

Guidelines for submission of geophysical data

South Australian Petroleum Act 2000

March 2006



**Guidelines for submission of geophysical data as
required under the South Australian *Petroleum Act 2000***

March 2006

**A guide to the preparation and submission of 'basic' geophysical data appropriate
to petroleum licences in South Australia.**

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INTRODUCTION

Regulation 37 of the South Australian *Petroleum Act 2000* requires the holder of a petroleum licence to submit to PIRSA certain geophysical data collected during exploration and development activities. The submission of these data should coincide with the submission of the Operations Report, which discusses the acquisition of the data.

The prime survey method used in the petroleum industry is the seismic reflection technique. However, other survey methods, which are to be considered in light of this guideline, include magnetics, gravity, electrical and electro-magnetic techniques.

The data to be considered are all field recordings and supporting documentation necessary to allow future explorers to reprocess the original data and all processed data, which would allow future explorers to reinterpret the original data.

All data submitted under this regulation will be made available to the public after a period of 2 years from the date of completion of recording of the data or in the case of processing/reprocessing of data, 2 years after completion of the processing/reprocessing program. In the case of seismic surveying PIRSA defines the "Date of Completion of Recording" to be the day the recording of subsurface seismic data was completed and the recording crew released.

Submission of Geophysical Data should not be confused with submission of Geophysical Reports, which is the subject of a separate guideline.

In recent years there has been a serious attempt to establish uniform standards and requirements at both State and Federal levels regarding the submission of both reports and data. However, there are differences in legislative requirements not only between the States but also with the Commonwealth. These differences make it difficult to develop a uniform set of data submission standards that satisfy all legislation. All the differences aside, the results of these discussions are now largely reflected in these guidelines and adherence to them will ensure that the results of exploration and development are captured and stored appropriately for the benefit of the industry in the future.

These guidelines will be reviewed periodically to ensure that they embrace changes in technology, industry standards and industry practice. The aim of these guidelines is to facilitate compliance with the *Petroleum Act 2000* and ultimately to benefit the petroleum industry and the wider community.

GEOPHYSICAL DATA TYPES

Regulation 37 details the range of data types to be considered when submitting data for a geophysical program. This includes all geophysical techniques as applied over the licence area including but not limited to seismic techniques, aeromagnetic, other air-borne techniques, electrical, gravity etc, plus any reprocessing of the above data types.

Essentially, the data as listed is all the data required for an independent third party to satisfactorily process, reprocess or re-interpret the data. This will involve then, all original field data, supporting documentation, navigation data, final processed data, quality control plots/calibrations, tape lists etc.

Tables 1-4 as attached provide a complete list of data types, time frames, media type and format as required under this regulation

Under Regulation 37 all "Basic data" must be submitted within 12 months of completion of field acquisition, or in the case of a reprocessing program, 12 months after the completion of reprocessing of the data. The original time for submission was listed as 6 months in the Regulations under the Petroleum Act. This was subsequently amended to 12 months in a general letter to all Operators in April 2004.

ACCEPTABLE MEDIA TYPES

The following media will be accepted by PIRSA for digital data submission but it must be appropriate to both the format and volume of the data being supplied. Other media may be accepted following consultation with PIRSA in recognition of ongoing improvements in technology or changes in industry standards.

Companies must use their discretion in this area in order to minimise the number of items being submitted and demands on storage requirements.

- 1.44 Mbyte Floppy Disk
- 650 Mbyte CD-ROM
- 4.7 Gbyte DVD
- 5.0 Gbyte EXABYTE 8mm Helical scan tape Cartridge
- 3490 Tape Cartridge (for seismic field data only)
- 3490E Tape Cartridge (for seismic field data only)
- 3590 Tape Cartridge (for seismic field data only)

All media should be clearly labelled both on the Disk/Tape/CD as well as the cover.

METADATA

It is now strongly recommended that metadata (data about data) be included in the header of the data file and not rely on textual reports to support the data. This will ensure that the digital can be used in isolation from any supporting documentation well into the future. It is further recommended that these data are presented in a file header at the top of the data and constructed in such a way as to present the information by category and then by subcategory.

While there are standards recommended by ANZLIC for metadata that should be used where possible, some data require more information for intelligent use, and some data require specific metadata as detailed in other international standards. More information regarding header data for specific data types are obtainable at the SEG and UKOOA web sites. As a minimum, metadata should include:

- The date the data were produced
- The date the data were altered
- The parameters controlling data acquisition
- The parameters controlling data alteration
- The name of the company for whom the data was produced, eg. the tenement holder
- The tenement (s) under which the data were produced
- The activity which produced the data, eg Survey name
- The name of the contractor producing the data
- Any translation parameters required for conversion of the data (especially location data)
- The equipment used to generate the data
- The original format of the data

Examples of appropriate header content and layout are given in Appendices 1 and 3.

DATA CONTENT

It will be the responsibility of the operator to submit data that is both accurate and complete. PIRSA staff will validate data and any shortfalls will be returned to the operator for correction.

DELIVERY OF DATA

All data submitted to PIRSA must comply with these guidelines. Mark all deliveries to the attention of the Chief Geophysicist, Petroleum and Geothermal Group and deliver to:

The Director

Petroleum and Geothermal Group

Office of Minerals and Energy Resources SA

Level 6

101 Grenfell St

ADELAIDE SA 5000

TABLE 1 2D SEISMIC DATA

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
FIELD DATA			
Shot point location data Must include final processed coordinate listings including elevation/bathymetry data	UKOOA	Twelve months after completion of the survey	P1/90, SPS or subsequent format with header information of navigation/shotpoint location data including elevations or bathymetry. Coordinates must be provided for source, receiver (if applicable), and CDP locations. All data must be GDA94 coordinates and full Header Information supplied. Detailed example of data format provided in Appendix 1.
Seismic field data	SEG Standard	Twelve months after completion of the survey	To be submitted on high density media and accompanied by Observer Logs and other support data. All tapes/cartridges to be clearly labelled.
Seismic support data	Digital	Twelve months after completion of the survey	Including Observer's logs (ASCII or PDF). Permanent marker listings (ASCII or EXCEL) and other information as appropriate.
	Hard Copy	Twelve months after completion of the survey	Data to include Observer logs, Permanent Marker details, Chainage Notes and Intersection Diagrams to be sorted on a Line basis.
Uphole data (onshore)	ASCII	Twelve months after completion of the survey	Data to include Line Name, shotpoint nos, date, elevation, total drill depth and coordinate details plus time depth pairs for each uphole. See Appendix 6 for details.
	Hard Copy	Twelve months after completion of the survey	Require field plots showing trace data and time picks plus lithological logs if available Data to be submitted in conjunction with other support data as listed above.
Itemised field tape listing	ASCII	Twelve months after completion of the survey	Field data showing tape number, survey name, line number, shotpoint range, data type in ASCII format. Detailed specifications are contained in Appendix 2.
PROCESSED DATA			
Raw and final stack data -if generated as part of the processing sequence	SEG-Y	Twelve months after completion of the survey	Includes fully annotated EBCDIC header. See Appendix 3 for detailed specifications
Raw and final migrated stack data	SEG-Y	Twelve months after completion of the survey	Includes fully annotated EBCDIC header. See Appendix 3 for detailed specifications
Fully annotated image of final processed migrated data	CGM+ or TIFF	Twelve months after completion of the survey	CGM+ file must be created using a time scale at least 5cm/sec. See Appendix 4 for detailed specifications.

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
	Hard Copy	Twelvemonths after completion of the survey	A paper QC plot must accompany the digital data for verification, in not less than 5cm/sec
Shotpoint to CDP relationship	ASCII	Twelve months after completion of the survey	Sufficient SP/CDP data for workstation interpretation. At least SOL and EOL relationships for each line and a listing of equivalent CDP/SP pairs for each line.
Itemised process tape listing	ASCII	Twelve months after completion of the survey	Processed data showing tape number, survey name, line number, shotpoint range, CDP range, data type in ASCII format. See Appendix 5 for detailed specifications
FINAL REPORTS			
Final Operations Report (including Recording, Navigation and Processing)	PDF and Hardcopy (see separate Guidelines)	Twelve months after completion of the survey	Location map included. Operations, Navigation and Processing Reports can be supplied as separate volumes.
Final Interpretation Report	PDF and Hardcopy (see separate Guidelines)	Twelve months after completion of the processing or reprocessing of the data	Must be in a separate volume to the Operations Report

TABLE 2 3D SEISMIC DATA

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
FIELD DATA			
Shot point location data Must include final processed coordinate listings including elevation/bathymetry data	UKOOA and SPS (if generated)	Twelve months after completion of the survey.	P1/90, SPS or subsequent format with all associated data sufficient to re-process seismic data. GDA94 Coordinates must be provided for source, receiver and CDP locations, including elevations or bathymetry where appropriate. Detailed examples are contained in Appendix 1.
Seismic field data	SEG Standard	Twelve months after completion of the survey.	To be submitted on high density media and accompanied by Observer's logs and other support data. All tapes/cartridges to be clearly labelled.
Seismic support data	Digital	Twelve months after completion of the survey	Including Observer's logs (ASCII or PDF). Permanent marker listings (ASCII or EXCEL) and other information as appropriate.
	Hard Copy	Twelve months after completion of the survey	Data to include Observer's logs, chainage notes, Permanent marker information.
Uphole data (onshore)	ASCII	Twelve months after completion of the survey	Data to include Line Name, shotpoint nos, date, elevation, total drill depth and coordinate details plus time depth pairs for each uphole. See Appendix 6 for details.
	Hard Copy	Twelve months after completion of the survey	Require field plots showing trace data and time picks plus lithological logs if available. Data to be submitted in conjunction with other support data as listed above.
Itemised field tape listing	ASCII	Twelve months after completion of the survey	Field data showing tape number, survey name, line number, shotpoint range, data type in ASCII format. Detailed specifications are contained in Appendix 2.
PROCESSED DATA			
Raw stack data -if generated as part of the processing sequence	SEG-Y	Twelve months after completion of the survey	EBCDIC header to be fully annotated. See Appendix 3 for detailed examples.
Filtered and final migrated stack data	SEG-Y	Twelve months after completion of the survey	EBCDIC header to be fully annotated. See Appendix 3 for detailed examples.
2D data subset	Hardcopy	Twelve months after completion	A paper QC plot to be generated on a 2 kilometre grid basis for Final

