-02112	1	2	3590	3
	82	02113-02542	02113-02542	1	1	3590	3
	83	02543-02972	02543-02972	1	2	3590	3
	84	02973-03102	02973-03102	1	1	3590	3
19	85	02993-02564	02993-02564	1	1	3590	3
	86	02563-02134	02563-02134	1	2	3590	3
	87	02133-01704	02133-01704	1	1	3590	3
	88	01703-01274	01703-01274	1	2	3590	3
	89	01273-01141	01273-01141	1	1	3590	3
20	90	01254-01683	01254-01683	1	1	3590	3
	91	01684-02113	01684-02113	1	2	3590	4
	92	02114-02543	02114-02543	1	1	3590	4
	93	02544-02973	02544-02973	1	2	3590	4
	94	02974-03102	02974-03102	1	1	3590	4
21	95	02992-02563	02992-02563	1	1	3590	4
	96	02562-02133	02562-02133	1	2	3590	4
	97	02132-01703	02132-01703	1	2	3590	4
	98	01702-01273	01702-01273	1	1	3590	4
	99	01272-01143	01272-01143	1	2	3590	4
22	100	01254-01683	01254-01683	1	1	3590	4
	101	01684-02113	01684-02113	1	2	3590	4
	102	02114-02543	02114-02543	1	1	3590	4
	103	02544-02973	02544-02973	1	2	3590	4
	104	02974-03101	02974-03101	1	1	3590	4
23	105	02994-02565	02994-02565	1	1	3590	4
	106	02564-02135	02564-02135	1	2	3590	4
	107	02134-01705	02134-01705	1	1	3590	4

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	108	01704-01275	01704-01275	1	1	3590	4	
	109	01274-01141	01274-01141	1	2	3590	4	
24	110	01254-01683	01254-01683	1	1	3590	4	
	111	01684-02113	01684-02113	1	2	3590	4	
	112	02114-02543	02114-02543	1	1	3590	4	
	113	02544-02973	02544-02973	1	2	3590	4	
	114	02974-03101	02974-03101	1	1	3590	4	
25	115	02992-02563	02992-02563	1	1	3590	4	
	116	02562-02133	02562-02133	1	2	3590	4	
	117	02132-01703	02132-01703	1	1	3590	4	
	118	01702-01273	01702-01273	1	2	3590	4	
	119	01272-01142	01272-01142	1	1	3590	4	
26	120	01254-01683	01254-01683	1	1	3590	4	
	121	01684-02113	01684-02113	1	2	3590	5	
	122	02114-02543	02114-02543	1	1	3590	5	
	123	02544-02973	02544-02973	1	2	3590	5	
	124	02974-03100	02974-03100	1	2	3590	5	
27	125	02992-02563	02992-02563	1	2	3590	5	
	126	02562-02133	02562-02133	1	1	3590	5	
	127	02132-01703	02132-01703	1	2	3590	5	
	128	01702-01273	01702-01273	1	2	3590	5	
	129	01272-01142	01272-01142	1	1	3590	5	
28	130	01254-01683	01254-01683	1	1	3590	5	
	131	01684-02113	01684-02113	1	2	3590	5	
	132	02114-02543	02114-02543	1	1	3590	5	
	133	02544-02973	02544-02973	1	2	3590	5	
	134	02974-03100	02974-03100	1	1	3590	5	
29	135	02992-02563	02992-02563	1	2	3590	5	
	136	02562-02133	02562-02133	1	1	3590	5	
	137	02132-01703	02132-01703	1	2	3590	5	
	138	01702-01273	01702-01273	1	1	3590	5	
	139	01272-01142	01272-01142	1	2	3590	5	
30	140	01254-01683	01254-01683	1	1	3590	5	
	141	01684-02113	01684-02113	1	2	3590	5	
	142	02114-02543	02114-02543	1	1	3590	5	
	143	02544-02973	02544-02973	1	2	3590	5	
	144	02974-03100	02974-03100	1	1	3590	5	
31	145	01145-02483	01145-02483	1	1	3590	5	First Files 1145, 1144 are noise record. FSP on tape 2910
	146	02482-02053	02482-02053	1	2	3590	5	
	147	02052-01623	02052-01623	1	1	3590	5	

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	148	01622-01193	01622-01193	1	2	3590	5	
	149	01192-08231	01192-08231	1	1	3590	5	Last Files 8232-8231 are noise records. LSP on tape 1143
32	150	01254-01683	01254-01683	1	1	3590	5	
	151	01684-02113	01684-02113	1	2	3590	6	
	152	02114-02543	02114-02543	1	1	3590	6	
	153	02544-02973	02544-02973	1	2	3590	6	
	154	02974-03100	02974-03100	1	2	3590	6	
33	155	02412-01983	02412-01983	1	1	3590	6	
	156	01982-01553	01982-01553	1	2	3590	6	
	157	01552-01142	01552-01142	1	1	3590	6	
34	158	00989-01418	00989-01418	1	1	3590	6	
	159	01419-01848	01419-01848	1	2	3590	6	
	160	01849-02278	01849-02278	1	1	3590	6	
	161	02279-02708	02279-02708	1	2	3590	6	
	162	02709-03099	02709-03099	1	1	3590	6	
35	163	03278-02849	03278-02849	1	1	3590	6	
	164	02848-02032	02848-02032	1	2	3590	6	
	165	02031-01602	02031-01602	1	1	3590	6	
	166	01601-01172	01601-01172	1	2	3590	6	
	167	01171-00877	01171-00877	1	1	3590	6	
36	168	00989-01418	00989-01418	1	2	3590	6	
	169	01419-01848	01419-01848	1	1	3590	6	
	170	01849-02278	01849-02278	1	2	3590	6	
	171	02279-02708	02279-02708	1	1	3590	6	
	172	02709-03138	02709-03138	1	2	3590	6	
	173	03139-03392	03139-03392	1	1	3590	6	
37	174	03277-02848	03277-02848	1	1	3590	6	
	175	02847-02418	02847-02418	1	2	3590	6	
	176	02417-01988	02417-01988	1	1	3590	6	
	177	01987-01558	01987-01558	1	2	3590	6	
	178	01557-01128	01557-01128	1	1	3590	6	
	179	01127-00876	01127-00876	1	2	3590	6	
38	180	00989-01418	00989-01418	1	1	3590	6	
	181	01419-01848	01419-01848	1	2	3590	7	
	182	01849-02278	01849-02278	1	1	3590	7	
	183	02279-02708	02279-02708	1	2	3590	7	
	184	02709-03393	02709-03393	1	1	3590	7	
39	185	03012-02583	03012-02583	1	1	8590	7	
	186	02582-02153	02582-02153	1	2	8590	7	
	187	02152-01723	02152-01723	1	1	8590	7	

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	188	01722-01293	01722-01293	1	2	8590	7
	189	01292-00877	01292-00877	1	1	8590	7
40	190	00989-01418	00989-01418	1	1	3590	7
	191	01419-03397	01419-03397	1	2	3590	7
41	192	03274-02845	03274-02845	1	1	3590	7
	193	02844-02415	02844-02415	1	2	3590	7
	194	02414-01985	02414-01985	1	1	3590	7
	195	01984-01555	01984-01555	1	2	3590	7
	196	01554-01125	01554-01125	1	1	3590	7
	197	01124-00877	01124-00877	1	2	3590	7
42	198	00989-01418	00989-01418	1	1	3590	7
	199	01419-01848	01419-01848	1	2	3590	7
	200	01849-02278	01849-02278	1	1	3590	7
	201	02279-02708	02279-02708	1	2	3590	7
	202	02709-03138	02709-03138	1	2	3590	7
	203	03139-03397	03139-03397	1	1	3590	7
43	204	03275-02846	03275-02846	1	1	3590	7
	205	02845-02416	02845-02416	1	2	3590	7
	206	02415-01986	02415-01986	1	2	3590	7
	207	01985-01556	01985-01556	1	1	3590	7
	208	01555-01126	01555-01126	1	2	3590	7
	209	01125-00877	01125-00877	1	1	3590	7
44	210	00989-01418	00989-01418	1	2	3590	7
	211	01419-01848	01419-01848	1	1	3590	8
	212	01849-02278	01849-02278	1	2	3590	8
	213	02279-02708	02279-02708	1	1	3590	8
	214	02709-03138	02709-03138	1	2	3590	8
	215	03139-03392	03139-03392	1	1	3590	8
45	216	03275-02846	03275-02846	1	2	3590	8
	217	02845-02416	02845-02416	1	1	3590	8
	218	02415-02322	02415-02322	1	2	3590	8
	219	01755-01326	01755-01326	1	1	3590	8
	220	01325-00896	01325-00896	1	2	3590	8
	221	00895-00876	00895-00876	1	1	3590	8
46	222	00989-01418	00989-01418	1	1	3590	8
	223	01419-01848	01419-01848	1	2	3590	8
	224	01849-02278	01849-02278	1	1	3590	8
	225	02279-02708	02279-02708	1	2	3590	8
	226	02709-03138	02709-03138	1	1	3590	8
	227	03139-03394	03139-03394	1	2	3590	8
47	228	03277-02848	03277-02848	1	1	3590	8

