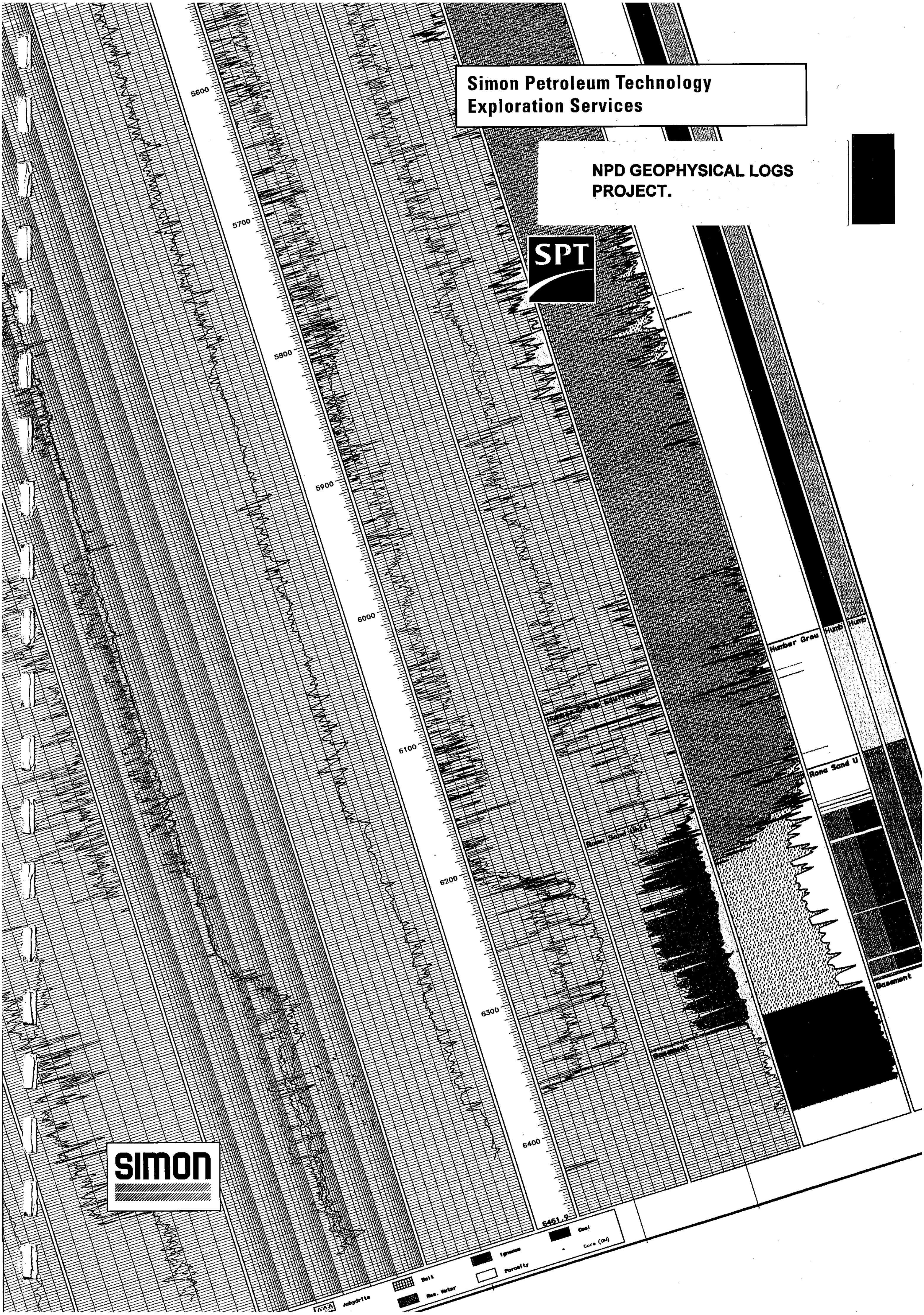
Simon Petroleum Technology Exploration Services

NPD GEOPHYSICAL LOGS PROJECT.



NPD GEOPHYSICAL LOGS PROJECT.

Robertson

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Introduction

The purpose of this project is to recreate digitally well calibrations performed in NOCS waters by seismic well survey contractors. These calibrations have been accepted by the well operators, and may have been used in regional studies, field models, or equity determinations. It is therefore important to recreate to within the tolerances specified by NPD, the original calibrations in digital format.

