

OXY USA RMAT

Garfield County, CO NAD27

Shell 797-03B Pad

Shell 797-03-31B - Slot S

OH

Design: OH

Standard Survey Report

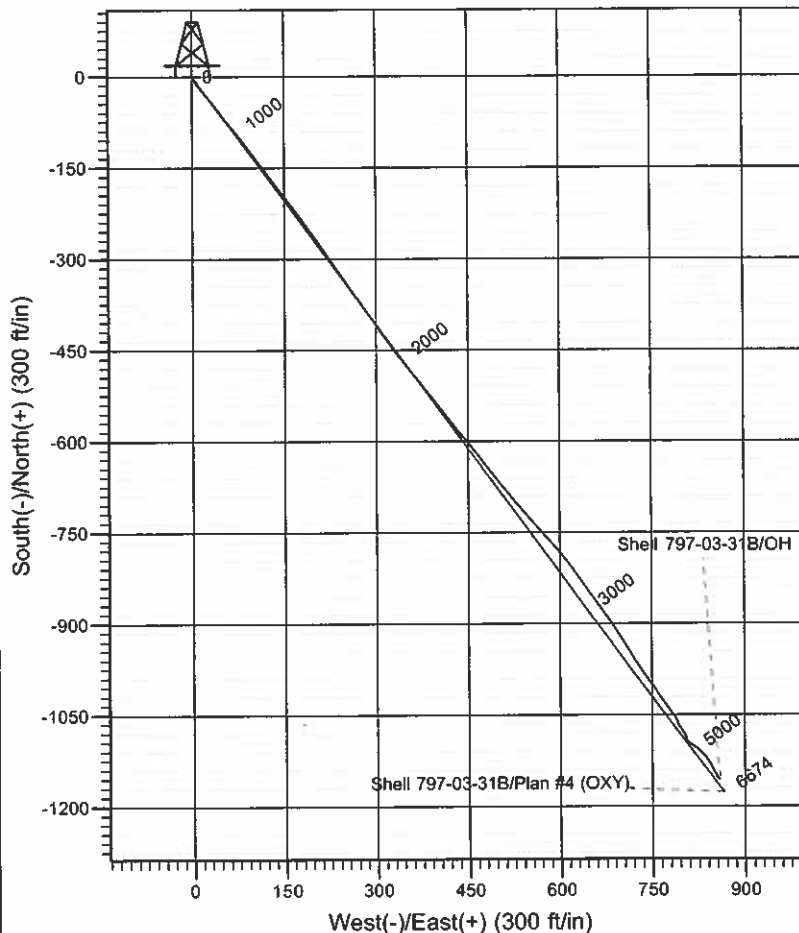
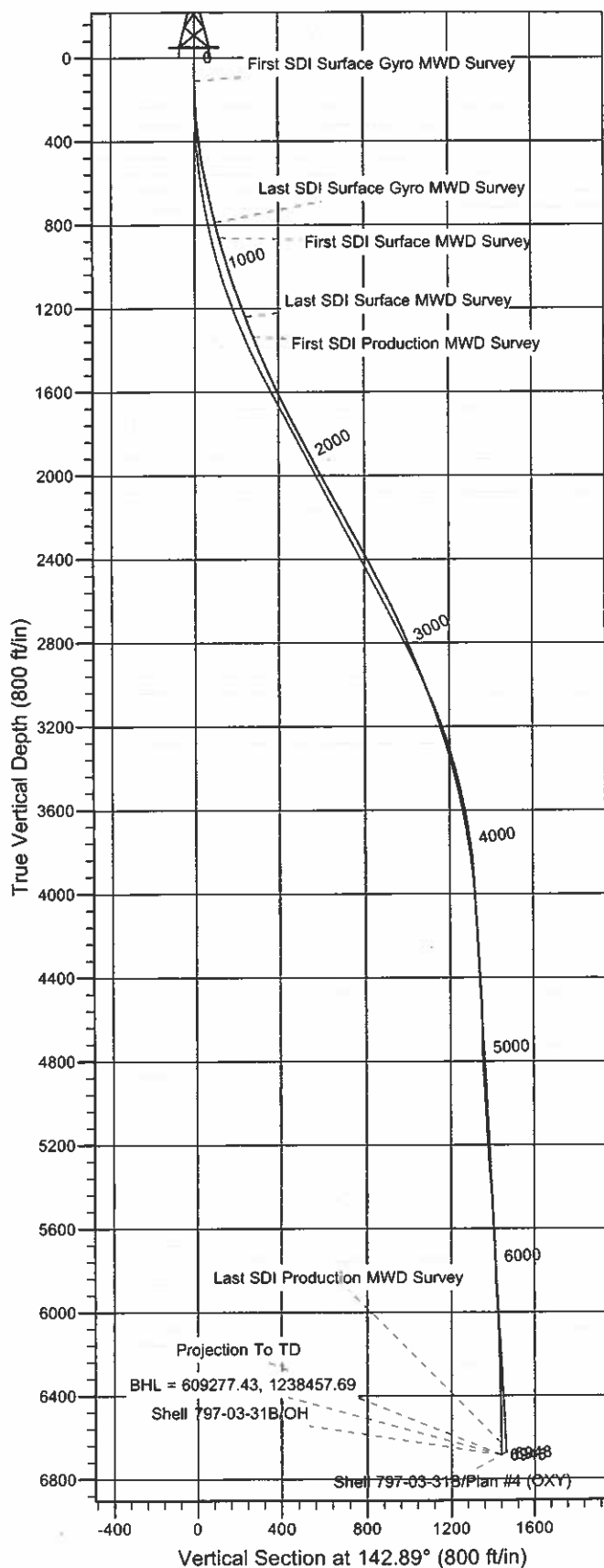
02 December, 2010



Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 797-03-31B
Wellbore: OH
Design: OH



Well Details: Shell 797-03-31B

+N/-S	+E/-W	TVD Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)und Level: 6325.00	Slot
0.00	0.00	Northings Eastings Latitude Longitude 610458.11 1237633.78 39° 28' 42.234 N 108° 12' 4.170 W	S

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Shell 797-03-31B - Slot S, True North
Vertical (TVD) Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
Section (VS) Reference: Slot - S(0.00N, 0.00E)
Measured Depth Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD27

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Colorado Central 502

System Datum: Mean Sea Level

Plan: OH

9:10, December 02 2010
Created By: Rex Hall

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-31B - Slot S
Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Project	Garfield County, CO NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado Central 502		

Site	Shell 797-03B Pad, Sec 3 T7S R97W				
Site Position:		Northing:	610,470.20 usft	Latitude:	39° 28' 42.340 N
From:	Lat/Long	Easting:	1,237,588.64 usft	Longitude:	108° 12' 4.750 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.70 °

Well	Shell 797-03-31B - Slot S,					
Well Position	+N/-S	0.00 ft	Northing:	610,458.11 usft	Latitude:	39° 28' 42.234 N
	+E/-W	0.00 ft	Easting:	1,237,633.78 usft	Longitude:	108° 12' 4.170 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,325.00 ft	

Wellbore	OH			
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2005-10	9/15/2008	10.78	65.77	52,511

Design	OH			
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Audit Notes:					0.00
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	142.89	

Survey Program		Date	12/2/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
113.00	798.00	Survey #1 - Surface Gyro MWD (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
874.00	1,272.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	
1,377.00	6,945.00	Survey #3 - Production MWD (OH)	MWD-SDI	MWD - Standard ISCWSA	

Survey	Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	113.00	0.88	167.87	113.00	-0.85	0.18	0.79	0.78	0.78	0.00
First SDI Surface Gyro MWD Survey										
	143.00	1.58	161.72	142.99	-1.47	0.36	1.39	2.37	2.33	-20.50
	174.00	2.11	154.78	173.97	-2.39	0.74	2.35	1.85	1.71	-22.39
	206.00	2.82	148.18	205.94	-3.59	1.40	3.71	2.39	2.22	-20.63
	237.00	3.43	143.26	236.90	-4.98	2.36	5.40	2.15	1.97	-15.87
	268.00	4.22	142.73	267.83	-6.63	3.61	7.46	2.55	2.55	-1.71
	299.00	4.93	143.44	298.73	-8.61	5.09	9.94	2.30	2.29	2.29