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	229	02847-02418	02847-02418	1	2	3590	8
	230	02417-01988	02417-01988	1	1	3590	8
	231	01987-01558	01987-01558	1	2	3590	8
	232	01557-01128	01557-01128	1	1	3590	8
	233	01127-00877	01127-00877	1	1	3590	8
48	234	01051-01480	01051-01480	1	1	3590	8
	235	01481-01910	01481-01910	1	2	3590	8
	236	01911-02340	01911-02340	1	1	3590	8
	237	02341-02770	02341-02770	1	2	3590	8
	238	02771-03200	02771-03200	1	1	3590	8
	239	03201-03393	03201-03393	1	2	3590	8
49	240	03276-02847	03276-02847	1	1	3590	8
	241	02846-02417	02846-02417	1	2	3590	9
	242	02416-01987	02416-01987	1	1	3590	9
	243	01986-01557	01986-01557	1	2	3590	9
	244	01556-01127	01556-01127	1	1	3590	9
	245	01126-00876	01126-00876	1	2	3590	9
50	246	00989-01418	00989-01418	1	1	3590	9
	247	01419-01848	01419-01848	1	2	3590	9
	248	01849-02278	01849-02278	1	1	3590	9
	249	02279-02708	02279-02708	1	1	3590	9
	250	02709-03138	02709-03138	1	2	3590	9
	251	03139-03394	03139-03394	1	2	3590	9
51	252	03278-02290	03278-02290	1	1	3590	9
52	253	02624-02195	02624-02195	1	2	3590	9
	254	02194-02173	02194-02173	1	1	3590	9
53	255	02458-02887	02458-02887	1	1	3590	9
	256	02888-03317	02888-03317	1	2	3590	9
	257	03318-03393	03318-03393	1	1	3590	9
54	258	03276-02847	03276-02847	1	1	3590	9
	259	02846-02417	02846-02417	1	2	3590	9
	260	02416-01987	02416-01987	1	1	3590	9
	261	01986-01557	01986-01557	1	2	3590	9
	262	01556-01127	01556-01127	1	1	3590	9
	263	01126-00876	01126-00876	1	2	3590	9
55	264	00989-01418	00989-01418	1	1	3590	9
	265	01419-01848	01419-01848	1	2	3590	9
	266	01849-02278	01849-02278	1	1	3590	9
	267	02279-02708	02279-02708	1	2	3590	9
	268	02709-03138	02709-03138	1	1	3590	9
	269	03139-03395	03139-03395	1	2	3590	9

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56	270	03275-02846	03275-02846	1	1	3590	9
	271	02845-02416	02845-02416	1	2	3590	10
	272	02415-01986	02415-01986	1	1	3590	10
	273	01985-01930	01985-01930	1	2	3590	10
	274	01929-01500	01929-01500	1	1	3590	10
	275	01499-01070	01499-01070	1	2	3590	10
	276	01069-00877	01069-00877	1	1	3590	10
57	277	00989-01418	00989-01418	1	1	3590	10
	278	01419-01848	01419-01848	1	2	3590	10
	279	01849-02278	01849-02278	1	1	3590	10
	280	02279-02708	02279-02708	1	2	3590	10
	281	02709-03138	02709-03138	1	1	3590	10
	282	03139-03396	03139-03396	1	2	3590	10
	283	03274-02845	03274-02845	1	2	3590	10
58	284	02844-02415	02844-02415	1	1	3590	10
	285	02414-01985	02414-01985	1	2	3590	10
	286	01984-01555	01984-01555	1	1	3590	10
	287	01554-01125	01554-01125	1	2	3590	10
	288	01124-00877	01124-00877	1	1	3590	10
	289	00989-01418	00989-01418	1	2	3590	10
	290	01419-01848	01419-01848	1	1	3590	10
59	291	01849-02278	01849-02278	1	2	3590	10
	292	02279-02708	02279-02708	1	1	3590	10
	293	02709-03138	02709-03138	1	2	3590	10
	294	03139-03396	03139-03396	1	1	3590	10
	295	03275-02846	03275-02846	1	1	3590	10
	296	02845-02416	02845-02416	1	2	3590	10
	297	02415-01986	02415-01986	1	1	3590	10
60	298	01985-01556	01985-01556	1	2	3590	10
	299	01555-01126	01555-01126	1	1	3590	10
	300	01125-00876	01125-00876	1	2	3590	10
	301	00989-01418	00989-01418	1	1	3590	11
	302	01419-01848	01419-01848	1	2	3590	11
	303	01849-02278	01849-02278	1	1	3590	11
	304	02279-02708	02279-02708	1	2	3590	11
61	305	02709-03138	02709-03138	1	1	3590	11
	306	03139-03395	03139-03395	1	2	3590	11
	307	02993-02564	02993-02564	1	1	3590	11
	308	02563-02134	02563-02134	1	2	3590	11
	309	02133-01704	02133-01704	1	1	3590	11
	310	01703-01274	01703-01274	1	2	3590	11

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	311	01273-01141	01273-01141	1	1	3590	11
63	312	01254-01683	01254-01683	1	1	3590	11
	313	01684-01952	01684-01952	1	2	3590	11
64	314	00989-01418	00989-01418	1	1	3590	11
	315	01419-01848	01419-01848	1	2	3590	11
	316	01849-02278	01849-02278	1	1	3590	11
	317	02279-02708	02279-02708	1	2	3590	11
	318	02709-03138	02709-03138	1	1	3590	11
	319	03139-03396	03139-03396	1	2	3590	11
65	320	03275-02846	03275-02846	1	1	3590	11
	321	02845-02416	02845-02416	1	2	3590	11
	322	02415-01986	02415-01986	1	1	3590	11
	323	01985-01556	01985-01556	1	2	3590	11
	324	01555-01126	01555-01126	1	1	3590	11
	325	01125-00877	01125-00877	1	2	3590	11
66	326	00989-01418	00989-01418	1	1	3590	11
	327	01419-01848	01419-01848	1	2	3590	11
	328	01849-02278	01849-02278	1	1	3590	11
	329	02279-02708	02279-02708	1	2	3590	11
	330	02709-03138	02709-03138	1	1	3590	11
	331	03139-03395	03139-03395	1	2	3590	12
67	332	02662-02233	02662-02233	1	1	3590	12
	333	02232-01803	02232-01803	1	2	3590	12
	334	01802-01373	01802-01373	1	1	3590	12
	335	01372-00943	01372-00943	1	2	3590	12
	336	00942-00876	00942-00876	1	1	3590	12
68	337	00989-01418	00989-01418	1	1	3590	12
	338	01419-01848	01419-01848	1	2	3590	12
	339	01849-02278	01849-02278	1	1	3590	12
	340	02279-02708	02279-02708	1	2	3590	12
	341	02709-03395	02709-03395	1	1	3590	12
69	342	03278-02851	03278-02851	1	1	3590	12
	343	02850-02421	02850-02421	1	2	3590	12
	344	02420-01991	02420-01991	1	1	3590	12
	345	01990-01561	01990-01561	1	2	3590	12
	346	01560-01131	01560-01131	1	1	3590	12
	347	01130-00877	01130-00877	1	2	3590	12
70	348	01001-01219	01001-01219	1	1	3590	12
71	349	01153-01066	01153-01066	1	1	3590	12
72	350	00989-01418	00989-01418	1	1	3590	12
	351	01419-01848	01419-01848	1	2	3590	12

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	352	01849-02278	01849-02278	1	1	3590	12	
	353	02279-02708	02279-02708	1	2	3590	12	
	354	02709-02925	02709-02925	1	1	3590	12	
	355	03115-03392	03115-03392	1	1	3590	12	
73	356	03279-02850	03279-02850	1	1	3590	12	
	357	02849-02710	02849-02710	1	2	3590	12	
	358	02140-01711	02140-01711	1	1	3590	12	
	359	01710-01281	01710-01281	1	2	3590	12	
	360	01280-00877	01280-00877	1	2	3590	12	Noise file 877, 876 at EOT NTBP
74	361	01489-01918	01489-01918	1	1	3590	13	
	362	01919-02348	01919-02348	1	2	3590	13	
	363	02349-02522	02349-02522	1	1	3590	13	
75	364	02904-03126	02904-03126	1	2	3590	13	
76	365	02932-02503	02932-02503	1	1	3590	13	
	366	02502-02073	02502-02073	1	2	3590	13	
	367	02072-01643	02072-01643	1	1	3590	13	
	368	01642-01213	01642-01213	1	2	3590	13	
	369	01212-00877	01212-00877	1	1	3590	13	
77	370	02208-02637	02208-02637	1	1	3590	13	
	371	02638-03067	02638-03067	1	2	3590	13	
	372	03068-03396	03068-03396	1	1	3590	13	
78	373	03270-02841	03270-02841	1	1	3590	13	
	374	02840-02411	02840-02411	1	2	3590	13	
	375	02410-02407	02410-02407	1	1	3590	13	No EOT Mark
	376	02406-02093	02406-02093	1	1	3590	13	
79	377	02280-02709	02280-02709	1	2	3590	13	
	378	02710-03139	02710-03139	1	1	3590	13	
	379	03140-03378	03140-03378	1	2	3590	13	
80	380	03268-02839	03268-02839	1	1	3590	13	
	381	02838-02409	02838-02409	1	2	3590	13	
	382	02408-02127	02408-02127	1	1	3590	13	
81	383	02314-02743	02314-02743	1	1	3590	13	
	384	02744-03173	02744-03173	1	2	3590	13	
	385	03174-03376	03174-03376	1	1	3590	13	
82	386	03273-02844	03273-02844	1	2	3590	13	
	387	02843-02414	02843-02414	1	1	3590	13	
	388	02413-02045	02413-02045	1	2	3590	13	
83	389	02348-02777	02348-02777	1	1	3590	13	
	390	02778-03207	02778-03207	1	2	3590	13	
	391	03208-03374	03208-03374	1	1	3590	14	

