



**Weatherford**

**VERTICALITY ANALYSIS**

COMPANY	Santos & Partners						
WELL	Marmbulligan 1						
FIELD	Marmbulligan						
PROVINCE/COUNTRY							
COUNTRY/STATE	Northern Territory						
LOCATION	OT Downs Basin						
Latitude	16°11'58.80" S	Other Services	Density Neutron				
Longitude	134°46'18.80" E	Focussed Electric Multichannel Sonic Acoustic Scanner					
Permanent Datum , Elevation 130 metres							
Log Measured From GL							
Drilling Measured From Surface							
Date	14-SEPT-2016	Elevations:				KB	metres
Run Number	1					DF	177.91
						GL	177.91
Service Order	---						
Depth Driller	674.80	metres					
Depth Logger	675.32	metres					
First Reading	675.20	metres					
Last Reading	106.80	metres					
Casing Driller	106.70	metres					
Casing Logger	106.80	metres					
Bit Size	3.875	inches					
Hole Fluid Type	KCL						
Density / Viscosity	1.08	g/cc	31.00				
PH / Fluid Loss	---	---					
Sample Source	TANKS						
Rm @ Measured Temp	0.066 @ 25.0	ohm-m					
Rmf @ Measured Temp	0.061 @ 25.0	ohm-m					
Rmc @ Measured Temp	0.099 @ 25.0	ohm-m					
Source Rmf / Rmc	CALC	CALC					
Rm @ BHT	0.041 @ 56.0	ohm-m					
Time Since Circulation	1 HRS 15 MIN						
Max Recorded Temp	56.00	deg C					
Equipment / Base	377	EMD					
Recorded By	Duncan Hinton		Nick Howlett				
Witnessed By	Paul McGliveray						
STOP CIRC	12:00 14-SEPT-2016						

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

**REMARKS**

# RUN NUMBER 1 IS THE PRIMARY DEPTH REFERENCE LOG. ALL OTHER RUNS ARE CORRELATED BACK TO THIS LOG.

# CUSTOMER SCALES AND INTERVALS LOGGED

# RUN 1: SQD, VO4  
- Tool Bridged at 109.7M  
- POOH and wait on wiper trip

# RUN 2: DUMMY

- Tool Bridged at 135.1M

- POOH and wait on wiper trip

# RUN 3: SQD, VO4

- TIME ON BOTTOM 13:30 / 14 SEPT 2016

- VO4/SQD - 341/433 - Calibrated 3 August 2016

- MAX TEMP ON RUN 56 DEG C

# RUN 4: RR5

- TIME ON BOTTOM 17:00 / 14 SEPT 2016

- RR5 - 595 - Calibrated 5 Aug 2016

# RUN 5: MS2

- TIME ON BOTTOM 19:00 / 14 SEPT 2016

- MS2 - 422

- MAX TEMP ON RUN 56 DEG C

# RUN 6: DD6

- TIME ON BOTTOM 22:05 / 14 SEPT 2016

- DD6 - 733 - Calibrated 3 August 2016

- MAX TEMP ON RUN 56 DEG C

# RUN 7: NN2

- TIME ON BOTTOM 01:10 / 15 SEPT 2016

- NN2 - 549 - Calibrated 3 August 2016

- MAX TEMP ON RUN 56 DEG C

# RUN 8: ATV

- TIME ON BOTTOM 04:20 / 15 SEPT 2016

- ATV - 100804

# RIG: FORACO 12

# NO REPEAT SECTION LOGGED AS PER CLIENT REQUIRMENT

# LOGGING CREW: ENGINEER - D. HINTON; N. HOWLETT

## Verticality Analysis Interpretation Notes

15-SEP-2016 05:54

All plotted output is automatically scaled to obtain the best visual effect within the physical space available. The maximum scales being 1:50000(metric) and 1:48000(imperial), and the minimum 1:1.

The analysis is derived by integrating 10cm sampled data down the borehole. The listing supplied will contain a maximum of 200 points in multiples of 1, 2, 5, 10, 20, 50 or 100 metres/feet depending on the total range of the analysis. However, the analysis is calculated for the entire range of the borehole and the final borehole position is included in the listing.

Computed verticality may only be fully derived in open sections of the borehole, away from the influence of any unusual magnetic effects, (as the azimuth calculations are derived from three solid state magnetometers). So the analysis will generally begin at the end of the casing and all borehole positional information will relate to this depth.

Up to ten cross sections may be requested for any borehole to be displayed at any scale, (the default scale is that of the cross-section for the entire hole).

Borehole positional error is derived assuming the following parameters.

	TILT (degrees)	AZIMUTH (degrees)
Typical Error	+/- 0.3333	+/- 10.0000
Maximum Error	+/- 0.5000	+/- 15.0000

Error analysis may be calculated and plotted from the data listing as follows:

a) Plot the four coordinates from the error listing (based upon zero azimuth error) on a target plot. Origin at the start of the analysis.

b) Describe arcs of +/- 10.00 degrees and +/- 15.00 degrees (centre at the origin) through the inner and outer points

respectively.

c) Connect the respective arcs together with straight lines to give the typical and maximum borehole positional error.

Given below is a full description of the parameters displayed on the ensuing listing:

LOG DEPTH	The depth recorded on the field logs for the borehole.
TRUE DEPTH	The true vertical depth corresponding to the above depth. Corrected from the start of the analysis.
HOLE TILT AND AZIMUTH	The sampled borehole orientation. Tilt measured from Vertical.
AXIAL COORDINATES	The coordinates North and East from the target origin.
POLAR COORDINATES	The polar or radial coordinates of the borehole.
ERROR COORDINATES	The polar coordinates corresponding to the typical and maximum tilt error.

N.B. The reference point for all bearing angles on this listing is given at the top of each sheet.