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
		of the survey	Migrated form to assist with data validation.
Final processed (grid) bin coordinates	UKOOA 3D binning grids	Twelve months after completion of the survey	To be completed using UKOOA "The Guidelines for the Definition of 3D Seismic Binning Grids With a Format for Data Exchange" format.
Velocity data	ASCII	Twelve months after completion of the survey	Including bin number and time stacking and migrated velocities versus RMS pairs for both stacked and migrated velocities.
Itemised process tape listing	ASCII	Twelve months after completion of the survey	Processed data showing tape number, survey name, line number, shotpoint range, data type in ASCII format. See Appendix 5 for detailed specifications.
FINAL REPORTS			
Final Operations Report (including Recording, Navigation and Processing)	PDF and Hardcopy (see separate Guidelines)	Twelve months after completion of the survey	Location map included. Operations, Navigation and Processing Reports can be supplied as separate volumes.
Final Interpretation Report	PDF and Hardcopy (see separate Guidelines)	Twelve months after completion of processing the data.	Must be in a separate volume to the Operations Report.

TABLE 3 SEISMIC REPROCESSING DATA

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
2D DATA			
PROCESSED DATA			
Raw and final stack data -if generated as part of the processing sequence	SEG-Y	Twelve months after completion of reprocessing of data	Includes fully annotated EBCDIC header. Outputs must be in the same format as specified in Appendix 3.
Raw and final migrated stack data	SEG-Y	Twelve months after completion of reprocessing of data	Includes fully annotated EBCDIC header. Outputs must be in the same format as specified in Appendix 3.
Fully annotated image of final processed migrated data.	CGM+ or TIFF	Twelve months after completion of reprocessing of data	CGM+ file must be created using a time scale of at least 5cm/sec.
	Hardcopy	Twelve months after completion of reprocessing of data	A paper QC plot must accompany the digital data verification, in not less than 5cm/sec.
Shotpoint to CDP relationship	ASCII	Twelve months after completion of reprocessing of data	Sufficient SP/CDP data for workstation loading and interpretation. At least SOL and EOL relationships for each line and a listing of equivalent CDP/SP pairs for each line.
3D DATA			
PROCESSED DATA			
Raw stacked data -if generated as part of the processing sequence	SEG-Y	Twelve months after completion of reprocessing of data	EBCDIC header to be fully annotated. Outputs must be in the same format as specified in Appendix 3.
Filtered and final migrated data	SEG-Y	Twelve months after completion of reprocessing of data	EBCDIC header to be fully annotated. Outputs must be in the same format as specified in Appendix 3.
2D data subset	Hardcopy	Twelve months after completion of reprocessing of data	A paper QC plot to be generated on a 2 kilometre grid basis for Final Migrated form to assist with data validation.
Final processed (grid) bin coordinates	UKOOA 3D binning grids	Twelve months after completion of reprocessing of data	To be completed using UKOOA "The Guidelines for the Definition of 3D Seismic Binning Grids With a Format for Data Exchange" format. Must have at least 4 corner coordinates, grid orientation ("left or right handedness"), first and last sublimes/crosslines and bin numbers. All coordinate data must also include clearly stated datum, spheroid and

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
			projection, also clearly stated transformation parameters if not in same coordinate system as was acquired in the field.
Velocity data	ASCII	Twelve months after completion of reprocessing of data	Including bin number and time stacking and migrated velocities versus RMS pairs for both stacked and migrated velocities.
Itemised process tape listing 2D and 3D	ASCII	Twelve months after completion of reprocessing of data	Processed data showing tape number, survey name, line number, shotpoint range, data type in ASCII format. See Appendix 5 for detailed specifications.
FINAL REPORTS			
Final Operations Report (reprocessing)	PDF and Hardcopy (see separate Guidelines)	Twelve months after completion of reprocessing of data	
Final Interpretation Report	PDF and Hardcopy (see separate Guidelines)	Twelve months after the completion of reprocessing of data	Interpretation to be in a separate volume to the Operations Report.

TABLE 4 GRAVITY, MAGNETIC AND OTHER SURVEY DATA

DATA REQUIRED	FORMAT	DATA DUE DATE	REMARKS
GRAVITY DATA			
Processed Gravity data	ASCII, Excel	Twelve months after completion of the survey	Must include headers detailing Survey Name, Licence, Date, Operators, Base Station Information. Data file to contain key items such as station, meter reading, observed gravity, elevation final processed gravity value etc. GDA94 coordination must be used with elevations based on AHD datum. Detailed example is provided in Appendix 7.
MAGNETIC DATA			
Processed Final Magnetic data (corrected and levelled)	ASCII, ASEG-GDF	Twelve months after completion of the survey	Fixed column ASCII including ASEG-GDF format. Including pre and post micro-levelling data. All coordinate data must clearly state datum, spheroid and projection and be in latitude and longitude. Elevations based on AHD. Transformation parameters are required where field data coordinate system is not the same as process coordinate system.
OTHER SURVEY TYPES			
Field data for other types of surveys	Digital	Twelve months after completion of the survey	Format of these data to be negotiated with the Director.
Processed data for other types of surveys	Digital	Twelve months after completion of the survey	Format of these data to be negotiated with the Director.
FINAL REPORTS AND IMAGES			
Final Operations Report (including Operations, Navigation, and Processing)	PDF and Hard Copy (see separate Guidelines)	Twelve months after completion of the survey	These can be supplied as separate volumes if necessary and must also include a location map.
Final Interpretation Report	PDF and Hard Copy (see separate Guidelines)	Twelve months after completion of the survey	To be a separate volume to the Operations Report.
Geophysical maps	PDF and Hard Copy	Twelve months after completion of the survey	Maps including contour maps derived from the survey, eg. TMI, Bouguer Gravity. These include any maps and digital image files included in the Interpretation Report.
Geophysical pixel images	ER Mapper Grid format	Twelve months after completion of the survey	Digital images files of maps and data included in the Interpretation Report.

APPENDIXES

1 Presentation of navigation data for seismic surveys using UKOOA P1/90 standard

As part of the requirements for submission of navigation data the Guidelines recommend using the current UKOOA (United Kingdom Offshore Operators Association) standard which is P1/90. Below is a description of the P1/90 format followed by an example of the data layout.

More detailed discussion of this format is available in a report entitled “UKOOA P1/90 Post Plot Data Exchange Format” which is available for download from www.seg.org web site.

It is assumed that this format will be used for data from a single 2D/3D seismic survey and not for compiled data bases including multiple surveys.

The data file and header content as presented will vary depending on whether the survey is onshore or offshore but operators are encouraged to ensure that contractors strive to honour the intent of uniform data format to ensure data viability in the future.

Further developments of data transfer standards have seen the development of the “Shell Processing Support” (SPS) format for 3D surveys. Details of this SEG adopted technical standard are also available from the SEG website. Essentially this data is presented as 3 files, namely S, R and X files that contain point data for both the source and receiver lines. The relationship file specifies the relationship between each shotpoint, its record number and the receiver groups. This SPS data format then is important when processing or reprocessing of field data. It is therefore considered as basic data and all three files (source, receiver and relationship) should also be submitted if prepared.

