Scientific Drilling

OXY USA RMAT

Garfield County, CO NAD27
Shell 797-03B Pad
Shell 697-34-24

OH

Design: OH

Standard Survey Report

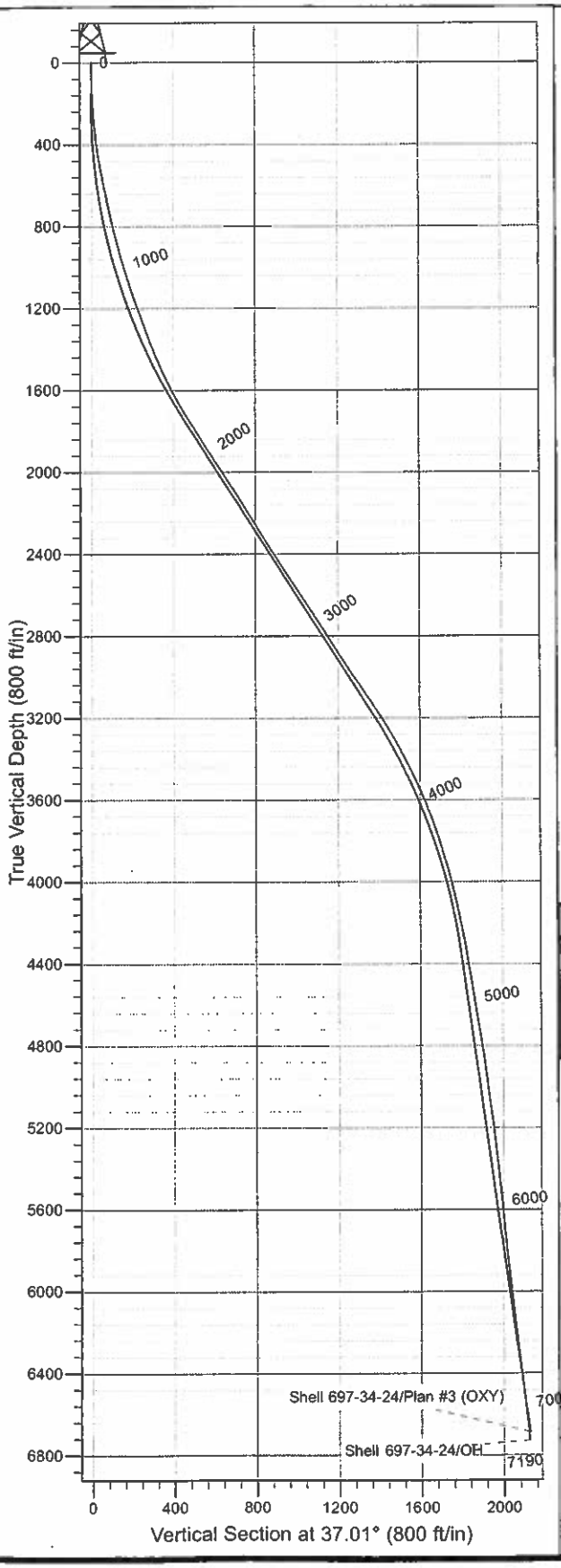
09 November, 2010

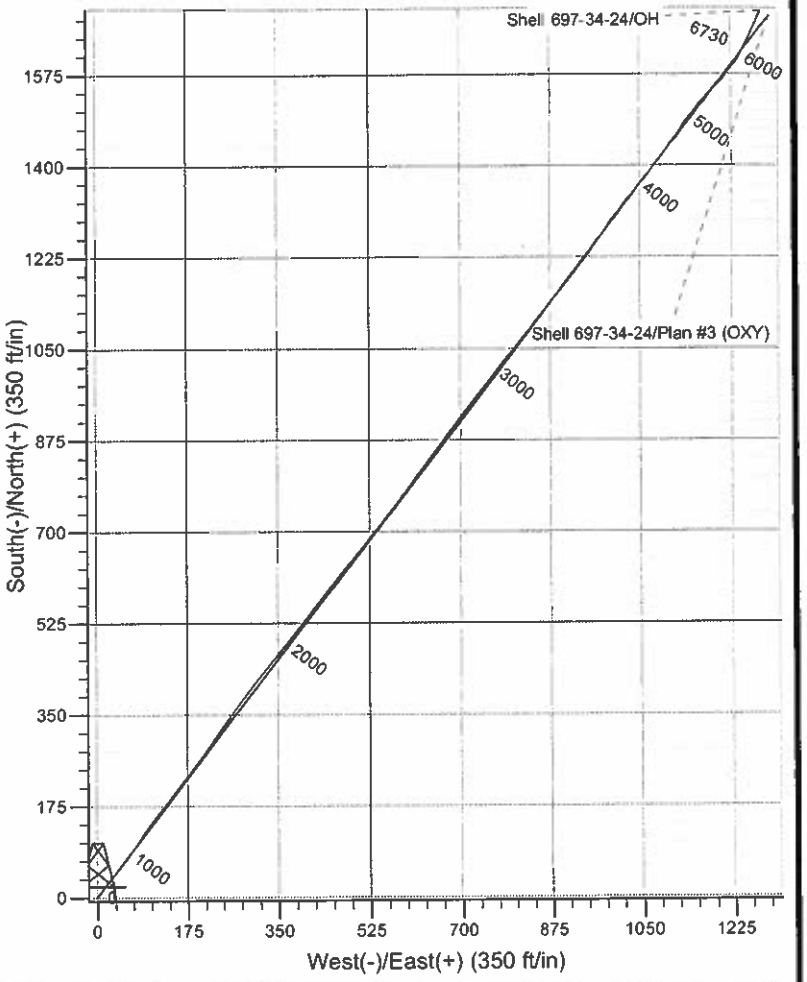
OXY

Scientific Drilling

Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 697-34-24
Wellbore: OH
Design: OH

OXY USA RMAT





WELL DETAILS: Shell 697-34-24					
Ground Level: GL 6325' & RKB 22' @ 6347.00ft (M22)					
		Northing	Easting	Latitude	Longitude
0.00	0.00	610474.20	1237622.97	39° 28' 42.390 N	108° 12' 4.314 W

REFERENCE INFORMATION	
Co-ordinate (N/E) Reference:	Well Shell 697-34-24, True North
Vertical (TVD) Reference:	GL 6325' & RKB 22' @ 6347.00ft (M22)
Section (VS) Reference:	Slot - (0.00N, 0.00E)
Measured Depth Reference:	GL 6325' & RKB 22' @ 6347.00ft (M22)
Calculation Method:	Minimum Curvature
Local North:	True
Location:	Sec 3 T7S R97W

PROJECT DETAILS: Garfield County, CO NAD27	Design: OH (Shell 697-34-24/OH)
Geodetic System: US State Plane 1927 (Exact solution) Datum: NAD 1927 (NADCON CONUS) Ellipsoid: Clarke 1866 Zone: Colorado Central 502	Created By: Julie Cruse Date: 2010-11-09

Company:	OXY USA RMAT	**Local Co-ordinate Reference:**	Well Shell 697-34-24
Project:	Garfield County, CO NAD27	**TVD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M22)
Site:	Shell 797-03B Pad	**MD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M22)