## Verticality Data Listing

C:\Logs\DRH\Santos\Marmbulligan 1\Marmbulligan 1\_WL Suite 1\_VO4-SQD\_MAIN.dta

All Co-ordinates With Respect To True North, all depths in metres

Date Processed: 15-SEP-2016

First Depth 104.60, 0.00 North, 0.00 East of Origin

Date Logged: 14-SEP-2016

DEPTHS		BOREHOLE		AXIAL CO-ORDS		POLAR		POLAR ERROR CO-ORDINATES (MAXIMUM & TYPICAL)							
Log	True	Tilt	Azi	North	East	Brg	Radius	Brg	Radius	Brg	Radius	Brg	Radius	Brg	Radius
104.60	104.60	1.7	292.9	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
109.00	109.00	1.8	113.7	-0.03	0.06	114	0.07	114	0.10	114	0.03	114	0.09	114	0.04
114.00	114.00	2.0	89.0	-0.02	0.23	96	0.23	96	0.32	96	0.15	96	0.29	96	0.18
119.00	118.99	2.2	90.9	-0.03	0.42	94	0.42	94	0.54	94	0.29	94	0.50	94	0.34
124.00	123.99	2.2	95.0	-0.04	0.61	94	0.61	94	0.78	94	0.44	94	0.73	94	0.50
129.00	128.98	2.2	98.2	-0.07	0.80	95	0.81	95	1.02	95	0.59	95	0.95	95	0.66
134.00	133.98	2.1	100.2	-0.10	0.99	96	0.99	96	1.25	96	0.73	96	1.16	96	0.82
139.00	138.98	2.1	101.5	-0.14	1.16	97	1.17	97	1.47	97	0.87	97	1.37	97	0.97
144.00	143.97	2.0	101.5	-0.17	1.33	97	1.34	97	1.68	97	0.99	97	1.57	97	1.11
149.00	148.97	1.9	101.0	-0.20	1.49	98	1.50	98	1.89	98	1.11	98	1.76	98	1.24
154.00	153.97	1.8	97.1	-0.22	1.64	98	1.66	98	2.09	98	1.23	98	1.94	98	1.37
159.00	158.97	1.8	88.4	-0.22	1.79	97	1.81	97	2.28	97	1.33	97	2.12	97	1.49
164.00	163.96	2.0	82.1	-0.20	1.96	96	1.97	96	2.49	96	1.45	96	2.32	96	1.63
169.00	168.96	2.1	81.8	-0.17	2.14	95	2.15	95	2.71	95	1.59	95	2.52	95	1.77
174.00	173.96	2.3	80.9	-0.14	2.33	93	2.34	93	2.94	93	1.73	93	2.74	93	1.93
179.00	178.95	2.4	82.1	-0.11	2.54	93	2.54	93	3.19	93	1.89	93	2.97	93	2.11
184.00	183.95	2.5	85.4	-0.09	2.75	92	2.75	92	3.44	92	2.06	92	3.21	92	2.29
189.00	188.94	2.6	87.6	-0.09	2.97	92	2.97	92	3.71	92	2.24	92	3.46	92	2.48
194.00	193.94	2.6	89.1	-0.08	3.19	91	3.20	91	3.98	91	2.42	91	3.72	91	2.68
199.00	198.93	2.6	90.8	-0.09	3.42	91	3.42	91	4.24	91	2.60	91	3.97	91	2.87
204.00	203.93	2.5	92.4	-0.09	3.64	91	3.64	91	4.50	91	2.77	91	4.21	91	3.06
209.00	208.92	2.5	92.4	-0.10	3.86	92	3.86	92	4.77	92	2.95	92	4.46	92	3.25
214.00	213.92	2.7	90.8	-0.11	4.09	91	4.09	91	5.04	91	3.13	91	4.72	91	3.45
219.00	218.91	2.8	90.4	-0.11	4.33	91	4.33	91	5.32	91	3.33	91	4.99	91	3.66
224.00	223.91	2.9	88.2	-0.10	4.58	91	4.58	91	5.62	91	3.54	91	5.27	91	3.88
229.00	228.90	3.1	86.5	-0.08	4.84	91	4.85	91	5.93	91	3.76	91	5.57	91	4.12
234.00	233.89	3.3	85.0	-0.06	5.13	91	5.13	91	6.25	91	4.00	91	5.88	91	4.37
239.00	238.88	3.5	83.6	-0.03	5.43	90	5.43	90	6.60	90	4.26	90	6.21	90	4.65
244.00	243.87	3.7	82.3	0.02	5.75	90	5.75	90	6.96	90	4.53	90	6.56	90	4.94
249.00	248.86	3.8	80.3	0.07	6.07	89	6.07	89	7.33	89	4.81	89	6.91	89	5.23
254.00	253.85	3.8	77.8	0.14	6.40	89	6.40	89	7.70	89	5.10	89	7.27	89	5.53
259.00	258.84	3.9	77.4	0.22	6.73	88	6.74	88	8.08	88	5.39	88	7.63	88	5.84
264.00	263.82	4.0	76.7	0.30	7.07	88	7.08	88	8.47	88	5.69	88	8.01	88	6.15
269.00	268.81	4.1	75.5	0.39	7.42	87	7.43	87	8.86	87	6.00	87	8.38	87	6.47
274.00	273.80	4.2	74.3	0.49	7.77	86	7.79	86	9.26	86	6.31	86	8.77	86	6.80
279.00	278.78	4.3	73.7	0.59	8.13	86	8.16	86	9.68	86	6.64	86	9.17	86	7.14
284.00	283.77	4.5	73.0	0.74	8.54	85	8.54	85	10.10	85	6.97	85	9.59	85	7.49



