



Scientific Drilling

OXY USA RMAT

Garfield County, CO NAD27

Shell 797-03B Pad

Shell 797-03-15A

OH

Design: OH

Standard Survey Report

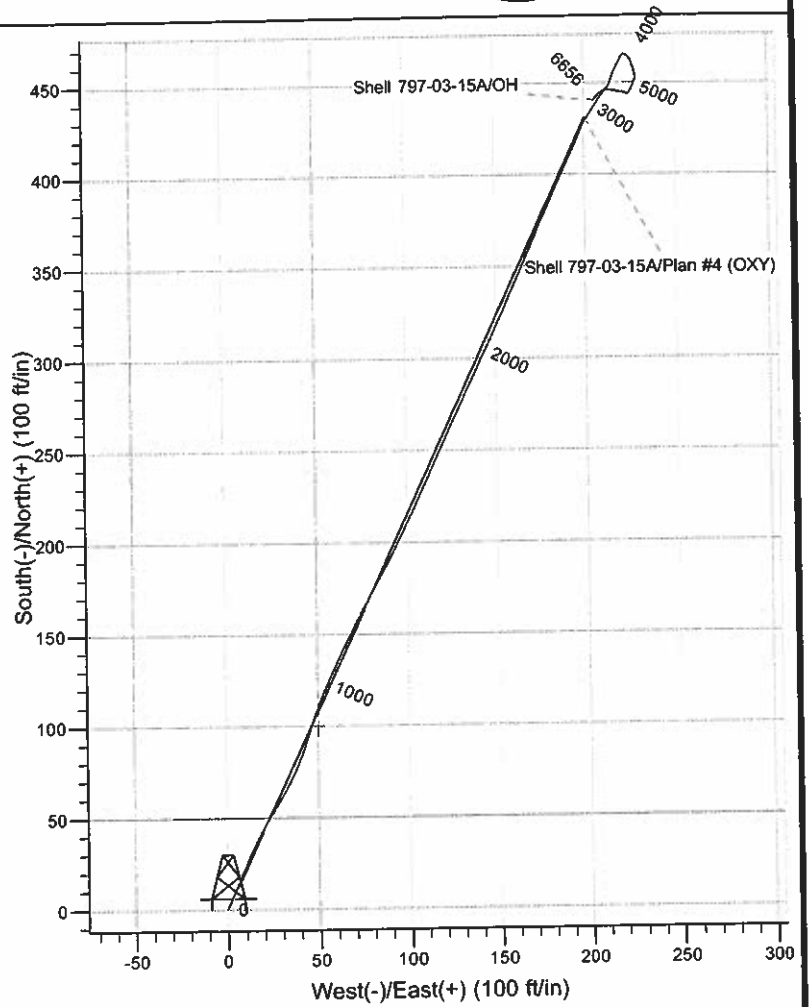
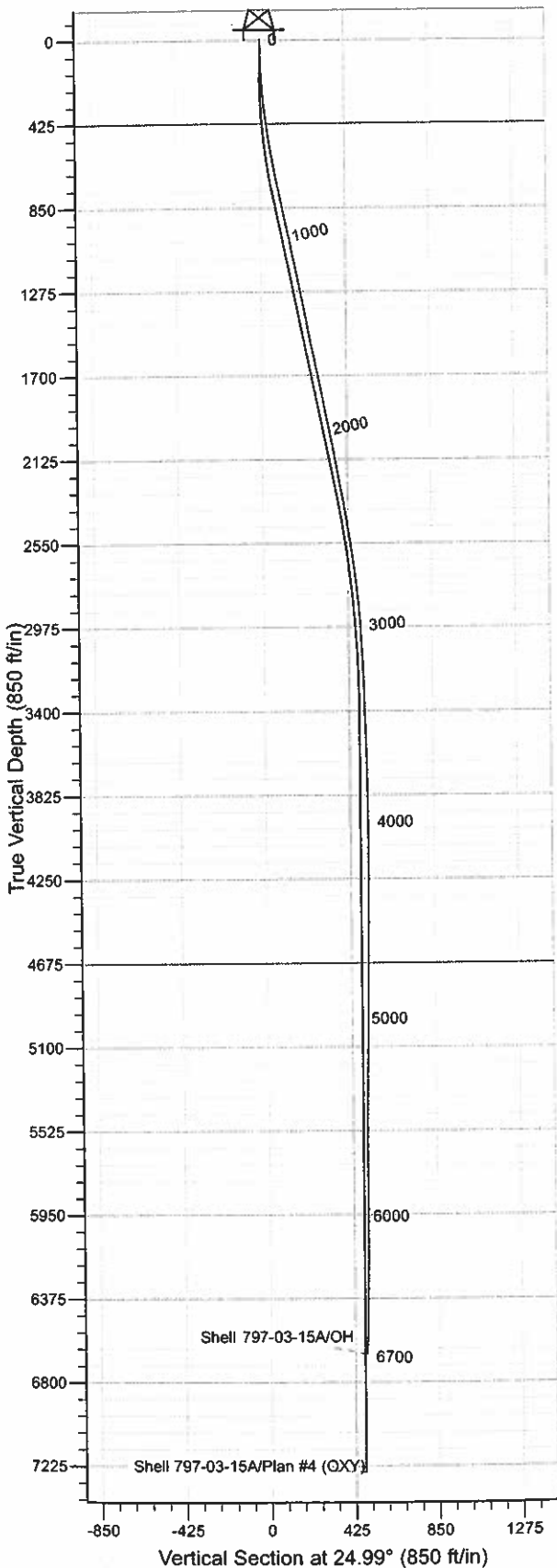
14 October, 2010





