



Scientific Drilling
Rocky Mountain Operations

OXY USA RMAT

Garfield County, CO NAD27
Cascade Creek 609-14 Pad
CC 697-08-64B - Slot K

OH

Design: OH

Standard Survey Report

08 September, 2010

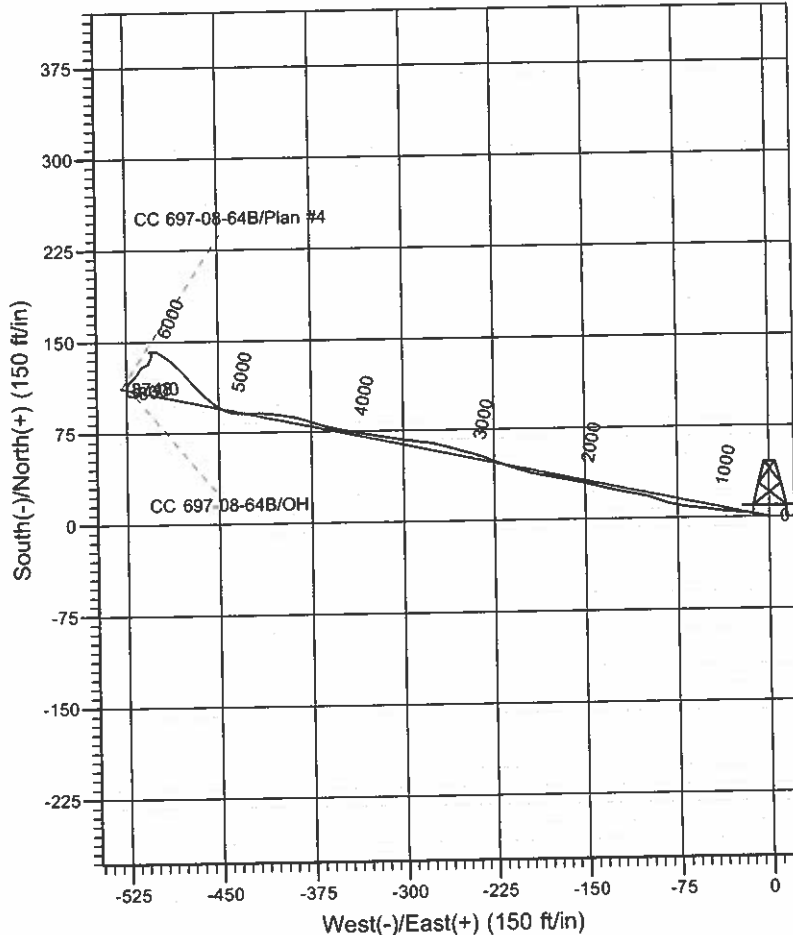
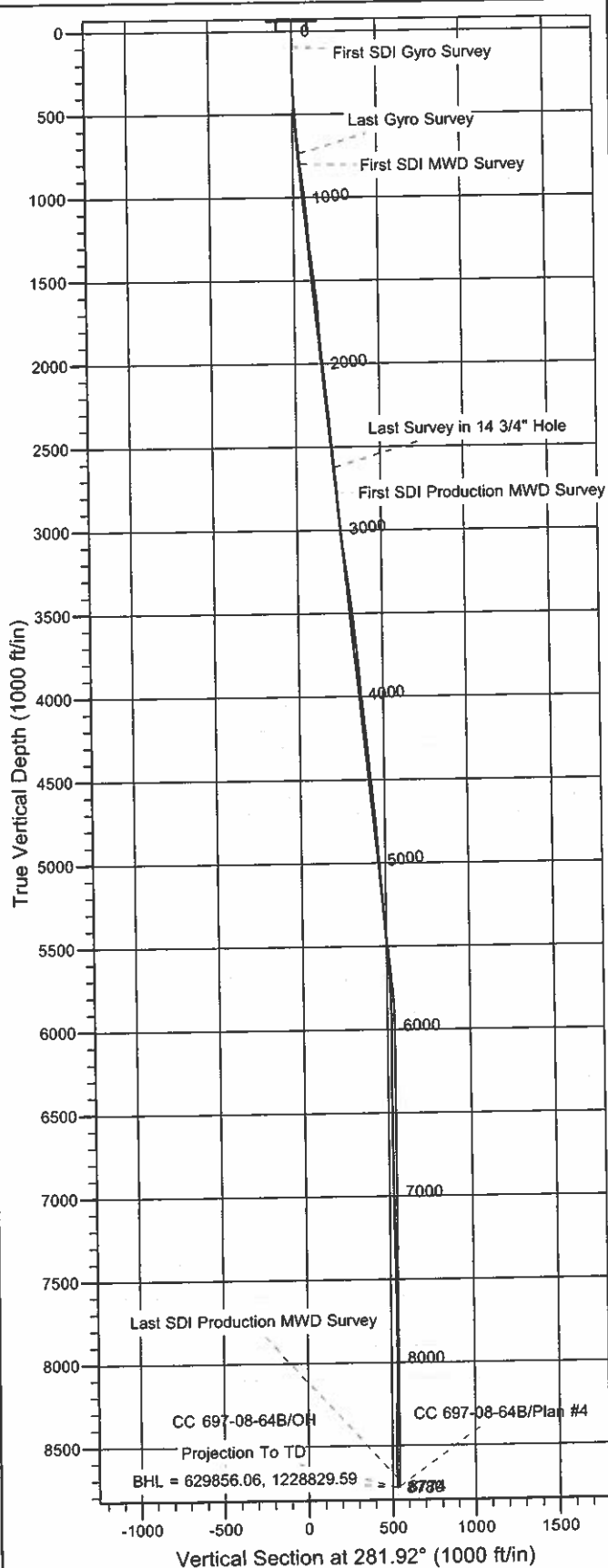