284.00	283.77	4.3	72.9	0.71	8.51	85	8.54	85	10.10	85	6.97	85	9.58	85	7.49
289.00	288.75	4.6	72.0	0.83	8.89	85	8.93	85	10.53	85	7.32	85	10.00	85	7.86
294.00	293.73	4.8	70.9	0.97	9.29	84	9.34	84	10.99	84	7.69	84	10.44	84	8.24
299.00	298.72	5.0	70.9	1.11	9.70	83	9.76	83	11.46	83	8.07	83	10.89	83	8.63
304.00	303.70	5.2	70.2	1.27	10.12	83	10.20	83	11.94	83	8.46	83	11.36	83	9.04
309.00	308.67	5.3	70.2	1.42	10.56	82	10.65	82	12.43	82	8.87	82	11.84	82	9.46
314.00	313.65	5.4	70.0	1.58	10.99	82	11.11	82	12.93	82	9.28	82	12.32	82	9.89
319.00	318.63	5.5	69.9	1.74	11.44	81	11.57	81	13.44	81	9.70	81	12.82	81	10.33
324.00	323.61	5.5	69.5	1.91	11.89	81	12.04	81	13.95	81	10.13	81	13.32	81	10.77
329.00	328.58	5.6	68.9	2.09	12.34	80	12.52	80	14.47	80	10.56	80	13.82	80	11.21
334.00	333.56	5.6	68.7	2.26	12.80	80	12.99	80	14.99	80	10.99	80	14.33	80	11.66
339.00	338.53	5.6	68.9	2.44	13.25	80	13.48	80	15.52	80	11.43	80	14.84	80	12.11
344.00	343.51	5.7	68.9	2.62	13.71	79	13.96	79	16.05	79	11.88	79	15.35	79	12.57
349.00	348.49	5.6	68.6	2.80	14.17	79	14.44	79	16.57	79	12.31	79	15.86	79	13.02
354.00	353.46	5.6	68.9	2.97	14.62	79	14.92	79	17.09	79	12.75	79	16.37	79	13.47
359.00	358.44	5.6	68.6	3.15	15.07	78	15.40	78	17.61	78	13.18	78	16.88	78	13.92
364.00	363.42	5.6	69.0	3.32	15.52	78	15.88	78	18.13	78	13.62	78	17.38	78	14.37
369.00	368.39	5.6	69.4	3.49	15.98	78	16.35	78	18.66	78	14.05	78	17.89	78	14.82
374.00	373.37	5.5	69.0	3.66	16.42	77	16.83	77	19.17	77	14.48	77	18.39	77	15.26
379.00	378.35	5.5	68.9	3.84	16.87	77	17.30	77	19.69	77	14.91	77	18.89	77	15.71
384.00	383.32	5.6	69.5	4.01	17.32	77	17.78	77	20.21	77	15.35	77	19.40	77	16.16
389.00	388.30	5.6	69.2	4.18	17.78	77	18.26	77	20.74	77	15.78	77	19.91	77	16.61
394.00	393.28	5.6	69.3	4.35	18.23	77	18.74	77	21.26	77	16.22	77	20.42	77	17.06
399.00	398.25	5.6	69.0	4.52	18.68	76	19.22	76	21.79	76	16.66	76	20.93	76	17.51
404.00	403.23	5.6	69.1	4.70	19.14	76	19.71	76	22.32	76	17.10	76	21.45	76	17.97
409.00	408.20	5.7	69.3	4.87	19.61	76	20.20	76	22.85	76	17.55	76	21.97	76	18.44
414.00	413.18	5.8	69.2	5.05	20.08	76	20.71	76	23.40	76	18.01	76	22.50	76	18.91
419.00	418.15	5.8	69.7	5.23	20.56	76	21.21	76	23.95	76	18.47	76	23.04	76	19.39
424.00	423.12	6.1	71.6	5.40	21.06	76	21.74	76	24.52	76	18.95	76	23.59	76	19.88
429.00	428.09	6.1	72.2	5.56	21.56	76	22.27	76	25.09	76	19.44	76	24.15	76	20.38
434.00	433.07	6.1	72.6	5.72	22.07	75	22.80	75	25.67	75	19.93	75	24.71	75	20.89
439.00	438.04	6.1	73.5	5.87	22.58	75	23.33	75	26.24	75	20.42	75	25.27	75	21.39
444.00	443.01	6.2	74.4	6.02	23.10	75	23.87	75	26.83	75	20.92	75	25.84	75	21.90
449.00	447.98	6.2	75.2	6.15	23.62	75	24.41	75	27.41	75	21.41	75	26.41	75	22.41
454.00	452.95	6.2	76.0	6.28	24.15	75	24.95	75	27.99	75	21.91	75	26.98	75	22.92
459.00	457.92	6.2	76.2	6.41	24.67	75	25.49	75	28.58	75	22.41	75	27.55	75	23.44