Digital records of deviation surveys and chekshot reports are also generated for entry into an NPD archive.

The well velocity survey reports provided to Robertson Research International have been issued by contractors such as GECO, Read Well Services, SSL, and Schlumberger. The data contained within them includes checkshot reports,knee points and calibrated time depth pairings. The latter are necessary to check that the RRI processing of data is to within the tolerences specified by NPD.

Wells for processing belong to one of three types. Type 1 has calibrated sonic, and density curves. These wells will be padded to MSL, and the calibrated sonic log will be integrated to obtain OWT.

Type 2 wells have paper record of contractors chosen knee points. HQLD logs are used to derive the desired output.

Type 3 wells require RRI personnel to pick knee points and calibrate the well.

1. PROJECT SUMMARY

Robertson Research Role

Information gathering.

From the Paper data provided identify:

1.1 Elevation Data

The elevation of the Kelly Bushing (or possibly Drill floor)above Mean Sea Level.

This value is entered into the events section of the Petroleum Engineering Module in Tigress, and can be obtained by inspection of the completion log well velocity survey or any of the paper log presentations.

1.2 The Deviation Survey.

This will usually be presented in paper copy or digitally on 3.5" floppy disk. Geographical co-ordinates will be converted to m UTM. and the data input into 'Tigress' in the Geology Module.

1.3. The Checkshot Survey.

This survey will be supplied as paper copy, and input directly into Tigress. It is exported in ascii format for the NPD database.

1.4 Wireline Data

Summary

Wells have been designated to fall into one of 3 categories or types.

1.4.1 TYPE 1

For type 1 wells tape data are received. The file contains at least 4 channels containing TVDSS, DTC, Rhob and TWT (TIME) data. The DTC and Rhob are to be padded to MSL, and the calibrated sonic log integrated. Precision is to be +/- 2 ms TWT. Other logs to be derived are Gardner, Velocity and Acoustic Impedance.

1.4.2 TYPE 2 WELL

Type 2 wells have paper copy of the well survey report. This contains information on knee points and time depth pairings. The wireline data are to be taken from the HQLD project. The sonic log is to be Padded to MSL, integrated, and calibrated using the knee point data provided. The calibration is to be checked against the time depth pairings. Precision is to be +/- 4 ms TWT. The density log is to be edited especially to remove spurious spikes. Derived logs will be Gardner, Velocity and Acoustic Impedance.

1.4.3 TYPE 3 WELL

Type 3 wells have paper copy of the well survey report. This contains information on time depth pairings, **but not on the knee points**. The wireline data are to be taken from the HQLD project. The sonic log is to be Padded to MSL, integrated, and calibrated using the knee point data provided. The calibration is to be checked against the time depth pairings. Precision is to be +/- 8 ms TWT. The density log is to be edited especially to remove spurious spikes. Derived logs will be Gardner, Velocity and Acoustic Impedance.

2. PROJECT TECHNICAL DETAILS.

2.1 Deviation (or Deflection) Survey.

In the case of type 1,2 &3 wells, the deviation survey will usually appear as a paper copy, typically with the following header details:

	MD	TVD	DEVIATION	AZIMUTH	DOGLEG	CO-ORDINATES
(alternative names)			drift angle or inclination or dip angle	drift direction or dip direction	dogleg severity	UTM
(units)	m	m	degrees	degrees	deg/30 m	rectangular co-ordinates (m) Delta Values (m)

In a fax from NPD's Mr SVEIN FINNESTAD dated 1/3/96, NPD stated 'the files (delivered by RRI) are not according to the NPD standard file structure for reporting of well path / well track data.

The following was stipulated:

MD	TVD	DEVIATION	AZIMUTH	NORTH	EAST	DOGLEG
m	m	Degrees	Grid North Ref	m UTM	m UTM	deg/30m

In the case of the first 2 columns the data are straight forward.

2.1.1 DEVIATION (Dip)

Deviation may be presented as D and M and needs converting to degrees and decimal fractions of a degree, e.g. 1° 15" = 1 + 15/60 = 1.25 °. Since dip is never likely to exceed 90° from the vertical, no polar co-ordinates (0-360°) are necessary. This conversion is for 'TIGRESS' to be able to read the data.