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84	392	03271-02842	03271-02842	1	1	3590	14
	393	02841-02412	02841-02412	1	1	3590	14
	394	02411-02086	02411-02086	1	1	3590	14
85	395	02273-02702	02273-02702	1	1	3590	14
	396	02703-03132	02703-03132	1	2	3590	14
	397	03133-03379	03133-03379	1	1	3590	14
86	398	02267-02696	02267-02696	1	1	3590	14
	399	02474-02903	02474-02903	1	2	3590	14
	400	02904-03333	02904-03333	1	1	3590	14
	401	03334-03378	03334-03378	1	2	3590	14
87	402	03288-02859	03288-02859	1	1	3590	14
	403	02858-02429	02858-02429	1	2	3590	14
	404	02428-02120	02428-02120	1	1	3590	14
88	405	02301-02730	02301-02730	1	2	3590	14
	406	02731-03160	02731-03160	1	1	3590	14
	407	03161-03376	03161-03376	1	2	3590	14
89	408	03293-02864	03293-02864	1	1	3590	14
	409	02863-02434	02863-02434	1	2	3590	14
	410	02433-02047	02433-02047	1	2	3590	14
90	411	02308-02737	02308-02737	1	2	3590	14
	412	02738-03167	02738-03167	1	1	3590	14
	413	03168-03375	03168-03375	1	2	3590	14
91	414	03288-02859	03288-02859	1	1	3590	14
	415	02858-02429	02858-02429	1	2	3590	14
	416	02428-02134	02428-02134	1	1	3590	14
92	417	02335-02764	02335-02764	1	2	3590	14
	418	02765-03194	02765-03194	1	1	3590	14
	419	03195-03374	03195-03374	1	1	3590	14
93	420	03290-02861	03290-02861	1	2	3590	14
	421	02860-02431	02860-02431	1	1	3590	15
	422	02430-02100	02430-02100	1	2	3590	15
94	423	02274-02703	02274-02703	1	1	3590	15
	424	02704-03133	02704-03133	1	2	3590	15
	425	03134-03378	03134-03378	1	1	3590	15
95	426	03292-02863	03292-02863	1	2	3590	15
	427	02862-02433	02862-02433	1	1	3590	15
	428	02432-02058	02432-02058	1	2	3590	15
96	429	02314-02743	02314-02743	1	2	3590	15
	430	02744-03173	02744-03173	1	2	3590	15
	431	03174-03375	03174-03375	1	1	3590	15
97	432	03289-02860	03289-02860	1	2	3590	15

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	433	02859-02430	02859-02430	1	1	3590	15	
	434	02429-02113	02429-02113	1	2	3590	15	
	435	00000-00000	00000-00000	1	1	3590	15	Blank Tape
98	436	03292-02863	03292-02863	1	2	3590	15	
	437	02862-02433	02862-02433	1	1	3590	15	
	438	02432-02058	02432-02058	1	2	3590	15	
99	439	02287-02716	02287-02716	1	1	3590	15	
	440	02717-02801	02717-02801	1	2	3590	15	
	441	02802-03231	02802-03231	1	1	3590	15	
	442	03232-03377	03232-03377	1	2	3590	15	
100	443	03291-02862	03291-02862	1	1	3590	15	
	444	02861-02432	02861-02432	1	2	3590	15	
	445	02431-02079	02431-02079	1	1	3590	15	
101	446	02274-02703	02274-02703	1	2	3590	15	
	447	02704-03133	02704-03133	1	1	3590	15	
	448	03134-03378	03134-03378	1	2	3590	15	
102	449	03290-02861	03290-02861	1	1	3590	15	
	450	02860-02431	02860-02431	1	2	3590	15	
	451	02430-02100	02430-02100	1	1	3590	16	
103	452	02314-02743	02314-02743	1	2	3590	16	
	453	02744-03173	02744-03173	1	1	3590	16	
	454	03174-03375	03174-03375	1	2	3590	16	
104	455	03289-02860	03289-02860	1	1	3590	16	
	456	02859-02430	02859-02430	1	2	3590	16	
	457	02429-02113	02429-02113	1	1	3590	16	
105	458	02280-02709	02280-02709	1	2	3590	16	
	459	02710-03139	02710-03139	1	1	3590	16	
	460	03140-03377	03140-03377	1	2	3590	16	
106	461	03292-02863	03292-02863	1	1	3590	16	
	462	02862-02433	02862-02433	1	2	3590	16	
	463	02432-02065	02432-02065	1	1	3590	16	
107	464	02321-02750	02321-02750	1	2	3590	16	
	465	02751-03180	02751-03180	1	1	3590	16	
	466	03181-03375	03181-03375	1	2	3590	16	
108	467	03291-02862	03291-02862	1	1	3590	16	
	468	02861-02432	02861-02432	1	2	3590	16	
	469	02431-02073	02431-02073	1	2	3590	16	
109	470	02246-02675	02246-02675	1	1	3590	16	
	471	02676-03105	02676-03105	1	1	3590	16	
	472	03106-03379	03106-03379	1	2	3590	16	
110	473	03289-02860	03289-02860	1	1	3590	16	

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	474	02859-02430	02859-02430	1	2	3590	16
	475	02429-02107	02429-02107	1	1	3590	16
111	476	02314-02743	02314-02743	1	2	3590	16
	477	02744-03173	02744-03173	1	1	3590	16
	478	03174-03375	03174-03375	1	2	3590	16
112	479	03291-02862	03291-02862	1	1	3590	16
	480	02861-02432	02861-02432	1	2	3590	16
	481	02431-02073	02431-02073	1	1	3590	17
113	482	02314-02743	02314-02743	1	2	3590	17
	483	02744-03076	02744-03076	1	1	3590	17
	484	03077-03173	03077-03173	1	1	3590	17
	485	03174-03375	03174-03375	1	2	3590	17
114	486	01298-01847	01298-01847	1	2	3590	17
	487	01848-02397	01848-02397	1	1	3590	17
	488	02398-03394	02398-03394	1	2	3590	17
115	489	02352-00877	02352-00877	1	1	3590	17
116	490	02341-02770	02341-02770	1	1	3590	17
	491	02771-03373	02771-03373	1	2	3590	17
117	492	03217-02668	03217-02668	1	1	3590	17
	493	02667-02065	02667-02065	1	2	3590	17
118	494	02274-02823	02274-02823	1	1	3590	17
	495	02824-03378	02824-03378	1	2	3590	17
119	496	03287-02738	03287-02738	1	1	3590	17
	497	02737-02188	02737-02188	1	2	3590	17
	498	02187-02141	02187-02141	1	1	3590	17
120	499	02600-03149	02600-03149	1	2	3590	17
	500	03150-03373	03150-03373	1	1	3590	17
121	501	03288-02739	03288-02739	1	2	3590	17
	502	02738-02189	02738-02189	1	1	3590	17
	503	02188-02114	02188-02114	1	2	3590	17
122	504	02240-02790	02240-02790	1	2	3590	17
	505	02791-03340	02791-03340	1	1	3590	17
	506	03341-03380	03341-03380	1	2	3590	17
123	507	03287-02738	03287-02738	1	1	3590	17
	508	02737-02188	02737-02188	1	2	3590	17
	509	02187-02148	02187-02148	1	1	3590	17
124	510	02341-02890	02341-02890	1	1	3590	17
	511	02891-03373	02891-03373	1	2	3590	18
125	512	03250-02701	03250-02701	1	1	3590	18
	513	02700-02344	02700-02344	1	2	3590	18
126	514	02321-03375	02321-03375	1	1	3590	18

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127	515	02407-02148	02407-02148	1	2	3590	18
128	516	00971-01520	00971-01520	1	1	3590	18
	517	01521-02070	01521-02070	1	2	3590	18
	518	02071-02620	02071-02620	1	1	3590	18
	519	02621-02927	02621-02927	1	2	3590	18
129	520	02028-03100	02028-03100	1	1	3590	18
130	521	03065-00876	03065-00876	1	2	3590	18
131	522	02052-01503	02052-01503	1	1	3590	18
	523	01502-00876	01502-00876	1	2	3590	18
132	524	01278-01827	01278-01827	1	2	3590	18
	525	01828-02377	01828-02377	1	1	3590	18
	526	02378-02906	02378-02906	1	2	3590	18
	527	02907-02927	02907-02927	1	1	3590	18
	528	02928-03394	02928-03394	1	2	3590	18
133	529	03209-02660	03209-02660	1	1	3590	18
	530	02659-02106	02659-02106	1	2	3590	18

Note ¹ : OS = outputstream, Dev = Device id, FFILE-LFILE = first/last file, FSP/LSP = first/last shotpoint

TRILOGY INFORMATION MANAGER - TAPE REPORT - GENERATED 17:04:09utc 27-Sep-2002

32. Appendix 2: Acquisition Tape Reports (Copy tapes)



Tape Report Survey 9227 Copy Tapes



Client	BHPBP	First Sequence	0001 SOL at 04:46:00utc 09-Aug-2002
Area	Vic/P45 Gippsland Basin	Last Sequence	0133 EOL at 15:48:31utc 25-Sep-2002
Vessel	GECO_BETA		
JobNumber	9227		
Survey Type	3D, Dual source, 8 Streamers		

Tape List ¹

Seq	Reel	FSP-LSP	FFILE-LFILE	OS	Dev	Media	Box	Remark	Missing shots
1	1	02996-02567	02996-02567	2	3	3590	1		
	2	02566-02137	02566-02137	2	4	3590	1		
	3	02136-01707	02136-01707	2	3	3590	1		
	4	01706-01277	01706-01277	2	4	3590	1		
	5	01276-01143	01276-01143	2	3	3590	1		
2	6	01254-01683	01254-01683	2	3	3590	1		
	7	01684-02113	01684-02113	2	4	3590	1		
	8	02114-02543	02114-02543	2	3	3590	1		
	9	02544-02973	02544-02973	2	4	3590	1		
	10	02974-03106	02974-03106	2	3	3590	1		
3	11	02996-02567	02996-02567	2	4	3590	1		
	12	02566-02137	02566-02137	2	3	3590	1		
	13	02136-01707	02136-01707	2	4	3590	1		
	14	01706-01277	01706-01277	2	3	3590	1		
	15	01276-01144	01276-01144	2	4	3590	1		
4	16	01254-01683	01254-01683	2	3	3590	1		
	17	01684-02113	01684-02113	2	4	3590	1		
	18	02114-02543	02114-02543	2	3	3590	1		
	19	02544-02973	02544-02973	2	4	3590	1		
	20	02974-03104	02974-03104	2	3	3590	1		
5	21	02995-02566	02995-02566	2	3	3590	1		
	22	02565-02136	02565-02136	2	4	3590	1		
	23	02135-01706	02135-01706	2	3	3590	1		