Scientific Drilling

Rocky Mountain Operations

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 609-14 Pad
Well: CC 697-08-64B
Wellbore: OH
Design: OH



Well Details: CC 697-08-64B

TVD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330) and Level: 8393.00
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.00 0.00 629735.18 1229344.03 39° 31' 50.229 N 108° 13' 57.238 W K

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-64B - Slot K, True North
Vertical (TVD) Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Section (VS) Reference: Slot - K(0.00N, 0.00E)
Measured Depth Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
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

12:55, September 08 2010
Created By: Rex Hall



Scientific Drilling International

Survey Report



Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 609-14 Pad
Well: CC 697-08-64B
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well CC 697-08-64B - Slot K
 GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
 GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
 True
 Minimum Curvature
 Rockies-R5000.1

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

Site Cascade Creek 609-14 Pad, Sec 9 T6S R97W

Site Position: Northing: 629,789.23 usft Latitude: 39° 31' 50.765 N
From: Map Easting: 1,229,350.88 usft Longitude: 108° 13' 57.172 W
Position Uncertainty: 0.00 ft Slot Radius: 13.200 in Grid Convergence: -1.72 °

Well CC 697-08-64B - Slot K, 169' FSL 263' FWL

Well Position +N/-S 0.00 ft Northing: 629,735.18 usft Latitude: 39° 31' 50.229 N
 +E/-W 0.00 ft Easting: 1,229,344.03 usft Longitude: 108° 13' 57.238 W
Position Uncertainty 0.00 ft Wellhead Elevation: ft Ground Level: 8,393.00 ft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/24/2008	10.83	65.81	52,541