UKOOA P1/90 header data

ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
H0100	Permit	H0600	Processing contractor	H1800	Projection type
H0101	Survey name	H0700	Onboard systems	H1900	Projection zone
H0102	Vessel name	H0800	Coordinate location	H2000	Grid units
H0103	Source details	H0900	Offset	H2001	Height units
H0104	Streamer details	H1000	Hours from GMT	H2002	Angle units
H0200	Survey date	H1100	Groups per shot	H2200	Central meridian
H0201	Postplot date	H1400	Survey spheroid	H2301	Grid origin
H0202	Tape Version	H1401	Datum shift	H2302	Grid coords at origin
H0300	Client	H1500	Postplot spheroid	H2401	Projection scale factor
H0400	Geophysical contractor	H1501	Datum shift	H2402	Coords of scale factor
H0500	Positioning contractor	H1700	Vertical datum	H2600	Remarks

UKOOA P1/90 data file

ITEM	DESCRIPTION	COLUMN	FORMAT
1	Record identification "S" = Centre of Source "G" = Receiver Group "Q" = Bin Centre "A" = Antenna position "T" = Tailbuoy position "C" = Common Mid Point "V" = Vessel Reference point "E" = Echo Sounder "Z" = Other, defined in H0800	1	A1
2	Line Name (left justified, including reshoot code)	2-13	A12
3	Spare	14-16	A3
4	Vessel ID	17	A1
5	Source ID	18	A1
6	Tailbuoy/Other ID	19	A1
7	Point Number (right justified)	20-25	A6
8	Latitude (d.m.s. N/S)	26-35	2(I2), F5.2, A1
9	Longitude (d.m.s. E/W)	36-46	I3,I2, F5.2, A1
10	Map grid Easting (metres)*	47-55	F9.1
11	Map grid Northing (metres)*	56-64	F9.1
12	Water depth (datum described in H1700)	65-70	F6.1
13	Julian Day of Year	71-73	I3
14	Time (h.m.s.,GMT or as stated in H1000)	74-79	3I2
15	Spare	80	1X

Example of UKOOA P1/90 data file for offshore 2D survey

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H0100AREA NAME .....: OFFSHORE SEISMIC SURVEY, EPP001
H0101JOB DESCRIPTION .....: 2D SINGLE STREAMER SINGLE SOURCE
H0102VESSEL DETAILS .....: MV DOLPHIN 1
H0103SOURCE DETAILS .....: G001 SOURCE 1 1
H0104STREAMER DETAILS .....: S001 480 RECEIVERS 1 1 1
H0105OTHER DETAILS .....: FG01 FRONT FLOAT 1 2
H0105OTHER DETAILS .....: FG02 FRONT FLOAT 1 3
H0105OTHER DETAILS .....: FG03 FRONT FLOAT 1 4
H0200DATE OF SURVEY .....: 20001210
H0201DATE OF TAPE .....: 18:01:01
H0202TAPE VERSION ID .....: UKOOA P1/90 - F9091-004A
H0203LINE PREFIX .....: N/A
H0300CLIENT NAME .....: GOOD OIL CO.
H0400GEOPHYSICAL CONTRACTOR...: REFLECTIONS R US.
H0500POSITION CONTRACTOR.....: XYZ EXPERTS
H0600POS. PROC. CONTRACTOR....: WIGGLE TRACE PROC CO.
H0700POS./ COMPUTER SYSTEM....:VESSEL : TRINAV DGPS
H0700POS./ COMPUTER SYSTEM....: : MRDGPS
H0700POS./ COMPUTER SYSTEM....:FLOAT POSITION : TRINAV RGPS
H0700POS./ COMPUTER SYSTEM....: TRINAV 2.6.0/NOV/2000/Patch11
H0800COORDINATE LOCATION.....: CENTRE OF SOURCE
H0900REF POINT V1 TO G001 SRC : 1 2 -30.00 -145.00
H0901REF POINT V1 TO S001 STR : 1 2 0.00 -280.67
H1000CLOCK TIME RELATIVE GMT .: GMT + 0.0 HOURS
H1100NUMBER OF REC. GROUPS....: 480
H1400GEODETTIC DATUM (SURVEY)..: WGS-84 GDA94 6378137.000 298.2572236
H1401TRANSFORMATION TO WGS84...: 0.0 0.0 0.0 0.000 0.000 0.000 0.0000000
H1500GEODETTIC DATUM (POSTPLOT): WGS-84 GDA94 6378137.000 298.2572236
H1501TRANSFORMATION TO WGS84...: 0.0 0.0 0.0 0.000 0.000 0.000 0.0000000
H1600DATUM TRANSFORMATIONS....: 0.0 0.0 0.0 0.000 0.000 0.000 0.0000000
H1700VERTICAL DATUM DESCR. ...: SL ECHO SOUNDER
H1800PROJECTION TYPE .....: 002U.T.M. SOUTHERN HEMISPHERE
H1900PROJECTION ZONE .....: 52 S
H2000GRID UNIT .....: 1METRES 01.000000000000
H2001HEIGHT UNIT .....: 1METRES 01.000000000000
H2002ANGULAR UNIT .....: 1DEGREES
H2200LONG. OF CENTR. MERID. ...: 129 0 0.000E
H2301GRID ORIGIN .....: 0 0 0.000N129 0 0.000E
H2302GRID COORD. AT ORIGIN ...: 500000.00E10000000.00N
H2401SCALE FACTOR .....: 0.9996000000
H2402LAT/LON WHERE SCALE DEF...: 0 0 0.000N129 0 0.000E
H2600COMMENTS.....:
H2600CABLE DEPTHS.....: ALL STREAMER DEPTHS ARE RELATIVE TO SEA LEVEL
H2600VESSEL POSITIONS ARE KALMAN FILTERED
H2600SOURCE AND RECEIVER POSITIONS ARE DERIVED FROM COMPASS DIRECTION LINES
H2600AND NOMINAL OFFSETS. STREAMER GROUP INTERVALS ARE COMPUTED USING TENSION
H2600MODEL
H2600DEPTH DATA CORRECTED FOR DRAFT
H2600DEPTH DATA CORRECTED FOR SPEED OF SOUND IN WATER
H2600DEPTH DATA UNCORRECTED FOR TIDE
H2600ALL TIMES ARE GPS TIMES
VW00FDW0001A 1 2084332518.36S1303642.77E 649862.56300793.1 420.5 18 55927
EW00FDW0001A 1 2084332517.85S1303643.67E 649885.96300808.5 420.5 18 55927
CW00FDW0001A 111 2084332522.85S1303636.46E 649697.36300657.3 420.5 18 55927
VW00FDW0001A 1 2085332517.76S1303643.43E 649879.86300811.3 420.0 18 55937
EW00FDW0001A 1 2085332517.24S1303644.32E 649903.06300827.1 420.0 18 55937
CW00FDW0001A 111 2085332522.25S1303637.10E 649714.26300675.7 420.0 18 55937
VW00FDW0001A 1 2086332517.15S1303644.06E 649896.46300829.9 418.7 18 55947
EW00FDW0001A 1 2086332516.62S1303644.95E 649919.56300845.8 418.7 18 55947
CW00FDW0001A 111 2086332521.62S1303637.73E 649730.76300694.7 418.7 18 55947
VW00FDW0001A 1 2087332516.53S1303644.70E 649913.26300848.6 419.0 18 55957
EW00FDW0001A 1 2087332516.02S1303645.60E 649936.66300863.9 419.0 18 55957
CW00FDW0001A 111 2087332520.99S1303638.35E 649747.16300713.8 419.0 18 55957

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Example of SPS data format R file

H00 SPS format version numb. SPS001,01.10.90;
H01 Description of survey area SOUTH AUSTRALIA,PEL 001 3D;
H02 Date of survey 01.01.01;
H022Tape/disk identifier PEL 001 3D
H03 Client THE GOOD OIL PETROLEUM CO.
H04 Geophysical contractor REFLECTIONS BY DESIGN,CREW 01
H05 Positioning contractor REFLECTIONS BY DESIGN,CREW 01
H06 Pos. proc. contractor XYZ EXPERTS
H07 Field computer system IMS,I/O SYSTEM TWO,MS-DOS DISKS;
H08 Coordinate location CENTRE OF SOURCE ARRAY CENTRE OF RECEIVER ARRAY;
H09 Offset to coord. location N/A;
H10 Clock time w.r.t. GMT +10;
H11 Spare
H12 Geodetic datum,-spheroid GDA94,WGS84,6378137,298.257223563;
H13 Spare
H14 Geodetic datum parameters;
H15 Spare
H16 Spare
H17 Vertical datum description AHD, Australian Height Datum;
H18 Projection type UTM;
H19 Projection zone 54,SOUTH;
H20 Description of grid units METRE;
H210Lat. of standard parallel(s)N/A;
H220Long. of central meridian 141 00 00.00E;
H241Scale factor 0.9996;
H30 Project code and descriptionPEL001,3D
H31 Line number format LINE NUMBER(1:16);
H400Type,Model,Polarity 1,I/O TWO,SEG;
H401Crew name, Comment 1, REFLECTIONS BY DESIGN
H402Sample int., Record Length 1,2MSEC,4SEC;
H403Number of channels 1,768;
H404Tape type, format, density 1,3490E,IEEE SEGD,75742;
H405Filter_alias Hz,dB pnt,slope1,103HZ,-6DB,288DB/OCT;
H406Filter_notch Hz,-3dB points 1,NONE;
H407Filter_low Hz,dB pnt,slope 1,5.5HZ,-3DB,12DB/OCT;
H408Time delay FTB-SOD app Y/N 1,0MSEC,NOT APPLIED;
H409Multi component recording 1,Z;
H410Aux. channel 1 contents 1,SWEEP 1 (T-REF);
H411Aux. channel 2 contents 1,CLOCK TB (CH5);
H412Aux. channel 3 contents
H413Aux. channel 4 contents
H414Spare
H415Spare
H416Spare
H417Spare
H418Spare
H419Spare
H600Type,model,polarity G1,SM-4,375 LD,SEG;
H601Damp coeff,natural freq. G1,0.68,10HZ;