Well:	Shell 697-34-24	**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 697-34-24,					
Well Position	**+N/-S**	0.00 ft	**Northing:**	610,474.21 usft	**Latitude:**	39° 28' 42.390 N
	+E/-W	0.00 ft	**Easting:**	1,237,622.97 usft	**Longitude:**	108° 12' 4.314 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	6,325.00 ft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2005-10	2010-10-20	10.50	65.72	52,308

Design	OH					
Audit Notes:						
Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**		0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**		
	0.00	0.00	0.00	37.01		

Survey Program **Date** 2010-11-09

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
112.00	549.00	Survey #1 - Surface Gyro MWD (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3
623.00	1,284.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
1,376.00	7,190.00	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
112.00	1.41	14.24	111.99	1.34	0.34	1.27	1.26	1.26	0.00
First SDI Surface Gyro MWD Survey									
144.00	2.29	35.24	143.97	2.24	0.80	2.27	3.43	2.75	65.63
175.00	2.82	31.20	174.94	3.40	1.56	3.65	1.80	1.71	-13.03
206.00	3.52	43.07	205.89	4.75	2.60	5.36	3.08	2.26	38.29
237.00	4.22	40.69	236.82	6.31	4.00	7.44	2.32	2.26	-7.68
268.00	4.66	42.54	267.73	8.10	5.59	9.83	1.49	1.42	5.97
300.00	5.28	39.64	299.61	10.19	7.41	12.60	2.09	1.94	-9.06