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	24	01705-01276	01705-01276	2	4	3590	1
	25	01275-01143	01275-01143	2	3	3590	1
6	26	01254-01683	01254-01683	2	3	3590	1
	27	01684-02113	01684-02113	2	4	3590	1
	28	02114-02543	02114-02543	2	3	3590	1
	29	02544-02973	02544-02973	2	4	3590	1
	30	02974-03104	02974-03104	2	3	3590	1
7	31	02995-02566	02995-02566	2	3	3590	2
	32	02565-02136	02565-02136	2	4	3590	2
	33	02135-01706	02135-01706	2	3	3590	2
	34	01705-01276	01705-01276	2	4	3590	2
	35	01275-01144	01275-01144	2	3	3590	2
8	36	01254-01683	01254-01683	2	4	3590	2
	37	01684-02113	01684-02113	2	3	3590	2
	38	02114-02543	02114-02543	2	4	3590	2
	39	02544-02973	02544-02973	2	3	3590	2
	40	02974-03103	02974-03103	2	4	3590	2
9	41	02994-02565	02994-02565	2	3	3590	2
	42	02564-02135	02564-02135	2	4	3590	2
	43	02134-01705	02134-01705	2	3	3590	2
	44	01704-01275	01704-01275	2	4	3590	2
	45	01274-01143	01274-01143	2	3	3590	2
10	46	01254-01683	01254-01683	2	4	3590	2
	47	01684-02113	01684-02113	2	3	3590	2
	48	02114-02543	02114-02543	2	4	3590	2
	49	02544-02973	02544-02973	2	3	3590	2
	50	02974-03103	02974-03103	2	4	3590	2
11	51	02994-02242	02994-02242	2	3	3590	2
	52	02241-01812	02241-01812	2	4	3590	2
	53	01811-01382	01811-01382	2	3	3590	2
	54	01381-01142	01381-01142	2	4	3590	2
12	55	02288-02717	02288-02717	2	3	3590	2
	56	02718-03103	02718-03103	2	4	3590	2
13	57	02990-02565	02990-02565	2	3	3590	2
	58	02564-02135	02564-02135	2	4	3590	2
	59	02134-01705	02134-01705	2	3	3590	2
	60	01704-01275	01704-01275	2	4	3590	2
	61	01274-01143	01274-01143	2	3	3590	3
14	62	01254-01683	01254-01683	2	4	3590	3
	63	01684-02113	01684-02113	2	4	3590	3
	64	02114-02311	02114-02311	2	3	3590	3

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15	65	02993-02564	02993-02564	2	3	3590	3
	66	02563-02134	02563-02134	2	4	3590	3
	67	02133-01704	02133-01704	2	3	3590	3
	68	01703-01274	01703-01274	2	4	3590	3
	69	01273-01142	01273-01142	2	3	3590	3
16	70	01254-01683	01254-01683	2	3	3590	3
	71	01684-02113	01684-02113	2	4	3590	3
	72	02114-02543	02114-02543	2	3	3590	3
	73	02544-02973	02544-02973	2	4	3590	3
	74	02974-03102	02974-03102	2	3	3590	3
17	75	02993-02564	02993-02564	2	4	3590	3
	76	02563-02134	02563-02134	2	3	3590	3
	77	02133-01704	02133-01704	2	4	3590	3
	78	01703-01274	01703-01274	2	3	3590	3
	79	01273-01143	01273-01143	2	4	3590	3
18	80	01253-01682	01253-01682	2	3	3590	3
	81	01683-02112	01683-02112	2	4	3590	3
	82	02113-02542	02113-02542	2	3	3590	3
	83	02543-02972	02543-02972	2	4	3590	3
	84	02973-03102	02973-03102	2	3	3590	3
19	85	02993-02564	02993-02564	2	3	3590	3
	86	02563-02134	02563-02134	2	4	3590	3
	87	02133-01704	02133-01704	2	3	3590	3
	88	01703-01274	01703-01274	2	4	3590	3
	89	01273-01141	01273-01141	2	3	3590	3
20	90	01254-01683	01254-01683	2	4	3590	3
	91	01684-02113	01684-02113	2	3	3590	4
	92	02114-02543	02114-02543	2	4	3590	4
	93	02544-02973	02544-02973	2	3	3590	4
	94	02974-03102	02974-03102	2	4	3590	4
21	95	02992-02563	02992-02563	2	3	3590	4
	96	02562-02133	02562-02133	2	4	3590	4
	97	02132-01703	02132-01703	2	3	3590	4
	98	01702-01273	01702-01273	2	4	3590	4
	99	01272-01143	01272-01143	2	3	3590	4
22	100	01254-01683	01254-01683	2	4	3590	4
	101	01684-02113	01684-02113	2	3	3590	4
	102	02114-02543	02114-02543	2	4	3590	4
	103	02544-02973	02544-02973	2	3	3590	4
	104	02974-03101	02974-03101	2	4	3590	4
23	105	02994-02565	02994-02565	2	3	3590	4

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	106	02564-02135	02564-02135	2	3	3590	4	
	107	02134-01705	02134-01705	2	4	3590	4	
	108	01704-01275	01704-01275	2	3	3590	4	
	109	01274-01141	01274-01141	2	4	3590	4	
24	110	01254-01683	01254-01683	2	3	3590	4	
	111	01684-02113	01684-02113	2	4	3590	4	
	112	02114-02543	02114-02543	2	3	3590	4	
	113	02544-02973	02544-02973	2	4	3590	4	
	114	02974-03101	02974-03101	2	3	3590	4	
25	115	02992-02563	02992-02563	2	3	3590	4	
	116	02562-02133	02562-02133	2	4	3590	4	
	117	02132-01703	02132-01703	2	3	3590	4	
	118	01702-01273	01702-01273	2	4	3590	4	
	119	01272-01142	01272-01142	2	3	3590	4	
26	120	01254-01683	01254-01683	2	3	3590	4	
	121	01684-02113	01684-02113	2	4	3590	5	
	122	02114-02543	02114-02543	2	3	3590	5	
	123	02544-02973	02544-02973	2	4	3590	5	
	124	02974-03100	02974-03100	2	3	3590	5	
27	125	02992-02563	02992-02563	2	3	3590	5	
	126	02562-02133	02562-02133	2	4	3590	5	
	127	02132-01703	02132-01703	2	3	3590	5	
	128	01702-01273	01702-01273	2	4	3590	5	
	129	01272-01142	01272-01142	2	3	3590	5	
28	130	01254-01683	01254-01683	2	3	3590	5	
	131	01684-02113	01684-02113	2	4	3590	5	
	132	02114-02543	02114-02543	2	3	3590	5	
	133	02544-02973	02544-02973	2	4	3590	5	
	134	02974-03100	02974-03100	2	3	3590	5	
29	135	02992-02563	02992-02563	2	4	3590	5	
	136	02562-02133	02562-02133	2	3	3590	5	
	137	02132-01703	02132-01703	2	4	3590	5	
	138	01702-01273	01702-01273	2	3	3590	5	
	139	01272-01142	01272-01142	2	4	3590	5	
30	140	01254-01683	01254-01683	2	3	3590	5	
	141	01684-02113	01684-02113	2	3	3590	5	
	142	02114-02543	02114-02543	2	4	3590	5	
	143	02544-02973	02544-02973	2	3	3590	5	
	144	02974-03100	02974-03100	2	3	3590	5	
31	145	01145-01144	01145-01144	2	3	3590	5	First Files 1145, 1144 are noise record. FSP on tape 2910

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	145	02910-02483	02910-02483	2	3	3590	5	
	146	02482-02053	02482-02053	2	4	3590	5	
	147	02052-01623	02052-01623	2	3	3590	5	
	148	01622-01193	01622-01193	2	4	3590	5	
	149	01192-01143	01192-01143	2	3	3590	5	LSP on tape 1143
	149	08232-08231	08232-08231	2	3	3590	5	Last files 8232-8231 are noise records.
32	150	01254-01683	01254-01683	2	3	3590	5	
	151	01684-02113	01684-02113	2	3	3590	6	
	152	02114-02543	02114-02543	2	3	3590	6	
	153	02544-02973	02544-02973	2	4	3590	6	
	154	02974-03100	02974-03100	2	3	3590	6	
33	155	02412-01983	02412-01983	2	3	3590	6	
	156	01982-01553	01982-01553	2	4	3590	6	
	157	01552-01142	01552-01142	2	3	3590	6	
34	158	00989-01418	00989-01418	2	3	3590	6	
	159	01419-01848	01419-01848	2	4	3590	6	
	160	01849-02278	01849-02278	2	3	3590	6	
	161	02279-02708	02279-02708	2	4	3590	6	
	162	02709-03099	02709-03099	2	3	3590	6	
35	163	03278-02849	03278-02849	2	3	3590	6	
	164	02848-02032	02848-02032	2	4	3590	6	
	165	02031-01602	02031-01602	2	3	3590	6	
	166	01601-01172	01601-01172	2	4	3590	6	
	167	01171-00877	01171-00877	2	3	3590	6	
36	168	00989-01418	00989-01418	2	4	3590	6	
	169	01419-01848	01419-01848	2	3	3590	6	
	170	01849-02278	01849-02278	2	4	3590	6	
	171	02279-02708	02279-02708	2	3	3590	6	
	172	02709-03138	02709-03138	2	4	3590	6	
	173	03139-03392	03139-03392	2	3	3590	6	
37	174	03277-02848	03277-02848	2	3	3590	6	
	175	02847-02418	02847-02418	2	4	3590	6	
	176	02417-01988	02417-01988	2	3	3590	6	
	177	01987-01558	01987-01558	2	4	3590	6	
	178	01557-01128	01557-01128	2	3	3590	6	
	179	01127-00876	01127-00876	2	4	3590	6	
38	180	00989-01418	00989-01418	2	3	3590	6	
	181	01419-01848	01419-01848	2	3	3590	7	
	182	01849-02278	01849-02278	2	4	3590	7	
	183	02279-02708	02279-02708	2	3	3590	7	