464.00	462.89	6.2	76.7	6.54	25.20	75	26.03	75	29.16	75	22.91	75	28.12	75	23.95
469.00	467.86	6.2	76.8	6.66	25.73	75	26.57	75	29.74	75	23.40	75	28.69	75	24.46
474.00	472.83	6.2	77.0	6.78	26.25	76	27.11	76	30.33	76	23.90	76	29.25	76	24.97
479.00	477.80	6.2	76.4	6.91	26.77	76	27.65	76	30.91	76	24.39	76	29.82	76	25.48
484.00	482.77	6.2	76.7	7.03	27.30	76	28.19	76	31.49	76	24.89	76	30.39	76	25.99
489.00	487.75	6.2	76.4	7.16	27.82	76	28.73	76	32.07	76	25.38	76	30.96	76	26.50
494.00	492.72	6.2	76.5	7.28	28.34	76	29.27	76	32.65	76	25.88	76	31.52	76	27.01
499.00	497.69	6.1	75.7	7.42	28.86	76	29.80	76	33.23	76	26.36	76	32.08	76	27.51
504.00	502.66	6.0	74.8	7.55	29.37	76	30.32	76	33.80	76	26.85	76	32.64	76	28.01
509.00	507.63	5.9	73.7	7.70	29.86	76	30.84	76	34.36	76	27.32	76	33.18	76	28.49
514.00	512.61	5.8	73.3	7.84	30.35	76	31.34	76	34.90	76	27.78	76	33.72	76	28.97
519.00	517.58	5.7	72.8	7.99	30.82	75	31.83	75	35.44	75	28.23	75	34.24	75	29.43
524.00	522.56	5.5	72.2	8.13	31.27	75	32.31	75	35.96	75	28.66	75	34.74	75	29.87
529.00	527.54	5.3	72.3	8.27	31.71	75	32.77	75	36.46	75	29.08	75	35.23	75	30.31
534.00	532.52	5.2	73.2	8.40	32.14	75	33.22	75	36.96	75	29.48	75	35.71	75	30.73
539.00	537.50	5.1	73.5	8.53	32.57	75	33.67	75	37.44	75	29.89	75	36.19	75	31.15
544.00	542.48	5.1	73.7	8.66	33.00	75	34.11	75	37.94	75	30.29	75	36.66	75	31.57
549.00	547.46	5.2	73.9	8.78	33.43	75	34.56	75	38.43	75	30.69	75	37.14	75	31.98
554.00	552.44	5.1	73.5	8.91	33.86	75	35.01	75	38.92	75	31.10	75	37.61	75	32.40
559.00	557.42	5.2	73.5	9.04	34.29	75	35.46	75	39.41	75	31.51	75	38.10	75	32.82
564.00	562.40	5.2	73.8	9.16	34.73	75	35.92	75	39.91	75	31.92	75	38.58	75	33.25
569.00	567.38	5.3	75.1	9.28	35.17	75	36.37	75	40.41	75	32.33	75	39.07	75	33.68
574.00	572.36	5.2	75.7	9.39	35.61	75	36.83	75	40.91	75	32.74	75	39.55	75	34.11
579.00	577.34	5.1	76.2	9.50	36.04	75	37.27	75	41.40	75	33.15	75	40.03	75	34.52
584.00	582.32	5.1	76.0	9.61	36.48	75	37.72	75	41.89	75	33.55	75	40.50	75	34.94
589.00	587.30	5.2	75.7	9.72	36.92	75	38.17	75	42.39	75	33.96	75	40.98	75	35.36
594.00	592.27	5.3	75.8	9.83	37.36	75	38.64	75	42.89	75	34.38	75	41.47	75	35.80
599.00	597.25	5.3	75.8	9.94	37.81	75	39.09	75	43.39	75	34.79	75	41.96	75	36.23
604.00	602.23	5.2	76.2	10.05	38.25	75	39.55	75	43.89	75	35.20	75	42.44	75	36.65
609.00	607.21	5.2	76.3	10.16	38.68	75	39.99	75	44.38	75	35.61	75	42.92	75	37.07
614.00	612.19	5.2	76.4	10.27	39.12	75	40.45	75	44.88	75	36.01	75	43.40	75	37.49
619.00	617.17	5.1	77.4	10.36	39.55	75	40.89	75	45.36	75	36.41	75	43.87	75	37.90
624.00	622.15	4.8	80.0	10.43	39.96	75	41.30	75	45.82	75	36.78	75	44.31	75	38.29
629.00	627.14	4.6	84.2	10.47	40.36	75	41.70	75	46.26	75	37.13	75	44.74	75	38.66
634.00	632.12	4.6	91.1	10.47	40.76	76	42.09	76	46.69	76	37.48	76	45.16	76	39.02
639.00	637.10	4.6	96.9	10.49	41.19	76	42.49	76	47.12	76	37.83	76	45.59	76	39.38

