



Scientific Drilling
Rocky Mountain Operations

OXY USA RMAT

Garfield County, CO NAD27
Cascade Creek 609-14 Pad
CC 697-08-62A - Slot M

OH

Design: OH

Standard Survey Report

26 August, 2010

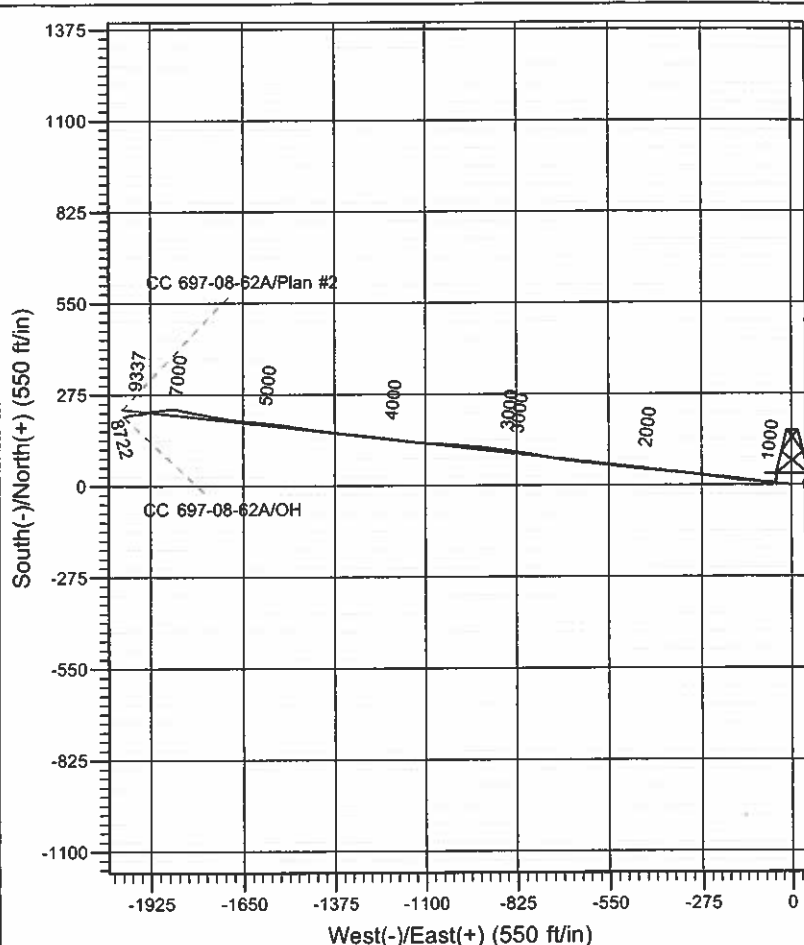
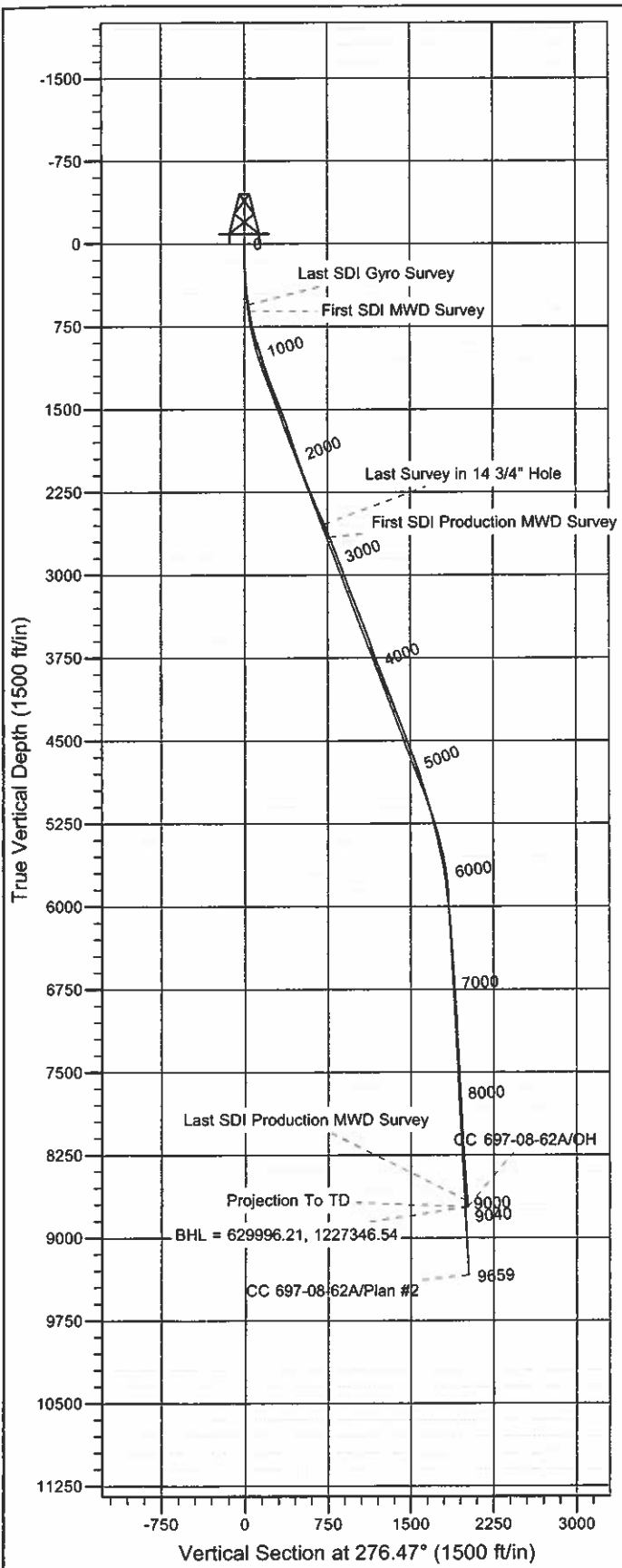