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	184	02709-03393	02709-03393	2	4	3590	7
39	185	03012-02583	03012-02583	2	3	8590	7
	186	02582-02153	02582-02153	2	4	8590	7
	187	02152-01723	02152-01723	2	3	8590	7
	188	01722-01293	01722-01293	2	4	8590	7
	189	01292-00877	01292-00877	2	3	8590	7
40	190	00989-01418	00989-01418	2	3	3590	7
	191	01419-03397	01419-03397	2	4	3590	7
41	192	03274-02845	03274-02845	2	3	3590	7
	193	02844-02415	02844-02415	2	4	3590	7
	194	02414-01985	02414-01985	2	3	3590	7
	195	01984-01555	01984-01555	2	4	3590	7
	196	01554-01125	01554-01125	2	3	3590	7
	197	01124-00877	01124-00877	2	4	3590	7
42	198	00989-01418	00989-01418	2	3	3590	7
	199	01419-01848	01419-01848	2	4	3590	7
	200	01849-02278	01849-02278	2	3	3590	7
	201	02279-02708	02279-02708	2	4	3590	7
	202	02709-03138	02709-03138	2	3	3590	7
	203	03139-03397	03139-03397	2	4	3590	7
43	204	03275-02846	03275-02846	2	3	3590	7
	205	02845-02416	02845-02416	2	4	3590	7
	206	02415-01986	02415-01986	2	3	3590	7
	207	01985-01556	01985-01556	2	4	3590	7
	208	01555-01126	01555-01126	2	3	3590	7
	209	01125-00877	01125-00877	2	4	3590	7
44	210	00989-01418	00989-01418	2	3	3590	7
	211	01419-01848	01419-01848	2	4	3590	8
	212	01849-02278	01849-02278	2	3	3590	8
	213	02279-02708	02279-02708	2	4	3590	8
	214	02709-03138	02709-03138	2	3	3590	8
	215	03139-03392	03139-03392	2	4	3590	8
45	216	03275-02846	03275-02846	2	3	3590	8
	217	02845-02416	02845-02416	2	4	3590	8
	218	02415-02322	02415-02322	2	3	3590	8
	219	01755-01326	01755-01326	2	4	3590	8
	220	01325-00896	01325-00896	2	3	3590	8
	221	00895-00876	00895-00876	2	4	3590	8
46	222	00989-01418	00989-01418	2	4	3590	8
	223	01419-01848	01419-01848	2	3	3590	8
	224	01849-02278	01849-02278	2	4	3590	8

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	225	02279-02708	02279-02708	2	3	3590	8
	226	02709-03138	02709-03138	2	4	3590	8
	227	03139-03394	03139-03394	2	3	3590	8
47	228	03277-02848	03277-02848	2	4	3590	8
	229	02847-02418	02847-02418	2	3	3590	8
	230	02417-01988	02417-01988	2	4	3590	8
	231	01987-01558	01987-01558	2	3	3590	8
	232	01557-01128	01557-01128	2	4	3590	8
	233	01127-00877	01127-00877	2	3	3590	8
48	234	01051-01480	01051-01480	2	3	3590	8
	235	01481-01910	01481-01910	2	4	3590	8
	236	01911-02340	01911-02340	2	3	3590	8
	237	02341-02770	02341-02770	2	4	3590	8
	238	02771-03200	02771-03200	2	3	3590	8
	239	03201-03393	03201-03393	2	4	3590	8
49	240	03276-02847	03276-02847	2	4	3590	8
	241	02846-02417	02846-02417	2	3	3590	9
	242	02416-01987	02416-01987	2	4	3590	9
	243	01986-01557	01986-01557	2	3	3590	9
	244	01556-01127	01556-01127	2	4	3590	9
	245	01126-00876	01126-00876	2	3	3590	9
50	246	00989-01418	00989-01418	2	3	3590	9
	247	01419-01848	01419-01848	2	4	3590	9
	248	01849-02278	01849-02278	2	3	3590	9
	249	02279-02708	02279-02708	2	3	3590	9
	250	02709-03138	02709-03138	2	4	3590	9
	251	03139-03394	03139-03394	2	3	3590	9
51	252	03278-02290	03278-02290	2	4	3590	9
52	253	02624-02195	02624-02195	2	3	3590	9
	254	02194-02173	02194-02173	2	4	3590	9
53	255	02458-02887	02458-02887	2	3	3590	9
	256	02888-03317	02888-03317	2	4	3590	9
	257	03318-03393	03318-03393	2	3	3590	9
54	258	03276-02847	03276-02847	2	3	3590	9
	259	02846-02417	02846-02417	2	4	3590	9
	260	02416-01987	02416-01987	2	3	3590	9
	261	01986-01557	01986-01557	2	4	3590	9
	262	01556-01127	01556-01127	2	3	3590	9
	263	01126-00876	01126-00876	2	4	3590	9
55	264	00989-01418	00989-01418	2	3	3590	9
	265	01419-01848	01419-01848	2	4	3590	9

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	266	01849-02278	01849-02278	2	3	3590	9
	267	02279-02708	02279-02708	2	4	3590	9
	268	02709-03138	02709-03138	2	3	3590	9
	269	03139-03395	03139-03395	2	4	3590	9
56	270	03275-02846	03275-02846	2	3	3590	10
	271	02845-02416	02845-02416	2	4	3590	10
	272	02415-01986	02415-01986	2	3	3590	10
	273	01985-01930	01985-01930	2	4	3590	10
	274	01929-01500	01929-01500	2	3	3590	10
	275	01499-01070	01499-01070	2	4	3590	10
	276	01069-00877	01069-00877	2	3	3590	10
57	277	00989-01418	00989-01418	2	3	3590	10
	278	01419-01848	01419-01848	2	4	3590	10
	279	01849-02278	01849-02278	2	3	3590	10
	280	02279-02708	02279-02708	2	4	3590	10
	281	02709-03138	02709-03138	2	3	3590	10
	282	03139-03396	03139-03396	2	4	3590	10
58	283	03274-02845	03274-02845	2	4	3590	10
	284	02844-02415	02844-02415	2	3	3590	10
	285	02414-01985	02414-01985	2	4	3590	10
	286	01984-01555	01984-01555	2	3	3590	10
	287	01554-01125	01554-01125	2	4	3590	10
	288	01124-00877	01124-00877	2	3	3590	10
59	289	00989-01418	00989-01418	2	4	3590	10
	290	01419-01848	01419-01848	2	3	3590	10
	291	01849-02278	01849-02278	2	4	3590	10
	292	02279-02708	02279-02708	2	3	3590	10
	293	02709-03138	02709-03138	2	4	3590	10
	294	03139-03396	03139-03396	2	3	3590	10
60	295	03275-02846	03275-02846	2	4	3590	10
	296	02845-02416	02845-02416	2	3	3590	10
	297	02415-01986	02415-01986	2	4	3590	10
	298	01985-01556	01985-01556	2	3	3590	10
	299	01555-01126	01555-01126	2	4	3590	10
	300	01125-00876	01125-00876	2	4	3590	10
61	301	00989-01418	00989-01418	2	3	3590	11
	302	01419-01848	01419-01848	2	4	3590	11
	303	01849-02278	01849-02278	2	3	3590	11
	304	02279-02708	02279-02708	2	3	3590	11
	305	02709-03138	02709-03138	2	4	3590	11
	306	03139-03395	03139-03395	2	3	3590	11

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62	307	02993-02564	02993-02564	2	4	3590	11
	308	02563-02134	02563-02134	2	3	3590	11
	309	02133-01704	02133-01704	2	4	3590	11
	310	01703-01274	01703-01274	2	3	3590	11
	311	01273-01141	01273-01141	2	4	3590	11
63	312	01254-01683	01254-01683	2	3	3590	11
	313	01684-01952	01684-01952	2	4	3590	11
64	314	00989-01418	00989-01418	2	3	3590	11
	315	01419-01848	01419-01848	2	4	3590	11
	316	01849-02278	01849-02278	2	3	3590	11
	317	02279-02708	02279-02708	2	4	3590	11
	318	02709-03138	02709-03138	2	4	3590	11
	319	03139-03396	03139-03396	2	3	3590	11
65	320	03275-02846	03275-02846	2	4	3590	11
	321	02845-02416	02845-02416	2	3	3590	11
	322	02415-01986	02415-01986	2	4	3590	11
	323	01985-01556	01985-01556	2	3	3590	11
	324	01555-01126	01555-01126	2	4	3590	11
	325	01125-00877	01125-00877	2	4	3590	11
66	326	00989-01418	00989-01418	2	3	3590	11
	327	01419-01848	01419-01848	2	4	3590	11
	328	01849-02278	01849-02278	2	3	3590	11
	329	02279-02708	02279-02708	2	4	3590	11
	330	02709-03138	02709-03138	2	3	3590	11
	331	03139-03395	03139-03395	2	4	3590	12
67	332	02662-02233	02662-02233	2	3	3590	12
	333	02232-01803	02232-01803	2	4	3590	12
	334	01802-01373	01802-01373	2	3	3590	12
	335	01372-00943	01372-00943	2	4	3590	12
	336	00942-00876	00942-00876	2	3	3590	12
68	337	00989-01418	00989-01418	2	3	3590	12
	338	01419-01848	01419-01848	2	4	3590	12
	339	01849-02278	01849-02278	2	3	3590	12
	340	02279-02708	02279-02708	2	4	3590	12
	341	02709-03395	02709-03395	2	3	3590	12
69	342	03278-02851	03278-02851	2	3	3590	12
	343	02850-02421	02850-02421	2	4	3590	12
	344	02420-01991	02420-01991	2	3	3590	12
	345	01990-01561	01990-01561	2	4	3590	12
	346	01560-01131	01560-01131	2	4	3590	12
	347	01130-00877	01130-00877	2	3	3590	12