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	281.93

Survey Program Date 9/8/2010

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
92.00	737.00	Survey #1 - Surface Gyro (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3
802.00	2,633.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
2,788.00	8,780.00	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
92.00	0.13	249.04	92.00	-0.04	-0.10	0.09	0.14	0.14	0.00
First SDI Gyro Survey									
184.00	1.14	271.14	183.99	-0.06	-1.11	1.07	1.11	1.10	24.02
276.00	1.35	294.37	275.97	0.41	-3.01	3.03	0.59	0.23	25.25
368.00	2.13	282.06	367.93	1.21	-5.67	5.80	0.94	0.85	-13.38
461.00	3.99	281.50	460.79	2.22	-10.53	10.76	2.00	2.00	-0.60
553.00	4.75	279.94	552.52	3.52	-17.42	17.77	0.84	0.83	-1.70
645.00	5.43	271.24	644.16	4.27	-25.53	25.86	1.12	0.74	-9.46

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-64B - Slot K
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-08-64B	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)
737.00	6.15	275.94	735.69	4.87	-34.78	35.04	0.94	0.78	5.11
Last Gyro Survey									
802.00	6.23	278.20	800.31	5.73	-41.73	42.02	0.39	0.12	3.48
First SDI MWD Survey									
896.00	6.37	278.38	893.75	7.22	-51.94	52.31	0.15	0.15	0.19
988.00	6.13	275.77	985.20	8.46	-61.88	62.29	0.40	-0.26	-2.84
1,083.00	6.03	281.59	1,079.67	9.97	-71.81	72.32	0.66	-0.11	6.13
1,178.00	5.15	282.37	1,174.21	11.89	-80.86	81.58	0.93	-0.93	0.82
1,272.00	5.62	292.20	1,267.80	14.53	-89.25	90.32	1.10	0.50	10.46
1,367.00	6.32	286.85	1,362.29	17.80	-98.56	100.11	0.94	0.74	-5.63
1,462.00	7.40	280.47	1,456.61	20.43	-109.58	111.44	1.39	1.14	-6.72
1,556.00	6.84	281.12	1,549.88	22.61	-121.02	123.08	0.60	-0.60	0.69
1,651.00	4.77	284.21	1,644.39	24.67	-130.41	132.69	2.20	-2.18	3.25
1,746.00	3.90	287.34	1,739.12	26.60	-137.32	139.85	0.95	-0.92	3.29
1,840.00	4.42	283.36	1,832.87	28.39	-143.89	146.66	0.63	0.55	-4.23
1,935.00	5.28	281.55	1,927.53	30.12	-151.74	154.69	0.92	0.91	-1.91
2,030.00	6.24	280.93	2,022.05	31.97	-161.09	164.22	1.01	1.01	-0.65
2,124.00	6.42	282.51	2,115.47	34.08	-171.24	174.58	0.27	0.19	1.68
2,219.00	5.54	277.68	2,209.96	35.84	-180.97	184.47	1.07	-0.93	-5.08
2,314.00	5.28	282.78	2,304.53	37.42	-189.77	193.41	0.58	-0.27	5.37
2,409.00	5.98	287.52	2,399.07	39.88	-198.76	202.71	0.88	0.74	4.99
2,503.00	5.72	289.02	2,492.58	42.88	-207.85	212.23	0.32	-0.28	1.60
2,598.00	5.80	288.14	2,587.11	45.91	-216.89	221.70	0.13	0.08	-0.93
2,633.00	5.63	287.61	2,621.93	46.98	-220.21	225.16	0.51	-0.49	-1.51
Last Survey in 14 3/4" Hole									
2,788.00	5.21	294.07	2,776.24	52.16	-233.88	239.61	0.48	-0.27	4.17
First SDI Production MWD Survey									
2,883.00	5.01	284.96	2,870.86	54.99	-241.83	247.97	0.88	-0.21	-9.59
2,978.00	5.63	285.14	2,965.45	57.27	-250.33	256.77	0.65	0.65	0.19
3,072.00	6.07	286.90	3,058.96	59.92	-259.54	266.32	0.51	0.47	1.87
3,167.00	7.21	284.26	3,153.33	62.85	-270.12	277.28	1.24	1.20	-2.78
3,262.00	8.00	276.88	3,247.49	65.11	-282.46	289.82	1.32	0.83	-7.77
3,357.00	7.56	278.02	3,341.62	66.78	-295.22	302.64	0.49	-0.46	1.20
3,451.00	7.12	278.64	3,434.85	68.51	-307.10	314.63	0.48	-0.47	0.66
3,546.00	6.33	279.87	3,529.19	70.30	-318.08	325.74	0.85	-0.83	1.29
3,641.00	5.63	280.31	3,623.67	72.03	-327.82	335.63	0.74	-0.74	0.46
3,735.00	5.19	279.95	3,717.26	73.59	-336.55	344.49	0.47	-0.47	-0.38
3,830.00	5.01	280.66	3,811.88	75.10	-344.86	352.93	0.20	-0.19	0.75
3,925.00	4.66	280.04	3,906.54	76.54	-352.73	360.94	0.37	-0.37	-0.65
4,019.00	5.72	286.72	4,000.16	78.55	-360.98	369.42	1.30	1.13	7.11
4,114.00	5.63	287.07	4,094.69	81.28	-369.97	378.78	0.10	-0.09	0.37
4,209.00	5.63	289.53	4,189.23	84.21	-378.81	388.04	0.25	0.00	2.59
4,304.00	6.24	281.45	4,283.72	86.79	-388.27	397.82	1.09	0.64	-8.51
4,398.00	5.54	278.90	4,377.23	88.50	-397.76	407.46	0.79	-0.74	-2.71