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H602 Nunits,len(X),width(Y)      G1,12,40M,0M;
H603Unit spacing X,Y             G1,3.33M,0M;
H604Location information         G1,SAND DUNE;
H605Spare
H606Spare
H607Spare
H608Spare
H610Type,model,polarity         KL,DEAD TRACE;
H611Damp coeff,natural freq.    KL,DEAD TRACE;
H613Unit spacing X,Y           KL,DEAD TRACE;
H614Location information         KL,SAND DUNE;
H615Spare
H616Spare
H617Spare
H618Spare
H700Type,model,polarity         V1,VIBROSEIS,MERTZ M26,SEG;
H701Size,vert.stk fold          V1,60,000LB,2SWEEP/VP;
H702Nunits,len(X),width(y)     V1,3,47M,0M;
H703Unit spacing X,Y           V1,13.3M,0M;
H704Control type                V1,GROUND FORCE PHASE AND AMPLITUDE LOCK;
H705Correlator,noise supp       V1,I/O2 CSM,BURST/DIVERSITY STACK;
H706Sweep type,length          V1,LINEAR,3SEC;
H707Sweep frequency start,end   V1,5HZ,90HZ;
H708Taper,length start,end     V1,COSINE,200MSEC,200MSEC;
H709Location information         V1,SAND DUNE;
H710Spare
H990R,S,X file quality control  D.CHECKER
H991Coord. status final/prov.   C.OORDE
H26      1      2      3      4      5      6      7      8
H26 567890123456789012345678901234567890123456789012345678901234567890
R01-AR1000      10601G1      0.0  0      433875.0 6965051.3 35.1 47130623
R01-AR1000      10611G1      0.0  0      433914.8 6965050.2 35.1 47130623
R01-AR1000      10621G1      0.0  0      433953.4 6965054.5 35.0 47130623
R01-AR1000      10631G1      0.0  0      433994.8 6965051.8 35.1 47130623
R01-AR1000      10641G1      0.0  0      434034.4 6965053.4 35.2 47130623
R01-AR1000      10651G1      0.0  0      434075.5 6965056.8 35.3 47130623
R01-AR1000      10661G1      0.0  0      434114.9 6965052.4 35.2 47130623
R01-AR1000      10671G1      0.0  0      434155.0 6965052.7 35.2 47130623
R01-AR1000      10681G1      0.0  0      434195.6 6965055.9 35.1 47130623
R01-AR1000      10691G1      0.0  0      434235.6 6965053.6 35.0 47130623
R01-AR1000      10701G1      0.0  0      434273.5 6965053.8 35.2 47130623
R01-AR1000      10711G1      0.0  0      434314.8 6965056.1 35.3 47130623
R01-AR1000      10721G1      0.0  0      434355.2 6965056.2 35.3 47130623
R01-AR1000      10731G1      0.0  0      434395.2 6965054.1 35.4 47130623

```

Example of SPS data format S File

H00 SPS format version numb. SPS001,01.10.90;
H01 Description of survey area SOUTH AUSTRALIA,PEL001,3D,
H02 Date of survey 01.01.01;
H022Tape/disk identifier PEL 001, 3D;
H03 Client THE GOOD OIL CO.;
H04 Geophysical contractor REFLECTIONS BY DESIGN,CREW 01 ;
H05 Positioning contractor REFLECTIONS BY DESIGN,CREW 01 ;
H06 Pos. proc. contractor XYZ EXPERTS;
H07 Field computer system IMS,I/O SYSTEM TWO,MS-DOS DISKS;
H08 Coordinate location CENTRE OF SOURCE ARRAY CENTRE OF RECEIVER ARRAY;
H09 Offset to coord.location N/A;
H10 Clock time w.r.t. GMT +10;
H11 Spare
H12 Geodetic datum,-spheroid GDA94,WGS84,6378137,298.257223563;
H13 Spare
H14 Geodetic datum parameters ;
H15 Spare
H16 Spare
H17 Vertical datum description AHD, Australian Height Datum;
H18 Projection type UTM;
H19 Projection zone 54,SOUTH;
H20 Description of grid units METRE;
H210Lat. of standard parallel(s)N/A;
H220Long. of central meridian 141 00 00.00E;
H241Scale factor 0.9996;
H30 Project code and descriptionPEL001,3D;
H31 Line number format LINE NUMBER(1:16);
H400Type,Model,Polarity 1,I/O TWO,SEG;
H401Crew name,Comment 1, REFLECTIONS BY DESIGN,CREW 01;
H402Sample int.,Record Length 1,2MSEC,4SEC;
H403Number of channels 1,768;
H404Tape type,format,density 1,3490E,IEEE SEGD,75742;
H405Filter_alias Hz,dB pnt,slope1,103HZ,-6DB,288DB/OCT;
H406Filter_notch Hz,-3dB points 1,NONE;
H407Filter_low Hz,dB pnt,slope 1,5.5HZ,-3DB,12DB/OCT;
H408Time delay FTB-SOD app Y/N 1,0MSEC,NOT APPLIED;
H409Multi component recording 1,Z;
H410Aux. channel 1 contents 1,SWEEP 1 (T-REF);
H411Aux. channel 2 contents 1,CLOCK TB (CH5);
H412Aux. channel 3 contents
H413Aux. channel 4 contents
H414Spare
H415Spare
H416Spare
H417Spare
H418Spare
H419Spare
H600Type,model,polarity G1,SM-4,375 LD,SEG;
H601Damp coeff,natural freq. G1,0.68,10HZ;

```

H602 Nunits,len(X),width(Y)      G1,12,40M,0M;
H603Unit spacing X,Y              G1,3.33M,0M;
H604Location information           G1,SAND DUNE;
H605Spare
H606Spare
H607Spare
H608Spare
H610Type,model,polarity           KL,DEAD TRACE;
H611Damp coeff,natural freq.      KL,DEAD TRACE;
H613Unit spacing X,Y              KL,DEAD TRACE;
H614Location information           KL,SAND DUNE;
H615Spare
H616Spare
H617Spare
H618Spare
H700Type,model,polarity           V1,VIBROSEIS,MERTZ M26,SEG;
H701Size,vert.stk fold             V1,60,000LB,2SWEEP/VP;
H702Nunits,len(X),width(y)        V1,3,47M,0M;
H703Unit spacing X,Y              V1,13.3M,0M;
H704Control type                   V1,GROUND FORCE PHASE AND AMPLITUDE LOCK;
H705Correlator,noise supp          V1,I/O2 CSM,BURST/DIVERSITY STACK;
H706Sweep type,length              V1,LINEAR,3SEC;
H707Sweep frequency start,end      V1,5HZ,90HZ;
H708Taper,length start,end         V1,COSINE,200MSEC,200MSEC;
H709Location information           V1,SAND DUNE;
H710Spare
H990R,S,X file quality control     D.CHECKER;
H991Coord. status final/prov.      C.OORDE;
H26      1          2          3          4          5          6          7          8
H26 56789012345678901234567890123456789012345678901234567890123456789012345678901234567890
S01-AS6072      10061V1  0 0.0  0      434339.3 6964775.2 35.2 47130623
S01-AS6072      10041V1  0 0.0  0      434333.5 6964855.4 35.3 47130823
S01-AS6072      10021V1  0 0.0  0      434335.3 6964935.9 35.2 47130910
S01-AS6072      10001V1  0 0.0  0      434335.9 6965013.5 35.2 47130953
S01-AS6076      10001V1  0 0.0  0      434493.2 6965016.7 36.2 47131122
S01-AS6076      10021V1  0 0.0  0      434502.6 6964934.5 36.3 47131211
S01-AS6076      10041V1  0 0.0  0      434499.1 6964855.1 36.2 47131325
S01-AS6076      10061V1  0 0.0  0      434493.8 6964776.6 36.0 47131420
S01-AS6080      10061V1  0 0.0  0      434650.6 6964774.9 39.0 47131541
S01-AS6080      10041V1  0 0.0  0      434654.4 6964855.5 38.8 47131639
S01-AS6080      10021V1  0 0.0  0      434653.5 6964936.4 38.4 47131726
S01-AS6080      10001V1  0 0.0  0      434653.9 6965016.6 38.2 47131807
S01-AS6084      10001V1  0 0.0  0      434817.2 6965015.8 41.6 47131921
S01-AS6084      10021V1  0 0.0  0      434818.4 6964934.4 41.2 47132012
S01-AS6084      10041V1  0 0.0  0      434817.2 6964854.5 40.7 47132056
S01-AS6084      10061V1  0 0.0  0      434819.0 6964775.1 40.5 47132139
S01-AS6088      10061V1  0 0.0  0      434975.4 6964776.0 38.8 47132737
S01-AS6088      10041V1  0 0.0  0      434973.8 6964853.6 37.3 47132823
S01-AS6088      10021V1  0 0.0  0      434976.2 6964936.3 38.0 47132907
S01-AS6088      10001V1  0 0.0  0      434977.8 6965015.2 38.6 47132957

```

Example of SPS data format X file

H00 SPS format version numb. SPS001,01.10.90;
H01 Description of survey area SOUTH AUSTRALIA,PEL001,3D;
H02 Date of survey 01.01.01;
H022Tape/disk identifier PEL001 3D;
H03 Client THE GOOD OIL COMPANY;
H04 Geophysical contractor REFLECTIONS BY DESIGN,CREW 01;
H05 Positioning contractor REFLECTIONS BY DESIGN,CREW 01;
H06 Pos. proc. contractor REFLECTIONS BY DESIGN,CREW 01;
H07 Field computer system IMS,I/O SYSTEM TWO,MS-DOS DISKS;
H08 Coordinate location CENTRE OF SOURCE ARRAY CENTRE OF RECEIVER ARRAY;
H09 Offset to coord.location N/A;
H10 Clock time w.r.t. GMT +10;
H11 Spare
H12 Geodetic datum,-spheroid GDA94,WGS84,6378137,298.257223563;
H13 Spare
H14 Geodetic datum parameters ;
H15 Spare
H16 Spare
H17 Vertical datum description AHD, Australian Height Datum;
H18 Projection type UTM;
H19 Projection zone 54,SOUTH;
H20 Description of grid units METRE;
H210Lat. of standard parallel(s)N/A;
H220Long. of central meridian 141 00 00.00E;
H241Scale factor 0.9996;
H30 Project code and descriptionPEL 001, 3D;
H31 Line number format LINE NUMBER(1:16);
H400Type,Model,Polarity 1,I/O TWO,SEG;
H401Crew name,Comment 1, REFLECTIONS BY DESIGN,CREW 01;
H402Sample int.,Record Length 1,2MSEC,4SEC;
H403Number of channels 1,768;
H404Tape type,format,density 1,3490E,IEEE SEGD,75742;
H405Filter_alias Hz,dB pnt,slope1,103HZ,-6DB,288DB/OCT;
H406Filter_notch Hz,-3dB points 1,NONE;
H407Filter_low Hz,dB pnt,slope 1,5.5HZ,-3DB,12DB/OCT;
H408Time delay FTB-SOD app Y/N 1,0MSEC,NOT APPLIED;
H409Multi component recording 1,Z;
H410Aux. channel 1 contents 1,SWEEP 1 (T-REF);
H411Aux. channel 2 contents 1,CLOCK TB (CH5);
H412Aux. channel 3 contents
H413Aux. channel 4 contents
H414Spare
H415Spare
H416Spare
H417Spare
H418Spare
H419Spare
H600Type,model,polarity G1,SM-4,375 LD,SEG;
H601Damp coeff,natural freq. G1,0.68,10HZ;

