



**End of Well Report  
for  
Origin Energy Resources**

Rig: ENSCO 102  
Well: Trefoil-1  
Field: Exploration  
Country: Australia  
Job No: AU-FE-0003279677  
Date: 01-Nov-04  
API No:



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## General Information

Company:	Origin Energy Resources	
Rig:	ENSCO 102	
Well:	Trefoil-1	
Field:	Exploration	
Country:	Australia	
API Number:		
Sperry-Sun Job Number:	AU-FE-0003279677	
Job start date:	01-Nov-04	
Job end date:	24-Nov-04	
North reference:	Grid	
Declination:	12.547	deg
Dip angle:	-70.529	deg
Total magnetic field:	61120	nT
Date of magnetic data:	31-Oct-04	
Wellhead coordinates N:	39 deg. 51 min 44.12 sec South	
Wellhead coordinates E:	145 deg. 22 min 30.73 sec East	
Vertical section direction:	Closure	deg
MWD Engineers:	M. Lee	S. Sweet
	A. Oraekwuotu	
Company Representatives:	M. Jackson	W. Jakimczuk
	M. Nasarczyk	H. Amos
Company Geologist:	M. Tindale	D. Cohen
Lease Name:	T/P18	
Unit Number:	040602	
State:	Tasmania	
County:		

## Operational Overview

Sperry-Sun Drilling Services were contracted by Origin Energy Resources to provide Logging While Drilling (LWD) services for the drilling of the Trefoil-1 well from the jackup drilling rig ENSCO 102.

### 16" Hole Section:

This section was drilled in one bit run using Sperry-Sun's Directional While Drilling (DWD) tool suite with a Pressure Case Directional (PCD-R) sonde for deviation control. The section was drilled to T at 666.0 mMDRT.

### 12¼" Hole Section:

This section was drilled in one bit run using Sperry-Sun's P4M Formation Evaluation While Drilling (FEWD) tool suite, comprising of a Dual Gamma Ray (DGR) and Four Phase Electromagnetic Wave Resistivity (EWR-P4) tools for logging purposes, with a Position Monitor (PM) for deviation control. The section was drilled to TD at 2428.0 mMDRT.

### 8½" Hole Section:



This section was drilled in three bit runs using Sperry-Sun's P4M Triple Combo tool suite, comprising of a Dual Gamma Ray (DGR), Four Phase Electromagnetic Wave Resistivity (EWR-P4) Compensated Neutron Porosity (CNP) and Stabilised Litho-Density (SLD) tools for logging purposes, with a Position Monitor (PM) for deviation control. The first run was drilled to core point at 2735.0 mMDRT. The second run logged the cored section to 2743.0 mMDRT and continued to drill to 3442.0 mMDRT. The third run drilled to well TD at 3545.0 mMDRT.

## Summary of MMDruns

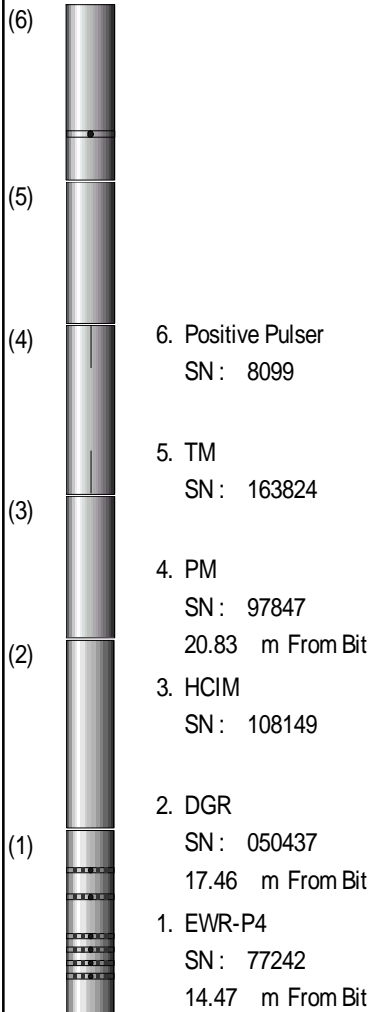
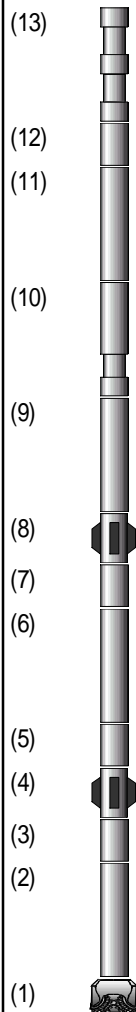
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TOTALS ==>	3330.00	353.70	353.70	230.99	0	0
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## Bitrun Summary

