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ACN 003 226 257

SEISMIC DATA REPROCESSING 2008

VIC /P63, VIC /P64 & T /46P

GIPPSLAND BASIN

G67B (EC-67) SURVEY

for

GREAT ARTESIAN OIL & GAS LTD

by

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SEISMIC DATA REPROCESSING 2008.

Executive Summary

Seismic data acquired in VIC /P63, VIC /P64 and T/46P in the Gippsland Basin During 1967 (G67B/EC67) were reprocessed in October/November 2008. There is no indication that these data have ever been reprocessed. The seismic sections generated in 1967 were not available in the archive.

The results obtained in 2008 appear to show sedimentary section and complex structure below the top Latrobe.

For the most part it appears that considerable improvement in processed data quality has been achieved. Therefore it has been possible to provide data that may support a more detailed interpretation.

Introduction

Selected seismic data acquired for Esso Australia during 1967 in VIC /P63, VIC /P64 and T/46P in the Gippsland Basin were reprocessed in 2008. The data were originally recorded during September through November 1967.

The data originally processed by Geophysical Service International in Sydney during the same period are judged to be of moderate quality, and have apparently never been reprocessed.

The data were acquired in a two boat operation by Geophysical Service International using a 24 trace streamer and an explosive source. All lines were recorded with a cable length of about 2100 meters.

Navigation services, supplied by Amalgamated Decca Surveys PL employed a Hyfix system which was operated in the 1700-2000 KHz range in hyperbolic mode.

- ATM Projection
- Clarke Spheroid 1858
- Zone 7
- Central Meridian 146 degrees East
- Australian Geodetic Datum

The antenna position on the vessel was calculated by phase differences within a lane from shore based transponders located at fixed trigonometric stations onshore. Three land based stations were used (one master and two slaves). The accuracy of the system depended on the distance of the vessels from the shore based transmitters and the resolution within a lane - typically about +/- 1.5 meters. The recording cycle was determined by the vessel's traverse between shotpoint intervals, with the ship speed compensated for at a master clock. A loading/firing tone was then transmitted to the shooting boat. Hifix readings were taken at the time of firing.