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70	348	01001-01219	01001-01219	2	3	3590	12	
71	349	01153-01066	01153-01066	2	3	3590	12	
72	350	00989-01418	00989-01418	2	3	3590	12	
	351	01419-01848	01419-01848	2	4	3590	12	
	352	01849-02278	01849-02278	2	3	3590	12	
	353	02279-02708	02279-02708	2	4	3590	12	
	354	02709-02925	02709-02925	2	3	3590	12	
	355	03115-03392	03115-03392	2	3	3590	12	
73	356	03279-02850	03279-02850	2	3	3590	12	
	357	02849-02710	02849-02710	2	3	3590	12	Noise file 877, 876 at EOT NTBP
	358	02140-01711	02140-01711	2	4	3590	12	
	359	01710-01281	01710-01281	2	3	3590	12	
	360	01280-00877	01280-00877	2	4	3590	12	
74	361	01489-01918	01489-01918	2	3	3590	13	
	362	01919-02348	01919-02348	2	4	3590	13	
	363	02349-02522	02349-02522	2	3	3590	13	
75	364	02904-03126	02904-03126	2	4	3590	13	
76	365	02932-02503	02932-02503	2	3	3590	13	
	366	02502-02073	02502-02073	2	4	3590	13	
	367	02072-01643	02072-01643	2	4	3590	13	
	368	01642-01213	01642-01213	2	3	3590	13	
	369	01212-00877	01212-00877	2	4	3590	13	
77	370	02208-02637	02208-02637	2	3	3590	13	
	371	02638-03067	02638-03067	2	3	3590	13	
	372	03068-03396	03068-03396	2	4	3590	13	
78	373	03270-02841	03270-02841	2	3	3590	13	
	374	02840-02411	02840-02411	2	4	3590	13	
	375	02410-02407	02410-02407	2	3	3590	13	No EOT Mark
	376	02406-02093	02406-02093	2	4	3590	13	
79	377	02280-02709	02280-02709	2	3	3590	13	
	378	02710-03139	02710-03139	2	3	3590	13	
	379	03140-03378	03140-03378	2	4	3590	13	
80	380	03268-02839	03268-02839	2	3	3590	13	
	381	02838-02409	02838-02409	2	4	3590	13	
	382	02408-02127	02408-02127	2	3	3590	13	
81	383	02314-02743	02314-02743	2	3	3590	13	
	384	02744-03173	02744-03173	2	4	3590	13	
	385	03174-03376	03174-03376	2	3	3590	13	
82	386	03273-02844	03273-02844	2	4	3590	13	
	387	02843-02414	02843-02414	2	3	3590	13	

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	388	02413-02045	02413-02045	2	4	3590	13
83	389	02348-02777	02348-02777	2	3	3590	13
	390	02778-03207	02778-03207	2	3	3590	13
	391	03208-03374	03208-03374	2	4	3590	14
84	392	03271-02842	03271-02842	2	3	3590	14
	393	02841-02412	02841-02412	2	3	3590	14
	394	02411-02086	02411-02086	2	4	3590	14
85	395	02273-02702	02273-02702	2	3	3590	14
	396	02703-03132	02703-03132	2	4	3590	14
	397	03133-03379	03133-03379	2	3	3590	14
86	398	02267-02696	02267-02696	2	4	3590	14
	399	02474-02903	02474-02903	2	3	3590	14
	400	02904-03333	02904-03333	2	3	3590	14
	401	03334-03378	03334-03378	2	3	3590	14
87	402	03288-02859	03288-02859	2	3	3590	14
	403	02858-02429	02858-02429	2	4	3590	14
	404	02428-02120	02428-02120	2	3	3590	14
88	405	02301-02730	02301-02730	2	4	3590	14
	406	02731-03160	02731-03160	2	3	3590	14
	407	03161-03376	03161-03376	2	4	3590	14
89	408	03293-02864	03293-02864	2	3	3590	14
	409	02863-02434	02863-02434	2	4	3590	14
	410	02433-02047	02433-02047	2	3	3590	14
90	411	02308-02737	02308-02737	2	3	3590	14
	412	02738-03167	02738-03167	2	4	3590	14
	413	03168-03375	03168-03375	2	3	3590	14
91	414	03288-02859	03288-02859	2	4	3590	14
	415	02858-02429	02858-02429	2	3	3590	14
	416	02428-02134	02428-02134	2	3	3590	14
92	417	02335-02764	02335-02764	2	4	3590	14
	418	02765-03194	02765-03194	2	3	3590	14
	419	03195-03374	03195-03374	2	4	3590	14
93	420	03290-02861	03290-02861	2	3	3590	14
	421	02860-02431	02860-02431	2	4	3590	15
	422	02430-02100	02430-02100	2	3	3590	15
94	423	02274-02703	02274-02703	2	4	3590	15
	424	02704-03133	02704-03133	2	3	3590	15
	425	03134-03378	03134-03378	2	4	3590	15
95	426	03292-02863	03292-02863	2	3	3590	15
	427	02862-02433	02862-02433	2	4	3590	15
	428	02432-02058	02432-02058	2	3	3590	15

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96	429	02314-02743	02314-02743	2	4	3590	15	
	430	02744-03173	02744-03173	2	3	3590	15	
	431	03174-03375	03174-03375	2	3	3590	15	
97	432	03289-02860	03289-02860	2	4	3590	15	
	433	02859-02430	02859-02430	2	3	3590	15	
	434	02429-02113	02429-02113	2	4	3590	15	
	435	00000-00000	00000-00000	2	3	3590	15	Blank Tape
98	436	03292-02863	03292-02863	2	3	3590	15	
	437	02862-02433	02862-02433	2	4	3590	15	
	438	02432-02058	02432-02058	2	3	3590	15	
99	439	02287-02716	02287-02716	2	4	3590	15	
	440	02717-02801	02717-02801	2	3	3590	15	
	441	02802-03231	02802-03231	2	4	3590	15	
	442	03232-03377	03232-03377	2	3	3590	15	
100	443	03291-02862	03291-02862	2	3	3590	15	
	444	02861-02432	02861-02432	2	4	3590	15	
	445	02431-02079	02431-02079	2	3	3590	15	
101	446	02274-02703	02274-02703	2	4	3590	15	
	447	02704-03133	02704-03133	2	3	3590	15	
	448	03134-03378	03134-03378	2	4	3590	15	
102	449	03290-02861	03290-02861	2	3	3590	15	
	450	02860-02431	02860-02431	2	4	3590	15	
	451	02430-02100	02430-02100	2	3	3590	16	
103	452	02314-02743	02314-02743	2	4	3590	16	
	453	02744-03173	02744-03173	2	3	3590	16	
	454	03174-03375	03174-03375	2	4	3590	16	
104	455	03289-02860	03289-02860	2	3	3590	16	
	456	02859-02430	02859-02430	2	4	3590	16	
	457	02429-02113	02429-02113	2	3	3590	16	
105	458	02280-02709	02280-02709	2	4	3590	16	
	459	02710-03139	02710-03139	2	3	3590	16	
	460	03140-03377	03140-03377	2	4	3590	16	
106	461	03292-02863	03292-02863	2	3	3590	16	
	462	02862-02433	02862-02433	2	4	3590	16	
	463	02432-02065	02432-02065	2	3	3590	16	
107	464	02321-02750	02321-02750	2	4	3590	16	
	465	02751-03180	02751-03180	2	3	3590	16	
	466	03181-03375	03181-03375	2	3	3590	16	
108	467	03291-02862	03291-02862	2	4	3590	16	
	468	02861-02432	02861-02432	2	3	3590	16	
	469	02431-02073	02431-02073	2	4	3590	16	

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109	470	02246-02675	02246-02675	2	3	3590	16
	471	02676-03105	02676-03105	2	4	3590	16
	472	03106-03379	03106-03379	2	4	3590	16
110	473	03289-02860	03289-02860	2	3	3590	16
	474	02859-02430	02859-02430	2	4	3590	16
	475	02429-02107	02429-02107	2	3	3590	16
111	476	02314-02743	02314-02743	2	4	3590	16
	477	02744-03173	02744-03173	2	3	3590	16
	478	03174-03375	03174-03375	2	4	3590	16
112	479	03291-02862	03291-02862	2	3	3590	16
	480	02861-02432	02861-02432	2	4	3590	16
	481	02431-02073	02431-02073	2	3	3590	17
113	482	02314-02743	02314-02743	2	4	3590	17
	483	02744-03076	02744-03076	2	3	3590	17
	484	03077-03173	03077-03173	2	4	3590	17
	485	03174-03375	03174-03375	2	3	3590	17
114	486	01298-01847	01298-01847	2	4	3590	17
	487	01848-02397	01848-02397	2	4	3590	17
	488	02398-03394	02398-03394	2	3	3590	17
115	489	02352-00877	02352-00877	2	4	3590	17
116	490	02341-02770	02341-02770	2	3	3590	17
	491	02771-03373	02771-03373	2	4	3590	17
117	492	03217-02668	03217-02668	2	3	3590	17
	493	02667-02065	02667-02065	2	4	3590	17
118	494	02274-02823	02274-02823	2	3	3590	17
	495	02824-03378	02824-03378	2	4	3590	17
119	496	03287-02738	03287-02738	2	3	3590	17
	497	02737-02188	02737-02188	2	3	3590	17
	498	02187-02141	02187-02141	2	3	3590	17
120	499	02600-03149	02600-03149	2	4	3590	17
	500	03150-03373	03150-03373	2	3	3590	17
121	501	03288-02739	03288-02739	2	4	3590	17
	502	02738-02189	02738-02189	2	3	3590	17
	503	02188-02114	02188-02114	2	4	3590	17
122	504	02240-02790	02240-02790	2	4	3590	17
	505	02791-03340	02791-03340	2	3	3590	17
	506	03341-03380	03341-03380	2	4	3590	17
123	507	03287-02738	03287-02738	2	3	3590	17
	508	02737-02188	02737-02188	2	4	3590	17
	509	02187-02148	02187-02148	2	4	3590	17
124	510	02341-02890	02341-02890	2	3	3590	17

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	511	02891-03373	02891-03373	2	4	3590	18
125	512	03250-02701	03250-02701	2	3	3590	18
	513	02700-02344	02700-02344	2	4	3590	18
126	514	02321-03375	02321-03375	2	3	3590	18
127	515	02407-02148	02407-02148	2	4	3590	18
128	516	00971-01520	00971-01520	2	3	3590	18
	517	01521-02070	01521-02070	2	4	3590	18
	518	02071-02620	02071-02620	2	3	3590	18
	519	02621-02927	02621-02927	2	3	3590	18
129	520	02028-03100	02028-03100	2	4	3590	18
130	521	03065-00876	03065-00876	2	3	3590	18
131	522	02052-01503	02052-01503	2	3	3590	18
	523	01502-00876	01502-00876	2	3	3590	18
132	524	01278-01827	01278-01827	2	4	3590	18
	525	01828-02377	01828-02377	2	4	3590	18
	526	02378-02906	02378-02906	2	4	3590	18
	527	02907-02927	02907-02927	2	4	3590	18
	528	02928-03394	02928-03394	2	4	3590	18
133	529	03209-02660	03209-02660	2	4	3590	18
	530	02659-02106	02659-02106	2	3	3590	18