2.1.2 AZIMUTH

The column entitled AZIMUTH may in some older reports have the data presented in degrees and minutes, D and M. These data need to be converted to Polar Co-ordinates i.e. 0 - 360 degrees. For example North 26° 40" E would be calculated as 0 + 26.666° = 26.666° , and South 80° 20" E =

180 - 80.333 = 99.666°: South 57° 40"W = 180 + 57.667° = 237.667°. This can be done quickly in POLARC.XLS which resides currently (12/3/96) in f:USERS/PDM/RMB/geologs . When the data are entered into the EXCEL spreadsheet as reported in degrees of the compass, the spreadsheet will convert them to POLAR CO-ORDINATES in degrees.

2.1.3 WELL CO-ORDINATES and WELL CO-ORDINATES SUBSEA.

NPD REQUIRE WELL CO-ORDINATES IN m UTM.

The requirement for all co-ordinates to be in mUTM requires transforming data which may originally have been provided to Well Operators by the deviation survey contractors in units of m and termed variously as rectangular co-ordinates or 'delta' values.

It is therefore necessary to check the completion log and look at the well co-ordinates. If they are in degrees North and East it is necessary to enter TIGRESS to convert them to mUTM.

The rectangular co-ordinates are then added or subtracted from the well head co-ordinates, depending on their direction in the case of Rectangular co-ordinates or the sign in the case of delta value co-ordinates.

A value in m (metres) with a N direction is added, a value with a S direction is subtracted from the UTM Northing. A value in m with an E direction is added to the UTM Easting co-ordinates, a value in m with a W direction is subtracted.

For example , For well 34/7-9, at 360 m MD, the well is vertical and no corrections are made to the well head co-ordinates, at 369 m MD, 0.03 m is subtracted from the wellhead Northing UTM value, and the value of -.03 m is seen in the paper copy of the deviation survey. Similarly at the same depth 0.01 m is subtracted from the UTM Easting If these values had been recorded as Rectangular co-ordinates they would have appeared as .03 S, .01 W, signifying the subtraction of the recorded values from the wellhead co-ordinates. (Values of 0.03 N and 0.01 E would have meant adding them to the wellhead UTM co-ordinates).

These notes outline the rules of how deviation distances from the wellhead co-ordinates are recorded by service companies, how they are identified for the NPD project ,and how they are used to derive the mUTM values for inputting into ASCII file for NPD archives.

A macro has been written which allows the subtraction and addition of values to and from the mUTM N and E co-ordinates, once the wellhead

co-ordinates have been obtained from TIGRESS. This Macro is with Data Preparation Group.

The following is a step by step guide on an actual example, which can be used to check the method for other wells. In the case of 34/8-9S the co-ordinate data are presented on the completion log in both mUTM and degrees and minutes.

2.1.4 SETTING UP A GEODETIC TEMPLATE IN TIGRESS

1) Go to the Bottom Right application (utilities) in the launcher.

2) Go to CARTOGRAPHIC PROJECTIONS.

3) Utilities - Create

4) CRS Name - Geologs

5) Comments - None

6) Project Default - YES

7) CRS TYPE - UNIVERSAL TRANSVERSE MERCATOR (UTM).

8) SPHEROID - SPHEROID SELECTED FROM TABLES
Then Highlight the INTERNATIONAL 1924 (Hayford 1909)

9) LONGITUDINAL ZONE - (Often) ZONE 31 (O - 6 DEGREES E)

10) HEMISPHERE - NORTHERN

11) EXTERNAL UNITS - INTERNATIONAL METRES.

12) OK.

TO CONVERT CO-ORDINATES IN DEGREES NORTHING AND EASTING TO m UTM USING TIGRESS.

EXAMPLE WELL 34/8-9S

1) INSPECT COMP LOG FOR WELL CO-ORDINATES.

which are UTM

61° 18' 50.53" N	6798082.3 m N
02° 23' 17.89"E	467241.6 m E

2) a) In the TIGRESS go to application launcher the bottom right Utilities

b) Choose CARTOGRAPHIC PROJECTION

c) Go to **geophlogs** directory.

d) Go to UTILITIES - TRANSFORM.

3) Source CRS click on define

Q Is a default geodetic system to be used as a source CRS ?