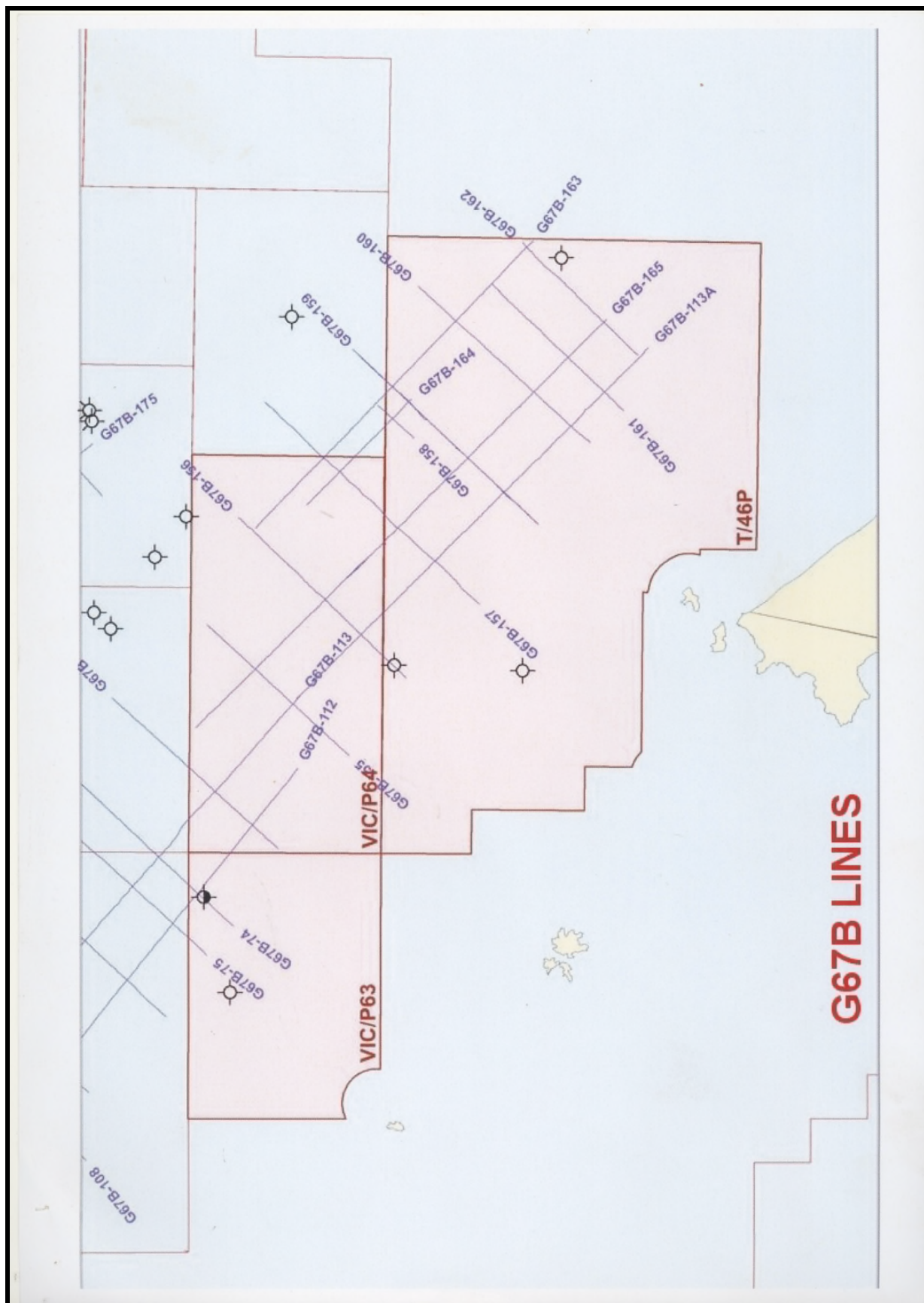
Data Acquisition Parameters

- Source – 15 kgs dynamite
- Number of recorded channels – 24 (even split between channels 12 and 13)
- Channel interval – approx. 92 meters
- Source interval – approx. 184 meters
- No of shots per shotpoint - 1
- Minimum offset – approx. 46 meters
- Maximum offset – approx. 1058 meters
- Offset of shooting boat – approx 152 meters
- Nominal fold of coverage – 6 fold
- Sample rate - 2ms
- Contractor – Geophysical Service International
- Instruments – DFS10000
- Recording format 21 track SEGB

Lines reprocessed.

Survey G67B (EC-67)

Line #	SP From	SP To	Direction of Shoot	Group Interval m	Shot Interval m
67	8396	8592	SW	92	184
74	10018	10157	NE	92	184
75	8227	8391	NE	92	184
112	7834	8154	NW	92	184
113	7709	7723	WNW	92	184
113	8769	9194	WNW	92	184
113A	4354	4758	NW	92	184
155	8595	8768	NE	92	184
156	5805	6011	SW	92	184
157	6012	6275	NE	92	184
158	6277	6320	NE	92	184
159	6675	6468	SW	92	184
160	6688	6893	SW	92	184
161	6894	7058	NE	92	184
162	7067	7194	SW	92	184
164	6321	6455	NW	92	184
165	7708	7554	SE	92	184



Line positions G67B (EC-67)

The Seismic Source

An inflated plastic bag containing about 15 kg of explosive was towed about 30 meters behind the shooting vessel at a depth of about 1.8 meters. A blaster controlled by the clock system fired the charge, transmitting a pulse to the recording system. This pulse was time word zero. The explosive was Nitro-Carbo-Nitrate.

Data Acquisition.