Note¹ : OS = outputstream, Dev = Device id, FFILE-LFILE = first/last file, FSP/LSP = first/last shotpoint

TRILOGY INFORMATION MANAGER - TAPE REPORT - GENERATED 17:04:24utc 27-Sep-2002

33. Appendix 3: Acquisition Production Reports



Survey Line Summary Report

Client	BHPBP	First Sequence	0001 SOL at 04:46:00utc 09-Aug-2002
Area	Vic/P45 Gippsland Basin	Last Sequence	0113 EOL at 04:55:34utc 17-Sep-2002
Vessel	GECO_BETA		
JobNumber	9227		
Survey Type	8 STREAMER DUAL SOURCE		

Sequence list ¹

Seq	Preplot/Line	Dir	Type	Status	FSP- LSP	From-To	MSP	Remark
1	GP021008/GP021008P001	018	Prime	Valid	02984-01144	04:46:00-08:44:00		
2	GP021216/GP021216P002	198	Prime	Valid	01266-03102	10:14:53-14:16:36		
3	GP021024/GP021024P003	018	Prime	Valid	02984-01144	15:47:40-19:52:40		
4	GP021232/GP021232P004	198	Prime	Valid	01266-03102	21:25:13-01:22:10	2440	
5	GP021040/GP021040P005	018	Prime	Valid	02983-01144	03:09:35-07:22:50		
6	GP021248/GP021248P006	198	Prime	Valid	01266-03102	09:12:27-13:08:45		
7	GP021056/GP021056P007	018	Prime	Valid	02983-01144	14:52:56-19:18:52		
8	GP021264/GP021264P008	198	Prime	Valid	01266-03101	21:01:42-00:58:20	2645	
9	GP021072/GP021072P009	018	Prime	Valid	02982-01144	02:44:11-07:12:39		
10	GP021280/GP021280P010	198	Unknown	Valid	01266-03101	08:49:25-12:59:30		
11	GP021088/GP021088P011	018	Prime	Scratched	02982-01143	05:57:10-10:22:03		All data scratched d/t swell noise
12	GP021296/GP021296P012	198	Prime	Valid	02300-03101	14:38:02-16:22:17		
13	GP021104/GP021104P013	018	Prime	Valid	02982-01143	19:01:41-23:14:09		
14	GP021296/GP021296A014	198	Reshoot	Scratched	01266-01362	01:36:52-01:51:09		Due to compressor failure
			Reshoot	Valid	01363-02309	01:51:18-03:58:52		Reshoot of seq #12 due streamers crossing
15	GP021120/GP021120P015	018	Prime	Scratched	02981-01143	07:21:42-11:31:35		All data scratch d/t weather..
16	GP021312/GP021312P016	198	Prime	Valid	01266-03100	14:01:41-18:09:01		
17	GP021136/GP021136P017	018	Prime	Valid	02981-01143	20:51:28-01:02:31	1624	
18	GP021328/GP021328P018	198	Prime	Valid	01266-03100	03:16:04-07:15:09		
19	GP021152/GP021152P019	018	Prime	Valid	02981-	09:02:54-12:59:32		

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					01143			
20	GP021344/GP021344P020	198	Prime	Valid	01266-03100	15:17:47-19:22:24		
21	GP021168/GP021168P021	018	Prime	Valid	02980-01143	21:12:23-01:24:16	1755	
22	GP021360/GP021360P022	198	Prime	Valid	01266-03099	03:59:55-08:02:13		
23	GP021088/GP021088A023	018	Reshoot	Valid	02982-01143	09:38:12-13:44:08		Reshoot of sequence 011
24	GP021376/GP021376P024	198	Prime	Valid	01266-03099	15:34:42-19:39:56		
25	GP021184/GP021184P025	018	Prime	Valid	02980-01143	21:25:28-01:36:57	1838	
26	GP021392/GP021392P026	198	Prime	Valid	01266-03098	03:59:04-08:01:16		
27	GP021200/GP021200P027	018	Prime	Valid	02980-01143	09:34:35-13:26:06		
28	GP021408/GP021408P028	198	Prime	Valid	01266-03098	15:04:29-19:07:10		
29	GP021200/GP021200J029	018	Infill	Valid	02980-01143	21:15:32-01:31:41	1802	
30	GP021424/GP021424P030	198	Prime	Valid	01266-03098	03:17:46-07:37:00		
31	GP021200/GP021200K031	018	Infill	Valid	02900-01143	09:31:54-13:21:44		
32	GP021424/GP021424J032	198	Infill	Valid	01266-03098	15:06:02-19:13:21		
33	GP021088/GP021088J033	018	Infill	Valid	02400-01143	22:21:09-01:25:07	1725	
34	GP021440/GP021440P034	198	Prime	Valid	01001-03097	03:44:13-08:18:04		
35	GP021680/GP021680P035	018	Prime	Valid	03266-02603	10:27:04-11:54:19		
			Prime	Scratched	02602-02571	11:54:27-11:58:22		All data scratch d/t gun 2-5 autofire.
			Prime	Scratched	02570-02184	-		No data recorded
			Prime	Valid	02183-00878	13:00:43-15:49:35		
36	GP021584/GP021584P036	198	Prime	Valid	01001-03391	17:48:54-22:56:17		
37	GP021696/GP021696P037	018	Prime	Valid	03265-00878	01:20:17-07:02:41		
38	GP021600/GP021600P038	198	Prime	Valid	01001-02800	09:09:50-12:49:23		
39	GP021664/GP021664P039	018	Prime	Valid	03000-00878	15:10:45-19:55:38		
40	GP021456/GP021456P040	198	Prime	Scratched	01001-03395	15:25:00-17:04:57		Scratched Due to weather
41	GP021808/GP021808P041	018	Prime	Valid	03262-00878	19:05:32-01:23:11	1362	
42	GP021456/GP021456A042	198	Reshoot	Valid	01001-03395	03:29:18-08:34:37		Reshoot of Seq #40
43	GP021792/GP021792P043	018	Prime	Valid	03263-00878	10:37:00-16:55:36		
44	GP021616/GP021616P044	198	Prime	Valid	01001-03390	18:27:45-23:26:14		
45	GP021776/GP021776P045	018	Prime	Valid	03263-00878	01:16:59-08:13:14		
46	GP021568/GP021568P046	198	Prime	Valid	01001-03392	09:41:37-14:30:22		
47	GP021712/GP021712P047	018	Prime	Valid	03265-00878	16:51:46-22:22:10		
48	GP021552/GP021552P048	198	Prime	Scratched	01001-01050	-		No data recorded d/t streamer work on streamer 5
			Prime	Scratched	01051-01209	00:36:31-00:55:51		Front half of streamer in spec - TAIL HALF OF STREAMER NTBP D/T DEPTH

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			Prime	Valid	01210-03392	00:55:58-05:20:23	
49	GP021728/GP021728P049	018	Prime	Valid	03264-00878	07:49:47-13:06:39	
50	GP021536/GP021536P050	198	Prime	Valid	01001-03392	14:30:41-19:23:59	
51	GP021664/GP021664A051	018	Reshoot	Valid	03266-03001	21:39:26-22:14:21	Reshoot seq 39 d/t bunkering
			Reshoot	Valid	03000-02991	22:14:29-22:15:41	Overlap sp's
52	GP021680/GP021680A052	018	Reshoot	Valid	02612-02603	23:08:35-23:09:51	2251 Overlap sp's
			Reshoot	Valid	02602-02184	23:10:00-00:10:08	2251 Reshoot seq 35 d/t gun autofire.
			Reshoot	Valid	02183-02174	00:10:17-00:11:37	2251 Overlap sp's
53	GP021600/GP021600A053	198	Infill	Valid	02470-02800	02:21:26-03:00:08	
			Reshoot	Valid	02801-03391	03:00:15-04:09:41	Reshoot seq 038 d/t bunkering
54	GP021744/GP021744P054	018	Prime	Valid	03264-00878	06:22:28-11:59:44	
55	GP021520/GP021520P055	198	Prime	Valid	01001-03393	13:36:54-18:17:08	
56	GP021760/GP021760P056	018	Prime	Valid	03263-00878	20:27:39-01:55:34	1664
57	GP021472/GP021472P057	198	Prime	Valid	01001-03394	03:46:56-08:37:22	
58	GP021824/GP021824P058	018	Prime	Valid	03262-01132	10:45:51-16:23:17	
			Prime	Scratched	01131-01077	16:23:28-16:34:29	All data NTBP d/t Compressor failure.
			Prime	Valid	01076-00878	16:34:40-17:11:45	
59	GP021488/GP021488P059	198	Prime	Valid	01001-03394	19:12:41-00:28:18	3181
60	GP021776/GP021776J060	018	Reshoot	Valid	03263-00878	02:08:23-08:32:50	Sps 2321-1756 Reshoot of seq #45 Due to aimpoint message loss
61	GP021520/GP021520J061	198	Infill	Valid	01001-03393	09:59:42-15:14:16	
62	GP021120/GP021120A062	018	Reshoot	Valid	02981-01143	17:49:22-22:01:37	Reshoot seq 15 d/t swell noise
63	GP021296/GP021296B063	198	Reshoot	Valid	01266-01362	00:14:27-00:28:09	Reshoot seq's 12 (streamers crossed) and 14 (compressor)
			Infill	Valid	01363-01900	00:28:18-01:51:04	
64	GP021488/GP021488J064	198	Infill	Valid	01001-03394	08:32:54-14:29:24	
65	GP021760/GP021760J065	018	Infill	Valid	03263-03223	16:56:45-17:02:57	No valid coverage acquired.
			Prime	Valid	03222-00878	17:03:06-22:42:59	
66	GP021504/GP021504P066	198	Prime	Valid	01001-03393	00:15:25-05:37:17	
67	GP021760/GP021760K067	018	Infill	Valid	02650-00878	08:30:02-12:12:37	
68	GP021520/GP021520K068	198	Infill	Valid	01001-03085	13:49:10-18:28:20	
69	GP021648/GP021648P069	018	Prime	Valid	03266-00878	22:11:38-03:14:20	2411
70	GP021552/GP021552A070	198	Reshoot	Valid	01001-01219	06:47:30-07:13:53	Reshoot of seq #48
71	GP021824/GP021824A071	018	Reshoot	Valid	01141-01067	09:09:41-09:21:41	
72	GP021632/GP021632P072	198	Prime	Valid	01001-02925	11:12:58-15:15:27	
			Prime	Scratched	02926-03114	-	All data scratch d/t Triacq hardware hang up