A. ***Click on YES.***

A line is added to the dialogue box stating 'Standard geodetic cartographic reference system. (units degrees of arc).

Now click on the DEFINE box on the line starting with target CRS.

TIGRESS will then prompt you with:

Q. Is a default geodetic system to be used as a target CRS ?.

A. ***NO***

A box will then appear :

'Transformation of target CRS select geologs utm'?

Click on OK.

A new line added to the previous dialogue box says:

'geologs utm (units : international metres)'.

Click on OK.

A message will then appear :
'Note: Default central co-ordinates will be projection origin of target'.

Click on OK.

A dialogue box will appear:
'Co-ordinate details for transformation'

Central co-ordinate 1, source CRS: 0~00' 00.00" N

[For 34/8-9s this will be filled in as 61~18' 50.53" N]

Central co-ordinate 2, source CRS: 3~00' 00.00" E

[For 34/8-9s this will be filled in as 2~23' 17.89" E]

In the same dialogue box Co-ordinate 1 increment, and co-ordinate 2 increment can be left unaltered.

In number of co-ordinate 1 values input 1.
in number of co-ordinate 2 values input 1.

Click on OK.

(Here, co-ordinate 1 is Easting or latitude and co-ordinate 1 is Northing or Longitude).

The next box to appear is the 'TRANSFORMATION OUTPUT'.

The top line shows:

1) Source co-ordinates (061^18'50.53N,002^23'17.89E) → Target Co-ordinates (467241.651, 6798082.192) Easting utm Northing utm

As can be seen the target co-ordinates are the same to within 10cm, as those given in the Hydro composite log as the m UTM co-ordinates, i.e. 6798082.3 m N, and 467241.6 m E.

WE NOW HAVE THE SURFACE CO-ORDINATES OF THE WELL IN APPROVED NPD UNITS mUTM.

IT IS NOW NECESSARY TO CALCULATE THE SUBSURFACE CO-ORDINATES IN mUTM FROM THE DEVIATION SURVEY DATA.

CALCULATION OF THE SUBSURFACE CO-ORDINATES IN mUTM FROM THE DEVIATION SURVEY DATA IN NON UTM UNITS.

The co-ordinates sub sea for each recorded deviation are given either directly in metres N and E in UTM (Universal Transverse Mercator) or as Rectangular Co-ordinates degrees North and East (Northings and Eastings, longitude and latitude). They can also be presented as 'DELTA' values, which are the UTM 'distances' from the central well co-ordinates in UTM metres. For example well 34/7-9 has a column headed :

	DELTA VALUES	
Depth............	+N, -S m	+E,-W m
360	.00	.00
369	-.03	-.01

The first row shows no deviation, because 0.0 is subtracted from the UTM well co-ordinates. The second row shows that (-).03 m is subtracted from the UTM Northing Value, and (-) 0.01 m is subtracted from the UTM Easting value.

3. CHECKSHOT SURVEY.

These data have been taken from the service company Checkshot survey tables, available for well types two and three (although they will be 'standardised' for type 1 wells for NPD database. The data they contain will not be used in our project). The files contain Measured depth and TVD MSL and **Tcorr**, the corrected one way travel time.

Tigress needs entries for reference datum type, MSL, Water Velocity, (usually 1478 or 1500 ms^{-1}, to be obtained from Contractors report). The method of calculating the True Vertical depth is MINIMUM CURVATURE, unless we can identify if the contractor has used another (e.g. balanced tangential, radius of curvature).

Tigress also requires input of gun depth (often between 3 and 10 m).

Headers with column descriptors are present on exported ASCII file for NPD Data base. The data are exported as **WELLI No CHKSHT.asc**

4. WIRELINE DATA.

4.1 PADDING.

APPLIES TO TYPE 1,2 & 3 WELLS.

Summary.

1) Load in Elevation and Deviation Data, and Rhob dt and Time (TVDSS) generated by the contractor for a Type 1 well.

2) Calculate water depth from MSL to GL in units of feet. Multiply by 206.22 $\mu s\ ft^{-1}$. (Vp water 1478 ms^{-1}). This gives OWT at GL.

3) Calculate depth between GL and top of first logging run in feet. Calculate time span between OWT at GL and OWT at top of run 1 in units of ms.

4) Calculate dt (slowness) in $\mu s\ ft^{-1}$ to pad log between GL and top of run 1.