Company:	OXY USA RMAT	**Local Co-ordinate Reference:**	Well Shell 697-34-24
Project:	Garfield County, CO NAD27	**TVD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M22)
Site:	Shell 797-03B Pad	**MD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M22)
Well:	Shell 697-34-24	**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	7.13	41.66	361.24	15.26	11.79	19.28	3.00	2.98	3.26
456.00	9.50	39.11	454.25	25.64	20.56	32.85	2.55	2.52	-2.71
549.00	10.73	34.01	545.80	38.77	30.24	49.17	1.63	1.32	-5.48
Last SDI Surface Gyro MWD Survey									
623.00	11.33	39.83	618.44	50.07	38.75	63.31	1.71	0.81	7.86
First SDI MWD Survey									
717.00	12.49	37.66	710.41	65.20	50.88	82.69	1.32	1.23	-2.31
811.00	13.72	36.17	801.96	82.25	63.67	104.00	1.36	1.31	-1.59
904.00	14.77	35.11	892.10	100.85	77.00	126.88	1.16	1.13	-1.14
999.00	16.53	33.71	983.58	122.00	91.46	152.48	1.89	1.85	-1.47
1,094.00	17.85	36.52	1,074.33	144.95	107.63	180.53	1.64	1.39	2.96
1,189.00	19.26	39.15	1,164.40	168.80	126.19	210.75	1.73	1.48	2.77
1,284.00	20.31	37.92	1,253.79	193.96	146.21	242.89	1.19	1.11	-1.29
Last Survey in 12 1/4" Hole									
1,376.00	21.10	38.01	1,339.84	219.60	166.22	275.42	0.86	0.86	0.10
First Survey in 7 7/8" Hole									
1,470.00	22.25	37.84	1,427.20	246.99	187.56	310.13	1.23	1.22	-0.18
1,566.00	24.36	34.76	1,515.36	277.61	210.00	348.09	2.54	2.20	-3.21
1,661.00	27.26	36.61	1,600.88	311.18	234.15	389.43	3.17	3.05	1.95
1,756.00	30.69	35.55	1,683.97	348.38	261.23	435.44	3.65	3.61	-1.12
1,851.00	32.18	36.17	1,765.03	388.53	290.26	484.97	1.60	1.57	0.65
1,947.00	33.06	39.59	1,845.89	429.35	322.03	536.70	2.13	0.92	3.56
2,042.00	32.10	38.98	1,925.94	468.94	354.43	587.81	1.07	-1.01	-0.64
2,138.00	33.33	37.84	2,006.71	509.60	386.65	639.68	1.43	1.28	-1.19
2,233.00	32.62	38.01	2,086.41	550.39	418.43	691.38	0.75	-0.75	0.18
2,328.00	32.18	36.43	2,166.62	590.91	449.22	742.28	1.00	-0.46	-1.66
2,423.00	31.83	39.68	2,247.19	630.55	480.24	792.60	1.85	-0.37	3.42
2,519.00	31.48	39.59	2,328.91	669.35	512.38	842.93	0.37	-0.36	-0.09
2,614.00	32.62	37.31	2,409.43	708.84	543.71	893.32	1.75	1.20	-2.40
2,708.00	34.21	36.78	2,487.89	750.15	574.89	945.08	1.72	1.69	-0.56
2,804.00	33.15	36.87	2,567.77	792.77	606.80	998.32	1.11	-1.10	0.09
2,900.00	32.71	35.55	2,648.35	834.87	637.63	1,050.50	0.88	-0.46	-1.38
2,995.00	33.41	36.69	2,727.97	876.73	668.18	1,102.31	0.99	0.74	1.20
3,091.00	31.39	37.84	2,809.02	917.67	699.32	1,153.75	2.20	-2.10	1.20
3,187.00	32.45	38.01	2,890.50	957.71	730.51	1,204.50	1.11	1.10	0.18
3,282.00	34.03	37.48	2,969.96	998.89	762.39	1,256.56	1.69	1.66	-0.56
3,378.00	34.38	40.38	3,049.36	1,040.86	796.29	1,310.49	1.74	0.36	3.02
3,474.00	33.59	38.28	3,128.96	1,082.35	830.31	1,364.10	1.47	-0.82	-2.19
3,570.00	32.54	38.45	3,209.41	1,123.42	862.81	1,416.46	1.10	-1.09	0.18
3,666.00	30.07	40.38	3,291.43	1,161.97	894.45	1,466.29	2.78	-2.57	2.01
3,761.00	27.96	37.66	3,374.51	1,197.73	923.48	1,512.32	2.62	-2.22	-2.86
3,857.00	26.56	36.69	3,459.85	1,232.76	950.06	1,556.29	1.53	-1.46	-1.01
3,952.00	24.36	33.79	3,545.62	1,266.08	973.65	1,597.10	2.66	-2.32	-3.05
4,046.00	21.63	37.57	3,632.15	1,295.93	995.00	1,633.78	3.30	-2.90	4.02