639.00	637.10	4.8	96.2	10.42	41.18	76	42.48	76	47.13	76	37.83	76	45.58	76	39.38
644.00	642.09	4.9	98.5	10.36	41.61	76	42.88	76	47.57	76	38.18	76	46.00	76	39.75
649.00	647.07	5.0	99.6	10.29	42.04	76	43.28	76	48.01	76	38.54	76	46.43	76	40.12
654.00	652.05	5.0	99.7	10.21	42.46	76	43.68	76	48.45	76	38.89	76	46.86	76	40.49
659.00	657.03	5.2	101.0	10.13	42.91	77	44.09	77	48.91	77	39.26	77	47.30	77	40.87
664.00	662.00	5.6	101.5	10.03	43.38	77	44.53	77	49.39	77	39.66	77	47.77	77	41.28
669.00	666.98	6.0	101.6	9.93	43.89	77	45.00	77	49.91	77	40.09	77	48.27	77	41.73
674.00	671.95	6.2	100.6	9.83	44.42	78	45.49	78	50.45	78	40.54	78	48.80	78	42.19
674.60	672.54	5.8	102.0	9.81	44.48	78	45.55	78	50.51	78	40.59	78	48.85	78	42.24

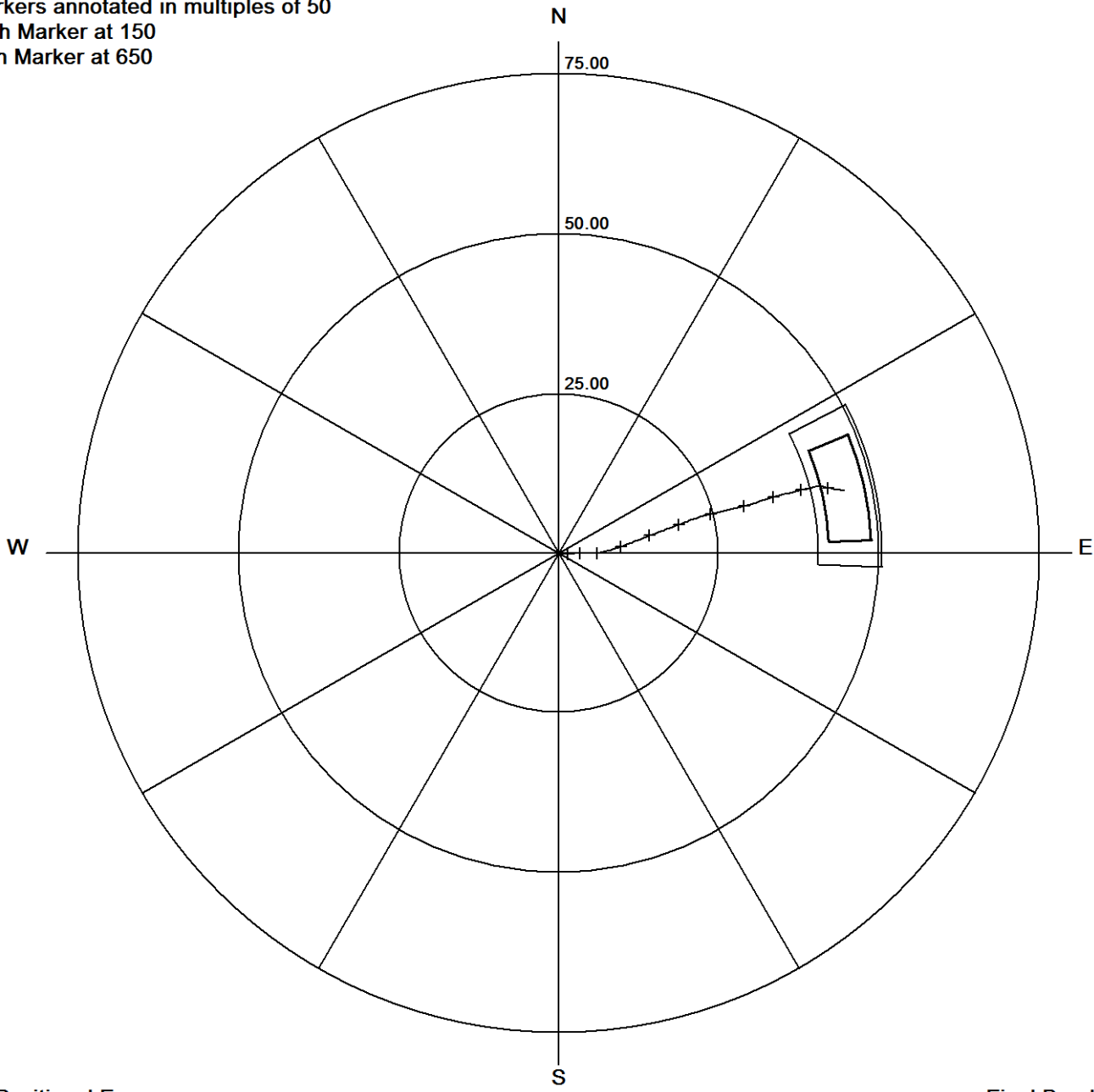
Cross Section

All Figures are Log Depths in metres

Plot With Respect to True North

Target Origin Depth 104.60  
Last Plotted Depth 674.60  
Depth Markers annotated in multiples of 50  
First Depth Marker at 150  
Last Depth Marker at 650

Scale 1:1000  
Declination 4.0 deg East



Borehole Positional Error

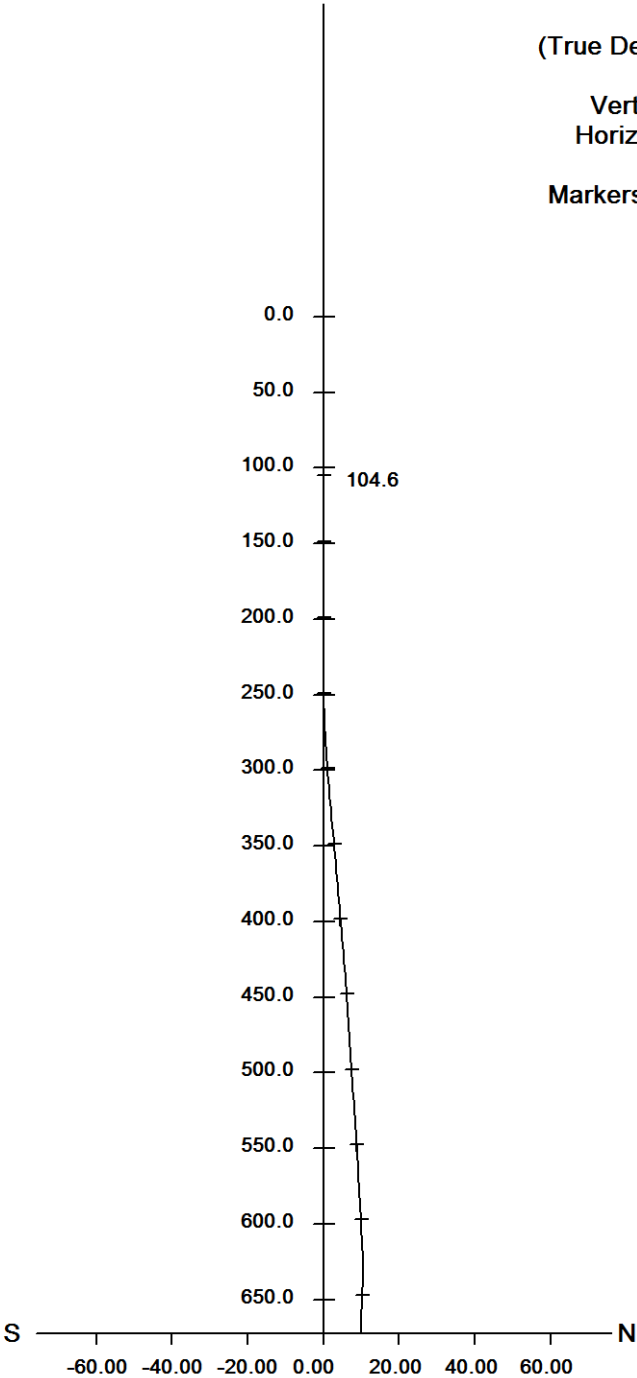
The two boxes surrounding the last plotted depth show the typical and maximum positional error at that depth.