Scientific Drilling

Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 797-03-15A
Wellbore: OH
Design: OH



WELL DETAILS: Shell 797-03-15A

Ground Level: GL 6325' & RKB 22' @ 6347.00ft (M37)
 Northing Easting Latitude Longitude
 0.00 0.00 610472.03 1237607.84 39° 28' 42.364 N 108° 12' 4.506 W

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Shell 797-03-15A, True North
 Vertical (TVD) Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
 Section (VS) Reference: Slot - (0.00N, 0.00E)
 Measured Depth Reference: GL 6325' & RKB 22' @ 6347.00ft (M37)
 Calculation Method: Minimum Curvature
 Local North: True
 Location: Sec 3 T7S R97W

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

Design: OH (Shell 797-03-15A/OH)

Created By: Julie Cruse Date: 2010-10-14



Scientific Drilling Survey Report



Company: OXY USA RMAT	Local Co-ordinate Reference: Well Shell 797-03-15A
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 797-03-15A	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 797-03-15A,					
Well Position	+N/-S 0.00 ft	Northing: 610,472.04 usft	Latitude: 39° 28' 42.364 N		
	+E/-W 0.00 ft	Easting: 1,237,607.84 usft	Longitude: 108° 12' 4.506 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)
	IGRF2010	2010-09-30	10.53	65.71	52,282

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	24.99	

Survey Program Date 2010-10-14					
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
130.00	974.00	Survey #1 - Surface (OH)	MWD-SDI	MWD - Standard ISCWSA	
1,031.00	6,700.00	Survey #2 - Production (OH)	MWD-SDI	MWD - Standard ISCWSA	

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
130.00	1.81	31.20	129.98	1.76	1.06	2.04	1.39	1.39	0.00
158.00	2.55	23.87	157.96	2.70	1.54	3.10	2.82	2.64	-26.18
255.00	5.01	22.02	254.74	8.60	4.01	9.49	2.54	2.54	-1.91
349.00	6.77	22.37	348.24	17.53	7.65	19.13	1.87	1.87	0.37
442.00	7.91	22.73	440.48	28.51	12.21	31.00	1.23	1.23	0.39
536.00	8.79	30.55	533.48	40.66	18.36	44.61	1.53	0.94	8.32
626.00	10.11	30.28	622.26	53.40	25.84	59.32	1.47	1.47	-0.30
720.00	11.26	28.35	714.63	68.60	34.36	76.70	1.28	1.22	-2.05
817.00	11.61	19.65	809.71	86.13	42.14	95.87	1.81	0.36	-8.97