Type 1 Well

5) Integrate the (Padded calibrated sonic log), and check with contractors Depth Time pairs. Precision to +/- 2 ms TWT.

Type 2 Well.

6) Enter knee points, apply linear and differential shift. Calibrate the edited HQLD dt. Check Time Depth Pairings with Contractors Report. Precision to +/- 4 ms TWT.

Type 3 Well.

7) As for type 2 except that Knee Points are identified by Robertson Personnel. Precision to +/- 8 ms TWT.

4.2 HOW TO PAD WELLS USING 'TIGRESS'.

This can be done in 'LOG LOAD' in TIGRESS.

4.2.1 METHOD OF 'LINEAR' PADDING (WHERE NO SPLINE HAS BEEN USED BY CONTRACTOR).

In this situation the relationships are constant only.

Padding from MSL to Ground level (sea bed offshore) is accomplished by using knowledge of speed of sound in water, and depth of water below MSL.

If water depth is 100m, and the conversion from metres to feet is m / 0.3048, this is converted to feet:

$$100 / 0.3048 = 328.0839 \text{ ft}$$

Speed of sound in water = 1478 m s^{-1} or 1478 / .3048 = 4849.0814 ft s^{-1}, to get to s ft^{-1} we take the reciprocal to give :

$$1 / 4849.0814 = 206.225\ \mu s\ ft^{-1}.$$

We now have calculated a time from MSL to GL, and have its dt value in $\mu s\ ft^{-1}$. The dt (sonic log) value can be entered into LOGLOAD and entered into each 0.1524 m (6") increment between MSL and GL.

PADDING BETWEEN GL AND TOP OF FIRST LOGGING RUN

In the case of **TYPE 1** wells, where there are usually data for one way time and **calibrated** sonic , the time at the start of the first logging run and its depth are presented. Since we know the GL depth, time and dt, and time and depth at the top of run 1, we can calculate the dt and time for the padding between GL and top of run 1.

(depth @ top run 1 - depth @ GL) / (time at top run 1 - time @ GL)

Note watch the units; keep ft and m separate make sure all times are in same units e.g. s, ms, μs.

The result will give the dt value in μs ft^{-1} . These values can be input into log load between GL and top of run 1 in the sonic log.

To obtain the one way time, the sonic log can be entered into the Geophysics module in VELOCITY the log data is entered WITHOUT the TZ table, and the CALIBRATED SONIC LOG IS INTEGRATED and saved. This will give us a one way time which as a non reference channel can be loaded into LOG TRACE EDIT and MULTIPLIED BY 2 to give Two Way Time (TWT). [When output finally for the project TWT is name TIME].

The logs must start at the Seismic Reference Depth (SRD) which in the NPD Geophysical Logs Project is MSL, i.e. 0 m TVDSS.

4.2.2 PADDING USING SPLINE MODEL TO DERIVE VARIABLE dt.

Since one objective is to repeat what has already been done by the company who surveyed the well, the way to proceed is to inspect the synthetic traces which should be supplied. The velocity and density models should be given there for what has been used for the inputs above the logs.

For example in the case of well 34/7-9 the print of the synthetic seismogram contains in the processing details the sonic and density models used above the tops of the density and sonic logs.

We have the following data:

Depth MSL	Velocity m/s	Density g/cc
0	1478	1.0
244	1478	1.0
244	1810	1.22
675	2257	2.25

These data appear odd. Firstly 244 m has two densities and velocities, which isn't possible physically. Moreover, the first interface values at the sea bed are not given. Inspection of the velocity and density curves shows that from the sea bed to the top of the first logged interval is not a straight line ramp, but a curved fit. This is has probably been applied to reduce the impedance contrast between sea floor and first logged interval, by reducing any step in velocity /density (AI). The curve data is probably derived by applying a spline fit using some of the data points in the table above. Hence 244 m 1810 m/s, 1.22 g/cc and 675 m 2257 m/s and 2.25 g/cc have been used for the spline fit along with the data at the top of the logs. This splined fit has given values of Vel and density at the sea bed, which is an important primary reflector, and which is also an important source of multiples, and therefore needs to be accurately derived since it will be used for identification of multiples and modelling.