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-31B - Slot S
Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
362.00	5.98	145.90	361.44	-13.50	8.54	15.92	1.71	1.67	3.90
393.00	6.77	141.50	392.25	-16.27	10.59	19.36	2.99	2.55	-14.19
424.00	7.39	139.57	423.01	-19.22	13.02	23.18	2.14	2.00	-6.23
487.00	9.06	138.78	485.36	-26.03	18.91	32.17	2.66	2.65	-1.25
548.00	11.52	141.59	545.38	-34.42	25.86	43.05	4.11	4.03	4.61
611.00	11.96	142.65	607.06	-44.54	33.73	55.87	0.78	0.70	1.68
705.00	13.28	144.67	698.79	-61.09	45.88	76.40	1.48	1.40	2.15
798.00	14.16	140.98	789.13	-78.64	59.22	98.45	1.33	0.95	-3.97
Last SDI Surface Gyro MWD Survey									
874.00	14.95	140.13	862.70	-93.39	71.36	117.53	1.08	1.04	-1.12
First SDI Surface MWD Survey									
967.00	16.88	143.65	952.13	-113.47	87.06	143.02	2.32	2.08	3.78
1,061.00	18.03	143.03	1,041.80	-136.09	103.89	171.21	1.24	1.22	-0.66
1,156.00	19.61	144.25	1,131.72	-160.77	122.05	201.85	1.71	1.66	1.28
1,251.00	21.10	142.95	1,220.78	-187.36	141.67	234.89	1.64	1.57	-1.37
1,272.00	21.54	142.15	1,240.35	-193.42	146.31	242.53	2.51	2.10	-3.81
Last SDI Surface MWD Survey									
1,377.00	21.63	142.86	1,337.98	-224.07	169.82	281.15	0.26	0.09	0.68
First SDI Production MWD Survey									
1,472.00	22.69	145.23	1,425.97	-253.08	190.84	316.97	1.46	1.12	2.49
1,568.00	23.92	144.35	1,514.13	-284.10	212.75	354.93	1.33	1.28	-0.92
1,663.00	26.12	145.84	1,600.21	-317.06	235.72	395.07	2.41	2.32	1.57
1,758.00	26.03	144.26	1,685.54	-351.29	259.64	436.79	0.74	-0.09	-1.66
1,853.00	27.70	145.40	1,770.29	-386.38	284.35	479.70	1.84	1.76	1.20
1,948.00	26.56	145.05	1,854.84	-421.97	309.06	522.98	1.21	-1.20	-0.37
2,044.00	27.61	142.33	1,940.31	-457.17	334.95	566.68	1.69	1.09	-2.83
2,140.00	28.75	141.80	2,024.93	-492.92	362.82	612.00	1.22	1.19	-0.55
2,235.00	28.05	141.36	2,108.50	-528.33	390.90	657.18	0.77	-0.74	-0.46
2,330.00	28.84	142.94	2,192.03	-564.06	418.66	702.42	1.15	0.83	1.66
2,425.00	27.96	139.52	2,275.60	-599.28	446.92	747.57	1.95	-0.93	-3.60
2,521.00	27.87	143.12	2,360.43	-634.35	475.00	792.47	1.76	-0.09	3.75
2,616.00	28.31	141.19	2,444.25	-669.67	502.45	837.20	1.06	0.46	-2.03
2,710.00	27.26	139.95	2,527.41	-703.52	530.27	880.98	1.28	-1.12	-1.32
2,806.00	25.68	138.55	2,613.34	-735.94	558.19	923.68	1.77	-1.65	-1.46
2,902.00	24.01	138.11	2,700.45	-766.07	585.00	963.88	1.75	-1.74	-0.46
2,997.00	23.04	140.75	2,787.56	-794.86	609.67	1,001.72	1.51	-1.02	2.78
3,093.00	22.07	145.05	2,876.22	-824.19	631.89	1,038.52	1.99	-1.01	4.48
3,189.00	21.19	145.14	2,965.46	-853.21	652.14	1,073.88	0.92	-0.92	0.09
3,285.00	20.66	144.09	3,055.13	-881.16	671.99	1,108.15	0.68	-0.55	-1.09
3,380.00	19.17	145.84	3,144.45	-907.65	690.58	1,140.49	1.69	-1.57	1.84
3,476.00	17.15	148.13	3,235.66	-932.71	706.90	1,170.33	2.23	-2.10	2.39
3,572.00	16.71	149.01	3,327.50	-956.56	721.48	1,198.14	0.53	-0.46	0.92
3,668.00	14.77	147.25	3,419.90	-978.69	735.21	1,224.07	2.08	-2.02	-1.83
3,764.00	12.49	142.24	3,513.19	-997.19	748.19	1,246.66	2.67	-2.38	-5.22