```

H602 Nunits,len(X),width(Y)      G1,12,40M,0M;
H603Unit spacing X,Y             G1,3.33M,0M;
H604Location information         G1,SAND DUNE;
H605Spare
H606Spare
H607Spare
H608Spare
H610Type,model,polarity         KL,DEAD TRACE;
H611Damp coeff,natural freq.    KL,DEAD TRACE;
H613Unit spacing X,Y           KL,DEAD TRACE;
H614Location information         KL,SAND DUNE;
H615Spare
H616Spare
H617Spare
H618Spare
H700Type,model,polarity         V1,VIBROSEIS,MERTZ M26,SEG;
H701Size,vert.stk fold          V1,60,000LB,2SWEEP/VP;
H702Nunits,len(X),width(y)     V1,3,47M,0M;
H703Unit spacing X,Y           V1,13.3M,0M;
H704Control type                V1,GROUND FORCE PHASE AND AMPLITUDE LOCK;
H705Correlator,noise supp       V1,I/O2 CSM,BURST/DIVERSITY STACK;
H706Sweep type,length          V1,LINEAR,3SEC;
H707Sweep frequency start,end   V1,5HZ,90HZ;
H708Taper,length start,end      V1,COSINE,200MSEC,200MSEC;
H709Location information         V1,SAND DUNE;
H710Spare
H990R,S,X file quality control  D.CHECKER;
H991Coord. status final/prov.   C.OORDE;
H26      1      2      3      4      5      6      7      8
H26 56789012345678901234567890123456789012345678901234567890123456789012345678901234567890
X201069 11101-AS6072          10061  1  60101-AR1000          1060  11191
X201069 11101-AS6072          10061  61 120101-AR1008          1060  11191
X201069 11101-AS6072          10061 121 180101-AR1016          1060  11191
X201069 11101-AS6072          10061 181 240101-AR1024          1060  11191
X201069 11101-AS6072          10061 241 300101-AR1032          1060  11191
X201069 21101-AS6072          10041  1  60101-AR1000          1060  11191
X201069 21101-AS6072          10041  61 120101-AR1008          1060  11191
X201069 21101-AS6072          10041 121 180101-AR1016          1060  11191
X201069 21101-AS6072          10041 181 240101-AR1024          1060  11191
X201069 21101-AS6072          10041 241 300101-AR1032          1060  11191
X201069 31101-AS6072          10021  1  60101-AR1000          1060  11191
X201069 31101-AS6072          10021  61 120101-AR1008          1060  11191
X201069 31101-AS6072          10021 121 180101-AR1016          1060  11191
X201069 31101-AS6072          10021 181 240101-AR1024          1060  11191
X201069 31101-AS6072          10021 241 300101-AR1032          1060  11191
X201069 41101-AS6072          10001  1  60101-AR1000          1060  11191
X201069 41101-AS6072          10001  61 120101-AR1008          1060  11191
X201069 41101-AS6072          10001 121 180101-AR1016          1060  11191
X201069 41101-AS6072          10001 181 240101-AR1024          1060  11191
X201069 41101-AS6072          10001 241 300101-AR1032          1060  11191

```

2 Presentation of seismic field tape summary in digital format

To assist PIRSA in maintaining data bases of field magnetic tapes and cartridges produced as a result of seismic surveys, it is requested that Operators provide digital tape summary lists to accompany each data shipment.

The key attribute data to be included in this file include tape Number, line number, shotpoint ranges and record ranges.

Data will be supplied in the following manner:

- Digital data to be provided in ASCII or Excel format and accompanied by a hard copy form as well.
- Each file must contain records that represent distinct Line Name/Tape Number relationships.
- The listing must contain, for each tape record the following data:
 - Line Name
 - Original Tape Number
 - Shotpoint –start and end
 - Record Number –start and end
 - Recording date
 - Data type eg, correlated, single sweep,
- Data for each field must be entered where known. It cannot be assumed the Line Name is the same as the previous record if not included.

Hard copy listings are still required and should be submitted at the same time as the digital data and may take the form of a transmittal note, which is stored with the tapes.

Headers to the data file may be arranged such that they contain the more static attribute data concerning the tapes such as Recording Contractor, Tape/Cartridge type, Tape capacity, Recording sample rate, Record Length, Survey Name etc. These header data may be organised to double as tape label or box labels as indicated in the examples.

Example of acceptable field tape listing for a 2D seismic survey

DATA TYPE : **SEISMIC**
CLIENT : **OIL COMPANY**
AREA : **COOPER NORTHWEST**
LICENCE : **PEL 99**
SURVEY NAME : **2000 GIRPS**
RECORDED BY : **GEOSERVICES**
TAPE TYPE : **BLACKWATCH 3490E CARTRIDGE**
FORMAT : **SEGD,CORRELATED**
TAPE CAPACITY : **500 MByte**
SAMPLE RATE : **4ms**
RECORD LENGTH : **3.0 Sec**

LINE NAME	VP START	VP END	RECORD START	RECORD END	TAPE NOS	RECORDING DATE
00-JPS	200.5	476.5	1	552	200398A	7/08/2000
00-JPR	430.5	200.5	1	462	200399A	8/08/2000
00-JPQ	200.5	440.5	1	484	200400A	9/08/2000
00-JPP	440.5	200.5	1	482	200401A	9/08/2000
00-JPN	200.5	400.5	1	398	200402A	9/08/2000
00-JPN	401.5	476.5	399	548	200403A	10/08/2000
00-JPM	520.5	200.5	1	640	200404A	10/08/2000
00-JPL	200.5	546.5	1	660	200405A	11/08/2000
00-JPL	547.5	552.5	661	672	200406A	11/08/2000
00-JPK	544.5	296.5	1	486	200407A	11/08/2000
00-JPK	292.5	200.5	487	656	200408A	11/08/2000
00-JPJ	200.5	416.5	1	434	200409A	12/08/2000
00-JPJ	417.5	630.5	435	862	200410A	12/08/2000
00-JPJ	631.5	728.5	863	1058	200411A	13/08/2000
00-JPH	732.5	534.5	1	386	200412A	13/08/2000
00-JPH	531.5	284.5	387	878	200413A	14/08/2000
00-JPH	283.5	200.5	879	1046	200414A	14/08/2000
00-JPY	200.5	562.5	1	696	200415A	14/08/2000
00-JPY	563.5	788.5	697	1132	200416A	15/08/2000
00-JPX	376.5	200.5	1	324	200417A	15/08/2000
00-JPW	200.5	360.5	1	322	200418A	15/08/2000
00-JPT	400.5	200.5	1	398	200419A	16/08/2000

Example of acceptable field tape listing for a 3D seismic survey

DATA TYPE	:	SEISMIC
CLIENT	:	OIL COMPANY
AREA	:	OTWAY BASIN
LICENCE	:	PEL 98
SURVEY	:	2001 OTWAY 3D SS
RECORDED BY	:	GEOSERVICES
TAPE TYPE	:	BLACKWATCH 3490E CARTRIDGE
FORMAT	:	SEGD,CORRELATED
TAPE CAPACITY	:	500 MByte
SAMPLE RATE	:	2ms
RECORD LENGTH	:	5.0 Sec

TAPE #	SWATH #	1 ST VP	LAST VP	1 ST FILE	LAST FILE	DATE	COMMENT
0001	1	5408-1024	5384-1021	1	65	4/4/2000	First tape
0002	1-2	5384-1022	5276-1044	66	326	5/4/2000	
0003	1-2	5276-1045	5312-1015	327	485	5/4/2000	
0004	1-2	5312-1016	5312-1060	486	530	6/4/2000	
0005	2	5312-1061	5336-1032	531	626	6/4/2000	
0006	1-2	5336-1033	5362-1006	627	734	6/4/2000	
0007	2	5361-1007	5360-1042	735	770	6/4/2000	
0008	2	5360-1043	5384-1021	771	887	6/4/2000	
0009	2	5384-1022	5408-1032	888	1012	7/4/2000	
0010	2	5408-1033	5408-1068	1013	1048	7/4/2000	
0011	3	5408-1071	5384-1059	1049	1197	7/4/2000	
0012	3	5384-1058	5366-1083	1198	1313	7/4/2000	
0013	3	5365-1076	5362-1045	1314	1355	8/4/2000	
0014	3	5360-1044	5336-1100	1356	1444	8/4/2000	
0015	3	5336-1099	5324-1061	1445	1540	8/4/2000	
0016	3	5324-1062	5312-1058	1541	1630	8/4/2000	
0017	3	5312-1057	5300-1096	1631	1721	8/4/2000	
0018	3	5300-1097	5276-1062	1722	1831	9/4/2000	
0019	3	5276-1063	5266-1096	1832	1883	9/4/2000	
0020	3	5266-1095	5240-1073	1884	2017	9/4/2000	
0021	4	5240-1072	5216-1092	2018	2192	9/4/2000	
0022	4	5216-1093	5228-1090	2193	2290	9/4/2000	
0023	4	5228-1090	5254-1136	2291	2386	10/4/2000	
0024	4	5252-1135	5266-1097	2387	2482	10/4/2000	
0025	4	5266-1098	5275-1099	2483	2567	10/4/2000	
0026	4	5276-1098	5288-1116	2568	2645	10/4/2000	
0027	4	5288-1117	5300-1095	2646	2717	11/4/2000	
0028	4	5300-1094	5311-1132	2718	2807	11/4/2000	Last tape

3 Presentation of EBCDIC header information for processed seismic data

The following minimum standards are set for the acceptance of digital processed SEG-Y seismic data. The specifications in this document may be updated from time to time as changes in technology occur and are accepted by industry.

1. All processed seismic data are to be submitted on 8mm Helical scan tape, DVD or CD. The specifications for recording data onto 8mm tape is that which is provided by EXABYTE CORPORATION. This is a proprietary format of EXABYTE CORPORATION. The 8mm tapes used according to this specification must be of the highest quality certified new tape available (N.B. the term 'Exabyte tape' used in this document is a generic term for all tapes complying with this specification).
2. The following classes of data are to be submitted in 32 bit SEG-Y format (in the following order of preference)
 - Filtered migrated stack
 - Filtered final stack
 - Raw final stack
 - Raw migrated stack (can be provided where it is embedded in existing tape structures)
3. Each tape must have a unique number or name securely written on the tape, and also must contain:
 - One format of data - ie. processed SEG-Y.
 - Different classes of data may be combined on one tape-but sorted into groups according to the order of priority as listed above in (2) Reprocessed data from earlier lines can be incorporated into the above grouping of data
Where large programs are involved, sets of data can be submitted on a progressive basis, notionally about every 3 months where it is convenient to combine sets of prospect oriented data
4. Each data file should contain only one version of one seismic line ie. on tape one, file one contains a final migrated stack of line 74-WAA, file two contains a final migrated stack of line 74-WAB etc. (ie. individual files are not to contain data from multiple or concatenated seismic lines).
5. The 3200 byte file header must be completed with at least the following information
 - Client
 - Processing Company
 - Date of Processing
 - The Line Name
 - Area/locality
 - The sample rate (interval) for processing
 - Samples per trace
 - Bytes per sample
 - At least the last part of the processing history file from the processor
 - Exact byte location for in-line and x-line values for 3D data
 - An example of acceptable file headers are shown in Attachment 1 and 2.
6. Trace header fields also are required to be in-filled as specified in Attachment 3, Word formats are as shown.