Clearly when padding in log load data for the spline fit are not actually used for log values, and the density and velocity from MSL to sea bed are 1.0 g/cc and 1478 m/s. Again whatever the spline function defines at sea floor for density and velocity are input at that depth into tigress.

Here however there is a problem. Whereas curved fits are applied by the GECO from sea bed to top of log we can only apply a linear fit by entering the values in LOG LOAD, saving them and allowing 'Tigress' to interpolate linearly between values, (this is done automatically when saving).

4.2.3 TEST OF PADDING AND ROBERTSON MODEL

We can test how good our model is by inspecting the travel time / depth pairs we have generated after integrating and calibrating the sonic log, and comparing them with the pairs presented in the DEPTH TIME REPORT by the well velocity survey contractor. For a type 1 well they should be within 2 ms one way time. Certainly our inability to reproduce data from a splined fit (we can do linear fit only) may compromise the fit at the first few points, but should converge with the contractors lower down the well.

4.3 LOG EDITING.

Where wireline data are needed in well types 2 & 3 , data will be obtained from the NPD Logs database. These NPD database logs are depth matched and merged, and the sonic log has been edited to approved NPD standards.

4.3.1 SONIC LOG

The sonic log data have been extrapolated from the first identified lithologically consistent data. For example the first data may be values through casing. These data will have an interval transit time of around 57 $\mu s\ ft^{-1}$, and are invalid for geophysical logs. They are therefore edited. If no contractors values for speed of sound in seawater are presented, we will use a value of 1478 ms^{-1}, (DT of 206.22 $\mu s\ ft^{-1}$).

4.3.2 DENSITY LOG

In the case of the density log needing editing the first approach will be to inspect the curve when overlain by corroborative traces, and at the same time inspect the completion log.

The most useful curves will probably be the Caliper, Drho, sonic, and deep resistivity.

As a rule of thumb logs may need editing when Drho exceeds +/- 0.15 g/cc, and the caliper +/- 2 " on bit size. The corroborative traces should always be inspected, with the comp' log before committing to alter the density log. For example if gas is encountered then the density will be lower than might be expected for the Sw=1 case. For example a quartz sand with $\phi = 0.3$ and grain density 2.65 g/cc and Rhofluid = 0.2 g/cc will have a calculated bulk density of 1.915 g/cc. However, the density tool will probably record a value slightly higher because the depth of investigation for such tools is typically in the order of 2- 6 inches and will therefore be much influenced by the flushed and invaded zones, where the filtrate density will be close to 1 g/cc.

Care should be taken when inspecting the upper sections of hole, especially where the hole diameter is large, and the formations poorly consolidated. Very low densities should be treated with suspicion, even though caliper and Drho values may appear 'reasonable'. For example a value of ~1.5 g/cc in a water bearing (Rhofl = 1 g/cc) quartz sand would correspond to a ϕ of 0.7 . Any values of Rhob much below this would be solid in liquid suspensions, which might be limited to the vicinity of the sea floor. However, shallow gas could give low values of density so inspect the completion log for gas shows. For example for ϕ = 0.5 , and Rhofluid = 0.05 g/cc Rhob = ~ 1.35 g/cc, but again the tool would investigate flushed and invaded formation so would probably derive a slightly higher density.

As a general rule if in doubt don't edit. You can always go back and edit if needs be.

4.3.3 GARDNER PSEUDO DENSITY RELATIONSHIP

Generated in the case of Type 2 &3 wells from the edited sonic. In the case of Type 1 well from the (edited?) calibrated sonic supplied. The algorithm (1) is:

$$\rho_b = 0.31 *(304800/DT)^{0.25}$$

Where DT is in the units of $\mu s\ ft^{-1}$ (to convert to velocity on ms^{-1}).

This will be overlain with the density log and inspected for agreement. If over sections of good hole conditions and good log quality around the zone of interest there is a consistent difference, then the Gardner pseudo density curve will be shifted laterally to better overlay with the density log. This has the effect of fine tuning the coefficients of the Gardner equation.

The sections of doubtful density log will be deleted from the original NPD density log and the resulting log will be saved and merged with the Gardner pseudo log, so that the deleted sections will be infilled with Gardner. The resulting density log will be saved as **GARDEN** signifying the merging of the and DENsity logs.

In the event of no density log being available then the Gardner pseudo log will be generated and saved as GARDNER. This will be a generic RHOB log.