Scientific Drilling International

Survey Report

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well Shell 797-03-31B - Slot S
Project:	Garfield County, CO NAD27	TVD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Site:	Shell 797-03B Pad	MD Reference:	GL 6325' & RKB 22' @ 6347.00ft (M37)
Well:	Shell 797-03-31B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
3,859.00	10.73	148.07	3,606.25	-1,012.82	759.16	1,265.74	2.22	-1.85	6.14	
3,954.00	10.55	145.05	3,699.61	-1,027.45	768.82	1,283.24	0.62	-0.19	-3.18	
4,049.00	7.91	143.56	3,793.38	-1,039.84	777.68	1,298.47	2.79	-2.78	-1.57	
4,144.00	6.60	145.40	3,887.61	-1,049.60	784.66	1,310.46	1.40	-1.38	1.94	
4,239.00	4.66	151.73	3,982.15	-1,057.49	789.59	1,319.73	2.14	-2.04	6.66	
4,334.00	3.43	165.71	4,076.91	-1,063.64	792.12	1,326.16	1.65	-1.29	14.72	
4,429.00	3.87	146.99	4,171.73	-1,069.09	794.57	1,331.98	1.33	0.46	-19.71	
4,524.00	3.43	145.93	4,266.53	-1,074.13	797.91	1,338.01	0.47	-0.46	-1.12	
4,620.00	2.90	146.81	4,362.39	-1,078.54	800.85	1,343.30	0.55	-0.55	0.92	
4,715.00	2.73	148.74	4,457.27	-1,082.49	803.34	1,347.95	0.20	-0.18	2.03	
4,810.00	2.46	155.51	4,552.17	-1,086.27	805.36	1,352.19	0.43	-0.28	7.13	
4,906.00	1.58	225.82	4,648.13	-1,089.07	805.26	1,354.37	2.54	-0.92	73.24	
5,000.00	1.23	162.28	4,742.10	-1,090.94	804.64	1,355.48	1.61	-0.37	-67.60	
5,096.00	3.69	130.73	4,838.01	-1,093.93	807.29	1,359.47	2.83	2.56	-32.86	
5,191.00	3.61	124.84	4,932.82	-1,097.64	812.07	1,365.30	0.40	-0.08	-6.20	
5,286.00	3.34	126.86	5,027.64	-1,101.01	816.73	1,370.80	0.31	-0.28	2.13	
5,381.00	2.64	124.66	5,122.51	-1,103.91	820.75	1,375.54	0.75	-0.74	-2.32	
5,477.00	3.43	136.62	5,218.38	-1,107.26	824.54	1,380.50	1.05	0.82	12.46	
5,572.00	4.92	134.86	5,313.12	-1,112.19	829.38	1,387.36	1.57	1.57	-1.85	
5,667.00	3.96	136.88	5,407.84	-1,117.46	834.51	1,394.65	1.02	-1.01	2.13	
5,762.00	3.34	141.89	5,502.64	-1,122.03	838.46	1,400.68	0.73	-0.65	5.27	
5,858.00	2.99	147.51	5,598.50	-1,126.35	841.53	1,405.97	0.49	-0.36	5.85	
5,922.00	2.29	156.92	5,662.43	-1,128.93	842.93	1,408.88	1.28	-1.09	14.70	
6,048.00	2.02	158.68	5,788.34	-1,133.32	844.72	1,413.46	0.22	-0.21	1.40	
6,143.00	3.69	147.43	5,883.22	-1,137.45	846.98	1,418.12	1.85	1.76	-11.84	
6,239.00	2.99	147.87	5,979.06	-1,142.18	849.97	1,423.69	0.73	-0.73	0.46	
6,334.00	2.20	157.27	6,073.96	-1,145.96	851.99	1,427.92	0.94	-0.83	9.89	
6,429.00	1.67	160.17	6,168.90	-1,148.94	853.17	1,431.01	0.57	-0.56	3.05	
6,524.00	1.32	149.27	6,263.87	-1,151.18	854.20	1,433.42	0.47	-0.37	-11.47	
6,619.00	1.06	148.83	6,358.85	-1,152.88	855.21	1,435.38	0.27	-0.27	-0.46	
6,714.00	0.97	130.73	6,453.84	-1,154.15	856.27	1,437.04	0.35	-0.09	-19.05	
6,807.00	0.88	128.62	6,546.82	-1,155.11	857.43	1,438.50	0.10	-0.10	-2.27	
6,890.00	0.44	102.25	6,629.82	-1,155.58	858.24	1,439.36	0.63	-0.53	-31.77	
Last SDI Production MWD Survey										
6,945.00	0.44	102.25	6,684.82	-1,155.67	858.65	1,439.68	0.00	0.00	0.00	
Projection To TD - BHL = 609277.43, 1238457.69										

Scientific Drilling International

Survey Report

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 797-03-31B
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Shell 797-03-31B - Slot S
TVD Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
MD Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies-R5000.1

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
113.00	113.00	-0.85	0.18	First SDI Surface Gyro MWD Survey
798.00	789.13	-78.64	59.22	Last SDI Surface Gyro MWD Survey
874.00	862.70	-93.39	71.36	First SDI Surface MWD Survey
1,272.00	1,240.35	-193.42	146.31	Last SDI Surface MWD Survey
1,377.00	1,337.98	-224.07	169.82	First SDI Production MWD Survey
6,890.00	6,629.82	-1,155.58	858.24	Last SDI Production MWD Survey
6,945.00	6,684.82	-1,155.67	858.65	Projection To TD
6,945.00	6,684.82	-1,155.67	858.65	BHL = 609277.43, 1238457.69

Checked By: _____ Approved By: _____ Date: _____