Run Time Data		Drilling Data			Mud Data				
MWD Run :	0100	Start Depth :	215.00	m	Mud Type :	Seawater/sw			
Rig Bit No:	2	End Depth :	666.00	m	Weight / Visc :	8.75	ppg /	28.00	spqt
Hole Size :	16.00	Footage :	451.00	m	Chlorides :	N/A	ppm		
Run Start :	01-Nov-04 21:30	Avg. Flow Rate :	1000.00	gpm	PV / YP :	N/A	cp /	N/A	pa
Run End :	03-Nov-04 14:00	Avg. RPM :	70.00	rpm	Solids/Sand :	N/A	% /	N/A	%
BRT Hrs :	40.50	Avg. WOB :	8.00	klb	%Oil / O:W:	N/A	% /	N/A	
Circ. Hrs :	16.50	Avg. ROP :	35.00	m/hr	pH/Fluid Loss:	N/A	pH /	N/A	cp <sub>tm</sub>
Oper. Hrs :	40.50	Avg. SPP :	2200.00	psig	Max. Temp. :	28.10	degC		
MWD Schematics		BHA Schematics							
 <p>2. Positive Pulser SN : 10608154</p> <p>1. PCD SN : 538 20.49 m From Bit</p>		(15)				Length (m)	O.D. (in)	I.D. (in)	
		(14)							
		(13)							
		(12)	15.	9 x HWDP	84.29	5.000	3.000		
			14.	Cross Over Sub	1.09	6.688	3.063		
		(11)	13.	2 x Drill Collar	19.02	8.500	2.880		
			12.	Drilling Jars	9.70	8.250	3.125		
		(10)	11.	3 x Drill Collar	28.58	8.500	2.875		
		(9)	10.	Cross Over Sub	0.80	8.250	2.938		
			09.	4 x Drill Collar	37.71	9.500	3.000		
		(8)	08.	Integral Blade Stabilizer	2.12	9.625	3.063		
		(7)	07.	Hang Off Sub	3.11	9.500	3.250		
		(6)	06.	NMDC	8.38	9.500	3.250		
		(5)	05.	Integral Blade Stabilizer	1.92	9.688	3.060		
		(4)	04.	Float Sub	0.85	9.630	3.250		
		(3)	03.	9-5/8" SperryDrill Lobe 6/7	8.54	9.625	6.135		
		(2)	02.	Cross Over Sub	0.31	9.500	3.000		
		(1)	01.	Hughes MX-1	0.40	16.000	3.000		
		Comments					MWD Performance		
The 16" hole was drilled to section TD at 666.0 mMDRT. Good detection throughout run.					Tool OD / Type :	9.50	in /	DWD	
					MWD Real-time%:	100.00	%		
					MWD Recorded%:	100.00	%		
					Min. Inc. :	0.17	deg /	300.92	m
					Max. Inc. :	0.41	deg /	504.18	m
					Final Az. :	259.13	deg		
					Max Op. Press. :	99	psig		