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Shell 797-03B Pad
Well: Shell 797-03-15A
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Shell 797-03-15A
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

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)
910.00	12.40	17.10	900.67	104.49	48.22	115.08	1.02	0.85	-2.74
974.00	12.31	23.52	963.20	117.31	52.97	128.71	2.15	-0.14	10.03
Last Survey in 12 1/4" Hole									
1,031.00	12.16	24.52	1,018.90	128.35	57.88	140.78	0.46	-0.26	1.75
First Survey in 7 7/8" Hole									
1,094.00	11.71	24.50	1,080.54	140.20	63.29	153.81	0.71	-0.71	-0.03
1,189.00	11.52	29.23	1,173.60	157.25	71.92	172.91	1.02	-0.20	4.98
1,284.00	11.21	28.51	1,266.73	173.64	80.96	191.59	0.36	-0.33	-0.76
1,380.00	10.90	28.92	1,360.95	189.79	89.80	209.96	0.33	-0.32	0.43
1,475.00	10.95	24.96	1,454.23	205.83	97.95	227.94	0.79	0.05	-4.17
1,570.00	11.83	25.26	1,547.36	222.82	105.92	246.70	0.93	0.93	0.32
1,665.00	11.49	24.73	1,640.40	240.22	114.03	265.90	0.38	-0.36	-0.56
1,760.00	11.52	24.57	1,733.49	257.44	121.93	284.85	0.05	0.03	-0.17
1,855.00	11.28	25.49	1,826.62	274.45	129.87	303.63	0.32	-0.25	0.97
1,951.00	11.35	25.19	1,920.75	291.48	137.94	322.46	0.10	0.07	-0.31
2,046.00	11.26	26.15	2,013.91	308.26	146.00	341.08	0.22	-0.09	1.01
2,141.00	10.76	24.28	2,107.16	324.67	153.74	359.22	0.65	-0.53	-1.97
2,236.00	10.29	23.17	2,200.56	340.56	160.72	376.57	0.54	-0.49	-1.17
2,332.00	9.94	22.81	2,295.07	356.08	167.31	393.42	0.37	-0.36	-0.38
2,427.00	10.38	25.27	2,388.58	371.37	174.14	410.17	0.65	0.46	2.59
2,522.00	9.23	23.25	2,482.19	386.11	180.80	426.35	1.26	-1.21	-2.13
2,617.00	8.52	24.79	2,576.05	399.50	186.76	441.00	0.79	-0.75	1.62
2,712.00	6.86	26.68	2,670.19	410.96	192.26	453.71	1.77	-1.75	1.99
2,807.00	5.89	20.62	2,764.61	420.59	196.52	464.24	1.24	-1.02	-6.38
2,901.00	5.36	30.72	2,858.16	428.88	200.46	473.42	1.19	-0.56	10.74
2,996.00	4.65	34.06	2,952.79	435.89	204.89	481.64	0.81	-0.75	3.52
3,090.00	3.78	35.21	3,046.54	441.58	208.81	488.45	0.93	-0.93	1.22
3,186.00	2.81	39.78	3,142.38	445.97	212.14	493.84	1.05	-1.01	4.76
3,281.00	1.76	22.37	3,237.30	449.11	214.18	497.55	1.31	-1.11	-18.33
3,377.00	1.58	23.34	3,333.26	451.69	215.27	500.34	0.19	-0.19	1.01
3,472.00	1.58	19.47	3,428.23	454.13	216.22	502.96	0.11	0.00	-4.07
3,568.00	1.58	27.30	3,524.19	456.55	217.27	505.60	0.22	0.00	8.16
3,664.00	1.41	25.01	3,620.16	458.80	218.38	508.10	0.19	-0.18	-2.39
3,759.00	1.49	27.47	3,715.13	460.95	219.44	510.50	0.11	0.08	2.59
3,855.00	1.62	23.64	3,811.09	463.30	220.56	513.11	0.17	0.14	-3.99
3,951.00	0.94	62.17	3,907.07	464.91	221.80	515.09	1.11	-0.71	40.14
4,046.00	1.23	120.72	4,002.05	464.75	223.37	515.61	1.15	0.31	61.63
4,141.00	1.32	140.32	4,097.03	463.39	224.94	515.04	0.47	0.09	20.63
4,237.00	0.79	145.60	4,193.01	461.99	226.02	514.23	0.56	-0.55	5.50
4,333.00	1.01	163.02	4,289.00	460.64	226.64	513.26	0.36	0.23	18.15
4,428.00	0.97	161.86	4,383.99	459.07	227.14	512.05	0.05	-0.04	-1.22
4,525.00	1.06	164.38	4,480.97	457.43	227.64	510.77	0.10	0.09	2.60
4,620.00	0.78	156.95	4,575.96	455.99	228.13	509.67	0.32	-0.29	-7.82