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Site:	Shell 797-03B Pad	**MD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M22)
Well:	Shell 697-34-24	**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)
4,142.00	19.35	38.36	3,722.07	1,322.43	1,015.66	1,667.38	2.39	-2.38	0.82
4,237.00	17.41	36.96	3,812.22	1,346.13	1,033.98	1,697.33	2.09	-2.04	-1.47
4,332.00	16.44	39.59	3,903.10	1,367.85	1,051.09	1,724.97	1.30	-1.02	2.77
4,427.00	14.60	39.07	3,994.63	1,387.50	1,067.20	1,750.37	1.94	-1.94	-0.55
4,522.00	12.49	36.08	4,086.99	1,405.10	1,080.80	1,772.61	2.34	-2.22	-3.15
4,618.00	11.70	36.34	4,180.86	1,421.33	1,092.68	1,792.72	0.82	-0.82	0.27
4,713.00	10.55	36.61	4,274.07	1,436.07	1,103.58	1,811.05	1.21	-1.21	0.28
4,808.00	9.94	35.55	4,367.55	1,449.73	1,113.53	1,827.95	0.67	-0.64	-1.12
4,904.00	9.32	35.20	4,462.20	1,462.82	1,122.83	1,844.00	0.65	-0.65	-0.36
4,998.00	8.62	32.21	4,555.05	1,475.00	1,130.97	1,858.63	0.89	-0.74	-3.18
5,094.00	9.23	37.48	4,649.89	1,487.20	1,139.49	1,873.50	1.06	0.64	5.49
5,189.00	9.85	39.59	4,743.58	1,499.51	1,149.31	1,889.23	0.75	0.65	2.22
5,284.00	8.44	37.92	4,837.37	1,511.27	1,158.77	1,904.32	1.51	-1.48	-1.76
5,379.00	7.74	39.42	4,931.42	1,521.71	1,167.12	1,917.68	0.77	-0.74	1.58
5,475.00	7.03	40.74	5,026.62	1,531.16	1,175.06	1,930.00	0.76	-0.74	1.38
5,570.00	8.18	43.46	5,120.79	1,540.47	1,183.50	1,942.52	1.27	1.21	2.86
5,665.00	7.56	43.11	5,214.89	1,549.93	1,192.42	1,955.45	0.65	-0.65	-0.37
5,761.00	6.51	43.29	5,310.17	1,558.51	1,200.47	1,967.14	1.09	-1.09	0.19
5,856.00	6.16	44.08	5,404.59	1,566.09	1,207.71	1,977.55	0.38	-0.37	0.83
5,951.00	5.98	37.13	5,499.06	1,573.69	1,214.24	1,987.56	0.80	-0.19	-7.32
6,046.00	5.10	35.64	5,593.61	1,581.07	1,219.69	1,996.73	0.94	-0.93	-1.57
6,141.00	4.75	35.29	5,688.26	1,587.71	1,224.42	2,004.88	0.37	-0.37	-0.37
6,237.00	5.98	42.93	5,783.84	1,594.62	1,230.12	2,013.83	1.48	1.28	7.96
6,332.00	6.77	33.44	5,878.25	1,602.92	1,236.58	2,024.34	1.38	0.83	-9.99
6,427.00	7.65	28.26	5,972.50	1,613.16	1,242.66	2,036.18	1.15	0.93	-5.45
6,522.00	6.60	26.67	6,066.77	1,623.61	1,248.10	2,047.80	1.12	-1.11	-1.67
6,617.00	6.16	28.08	6,161.18	1,632.98	1,252.95	2,058.21	0.49	-0.46	1.48
6,712.00	6.86	23.25	6,255.57	1,642.69	1,257.59	2,068.75	0.93	0.74	-5.08
6,805.00	8.09	23.86	6,347.77	1,653.78	1,262.43	2,080.52	1.33	1.32	0.66
6,901.00	7.65	25.71	6,442.87	1,665.72	1,267.93	2,093.36	0.53	-0.46	1.93
6,997.00	6.51	25.53	6,538.14	1,676.38	1,273.05	2,104.96	1.19	-1.19	-0.19
7,092.00	6.16	20.87	6,632.56	1,686.01	1,277.19	2,115.14	0.65	-0.37	-4.91
7,132.00	5.63	20.87	6,672.34	1,689.85	1,278.65	2,119.08	1.33	-1.33	0.00
Last SDI MWD Survey									
7,190.00	5.63	20.87	6,730.06	1,695.16	1,280.68	2,124.55	0.00	0.00	0.00

Projection to TD - BHL = 612130.54 ft N, 1238953.48 ft E

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Site:	Shell 797-03B Pad	**MD Reference:**	GL 6325' & RKB 22' @ 6347.00ft (M22)
Well:	Shell 697-34-24	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Rockies-R5000.1

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
112.00	111.99	1.34	0.34	First SDI Surface Gyro MWD Survey
549.00	545.80	38.77	30.24	Last SDI Surface Gyro MWD Survey
623.00	618.44	50.07	38.75	First SDI MWD Survey
1,284.00	1,253.79	193.96	146.21	Last Survey in 12 1/4" Hole
1,376.00	1,339.84	219.60	166.22	First Survey in 7 7/8" Hole
7,132.00	6,672.34	1,689.85	1,278.65	Last SDI MWD Survey
7,190.00	6,730.06	1,695.16	1,280.68	Projection to TD
7,190.00	6,730.06	1,695.16	1,280.68	BHL = 612130.54 ft N, 1238953.48 ft E

Checked By: _____ Approved By: _____ Date: _____