## Bitrun Summary

Run Time Data		Drilling Data		Mud Data			
MWD Run :	0200	Start Depth :	666.00 m	Mud Type :	Drispac/Soltex		
Rig Bit No:	3	End Depth :	2428.00 m	Weight / Visc :	9.10 ppg /	98.00 spqt	
Hole Size :	12.25 in	Footage :	1762.00 m	Chlorides :	18000 ppm		
Run Start :	06-Nov-04 17:17	Avg. Flow Rate :	850.00 gpm	PV / YP :	35.00 cp /	43.00 pa	
Run End :	11-Nov-04 15:13	Avg. RPM :	85.00 rpm	Solids/Sand :	4.2 % /	0.10 %	
BRT Hrs :	117.94	Avg. WOB :	15.00 klb	%Oil / O:W :	0 % /	0:94.8	
Circ. Hrs :	84.98	Avg. ROP :	34.00 m/hr	pH/Fluid Loss:	8.80 pH /	4.40 cptm	
Oper. Hrs :	117.94	Avg. SPP :	3550.00 psig	Max. Temp. :	92.00 degC		
MWD Schematics		BHA Schematics					
				Component	Length	O.D.	I.D.
				(m)	(in)	(in)	
		13.	HWDP	84.29	5.000	3.000	
		12.	9 x HWDP	1.09	8.250	2.880	
		11.	Drill Collar	19.02	8.250	2.813	
		10.	2 x Drill Collar	9.70	8.250	3.000	
		09.	Drill Collar	57.06	8.250	2.810	
		08.	6 x Drill Collar	2.24	8.000	3.000	
		07.	Hang Off Sub	3.11	8.000	1.920	
		06.	MWD	9.82	8.000	1.920	
		05.	Float Sub	0.74	8.000	3.000	
		04.	Integral Blade Stabilizer	1.71	8.000	2.875	
		03.	Cross Over Sub	1.20	9.500	3.000	
		02.	9-5/8" SperryDrill Lobe 6/7	8.52	9.630	3.000	
		01.	Reed RSX 162	0.25	12.250	2.750	
Comments				MWD Performance			
The 12¼" hole was drilled to section TD at 2428.0 mMDRT. Good detection throughout run. All recorded data recovered at surface.				Tool OD / Type :	8.00 in /	P4M	
				MWD Real-time%:	97.67 %		
				MWD Recorded%:	100.00 %		
				Min. Inc. :	0.01 deg /	1946.67 m	
				Max. Inc. :	0.43 deg /	2353.51 m	
				Final Az. :	63.76 deg		
				Max Op. Press. :	3769 psig		

## Bitrun Summary



Run Time Data		Drilling Data		Mud Data			
MWD Run :	0300	Start Depth :	2428.00 m	Mud Type :	Drispac/Soltex		
Rig Bit No:	4	End Depth :	2735.00 m	Weight / Visc :	9.20 ppg /	125.00 spqt	
Hole Size :	8.50 in	Footage :	307.00 m	Chlorides :	18000 ppm		
Run Start :	14-Nov-04 23:16	Avg. Flow Rate :	550.00 gpm	PV / YP :	41.00 cp /	44.00 pa	
Run End :	17-Nov-04 00:18	Avg. RPM :	95.00 rpm	Solids/Sand :	4.5 % /	0.05 %	
BRT Hrs :	49.03	Avg. WOB :	10.00 klb	%Oil / O:W :	0 % /	0:94.5	
Circ. Hrs :	26.82	Avg. ROP :	26.79 m/hr	pH/Fluid Loss:	9.00 pH /	4.60 cptm	
Oper. Hrs :	49.03	Avg. SPP :	2900.00 psig	Max. Temp. :	96.00 degC		
MWD Schematics		BHA Schematics					
<div><div><div>(9)</div><div></div></div><div><div>(8)</div><div></div></div><div><div>(7)</div><div></div></div><div><div>(6)</div><div>9. Positive Pulser SN: 8213</div></div><div><div>(5)</div><div>8. TM SN: 134334</div></div><div><div>(4)</div><div>7. PM SN: 34827 16.07 m From Bit</div></div><div><div>(3)</div><div>6. HCIM SN: 76895</div></div><div><div>(2)</div><div>5. CNP SN: 75464 11.73 m From Bit</div></div><div><div>(1)</div><div>4. SLD SN: 54290 8.46 m From Bit</div></div><div><div></div><div>3. DDS SN: 0 0.00 m From Bit</div></div><div><div></div><div>2. DGR SN: 77713 6.65 m From Bit</div></div><div><div></div><div>1. EWR-P4 SN: 61101 3.65 m From Bit</div></div></div>		<div><div><div>(10)</div><div></div></div><div><div>(9)</div><div></div></div><div><div>(8)</div><div></div></div><div><div>(7)</div><div></div></div><div><div>(6)</div><div>10. 9 x HWDP 84.29 5.000 3.000</div></div><div><div></div><div>09. 2 x Drill Collar 18.64 6.750 2.813</div></div><div><div></div><div>08. Drilling Jars 9.35 6.500 2.750</div></div><div><div>(5)</div><div>07. 8 x Drill Collar 74.87 6.750 2.810</div></div><div><div>(4)</div><div>06. NMDC 8.64 6.750 2.813</div></div><div><div>(3)</div><div>05. Integral Blade Stabilizer 1.31 6.500 2.813</div></div><div><div></div><div>04. Hang Off Sub 3.06 6.875 1.920</div></div><div><div>(2)</div><div>03. MWD 15.89 6.750 1.920</div></div><div><div>(1)</div><div>02. Near Bit Stabilizer 1.29 6.500 2.313</div></div><div><div></div><div>01. Smith MA74EPX 0.31 8.500 2.000</div></div></div>					
Comments				MWD Performance			
Drilled 8½" hole to 2735.0m and POOH for coring run. Occasional poor detection and all recorded data recovered at surface.				Tool OD / Type : 6.75 in / P4M			
				MWD Real-time%: 95.00 %			
				MWD Recorded%: 100.00 %			
				Min. Inc. : 0.42 deg / 2493.19 m			
				Max. Inc. : 0.67 deg / 2638.47 m			
				Final Az. : 66.62 deg			
				Max Op. Press. : 4291 psig			