Final Borehole Position

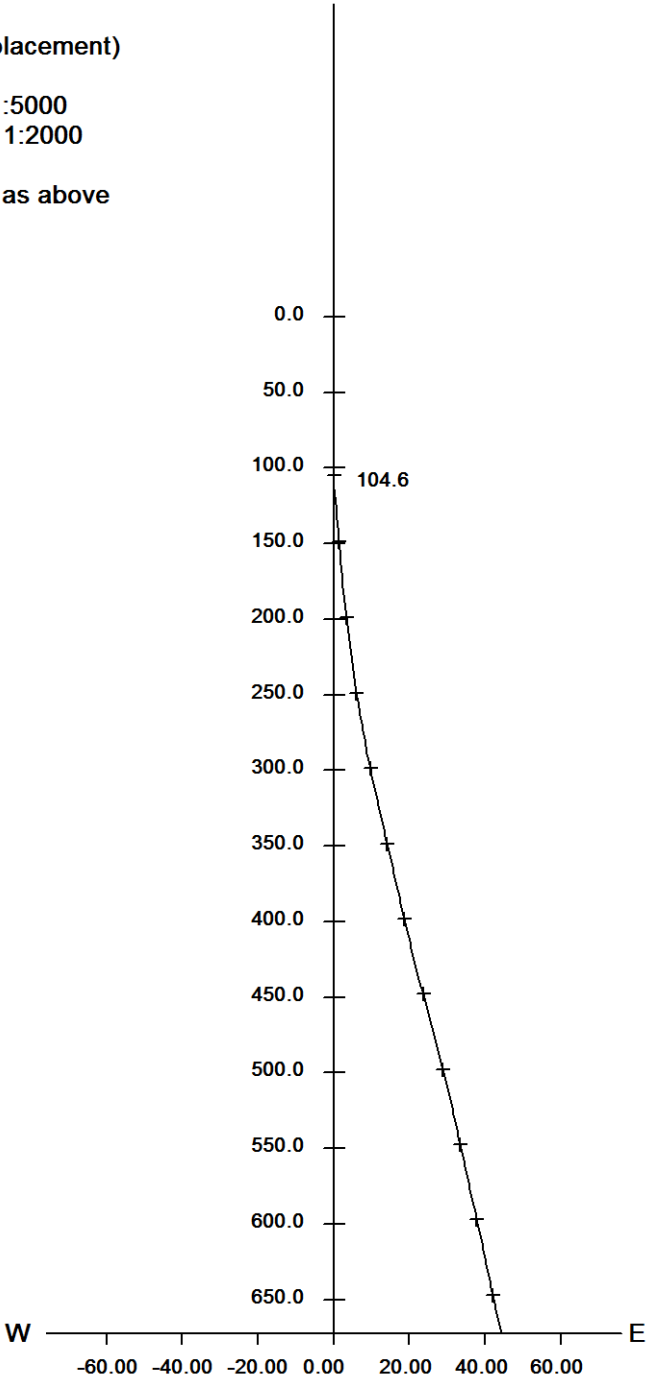
The last plotted depth is at  
9.81 metres North  
44.48 metres East  
ie 45.55 metres from the origin  
78 deg from True North

Vertical Sections

North-South Section



East-West Section



(True Depth vs Displacement)