4.3.4 VELOCITY LOG.

Are Generated by converting dt from μs/ft to m/s .

((1/dt) * 1E6)* 0.3048 = m/s

4.3.5 ACOUSTIC IMPEDANCE

Is the product of Velocity (m/s) and Rhob edited g/cc .

4.3.6 FILTERING OF LOG DATA

If data are considered 'noisy' then a filter such as a '**Hanning**' or '**Rectangular**' may be applied to the sonic density or Gardner or GARDEN derived density curve. This will reduce the effect of spurious acoustic impedance spikes, **but should not be performed as a matter of course.**

5 WELL DOCUMENTATION AND IDENTIFICATION.

All wells exported to NPD within this project will be in either LIS TAR or ascii format and will be designated with the Robertson unique well identifying number (Welli number). The log data well have the suffix g, signifying geophysical. This will allow discrimination between HQLD log sets and the geophysical log sets. For example well 15/9-17 lti files are presented as 6555g.lti . Similarly 6555g.asc is the same file in ascii format. The checkshot survey data are presented as 6555chkshtMD.asc , and the deviation survey for this well is 6555dev.txt . The 1:5000 cgm file is labelled 6555.cgm. Each tape header will have details of well number e.g. 15/9-17, and trace headers and units .

5.1.1 DRIFT CURVE.

The drift curve is presented on a 1:5000 scale, with the integrated calibrated sonic, checkshot points and knee points, calibrated sonic, uncalibrated sonic and edited density log. The first track on the plot contains the uncalibrated and calibrated sonic logs as DT and DT - Cali respectively. The second track

contains the density log. The third contains the calibrated integrated sonic, checkshot, and knee point data, and the fourth track contains the drift curve.

5.1.2 cgm File

The graphical data are presented at 1:5000 scale as **cgm metafiles**, and are named using the previous well conventions for example well 15/9-17 is saved as **6555.cgm** . The cgm files are generated for type 2 & 3 wells only. Type 1 wells are supplied to us with calibrated sonic logs.

6 DATA EXPORT

6.1.1 LTI & ASCII FILES TYPE 1 WELLS.

Column	Description	Mnemonic	Units
1	Measured Depth RKB	DEPTH	m
2	True Vertical Depth below MSL	TVD	m
3	Two Way Travel Time	TIME	ms
4	Calibrated Sonic (Padded to 0m MSL)	DTC	µs/ft
5	Velocity Log	VEL	m/s
6	RHOB (supplied)	RHOB	g/cc
7	RHOB Gardner	GARD	g/cc
8	Acoustic Impedance	AI	g/cc m/s

6.1.2 The LTI and ASCII files for TYPE 2 & 3 wells

These will have 10 columns of data:

Column	Description	Mnemonic	Units
1	Measured Depth RKB	DEPTH	m
2	True Vertical Depth below MSL	TVD	m
3	Two Way Travel Time	TIME ✓	ms
4	Unedited Sonic (HQLD)	DT ✓	µs/ft
5	Edited Sonic (Padded to 0m MSL)	DTE ✓	µs/ft
6	Calibrated Sonic	DTC ✓	µs/ft
7	Velocity Log	VEL ✓	m/s
8	RHOB edited	RHOB ✓	g/cc
9	RHOB Gardner	GARD ✓	g/cc
10	ACOUSTIC IMPEDANCE	AI	g/cc m/s

Each file will reside in export4/rawtapeout/geologs/geophlogs/....lti

The final 10 column file is to be saved on 'exabyte' in LIS an ASCII formats for shipment to NPD.

6.1.3 TAPE LISTINGS

WELL 15/9-17.

6555g.lti	Wireline Logs in LIS format Measured Depth RKB.
6555g.asc	Wireline Logs in ascii format Measured Depth RKB.
6555dev.txt	Deviation Survey ascii format.
6555chkshtMD.asc	Checkshot Survey ascii textfile format MD RKB.
6555g.cgm	Drift curve 1:5000 scale cgm format.

WELL 34/8-9S

17390g.lti	Wireline Logs in LIS format Measured Depth RKB
17390g.asc	Wireline Logs in ascii format Measured Depth RKB.
17390dev.txt	Deviation Survey ascii textfile format.
17390chkshtMD.asc	Checkshot Survey ascii textfile format MD RKB.