## Bitrun Summary

Run Time Data		Drilling Data		Mud Data			
MWD Run :	0400	Start Depth :	2735.00 m	Mud Type :	Drispac/Soltex		
Rig Bit No:	6	End Depth :	3442.00 m	Weight / Visc :	9.40 ppg /	115.00 spqt	
Hole Size :	8.50 in	Footage :	707.00 m	Chlorides :	18000 ppm		
Run Start :	18-Nov-04 00:56	Avg. Flow Rate :	540.00 gpm	PV / YP :	46.00 cp /	34.00 pa	
Run End :	22-Nov-04 08:35	Avg. RPM :	90.00 rpm	Solids/Sand :	6.0 % /	0.05 %	
BRT Hrs :	103.66	Avg. WOB :	13.20 klb	%Oil / O:W:	0 % /	0:93.0	
Circ. Hrs :	79.19	Avg. ROP :	11.95 m/hr	pH/Fluid Loss:	8.80 pH /	4.00 cptm	
Oper. Hrs :	103.66	Avg. SPP :	2974.00 psig	Max. Temp. :	96.00 degC		
MWD Schematics		BHA Schematics					
<div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div> <div><div>9. Positive Pulser SN: 8213</div><div>8. TM SN: 134334</div><div>7. PM SN: 34827 16.07 m From Bit</div><div>6. HCIM SN: 76895</div><div>5. CNP SN: 75464 11.73 m From Bit</div><div>4. SLD SN: 54290 8.46 m From Bit</div><div>3. DDS SN: 0 0.00 m From Bit</div><div>2. DGR SN: 77713 6.65 m From Bit</div><div>1. EWR-P4 SN: 61101 3.65 m From Bit</div></div>		<div><div>(10)</div><div>(9)</div><div>(8)</div><div>(7)</div><div>(6)</div><div>(5)</div><div>(4)</div><div>(3)</div><div>(2)</div><div>(1)</div></div> <div><div>Component</div><div>Length</div><div>O.D.</div><div>I.D.</div><div>(m)</div><div>(in)</div><div>(in)</div></div> <div><div>10. 9 x HWDP</div><div>84.29</div><div>5.000</div><div>3.000</div></div> <div><div>09. 2 x Drill Collar</div><div>18.64</div><div>6.750</div><div>2.813</div></div> <div><div>08. Drilling Jars</div><div>9.35</div><div>6.500</div><div>2.750</div></div> <div><div>07. 8 x Drill Collar</div><div>74.87</div><div>6.750</div><div>2.810</div></div> <div><div>06. NMDC</div><div>8.64</div><div>6.750</div><div>2.813</div></div> <div><div>05. Integral Blade Stabilizer</div><div>1.31</div><div>6.500</div><div>2.813</div></div> <div><div>04. Hang Off Sub</div><div>3.06</div><div>6.875</div><div>1.920</div></div> <div><div>03. MWD</div><div>15.89</div><div>6.750</div><div>1.920</div></div> <div><div>02. Near Bit Stabilizer</div><div>1.29</div><div>6.500</div><div>2.313</div></div> <div><div>01. Smith MA74EPX</div><div>0.31</div><div>8.500</div><div>2.000</div></div>					
Comments				MWD Performance			
Drilled 8½" hole to 3442.0m and POOH for bit and pulser change. Good detection throughout run and all recorded data recovered at surface.				Tool OD / Type : 6.75 in / P4M			
				MWD Real-time%: 99.00 %			
				MWD Recorded%: 100.00 %			
				Min. Inc. : 0.25 deg / 3131.71 m			
				Max. Inc. : 0.73 deg / 3421.00 m			
				Final Az. : 77.25 deg			
				Max Op. Press. : 5520 psig			