7. A hard copy quality control (full scale) plot of the filtered migrated stack of each line should also be provided, preferably in a folded form. The time scale of this plot must be not less than 5cms/sec

Attachment 1 Presentation of data in SEG-Y EBCDIC file header for processed data

Reel Identification Header - EBCDIC Card Image Block

C 1 CLIENT SANTOS LIMITED COMPANY WESTERN GEOPHYSICAL CREW NO
C 2 LINE 96-HJZ AREA MOOMBA
C 3 REEL NO DAY-START OF REEL YEAR OBSERVER
C 4 INSTRUMENT MFG MODEL SERIAL NO
C 5 DATA TRACES/RECORD 508 AUXILIARY TRACES/RECORD 0 CDP FOLD 90
C 6 SAMPLE INTERVAL 4.00 SAMPLES/TRACE 793 BITS/IN BYTES/SAMPLE 4
C 7 RECORDING FORMAT FORMAT THIS REEL SEG-Y MEASUREMENT SYSTEM METERS
C 8 SAMPLE CODE FLOATING PT
C 9
C10
C11 WESTERN GEOPHYSICAL
C12 ADELAIDE PROCESSING CENTRE
C13
C14 THE PROCESSING STAGE IS THE LAST FILE LISTED IN THE HISTORY BELOW.
C15
C16
C17
C18
C19
C20
C21
C22
C23
+ OUTPUT smout: .f 6.7 1.hf 6.3 pm: .f 6.3 09:28:33 adrs01
 File: /ud/ad01/j2246/96murt/hjz/seismic_sfam/raw_final_stack
CONTROL 15/01/97 13:55:44 adsv2.adelaide.waii.com
+ INPUT sminpu: .f 6.12 1.hf 6.5 pm: .f 6.6 13:55:44 adsv2
+ VELFUNCT smvel: .f 7.5 pm: .f 7.2 13:55:45 adsv2
 File: /caps_vel/j2246/96-HJZ.migvel
+ SMFDMG@ smfdmg: .f 2.7 1.hf 2.1 2.hf 2.1 pm: 13:55:48 adsv2
+ OUTPUT smout: .f 6.7 1.hf 6.3 pm: .f 6.3 13:55:49 adsv2
 File: /ud/ad01/j2246/96murt/hjz/seismic_sfam/raw_mig_stack
+ SMTVSWA smtvs: .f 11.3 1.hf 11.1 pm: .f 11.5 13:55:50 adsv2
+ RNA smrnaf: .f 2.2 1.hf 2.1 pm: .f 2.5 13:55:50 adsv2
+ TRCMATH smmath: .f 2.2 1.hf 2.1 pm: .f 2.3 13:55:50 adsv2
+ BPFILTER smflt: .f 4.1 1.hf 4.1 13:55:50 adsv2
+ TRACE_BALANCE smb: .f 1.1 1.hf 1.1 pm: .f 1.2 13:55:50 adsv2
+ OUTPUT smout: .f 6.7 1.hf 6.3 pm: .f 6.3 13:55:50 adsv2
 File: /ud/ad01/j2246/96murt/hjz/seismic_sfam/filt_mig_stack
CONTROL 15/01/97 14:01:16 adsv2.adelaide.waii.com
+ INPUT sminpu: .f 6.12 1.hf 6.5 pm: .f 6.6 14:01:16 adsv2

Reel Identification Header - EBCDIC Card Image Block

File Header # 1

C01 CLIENT: ORIGIN ENERGY 2000 MT LYON SURVEY
C02 LINE OE00A-01 FINAL MIG
C03 RECORDED BY TRACE-TERRACORP APRIL 2000
C04 SOURCE: 4 VIB INLINE STANDING PAD TO PAD: 12M
C05 NO. OF SWEEPS : 6 SWEEP FREQ : 6 - 72 HZ
C06 SWEEP LENGTH : 8000 MSEC VARISWEEPS
C07 GEOPHONE TYPE: SM4 10 HZ. 6 PHONES IN SERIES OVER 15M
C08 SPREAD: NOMINAL 250 SPLIT SPREAD INST.: I/O SYSTEM TWO
C09 2MS SAMPLE RATE RECORD LENGTH : 5 SECONDS
C10 TAPE FORMAT: SEG Y
C11 500 CHANNELS
C12 **** PROCESSING PARAMETERS ****
C13 TRANSCRIPTION TO ROBERTSON INTERNAL FORMAT
C14 ZERO TO MINIMUM PHASE CONVERSION
C15 AMPLITUDE RECOVERY SPHERICAL DIVERGENCE CORRECTION
C16 F-K FILTER - DESIGN: 900M/S VELOCITY FILTER
C17 CDP SORT + SURFACE CONSISTENT SPIKING DECONVOLUTION
C18 STATICS : FLOATING DATUM CORRECTION.
C19 RESIDUAL STATICS
C20 DMO
C21 FINAL VELOCITIES ANALYSIS
C22 NMO + MUTE + PRE-STACK SCALING
C23 STATICS : F.D. TO S.R.D. -200 MS NEW TIME ORIGIN
C24 CDP TRIM STATICS
C25 STACK
C27 F.D. MIGRATION
C28 FILTER + SCALE
C39 TAPE POLARITY: SEG NORMAL
C40 CDPS 1 TO 1336 VPS 100.0 TO 767.5

Attachment 3 Presentation of data in SEG Y trace headers

Onshore post stack data

BYTES	WORD	MEANING	2D	2D	3D
			STRAIGHT	CROOKED	
13 - 16	I004	Trace Number	YES	YES	YES
17 - 20	IBM-FP	2-D Shotpoint Number	YES	YES	
	I005	3-D Shotpoint Number (Xline Number for 3D)			YES
21 - 24	I006	CDP Number	YES	YES	YES
33 - 34	H017	Stackword (Poststack)	YES	YES	YES
49 - 52	I013	Depth of Source			
71 - 72	H036	Coordinate Scalar	YES	YES	YES
73 - 76	I019	X-Coordinate at Centroid	YES	YES	YES
77 - 80	I020	Y-Coordinate at Centroid	YES	YES	YES
81 - 84	I021	X-Coordinate at Cell Centre	YES	YES	YES
85 - 88	I022	Y-Coordinate at Cell Centre	YES	YES	YES
89 - 90	H045	Coordinate Units	YES	YES	YES
95 - 96	H048	Uphole Time at Source Location			
99 - 100	H050	Field Static Correction at Source Location	YES	YES	NO
101 - 102	H051	Field Static Correction at Detector Location	YES	YES	NO
109 - 110	H055	Time of First Sample (TMFS)	YES	YES	YES
111 - 112	H056	Time of First Sample (TMFS)	YES	YES	YES
113 - 114	H057	First Live Sample	YES	YES	YES
115 - 116	H058	Number of Samples in This Trace	YES	YES	YES
117 - 118	H059	Sample Interval in Microseconds for This Trace	YES	YES	YES
185 - 188	IBM-FP	Residual Static Correction at Source Location	YES	YES	NO
189 - 192	IBM-FP	Residual Static Correction at Detector Location.	YES	YES	NO
193 - 194	H097	Total Static applied	YES	YES	YES
195 - 196	H098	Station Number at Detector Location	YES	YES	NO
197 - 198	H099	Line Number within a 3-D survey (Inline Number)	NO	NO	YES
201 - 204	IBM-FP	2-D Shotpoint Number	YES	YES	
	I051	3-D Shotpoint Number (Xline Number for 3D)			YES
219 - 220	H110	Station Number at Source Location	YES	YES	NO
221 - 222	H111	Elevation at Midpoint Location	YES	YES	NO
223 - 224	H112	Station Number at Midpoint Location	YES	YES	NO
225 - 228	IBM-FP	Residual statics (untied) at Detector Location	YES	YES	NO
229 - 232	IBM-FP	Residual statics (untied) at Source Location	YES	YES	NO
233 - 236	IBM-FP	CDP datum correction	YES	YES	YES

NOTES:

- Null values may be represented as '99999', '-9999' or 32767.
- Other locations not pertinent to onshore poststack data are not listed above.
- For crooked line processing the Shotpoint and Detector data is provided as information only. Actual trace location should be determined from X and Y coordinates.
- Where sources are not at surface, depth to source and uphole time fields are to be filled.
- Coordinate data entered in header must be GDA94.

4 Presentation of processed seismic sections in a CGM+ (unbanded) format

The following minimum standards are set for the acceptance of digital processed seismic data in a CGM+ (unbanded) format. The specifications in this document may be updated from time to time as changes in technology occur and are accepted by industry.

1. All processed seismic data are to be submitted on 8mm Helical scan tape or CD. The specifications for recording data on 8mm tape is that which is provided by EXABYTE CORPORATION. This is a proprietary format of EXABYTE CORPORATION. The 8mm tapes used according to this specification must be of the highest quality certified new tape available (N.B. the term 'Exabyte tape' is used in this document is a generic term for all tapes complying with this specification).
2. The following data are to be submitted in CGM+(unbanded) format:
 - Filtered migrated stack (when produced)
 - Filtered final stack
3. Each tape must have an unique number or name securely written on the tape, and contain:
 - One format of data only - ie. CGM+(unbanded).
 - Different classes of data may be combined on one tape- but sorted into groups according to the order of priority as listed in (2) above. Reprocessed data from earlier lines can also be incorporated into the above grouping of data
4. Where large programs are involved, sets of data can be submitted on a progressive basis, notionally about every 3 months when and where it is convenient to combine sets of prospect oriented data
5. Each file should contain only one version of one seismic line ie. tape one, file one should contain a final stack version of line 74-WAA, file two contains a final stack version of line 74-WAB etc. (ie. individual files are not to contain multiple or concatenated seismic lines).
6. File naming should follow the convention of incorporating the line name plus an indication of the form of processing followed by a suffix of .cgm. For example, a file name 98-AAA_fmigstk.cgm represents final migrated stack data in a CGM format for line 98-AAA.
7. It will be expected that CGM+ data sets will accompany the SEG Y data set shipments.
8. A hard copy, quality control (full scale) plot of the filtered migrated stack section for each line should be provided in a folded paper form with each shipment. The time scale of this plot must not be less than 5cms/sec.

5 Presentation of tape and file listings for processed seismic data

1. A listing of tape, file and attribute data in ASCII format and in hard copy form is to be provided with each shipment of archive SEG-Y processed seismic data. The hard copy may take the form of a paper print, which is folded and stored, within the tape box. The listing must show, for each SEG-Y tape, the following attributes:
 - The tape number
 - The type of data on the tape - eg seismic
 - The data format - eg SEG-Y
 - The operator's name
 - The processing contractor's name
 - The tape format - eg 2.3, 5 Gbyte Exabyte
 - The date processed (file creation date)
 - The data sample rate
 - A listing for each file, showing :
 - The file sequence number on tape - 1,2,3,4 etc
 - Line name in full eg 74-WAA
 - CDP - start and finish
 - Corresponding surface station - start and finish
 - Data type - eg filtered final stack (plus processing code if necessary)
2. A listing of tape, file and attribute data in ASCII format on 3.5" floppy disk/CD and in hard copy form is to be provided, with each shipment of digital processed seismic data in CGM format. The hard copy listing of all CGM files is required to be folded and stored within the tape box showing:
 - Line name in full eg 74-WAA
 - Surface station - start and finish
 - File name (in full)
 - Data type - eg filtered final stack)
3. For crooked line and 3D processing, the CDP effectively becomes the virtual surface station, for spatial location purposes. If any parameters (such as sample rate) vary from file to file, then each variable is to be listed for each file. There may be several listing files on the disk provided that each file relates to a separate tape. For 3D data the corner points of the 3D data volume must be presented along with datum and projection information.
4. Examples of acceptable listings are shown below. Listing headers may be planned so that a hardcopy of the listing can double as a tape box label, as indicated in the examples.

Example of acceptable SEG Y tape label and file listing