Vertical Scale 1:5000  
Horizontal Scale 1:2000

Markers annotated as above

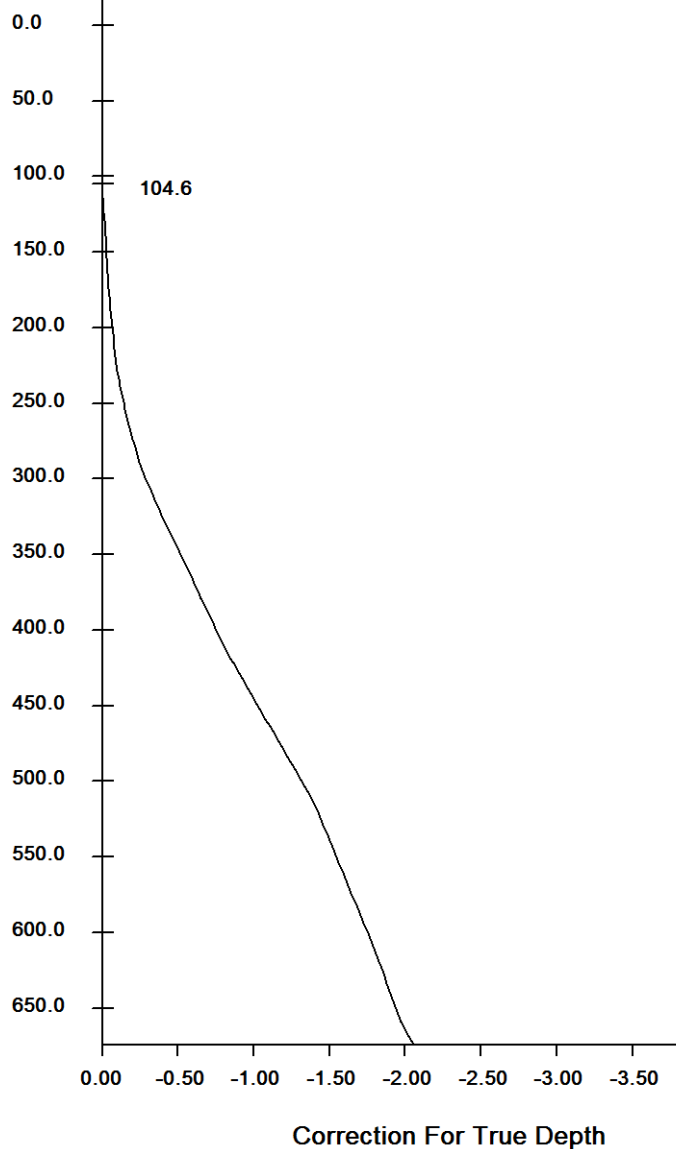
Depth Correction Analysis

Vertical Scale 1:5000  
Horizontal Scale 1:50

Log

Depth

Depths		Depths	
Log	True	Log	True
104.60	104.60	439.00	438.04
109.00	109.00	444.00	443.01
114.00	114.00	449.00	447.98
119.00	118.99	454.00	452.95
124.00	123.99	459.00	457.92
129.00	128.98	464.00	462.89
134.00	133.97	469.00	467.86
139.00	138.96	474.00	472.83
144.00	143.95	479.00	477.80
149.00	148.94	484.00	482.77
154.00	153.93	489.00	487.74
159.00	158.92	494.00	492.71
164.00	163.91	499.00	497.68
169.00	168.90	504.00	502.65
174.00	173.89	509.00	507.62
179.00	178.88	514.00	512.59
184.00	183.87	519.00	517.56
189.00	188.86	524.00	522.53
194.00	193.85	529.00	527.50
199.00	198.84	534.00	532.47
204.00	203.83	539.00	537.44
209.00	208.82	544.00	542.41
214.00	213.81	549.00	547.38
219.00	218.80	554.00	552.35
224.00	223.79	559.00	557.32
229.00	228.78	564.00	562.29
234.00	233.77	569.00	567.26
239.00	238.76	574.00	572.23
244.00	243.75	579.00	577.20
249.00	248.74	584.00	582.17
254.00	253.73	589.00	587.14
259.00	258.72	594.00	592.11
264.00	263.71	599.00	597.08
269.00	268.70	604.00	602.05
274.00	273.69	609.00	607.02
279.00	278.68	614.00	611.99
284.00	283.67	619.00	616.96
289.00	288.66	624.00	621.93
294.00	293.65	629.00	626.90
299.00	298.64	634.00	631.87
304.00	303.63	639.00	636.84
309.00	308.62	644.00	641.81
314.00	313.61	649.00	646.78
319.00	318.60	654.00	651.75
324.00	323.59	659.00	656.72
329.00	328.58	664.00	661.69
334.00	333.57	669.00	666.66
339.00	338.56	674.00	671.63
344.00	343.55	679.00	676.60
349.00	348.54	684.00	681.57
354.00	353.53	689.00	686.54
359.00	358.52	694.00	691.51
364.00	363.51	699.00	696.48
369.00	368.50	704.00	701.45
374.00	373.49	709.00	706.42
379.00	378.48	714.00	711.39
384.00	383.47	719.00	716.36
389.00	388.46	724.00	721.33
394.00	393.45	729.00	726.30
399.00	398.44	734.00	731.27
404.00	403.43	739.00	736.24
409.00	408.42	744.00	741.21
414.00	413.41	749.00	746.18
419.00	418.40	754.00	751.15
424.00	423.39	759.00	756.12
429.00	428.38	764.00	761.09
434.00	433.37	769.00	766.06
439.00	438.36	774.00	771.03
444.00	443.35	779.00	776.00
449.00	448.34	784.00	780.97
454.00	453.33	789.00	785.94
459.00	458.32	794.00	790.91
464.00	463.31	799.00	795.88
469.00	468.30	804.00	800.85
474.00	473.29	809.00	805.82
479.00	478.28	814.00	810.79
484.00	483.27	819.00	815.76
489.00	488.26	824.00	820.73
494.00	493.25	829.00	825.70
499.00	498.24	834.00	830.67
504.00	503.23	839.00	835.64
509.00	508.22	844.00	840.61
514.00	513.21	849.00	845.58
519.00	518.20	854.00	850.55
524.00	523.19	859.00	855.52
529.00	528.18	864.00	860.49
534.00	533.17	869.00	865.46
539.00	538.16	874.00	870.43
544.00	543.15	879.00	875.40
549.00	548.14	884.00	880.37
554.00	553.13	889.00	885.34
559.00	558.12	894.00	890.31
564.00	563.11	899.00	895.28
569.00	568.10	904.00	900.25
574.00	573.09	909.00	905.22
579.00	578.08	914.00	910.19
584.00	583.07	919.00	915.16
589.00	588.06	924.00	920.13
594.00	593.05	929.00	925.10
599.00	598.04	934.00	930.07
604.00	603.03	939.00	935.04
609.00	608.02	944.00	940.01
614.00	613.01	949.00	944.98
619.00	618.00	954.00	949.95
624.00	623.00	959.00	954.92
629.00	628.00	964.00	959.89
634.00	633.00	969.00	964.86
639.00	638.00	974.00	969.83
644.00	643.00	979.00	974.80
649.00	648.00	984.00	979.77
654.00	653.00	989.00	984.74
659.00	658.00	994.00	989.71
664.00	663.00	999.00	994.68



134.00	133.98	469.00	467.86
139.00	138.98	474.00	472.83
144.00	143.97	479.00	477.80
149.00	148.97	484.00	482.77
154.00	153.97	489.00	487.75
159.00	158.97	494.00	492.72
164.00	163.96	499.00	497.69
169.00	168.96	504.00	502.66
174.00	173.96	509.00	507.63
179.00	178.95	514.00	512.61
184.00	183.95	519.00	517.58
189.00	188.94	524.00	522.56
194.00	193.94	529.00	527.54
199.00	198.93	534.00	532.52
204.00	203.93	539.00	537.50
209.00	208.92	544.00	542.48
214.00	213.92	549.00	547.46
219.00	218.91	554.00	552.44
224.00	223.91	559.00	557.42
229.00	228.90	564.00	562.40
234.00	233.89	569.00	567.38
239.00	238.88	574.00	572.36
244.00	243.87	579.00	577.34
249.00	248.86	584.00	582.32
254.00	253.85	589.00	587.30
259.00	258.84	594.00	592.27
264.00	263.82	599.00	597.25
269.00	268.81	604.00	602.23
274.00	273.80	609.00	607.21
279.00	278.78	614.00	612.19
284.00	283.77	619.00	617.17
289.00	288.75	624.00	622.15
294.00	293.73	629.00	627.14
299.00	298.72	634.00	632.12
304.00	303.70	639.00	637.10
309.00	308.67	644.00	642.09
314.00	313.65	649.00	647.07
319.00	318.63	654.00	652.05
324.00	323.61	659.00	657.03
329.00	328.58	664.00	662.00
334.00	333.56	669.00	666.98
339.00	338.53	674.00	671.95
344.00	343.51	674.60	672.54
349.00	348.49		
354.00	353.46		
359.00	358.44		
364.00	363.42		
369.00	368.39		
374.00	373.37		
379.00	378.35		
384.00	383.32		
389.00	388.30		
394.00	393.28		
399.00	398.25		
404.00	403.23		
409.00	408.20		
414.00	413.18		
419.00	418.15		
424.00	423.12		
429.00	428.09		
434.00	433.07		