## Bitrun Summary

Run Time Data		Drilling Data		Mud Data			
MWD Run :	0500	Start Depth :	3442.00 m	Mud Type :	Drispac/Soltex		
Rig Bit No:	7	End Depth :	3545.00 m	Weight / Visc :	9.40 ppg /	140.00 spqt	
Hole Size :	8.50 in	Footage :	103.00 m	Chlorides :	18000 ppm		
Run Start :	22-Nov-04 14:43	Avg. Flow Rate :	530.00 gpm	PV / YP :	51.00 cp /	40.00 pa	
Run End :	24-Nov-04 09:17	Avg. RPM :	60.00 rpm	Solids/Sand :	5.8 % /	0.05 %	
BRT Hrs :	42.57	Avg. WOB :	38.00 klb	%Oil / O:W:	0 % /	0.93.2	
Circ. Hrs :	23.50	Avg. ROP :	5.56 m/hr	pH/Fluid Loss:	9.00 pH /	3.10 cptm	
Oper. Hrs :	42.57	Avg. SPP :	3980.00 psig	Max. Temp. :	120.00 degC		
MWD Schematics		BHA Schematics					
<div><div>(9)</div><div></div><div>(8)</div><div>(7)</div><div>(6)9. Positive Pulser SN: 8447</div><div>(5)8. TM SN: 163824</div><div>(4)7. PM SN: 34827 24.47 m From Bit</div><div>(3)6. HCIM SN: 76895</div><div>(2)5. CNP SN: 75464 20.13 m From Bit</div><div>(1)4. SLD SN: 54290 16.86 m From Bit</div><div>3. DDS SN: 0 0.00 m From Bit</div><div>2. DGR SN: 77713 15.05 m From Bit</div><div>1. EWR-P4 SN: 61101 12.05 m From Bit</div></div>		<div><div>(12)</div><div></div><div>(11)</div><div>(10)</div><div>(9)</div><div>(8)12. 9 x HWDP 84.29 5.000 3.000</div><div>(7)11. 2 x Drill Collar 18.64 6.750 2.813</div><div>(6)10. Drilling Jars 9.35 6.500 2.750</div><div>(5)09. 11 x Drill Collar 103.14 6.750 2.810</div><div>(4)08. NMDC 8.64 6.750 2.813</div><div>(3)07. Integral Blade Stabilizer 1.32 6.500 2.813</div><div>(2)06. Hang Off Sub 3.16 6.875 1.920</div><div>(1)05. MWD 15.89 6.750 1.920</div><div>04. Float Sub 0.77 6.500 2.845</div><div>03. Integral Blade Stabilizer 1.31 6.500 2.313</div><div>02. 6-3/4" SperryDrill Lobe 6/7 7.68 6.750 4.498</div><div>01. Hughes MX-20HDX 0.24 8.500 2.000</div></div>					
Comments				MWD Performance			
Drilled 8½" hole to 3545.0m, well TD and POOH for logging. Good detection throughout run and all recorded data recovered at surface.				Tool OD / Type :	6.75 in /	P4M	
				MWD Real-time%:	99.00 %		
				MWD Recorded%:	100.00 %		
				Min. Inc. :	0.45 deg /	3508.66 m	
				Max. Inc. :	0.52 deg /	3478.23 m	
				Final Az. :	83.89 deg		
				Max Op. Press. :	5685 psig		