```

DATA TYPE           : SEISMIC
SEG-Y ARCHIVE      : MX-999
:
CLIENT             : OIL COMPANY
AREA               : COOPER NORTHWEST
LICENCE           : PEL 0
SURVEY            : 1996 GIRPS
FORMAT            : IBM - FLOATING POINT
DENSITY           : 2.3gBy 8mm CARTRIDGE
SAMPLE RATE       : 4ms
RECORD LENGTH     : 3.0 SEC
  
```

```

PROCESSED BY ADELAIDE CENTRE
CREATION DATE      : 30-FEB-1999
  
```

COOPER NORTHWEST		PEL 0				MX - 999
RAW,	FILT	FINAL,	MIGRATED	STACK	SEG Y	FEBRUARY 1999
#	<u>LINE</u>	<u>STATION RANGE</u>		<u>CDP RANGE</u>		<u>DATA TYPE</u>
1	85-YHW	206.75	439.25	414	879	filt mig stack
2	88-BLZ	127.25	315.75	255	632	filt mig stack
3	90-CJL	200.25	507.75	403	1018	filt mig stack
4	96-HJZ	201.25	450.75	403	902	filt mig stack
5	96-HKA	201.25	492.75	403	986	filt mig stack
6	96-HKB	201.25	404.75	403	810	filt mig stack
7	96-HKC	201.25	440.75	403	882	filt mig stack
8	96-HKD	201.25	452.75	403	906	filt mig stack
9	85-YHW	206.75	439.25	414	879	filt final stack
10	88-BLZ	127.25	315.75	255	632	filt final stack
11	90-CJL	200.25	507.75	403	1018	filt final stack
12	96-HJZ	201.25	450.75	403	902	filt final stack
13	96-HKA	201.25	492.75	403	986	filt final stack
14	96-HKB	201.25	404.75	403	810	filt final stack
15	96-HKC	201.25	440.75	403	882	filt final stack
16	96-HKD	201.25	452.75	403	906	filt final stack
17	85-YHW	206.75	439.25	414	879	raw mig stack
18	88-BLZ	127.25	315.75	255	632	raw mig stack
19	90-CJL	200.25	507.75	403	1018	raw mig stack
20	96-HJZ	201.25	450.75	403	902	raw mig stack
21	96-HKA	201.25	492.75	403	986	raw mig stack
22	96-HKB	201.25	404.75	403	810	raw mig stack
23	96-HKC	201.25	440.75	403	882	raw mig stack
24	96-HKD	201.25	452.75	403	906	raw mig stack
25	85-YHW	206.75	439.25	414	879	raw final stack

Example of acceptable CGM tape and file listing

```

DATA TYPE           : SEISMIC
CGM ARCHIVE         : FDX- 999
                    :
CLIENT              : OIL COMPANY
AREA                : COOPER NORTHWEST
LICENCE             : PEL 0
SURVEY              : 1996 GIRPS
FORMAT              : UNIX TAR
DENSITY             : 2.3gBy 8mm CARTRIDGE
  
```