Diagrams of the source and cable layout for the G67B survey are shown at the end of this report.

Units of measurement for the various components were a mixture of imperial and metric. The reprocessing was carried out using metric, imperial measurements having been converted

As far as can be ascertained from archive documents the source was towed at a depth of about 1.8 meters, and the cable at about 15 meters.

Data Available

The original seismic field data were transcribed and made available in SEG Y format on 3590 cassette tape.

All lines had comprehensive observer logs. No original seismic sections were available.

No original navigation data was available. Shotpoint coordinate data was only accessible from the Victoria Department of Primary Industries 'Petroleum GIS Data 2006 DVD'. However with no metadata, the voracity of this data set could not be relied upon. However it was necessary to provide coordinate data in the reprocessing, but since these did not relate to the real data the processing coordinates in the SEG Y trace headers are fictitious and should be ignored.

Data Reprocessing

Data for all lines were processed using the same sequence as shown below..

The following is a description of the processing sequence that was arrived at after rigorous testing and experiment:

- Load SEG Y into PROMAX format
- Resample from 2ms to 4ms
- Assign acquisition geometry to shot records using 24 field traces
- Display all records, edit bad/noisy traces and remove bad records.
- True amplitude recovery 6db per octave
- Mute first arrivals and water breaks
- Sum adjacent CMP gathers into "super gathers". i.e. A super gather was composed of 72 traces.
- Calculate and apply normal moveout velocities (1 analysis per 200 CMP)
- Apply Radon velocity filtering
- Re-assign acquisition geometry into 12 fold CDP gathers
- Shot record deconvolution. An average 100ms spiking operator was designed from each 24 trace shot record
- Calculate and apply normal moveout velocities (1 analysis per 100 CMP)
- Spectral whitening
- Common midpoint stack – 6 fold
- FX deconvolution
- FX migration using 95% stack velocities
- Scale and output in SEG Y – stack and migration and velocities in ASCII

Comments:

The shot records were severely affected by ringing and all types of multiple, which the original processing failed to significantly attenuate. In the reprocessing the use of super gathers and radon filtering assisted in the attenuation of both the ring and the simple multiples, as well as providing an effective input to velocity analysis. Shotpoint and Common-mid-point (CMP) numbers in the trace headers were derived from spread geometries as described in the Observers Logs and assumed regular source and receiver spacing.

Example of 2008 Processing

The sample reprocessed stack section for line G67B-165 attached to this report shows good quality data. Displays of the original processing were not available

Conclusions

For the most part it is assumed that considerable improvement in processed data quality has been achieved.

Data archiving.

Stack and migrated data in SEG-Y, and stacking velocity data for the lines, listed above, were output to CD in separate directories.

SEG-Y Header Information

The following table is a listing of the relevant trace header information and the byte number where it is located:

Use	Bytes.
Trace Sequence no. within processed line	5-8
Shot point number x 1000	17-20
CMP ensemble number	21-24
CMP Fold	33-34
Approx water depth (fathoms or meters)	61-64
Coordinate units used in processing (m)	89-90
Total static applied (source & cable in m.)	103-104
No. of samples in a trace	115-116
Sample interval (ms)	117-118

The text header (EBCDIC) briefly describes the acquisition and processing parameters.