## 3D Borehole Deviation

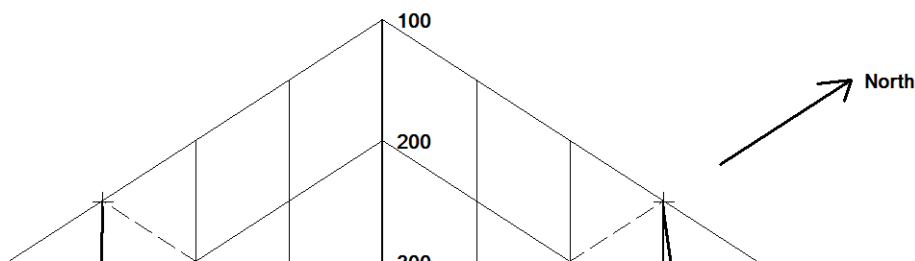
All figures are True Depths / displacements in metres

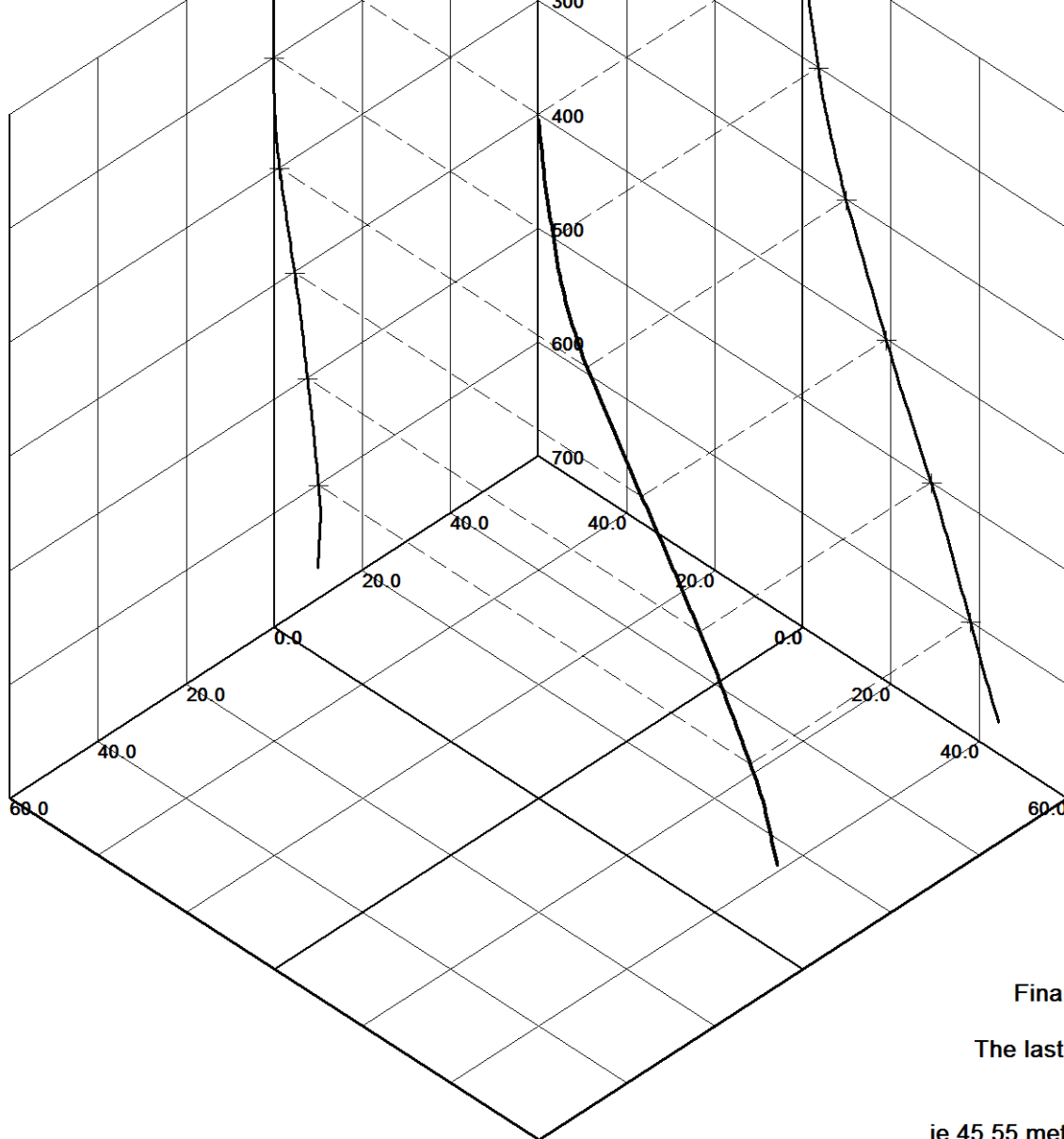
Origin Depth 104.60

Last Plotted Depth 674.60

Plot With Respect to True North

Declination 4.0 deg East





COMPANY Santos & Partners  
 WELL Marmbulligan 1  
 FIELD Marmbulligan  
 PROVINCE/COUNTY  
 COUNTRY/STATE Northern Territory

Elevation Kelly Bushing		metres	First Reading		metres
Elevation Drill Floor	175.00	metres	Depth Driller	674.80	metres
Elevation Ground Level	175.00	metres	Depth Logger	675.32	metres



**Weatherford®**

VERTICALITY ANALYSIS