## Directional Survey Data

Measured Depth (metres)	Inclination (degrees)	Direction (degrees)	Vertical Depth (metres)	Latitude (metres)	Departure (metres)	Vertical Section (metres)	Dogleg (deg/30m)
14.93	0.28	227.56	14.93	0.02 S	0.03 W	-0.02	TIE-IN
157.93	0.24	111.58	157.93	0.37 S	0.01 W	-0.11	0.09
242.92	0.31	216.07	242.92	0.62 S	0.03 E	-0.15	0.15
271.90	0.26	284.04	271.90	0.67 S	0.08 W	-0.27	0.33
300.92	0.17	201.71	300.92	0.69 S	0.16 W	-0.35	0.30
330.00	0.41	230.28	330.00	0.79 S	0.26 W	-0.47	0.29
359.06	0.41	266.92	359.06	0.87 S	0.45 W	-0.67	0.27
388.11	0.22	245.94	388.11	0.90 S	0.60 W	-0.83	0.22
417.14	0.34	274.84	417.14	0.91 S	0.74 W	-0.97	0.19
446.14	0.37	235.59	446.14	0.96 S	0.91 W	-1.14	0.25
475.16	0.40	278.80	475.16	1.00 S	1.08 W	-1.32	0.30
504.18	0.41	282.84	504.17	0.96 S	1.28 W	-1.50	0.03
533.18	0.31	240.27	533.17	0.97 S	1.45 W	-1.67	0.29
562.18	0.18	291.63	562.17	0.99 S	1.57 W	-1.78	0.25
591.14	0.22	204.81	591.13	1.03 S	1.63 W	-1.85	0.29
641.65	0.35	259.13	641.64	1.14 S	1.82 W	-2.07	0.17
669.83	0.22	257.56	669.82	1.17 S	1.96 W	-2.21	0.14
698.86	0.26	268.76	698.85	1.19 S	2.08 W	-2.33	0.06
728.56	0.19	269.22	728.55	1.19 S	2.19 W	-2.44	0.07
756.58	0.19	307.61	756.57	1.16 S	2.28 W	-2.51	0.13
786.17	0.16	314.47	786.16	1.10 S	2.35 W	-2.56	0.04
815.11	0.10	284.44	815.10	1.06 S	2.40 W	-2.60	0.09
844.16	0.12	314.77	844.15	1.04 S	2.44 W	-2.64	0.06
872.84	0.12	295.00	872.83	1.01 S	2.49 W	-2.67	0.04
902.16	0.18	266.56	902.15	1.00 S	2.56 W	-2.74	0.10
931.24	0.18	236.49	931.23	1.02 S	2.65 W	-2.83	0.10
960.31	0.14	220.66	960.30	1.07 S	2.71 W	-2.90	0.06
989.40	0.11	280.20	989.39	1.10 S	2.76 W	-2.95	0.13
1018.08	0.10	263.65	1018.07	1.09 S	2.81 W	-3.00	0.03
1046.97	0.04	218.89	1046.96	1.10 S	2.84 W	-3.04	0.08
1076.06	0.04	210.61	1076.05	1.12 S	2.85 W	-3.05	0.01
1105.00	0.11	202.29	1104.99	1.15 S	2.87 W	-3.08	0.07
1134.08	0.11	229.21	1134.07	1.20 S	2.90 W	-3.12	0.05
1163.21	0.04	91.07	1163.20	1.22 S	2.91 W	-3.14	0.14
1192.06	0.04	217.57	1192.05	1.22 S	2.91 W	-3.14	0.08
1221.26	0.04	44.16	1221.25	1.23 S	2.91 W	-3.14	0.09
1250.02	0.04	130.95	1250.01	1.22 S	2.89 W	-3.12	0.06
1278.99	0.04	15.22	1278.98	1.22 S	2.88 W	-3.11	0.07
1308.18	0.04	135.36	1308.17	1.22 S	2.87 W	-3.10	0.07
1337.26	0.10	149.36	1337.25	1.25 S	2.85 W	-3.09	0.06