Disclaimer

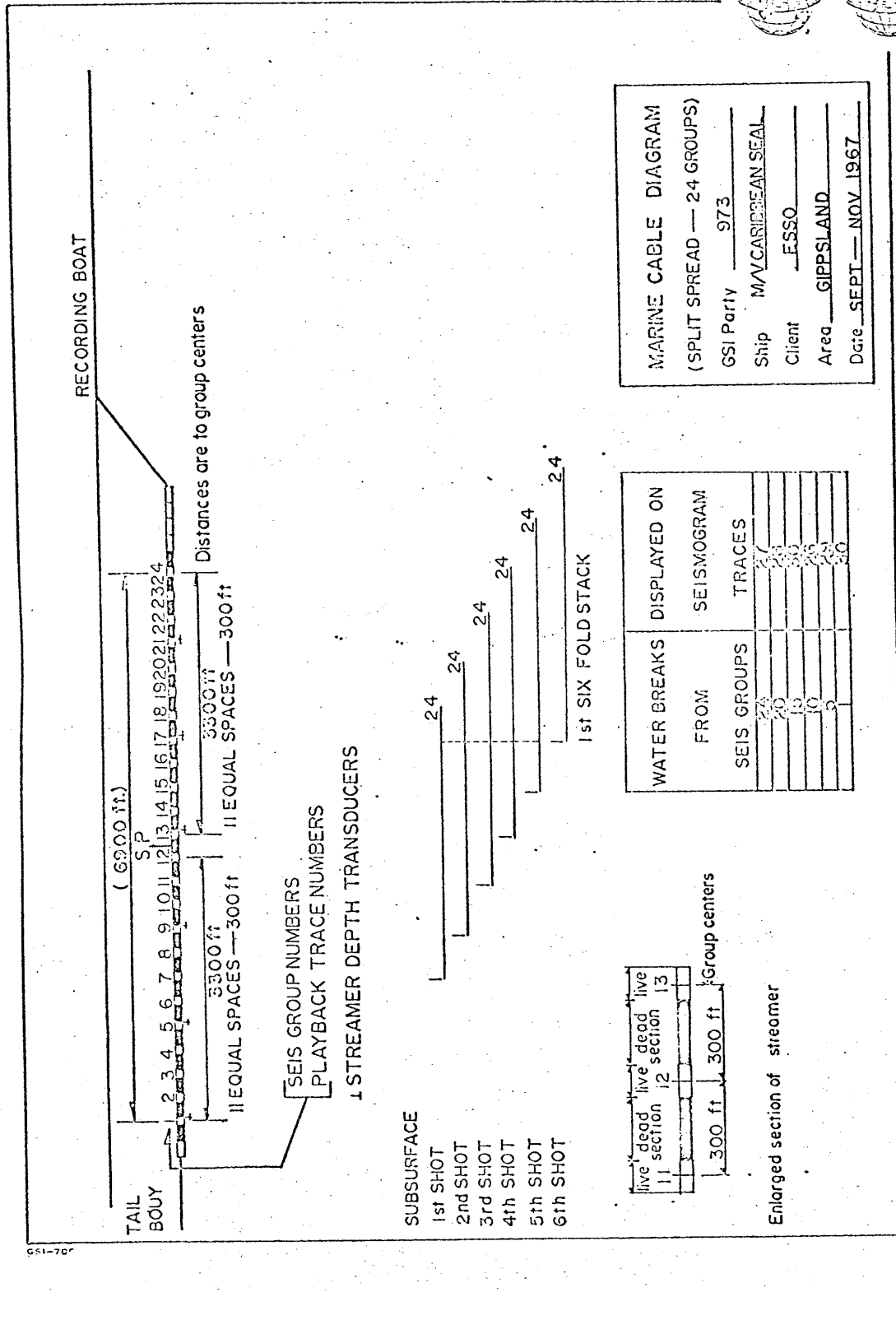
The reprocessing discussed in this report and shown in any inclusions and/or attachments has been derived from the original raw seismic data and ships logs (when available).

However as no independent verification of the said data is possible, IGEC, its members and employees gives no warranty, either direct or implied, that the said information or the reprocessing is correct, and accepts no responsibility for any resultant errors contained herein or for any damage or loss, however caused, suffered by any individual, company or corporation.