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 609-14 Pad
Well: CC 697-08-64B
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well CC 697-08-64B - Slot K
TVD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
MD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
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)
4,493.00	5.45	277.49	4,471.79	89.80	-406.76	416.54	0.17	-0.09	-1.48
4,588.00	5.28	273.01	4,566.37	90.62	-415.60	425.35	0.48	-0.18	-4.72
4,682.00	6.16	267.91	4,659.91	90.66	-424.96	434.52	1.08	0.94	-5.43
4,777.00	5.45	273.36	4,754.42	90.74	-434.56	443.93	0.95	-0.75	5.74
4,872.00	4.66	290.59	4,849.05	92.36	-442.67	452.20	1.79	-0.83	18.14
4,966.00	4.92	302.45	4,942.73	95.87	-449.65	459.75	1.09	0.28	12.62
5,061.00	5.28	312.12	5,037.35	100.99	-456.33	467.35	0.98	0.38	10.18
5,156.00	4.66	311.16	5,132.00	106.46	-462.48	474.49	0.66	-0.65	-1.01
5,251.00	5.19	318.71	5,226.65	112.23	-468.22	481.30	0.88	0.56	7.95
5,346.00	5.19	322.05	5,321.26	118.84	-473.69	488.03	0.32	0.00	3.52
5,440.00	5.36	314.76	5,414.86	125.29	-479.43	494.97	0.74	0.18	-7.76
5,535.00	5.28	313.00	5,509.45	131.39	-485.77	502.44	0.19	-0.08	-1.85
5,629.00	4.22	308.26	5,603.13	136.48	-491.65	509.24	1.20	-1.13	-5.04
5,724.00	3.61	300.17	5,697.91	140.15	-496.98	515.22	0.86	-0.64	-8.52
5,819.00	2.55	282.68	5,792.77	142.12	-501.63	520.17	1.48	-1.12	-18.41
5,914.00	1.67	256.31	5,887.71	142.26	-505.04	523.53	1.36	-0.93	-27.76
6,008.00	0.44	115.16	5,981.69	141.78	-506.04	524.42	2.16	-1.31	-150.16
6,103.00	0.70	109.45	6,076.69	141.43	-505.16	523.49	0.28	0.27	-6.01
6,198.00	0.44	142.76	6,171.68	140.95	-504.40	522.64	0.43	-0.27	35.06
6,293.00	0.79	179.67	6,266.68	140.00	-504.17	522.22	0.54	0.37	38.85
6,387.00	0.79	187.49	6,360.67	138.71	-504.25	522.03	0.11	0.00	8.32
6,482.00	0.88	199.45	6,455.66	137.37	-504.58	522.08	0.21	0.09	12.59
6,577.00	1.14	203.67	6,550.65	135.82	-505.20	522.37	0.28	0.27	4.44
6,671.00	1.32	215.00	6,644.62	134.08	-506.20	522.98	0.32	0.19	12.05
6,766.00	0.35	162.18	6,739.61	132.90	-506.74	523.27	1.20	-1.02	-55.60
6,861.00	0.35	154.53	6,834.61	132.37	-506.53	522.94	0.05	0.00	-8.05
6,956.00	0.53	226.96	6,929.61	131.80	-506.72	523.02	0.57	0.19	76.24
7,051.00	1.23	252.53	7,024.60	131.20	-508.02	524.16	0.83	0.74	26.92
7,145.00	1.67	247.35	7,118.57	130.37	-510.24	526.17	0.49	0.47	-5.51
7,240.00	1.93	230.30	7,213.52	128.81	-512.75	528.30	0.62	0.27	-17.95
7,335.00	1.67	203.84	7,308.48	126.52	-514.54	529.58	0.91	-0.27	-27.85
7,430.00	1.85	212.02	7,403.43	123.96	-515.91	530.39	0.32	0.19	8.61
7,524.00	2.29	225.11	7,497.37	121.35	-518.05	531.94	0.68	0.47	13.93
7,619.00	2.20	227.04	7,592.30	118.76	-520.73	534.03	0.12	-0.09	2.03
7,714.00	1.67	219.75	7,687.24	116.46	-522.95	535.72	0.61	-0.56	-7.67
7,808.00	1.49	201.20	7,781.21	114.26	-524.26	536.56	0.57	-0.19	-19.73
7,903.00	1.76	175.01	7,876.17	111.66	-524.58	536.34	0.82	0.28	-27.57
7,998.00	1.58	179.41	7,971.13	108.90	-524.44	535.63	0.23	-0.19	4.63
8,092.00	1.06	144.43	8,065.11	106.89	-523.93	534.71	1.00	-0.55	-37.21
8,187.00	0.88	102.68	8,160.09	106.02	-522.70	533.33	0.75	-0.19	-43.95
8,287.00	0.88	108.66	8,260.08	105.60	-521.23	531.80	0.09	0.00	5.98
8,377.00	1.41	76.40	8,350.07	105.64	-519.49	530.11	0.91	0.59	-35.84
8,471.00	1.58	75.17	8,444.03	106.25	-517.12	527.91	0.18	0.18	-1.31

Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-64B - Slot K
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-08-64B	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)
8,566.00	0.35	145.13	8,539.02	106.34	-515.69	526.53	1.58	-1.29	73.64
8,661.00	0.70	249.37	8,634.02	105.90	-516.06	526.81	0.90	0.37	109.73
8,725.00	0.97	253.85	8,698.01	105.61	-516.95	527.62	0.43	0.42	7.00
Last SDI Production MWD Survey									
8,780.00	0.97	253.85	8,753.00	105.35	-517.84	528.44	0.00	0.00	0.00
Projection To TD - BHL = 629856.06, 1228829.59									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
92.00	92.00	-0.04	-0.10	First SDI Gyro Survey
737.00	735.69	4.87	-34.78	Last Gyro Survey
802.00	800.31	5.73	-41.73	First SDI MWD Survey
2,633.00	2,621.93	46.98	-220.21	Last Survey in 14 3/4" Hole
2,788.00	2,776.24	52.16	-233.88	First SDI Production MWD Survey
8,725.00	8,698.01	105.61	-516.95	Last SDI Production MWD Survey
8,780.00	8,753.00	105.35	-517.84	Projection To TD
8,780.00	8,753.00	105.35	-517.84	BHL = 629856.06, 1228829.59

Checked By: _____	Approved By: _____	Date: _____
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