## Directional Survey Data

Measured Depth (metres)	Inclination (degrees)	Direction (degrees)	Vertical Depth (metres)	Latitude (metres)	Departure (metres)	Vertical Section (metres)	Dogleg (deg/30m)
1366.26	0.10	170.95	1366.25	1.29 S	2.84 W	-3.09	0.04
1395.17	0.09	144.86	1395.16	1.34 S	2.82 W	-3.08	0.05
1424.33	0.06	136.27	1424.32	1.37 S	2.80 W	-3.07	0.03
1453.35	0.05	88.56	1453.34	1.38 S	2.77 W	-3.05	0.05
1482.62	0.05	114.69	1482.61	1.39 S	2.75 W	-3.03	0.02
1511.65	0.13	148.50	1511.64	1.42 S	2.72 W	-3.01	0.09
1540.65	0.13	153.08	1540.64	1.47 S	2.69 W	-3.00	0.01
1569.66	0.07	139.36	1569.65	1.51 S	2.67 W	-2.98	0.07
1598.46	0.16	142.24	1598.45	1.56 S	2.63 W	-2.96	0.10
1656.39	0.18	132.60	1656.38	1.68 S	2.52 W	-2.89	0.02
1685.50	0.15	157.44	1685.49	1.75 S	2.47 W	-2.86	0.08
1714.59	0.02	350.18	1714.58	1.78 S	2.45 W	-2.85	0.18
1743.68	0.15	253.46	1743.67	1.79 S	2.49 W	-2.89	0.16
1772.72	0.09	271.90	1772.71	1.80 S	2.55 W	-2.95	0.07
1801.66	0.02	223.84	1801.65	1.80 S	2.57 W	-2.97	0.08
1830.56	0.15	316.18	1830.55	1.77 S	2.60 W	-2.99	0.16
1859.47	0.08	329.16	1859.46	1.73 S	2.64 W	-3.02	0.07
1888.51	0.08	300.76	1888.50	1.70 S	2.67 W	-3.04	0.04
1917.61	0.11	284.00	1917.60	1.68 S	2.71 W	-3.08	0.04
1946.67	0.01	141.29	1946.66	1.68 S	2.74 W	-3.10	0.12
1975.72	0.11	344.70	1975.71	1.65 S	2.74 W	-3.10	0.12
2004.82	0.07	333.35	2004.81	1.61 S	2.76 W	-3.10	0.04
2033.84	0.06	12.54	2033.83	1.58 S	2.76 W	-3.10	0.05
2062.96	0.10	354.28	2062.95	1.54 S	2.76 W	-3.08	0.05
2091.93	0.09	5.90	2091.92	1.49 S	2.76 W	-3.07	0.02
2121.13	0.14	11.21	2121.12	1.44 S	2.75 W	-3.05	0.05
2150.14	0.09	37.57	2150.13	1.38 S	2.73 W	-3.01	0.07
2179.32	0.16	36.77	2179.31	1.33 S	2.69 W	-2.96	0.06
2208.29	0.19	58.16	2208.28	1.27 S	2.63 W	-2.88	0.08
2237.39	0.30	45.52	2237.38	1.20 S	2.53 W	-2.77	0.12
2266.43	0.38	58.15	2266.42	1.09 S	2.40 W	-2.61	0.12
2324.50	0.30	41.24	2324.49	0.88 S	2.14 W	-2.30	0.07
2353.51	0.43	63.46	2353.50	0.77 S	1.99 W	-2.13	0.20
2382.51	0.31	63.76	2382.50	0.69 S	1.82 W	-1.94	0.12
2493.19	0.42	64.03	2493.17	0.38 S	1.19 W	-1.25	0.03
2522.35	0.43	64.82	2522.33	0.29 S	1.00 W	-1.04	0.01
2551.47	0.45	74.18	2551.45	0.21 S	0.79 W	-0.82	0.08
2580.56	0.45	70.93	2580.54	0.14 S	0.57 W	-0.59	0.03
2609.65	0.60	70.66	2609.63	0.06 S	0.32 W	-0.32	0.15
2638.47	0.67	69.43	2638.45	0.05 N	0.02 W	0.00	0.08