```

PROCESSED BY ADELAIDE CENTRE
CREATION DATE       : 30-FEBRUARY-1997
  
```

COOPER NORTHWEST		PEL 0		FDX- 999	
FILT FINAL, FILT MIGRATED STACK			CGM		FEBRUARY 1997
<u>LINE</u>	<u>STATION RANGE</u>		<u>FILE NAME</u>		
80-KBQ	101.25	273.75	80kbqs_filt_final_stack.CGM		
80-KBQ	101.25	273.75	80kbqs_filt_mig_stack.CGM		
80-KBW	101.25	277.75	80kbwt_filt_final_stack.CGM		
80-KBW	101.25	277.75	80kbwt_filt_mig_stack.CGM		
84-SSR	372.25	694.75	84ssrs_filt_final_stack.CGM		
84-SSR	372.25	694.75	84ssrs_filt_mig_stack.CGM		
84-SSS	325.25	795.75	84ssst_filt_final_stack.CGM		
84-SSS	325.25	795.75	84ssst_filt_mig_stack.CGM		
84-STG	200.25	354.75	84stgr_filt_final_stack.CGM		
84-STG	200.25	354.75	84stgr_filt_mig_stack.CGM		
85-YHW	206.75	439.25	85yhws_filt_final_stack.CGM		
85-YHW	206.75	439.25	85yhws_filt_mig_stack.CGM		
88-BLZ	127.25	315.75	88blzr_filt_final_stack.CGM		
88-BLZ	127.25	315.75	88blzr_filt_mig_stack.CGM		
88-BMA	140.25	375.75	88bmar_filt_final_stack.CGM		
88-BMA	140.25	375.75	88bmar_filt_mig_stack.CGM		
88-BMT	200.75	508.75	88bmts_filt_final_stack.CGM		
88-BMT	200.75	508.75	88bmts_filt_mig_stack.CGM		
90-CJL	200.25	507.75	90cjlr_filt_final_stack.CGM		
90-CJL	200.25	507.75	90cjlr_filt_mig_stack.CGM		
96-HJZ	201.25	450.75	96hjz_filt_final_stack.CGM		
96-HJZ	201.25	450.75	96hjz_filt_mig_stack.CGM		

6 Presentation of uphole data in digital form

PIRSA maintains a digital data base of uphole data in order to facilitate the reprocessing of both 2D and 3D seismic data and maximising the use of all possible data sets. Having the locations of all uphole points in an area could also assist with future survey planning. In order for this data base to be fully maintained and current, certain key attribute data need to be submitted in digital form. These data include the following:

- Line Name
- Shotpoint number
- Uphole Nos
- Coordinate details
- Projection, datum, zone details
- Elevation
- Depth drilled
- Date of recording
- Lithology
- Time versus depth pairs

Currently TD pairs can be submitted as .FBR files (see attachment 1) while the remaining information can be submitted as a listing file in either ASCII or Excel format (see attachment 2).

The traditional uphole field plots should be submitted as PDF files at the same time and in association with other supporting data.

Attachment 1 Presentation of time versus depth data (FBR files)

Velocity data Statics Control: first break data

CLIENT: GOOD OIL CO
SURVEY NAME: PEL 001 SEISMIC SURVEY
UPHOLE NO: UH001
LINE NAME: 01-001
SHOTPOINT NO: 127
DATE: 15/4/2001
OPERATOR: D. HOLE
SITE DESCRIPTION: SANDY LOAM
DEPTH UNITS: METRES
Nos of levels: 16

Level	Pick
29.00	26.75
28.00	26.00
26.00	25.00
24.00	24.25
22.00	23.50
20.00	22.75
18.00	21.50
16.00	20.50
14.00	19.25
12.00	18.00
10.00	17.00
8.00	15.50
6.00	14.50
4.00	10.50
3.00	8.50
2.00	6.75

Number of layers: 3

Depth	Time	Velocity	Fit
0.00	0.00	296.30	0.99
1.82	6.14	500.00	0.99
6.22	14.94	1895.87	0.99

Attachment 2 Example of data listing file for uphole data

UPHOLE NUMBER	LINE NAME	SP	DRILL DEPTH (m)	ELEVATION	EASTING	NORTHING	DATUM	ZONE	DATE RECORDED	COMMENTS
1	OB005384	1018	30	53.1	463433.0	5858094.1	GDA 94	54	12/04/2000	OFFSET 5 MTS SOUTH
2	OB005384	1048	30	54.1	464632.8	5858093.6	GDA 94	54	13/04/2000	
3	OB005384	1078	30	54.7	465833.1	5858094.2	GDA 94	54	13/04/2000	
4	OB005384	1108	30	56.1	467033.6	5858094.7	GDA 94	54	13/04/2000	
5	OB005384	1168	24	58.3	469432.7	5858094.7	GDA 94	54	26/04/2000	
6	OB005384	1198	30	59.0	470632.8	5858093.6	GDA 94	54	26/04/2000	OFFSET 10 M NORTH ALONG OB005384
7	OB005385	1228	30	59.4	471834.1	5858155.1	GDA 94	54	25/04/2000	
8	OB005383	1258	30	59.9	473031.4	5858070.2	GDA 94	54	19/04/2000	APPROX. LOCATION
9	OB005384	1288	30	60.6	474233.8	5858097.5	GDA 94	54	19/04/2000	
10	OB005384	1318	30	61.2	475432.9	5858094.3	GDA 94	54	19/04/2000	UH NOT SURVEYED
11	OB005384	1342	30	60.4	476378.8	5858096.8	GDA 94	54	19/04/2000	
12	OB005384	1378	30	62.2	477832.6	5858094.0	GDA 94	54	19/04/2000	
13	OB005348	1018	30	52.6	463433.3	5856654.1	GDA 94	54	12/04/2000	
14	OB005347	1048	30	54.6	464633.5	5856614.1	GDA 94	54	12/04/2000	
15	OB005345	1078	30	55.7	465833.0	5856534.3	GDA 94	54	13/04/2000	
16	OB005348	1108	30	56.6	467032.8	5856654.3	GDA 94	54	13/04/2000	
17	OB005348	1138	30	58.5	468233.1	5856654.0	GDA 94	54	25/04/2000	
18	OB005348	1168	30	58.4	469432.4	5856653.5	GDA 94	54	25/04/2000	
19	OB005348	1198	30	60.0	470633.0	5856654.3	GDA 94	54	25/04/2000	
20	OB005348	1228	30	60.5	471834.0	5856653.0	GDA 94	54	25/04/2000	
21	OB005348	1258	30	60.8	473032.4	5856654.4	GDA 94	54	18/04/2000	
22	OB005348	1288	30	60.8	474231.3	5856656.6	GDA 94	54	19/04/2000	
23	OB005348	1318	30	60.7	475433.2	5856653.7	GDA 94	54	19/04/2000	
24	OB005348	1348	30	61.8	476633.0	5856654.0	GDA 94	54	20/04/2000	

7 Presentation of magnetic, gravity and 'other' geophysical data

Geophysical data other than seismic data includes gravity, magnetic, radiometric and electromagnetic data. These data must be submitted as final processed data (corrected and levelled) as fixed column ASCII files. Supporting documentation must be sufficient to enable data loading and interpretation. These supporting digital data files should accompany the data files and be comprehensive enough for the data to stand alone and not be reliant on supporting reports.

The general information required includes:

- The Tenement Number
- The Tenement Holder
- Name of contracting company
- The equipment used to generate the data
- The date the data were recorded
- The parameters controlling data acquisition
- The original format of the data
- The date the data were processed or altered
- The parameters controlling data alteration
- Any translation parameters required for the conversion of the data (especially location data).

The mechanism for data transfer is best achieved by using the ASEG-GDF2 data format. This format has been designed as a data exchange and archive standard for geophysical point and line data. The format for data presentation involves having definition, description or metadata files (.Dfn, .Des or .Met) which contain a decodable description of the data plus the data file (.dat). The data description files are used to describe summary attribute data pertaining to the survey plus the resultant data including items such as processing details, survey summary data, calibration data, base station data, coordinate systems (datum and projection) as well as the data field names. This form of data presentation becomes an ideal way of preserving the documentation for the survey as well as providing an automatic decoding option for the data. Further details on this data format are available at the ASEG website, www.aseg.org.au or the SEG website, www.seg.org. The data files (.dat) are simply multicolumn ASCII files.

For gravity data, final processed gravity values are to be presented as fixed column ASCII files and must include as a minimum, the following fields:

- Station Number
- Latitude (GDA94 to 6 decimal places)
- Longitude (GDA94 to 6 decimal places)
- Observed Gravity (Drift corrected), IGSN 71 datum
- Elevation (metres AHD)
- Terrain correction (if calculated)
- Free Air Anomaly
- Bouguer Anomaly for a range of densities (1.90, 2.2, 2.67)
- Station Description eg field, repeat, base etc.

For aeromagnetic data, final processed values (corrected and levelled) should be presented also as fixed column ASCII files and must include as a minimum the following fields:

- Line Name
- Flight Nos
- Time
- Date
- Fiducial Nos
- Easting –MGA94
- Northing – MGA94
- Latitude – GDA94
- Longitude – GDA94
- Altitude
- GPS Height
- Raw Magnetic Field
- Diurnally Corrected Magnetic Field
- IGRF Corrected Magnetic Field

For aeromagnetic data, final processed values (corrected and levelled) should be presented also as fixed column ASCII files and must include as a minimum the following fields:

- Line Name
- Flight Nos
- Time
- Date
- Fiducial Nos
- Easting –MGA94
- Northing – MGA94
- Latitude – GDA94
- Longitude – GDA94
- Altitude
- GPS Height
- Raw Magnetic Field
- Diurnally Corrected Magnetic Field
- IGRF Corrected Magnetic Field