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			Prime	Valid	03115-03317	15:42:32-16:09:10		
			Prime	Scratched	03318-03334	16:09:18-16:11:43	All data scratched d/t LMF compressor shutdown	
			Prime	Valid	03335-03390	16:11:53-16:19:17		
73	GP021632/GP021632J073	018	Infill	Valid	03267-02816	19:13:31-20:39:21	1626	
			Infill	Scratched	02815-02806	20:39:32-20:41:12	1626	All data scratch d/t no source fired.
			Infill	Valid	02805-02710	20:41:23-20:58:24	1626	
			Infill	Scratched	02709-02141	-	1626	No data recorded d/t coverage not required
			Infill	Valid	02140-00878	22:34:49-01:54:56	1626	
74	GP021536/GP021536J074	198	Infill	Valid	01500-02500	04:15:44-06:22:08		
75	GP021632/GP021632A075	198	Reshoot	Valid	02916-03124	07:20:13-07:47:36		
76	GP021664/GP021664J076	018	Infill	Valid	02920-02720	19:20:50-20:04:02	1300	
			Infill	Valid	02719-02641	20:04:14-20:19:23	1300	NTBP d/t coverage already acquired
			Infill	Valid	02640-02190	20:19:35-21:41:32	1300	
			Infill	Valid	02189-01581	21:41:42-23:19:51	1300	NTBP d/t coverage already acquired
			Infill	Valid	01580-00878	23:20:00-00:57:46	1300	
77	GP021488/GP021488K077	198	Infill	Valid	02220-03394	17:50:51-20:14:18		
78	GP021952/GP021952P078	018	Prime	Valid	03258-02094	22:39:48-01:47:43	2741	
79	GP022128/GP022128P079	198	Prime	Valid	02292-03376	03:32:06-06:30:19		
80	GP022032/GP022032P080	018	Prime	Valid	03256-02128	08:45:43-11:12:37		
81	GP022208/GP022208P081	198	Prime	Valid	02326-03374	13:04:43-15:41:21		
82	GP021840/GP021840P082	018	Prime	Valid	03261-02047	17:37:06-20:46:39		
83	GP022288/GP022288P083	198	Prime	Scratched	02360-02440	22:51:43-23:03:50	2884	All data scratch d/t compressor failure.
			Prime	Valid	02441-03372	23:03:58-01:04:17	2884	
84	GP021936/GP021936P084	018	Prime	Valid	03259-02087	02:56:41-05:29:31		
85	GP022112/GP022112P085	198	Prime	Valid	03082-03082	09:25:17-09:25:17		
86	GP022144/GP022144P086	198	Prime	Valid	02299-03376	09:48:25-12:31:09		
87	GP022016/GP022016P087	018	Prime	Valid	03256-02121	15:38:45-19:00:29		
88	GP022224/GP022224P088	198	Prime	Valid	02333-03374	20:51:58-23:35:41		
89	GP021856/GP021856P089	018	Prime	Valid	03261-02053	02:14:17-05:35:07		
90	GP022240/GP022240P090	198	Prime	Valid	02340-03373	07:38:06-10:08:45		
91	GP022048/GP022048P091	018	Prime	Valid	03256-02135	12:08:17-14:49:09		
92	GP022304/GP022304P092	198	Prime	Valid	02367-03372	16:19:34-18:14:46		
93	GP021968/GP021968P093	018	Prime	Valid	03258-02101	20:12:17-22:52:32		
94	GP022160/GP022160P094	198	Prime	Valid	02306-03376	00:45:59-02:58:38		

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95	GP021872/GP021872P095	018	Prime	Valid	03260-02060	05:06:53-08:16:24
96	GP022256/GP022256P096	198	Prime	Valid	02346-03373	10:37:29-12:57:27
97	GP022000/GP022000P097	018	Prime	Valid	03257-02115	14:51:56-18:55:16
98	GP021872/GP021872J098	018	Infill	Valid	03260-02060	02:44:29-05:43:50
99	GP022192/GP022192P099	198	Prime	Valid	02319-03375	07:38:43-09:49:19
100	GP021920/GP021920P100	018	Prime	Valid	03259-02081	11:39:32-14:13:59
101	GP022160/GP022160J101	198	Infill	Valid	02306-03376	15:46:26-17:49:55
102	GP021968/GP021968J102	018	Infill	Valid	03258-02101	20:25:51-23:35:47
103	GP022256/GP022256J103	198	Infill	Valid	02346-03373	01:26:33-03:44:02
104	GP022000/GP022000J104	018	Infill	Valid	03257-02115	05:43:19-08:44:50
105	GP022176/GP022176P105	198	Prime	Valid	02312-03375	11:15:21-13:29:23
106	GP021888/GP021888P106	018	Prime	Valid	03260-02067	15:22:50-19:05:41
107	GP022272/GP022272P107	198	Prime	Valid	02353-03373	21:19:24-23:23:57
108	GP021904/GP021904P108	018	Prime	Valid	03259-02074	01:37:51-04:11:20
109	GP022096/GP022096P109	198	Prime	Valid	02278-03377	06:27:49-08:56:37
110	GP021984/GP021984P110	018	Prime	Valid	03257-02108	11:21:26-13:39:12
111	GP022256/GP022256K111	198	Infill	Valid	02346-03373	15:39:46-18:00:26
112	GP021904/GP021904J112	018	Infill	Valid	03259-02074	20:08:17-23:11:15
113	GP022256/GP022256L113	198	Infill	Valid	02346-03373	01:55:49-04:55:34

TRILOGY INFORMATION MANAGER - SURVEY LINE SUMMARY REPORT - GENERATED
21:35:50utc 23-Sep-2002



Survey Line Summary Report

Client	BHPBP	First Sequence	0114 SOL at 06:07:58utc 22-Sep-2002
Area	Vic/P45 Gippsland Basin	Last Sequence	0133 EOL at 15:48:31utc 25-Sep-2002
Vessel	GECO_BETA		
JobNumber	9227		
Survey Type	3D, Dual source, 6 Streamers		

Sequence list ¹

Seq	Preplot/Line	Dir	Type	Status	FSP-LSP	From-To	MSP	Remark
114	GP021568/GP021568J114	198	Infill	Valid	01330-02820	06:07:58-09:13:21		
115	GP021776/GP021776K115	018	Reshoot	Valid	02350-02010	11:10:45-11:52:24		
116	GP022320/GP022320P116	198	Prime	Valid	02373-03128	14:01:15-15:33:45		
			Prime	Scratched	03129-03140	15:33:53-15:35:25		
117	GP021888/GP021888J117	018	Infill	Valid	03215-02310	17:28:38-19:14:11		
118	GP022160/GP022160K118	198	Infill	Valid	02306-03285	20:50:18-22:53:21		
119	GP022064/GP022064P119	018	Prime	Valid	03255-02142	00:51:47-03:19:33		
120	GP022320/GP022320J120	198	Infill	Valid	02630-03371	05:32:57-07:05:36		
121	GP022000/GP022000K121	018	Infill	Valid	03257-02115	08:36:23-10:57:16		
122	GP022080/GP022080P122	198	Prime	Valid	02272-03378	12:55:43-15:06:16		
123	GP022080/GP022080J123	018	Infill	Valid	03255-02149	17:39:17-19:55:17		
124	GP022320/GP022320K124	198	Infill	Valid	02373-03371	22:44:57-00:41:00	3032	
125	GP022080/GP022080K125	018	Infill	Scratched	03250-03201	03:25:17-03:35:40		Scratched - streamers not at shooting depth
			Infill	Valid	03200-02365	03:35:51-05:35:10		EOL due to Whale Sighting
			Infill	Scratched	02364-02345	05:35:19-05:38:00		Scratched - no guns firing due to whale sighting
126	GP022272/GP022272J126	198	Infill	Valid	02353-02720	07:30:50-08:14:34		
127	GP022080/GP022080L127	018	Infill	Valid	02376-02150	09:45:08-10:11:55		
128	GP022336/GP022336T128	109	Prime	Valid	01001-02925	13:40:34-18:17:54		2-D tie line
129	GP021408/GP021408J129	198	Infill	Valid	02030-02254	21:58:47-22:26:43	2890	First line segment before whale obs.
			Infill	Scratched	02255-03027	22:26:51-00:18:56	2890	Scratched dt whale sighting
			Infill	Valid	03028-03081	00:19:05-00:26:24	2890	Second line segment

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			Infill	Scratched	03082-03098	00:26:31-00:28:27	2890	Scratched dt whale
130	GP021728/GP021728J130	018	Infill	Valid	03033-02630	02:10:14-03:03:59		
131	GP021728/GP021728K131	018	Infill	Valid	02020-01105	04:45:11-06:48:12		
132	GP021536/GP021536K132	198	Infill	Valid	01310-03300	08:06:40-12:14:31		
133	GP021984/GP021984J133	018	Infill	Valid	03177-02625	14:33:16-15:48:31		

TRILOGY INFORMATION MANAGER - SURVEY LINE SUMMARY REPORT - GENERATED 16:56:59utc 27-Sep-2002