## Directional Survey Data

Measured Depth (metres)	Inclination (degrees)	Direction (degrees)	Vertical Depth (metres)	Latitude (metres)	Departure (metres)	Vertical Section (metres)	Dogleg (deg/30m)
2696.63	0.54	66.62	2696.61	0.28 N	0.55 E	0.61	0.07
2725.43	0.56	70.87	2725.40	0.38 N	0.81 E	0.88	0.05
2754.41	0.42	60.49	2754.38	0.48 N	1.03 E	1.13	0.17
2783.57	0.34	64.20	2783.54	0.57 N	1.21 E	1.32	0.08
2811.73	0.34	63.34	2811.70	0.65 N	1.36 E	1.48	0.01
2841.41	0.44	69.81	2841.38	0.73 N	1.54 E	1.68	0.11
2899.47	0.28	70.57	2899.44	0.85 N	1.89 E	2.05	0.08
2928.59	0.38	81.57	2928.56	0.89 N	2.05 E	2.22	0.12
2957.61	0.45	75.30	2957.58	0.93 N	2.25 E	2.42	0.09
2983.90	0.39	63.39	2983.87	1.00 N	2.44 E	2.62	0.12
3015.37	0.34	80.22	3015.34	1.06 N	2.62 E	2.82	0.11
3044.33	0.38	92.33	3044.30	1.07 N	2.81 E	2.99	0.09
3069.85	0.38	83.94	3069.82	1.08 N	2.98 E	3.16	0.07
3102.61	0.31	89.57	3102.58	1.09 N	3.17 E	3.35	0.07
3131.71	0.25	91.08	3131.68	1.09 N	3.32 E	3.49	0.06
3160.75	0.32	87.86	3160.72	1.09 N	3.47 E	3.63	0.07
3189.89	0.28	92.69	3189.85	1.09 N	3.62 E	3.78	0.05
3218.90	0.33	85.93	3218.86	1.09 N	3.77 E	3.93	0.07
3247.89	0.28	78.16	3247.85	1.11 N	3.92 E	4.08	0.07
3276.89	0.41	87.73	3276.85	1.13 N	4.10 E	4.25	0.15
3302.14	0.39	69.02	3302.10	1.17 N	4.27 E	4.42	0.16
3334.87	0.45	62.58	3334.83	1.27 N	4.48 E	4.66	0.07
3363.86	0.53	53.76	3363.82	1.40 N	4.69 E	4.89	0.11
3421.00	0.73	77.25	3420.96	1.63 N	5.26 E	5.50	0.17
3478.23	0.52	74.50	3478.18	1.78 N	5.87 E	6.13	0.11
3508.66	0.45	83.89	3508.61	1.83 N	6.12 E	6.39	0.11
3545.00	0.45	83.89	3544.95	1.86 N	6.40 E	6.67	0.00

## Directional Survey Data

CALCULATION BASED ON Minimum Curvature METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT

TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD

VERTICAL SECTION IS COMPUTED ALONG CLOSURE OF 73.78 DEGREES (GRID)

A TOTAL CORRECTION OF 11.50 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.

HORIZONTAL DISPLACEMENT(CLOSURE) AT 3545.00 METRES

IS 6.67 METRES ALONG 73.78 DEGREES (GRID)

The first two surveys were taken inside casing so azimuths are invalid.

RT-MSL = 39.9m

Final survey is projected to TD.