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Survey Report



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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 797-03-15A	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)
4,716.00	0.70	173.55	4,671.95	454.80	228.45	508.74	0.24	-0.08	17.29
4,811.00	0.79	166.25	4,766.94	453.59	228.67	507.73	0.14	0.09	-7.68
4,907.00	0.77	186.18	4,862.94	452.31	228.76	506.60	0.28	-0.02	20.76
5,002.00	1.01	207.15	4,957.92	450.93	228.31	505.16	0.42	0.25	22.07
5,097.00	0.88	197.19	5,052.91	449.49	227.71	503.60	0.22	-0.14	-10.48
5,193.00	1.06	203.17	5,148.90	447.97	227.14	501.99	0.21	0.19	6.23
5,288.00	1.10	210.84	5,243.88	446.38	226.33	500.20	0.16	0.04	8.07
5,383.00	1.23	205.54	5,338.86	444.67	225.42	498.27	0.18	0.14	-5.58
5,478.00	0.44	242.98	5,433.85	443.59	224.66	496.97	0.97	-0.83	39.41
5,573.00	0.62	280.25	5,528.85	443.51	223.83	496.55	0.40	0.19	39.23
5,668.00	0.62	296.59	5,623.84	443.83	222.86	496.43	0.19	0.00	17.20
5,763.00	0.70	291.58	5,718.83	444.28	221.86	496.41	0.10	0.08	-5.27
5,858.00	0.62	273.39	5,813.83	444.52	220.81	496.19	0.23	-0.08	-19.15
5,954.00	0.53	270.75	5,909.82	444.56	219.85	495.81	0.10	-0.09	-2.75
6,049.00	0.70	286.05	6,004.82	444.72	218.85	495.54	0.25	0.18	16.11
6,144.00	1.23	283.76	6,099.80	445.13	217.30	495.25	0.56	0.56	-2.41
6,239.00	1.06	278.66	6,194.79	445.50	215.44	494.81	0.21	-0.18	-5.37
6,334.00	1.48	271.95	6,289.76	445.68	213.35	494.08	0.47	0.44	-7.06
6,429.00	1.76	248.17	6,384.73	445.17	210.77	492.54	0.76	0.29	-25.03
6,524.00	1.67	222.06	6,479.68	443.60	208.48	490.15	0.82	-0.09	-27.48
6,619.00	1.41	224.08	6,574.65	441.74	206.74	487.72	0.28	-0.27	2.13
6,644.00	1.67	225.43	6,599.64	441.26	206.27	487.09	1.05	1.04	5.40
Last SDI MWD Survey									
6,700.00	1.67	225.43	6,655.62	440.12	205.11	485.56	0.00	0.00	0.00
Projection to TD - BHL = 610905.86 ft N, 1237825.94 ft E									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
974.00	963.20	117.31	52.97	Last Survey in 12 1/4" Hole
1,031.00	1,018.90	128.35	57.88	First Survey in 7 7/8" Hole
6,644.00	6,599.64	441.26	206.27	Last SDI MWD Survey
6,700.00	6,655.62	440.12	205.11	Projection to TD
6,700.00	6,655.62	440.12	205.11	BHL = 610905.86 ft N, 1237825.94 ft E

Checked By: _____ Approved By: _____ Date: _____