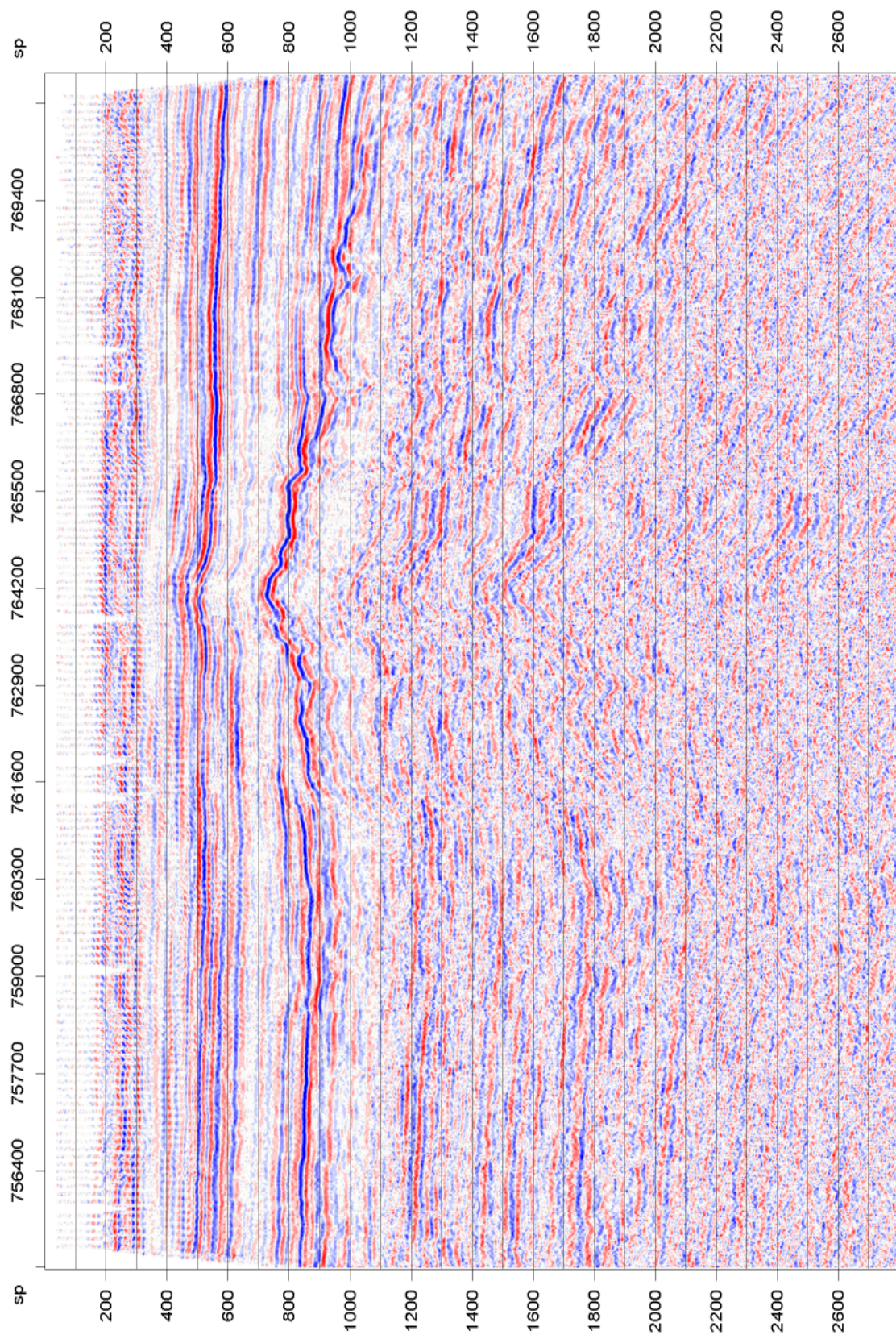
Respectfully submitted
J Saunders
IGEC PTY LTD
December 2008.

Attachments to this report

- Diagram of the cable deployment
- Reprocessed stack section for line G67B-165



Recording cable configuration G67B (EC-67)



Line G67B-165 (EC67-165) 2008 Stack