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Rocky Mountain Operations

Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 609-14 Pad
Well: CC 697-08-62A
Wellbore: OH
Design: OH



Well Details: CC 697-08-62A

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	629727.68	1229343.91	39° 31' 50.155 N	108° 13' 57.237 W	M

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-62A - Slot M, True North
Vertical (TVD) Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Section (VS) Reference: Slot - M(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

11:49, August 26 2010
Created By: Rex Hall



Scientific Drilling International

Survey Report



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MD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Rockies-R5000.1

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

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:	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well	CC 697-08-62A - Slot M				
Well Position	+N/-S 0.00 ft	Northing:	629,727.68 usft	Latitude:	39° 31' 50.155 N
	+E/-W 0.00 ft	Easting:	1,229,343.91 usft	Longitude:	108° 13' 57.237 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)
	IGRF2010	7/6/2010	10.58	65.75	52,313

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	276.47	

Survey Program Date 8/26/2010

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
92.00	553.00	Survey #1 - Surface Gyro (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3
618.00	2,662.00	Survey #2 - Surface MWD (OH)	MWD-SDI	MWD - Standard ISCWSA
2,788.00	9,040.00	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	0.02	237.22	92.00	-0.01	-0.01	0.01	0.02	0.02	0.00
184.00	2.38	268.42	183.97	-0.07	-1.94	1.92	2.57	2.57	33.91
276.00	3.14	285.07	275.87	0.53	-6.28	6.30	1.19	0.83	18.10
368.00	4.37	278.55	367.67	1.71	-12.18	12.29	1.41	1.34	-7.09
461.00	6.48	274.73	460.25	2.67	-20.91	21.08	2.30	2.27	-4.11
553.00	8.92	276.22	551.41	3.87	-33.18	33.40	2.66	2.65	1.62
Last SDI Gyro Survey									
618.00	9.93	276.47	615.53	5.05	-43.76	44.05	1.56	1.55	0.38

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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)
First SDI MWD Survey									
710.00	12.28	274.25	705.80	6.67	-61.40	61.76	2.60	2.55	-2.41
802.00	14.60	276.10	795.28	8.62	-82.69	83.13	2.56	2.52	2.01
896.00	17.23	274.96	885.67	11.09	-108.34	108.90	2.82	2.80	-1.21
988.00	17.59	273.29	973.45	13.06	-135.80	136.40	0.67	0.39	-1.82
1,082.00	17.15	275.40	1,063.17	15.18	-163.77	164.44	0.82	-0.47	2.24
1,177.00	17.85	278.56	1,153.77	18.67	-192.12	193.00	1.24	0.74	3.33
1,271.00	19.70	278.21	1,242.77	23.07	-222.05	223.23	1.97	1.97	-0.37
1,366.00	21.72	277.59	1,331.62	27.68	-255.32	256.82	2.14	2.13	-0.65
1,461.00	20.93	276.80	1,420.12	32.01	-289.60	291.36	0.88	-0.83	-0.83
1,555.00	21.46	275.66	1,507.76	35.70	-323.38	325.34	0.71	0.56	-1.21
1,650.00	22.16	275.48	1,595.96	39.12	-358.51	360.63	0.74	0.74	-0.19
1,745.00	18.64	276.71	1,684.99	42.61	-391.43	393.74	3.73	-3.71	1.29
1,839.00	17.85	275.48	1,774.26	45.74	-420.69	423.17	0.93	-0.84	-1.31
1,934.00	17.15	274.96	1,864.86	48.34	-449.14	451.73	0.75	-0.74	-0.55
2,029.00	18.91	277.07	1,955.20	51.45	-478.37	481.13	1.98	1.85	2.22
2,123.00	21.10	277.50	2,043.52	55.53	-510.27	513.28	2.34	2.33	0.46
2,218.00	20.93	276.71	2,132.20	59.75	-544.08	547.34	0.35	-0.18	-0.83
2,313.00	22.69	276.27	2,220.40	63.73	-579.14	582.64	1.86	1.85	-0.46
2,408.00	22.51	275.48	2,308.10	67.47	-615.46	619.14	0.37	-0.19	-0.83
2,502.00	22.25	276.36	2,395.02	71.16	-651.06	654.93	0.45	-0.28	0.94
2,597.00	23.39	279.44	2,482.59	76.24	-687.54	691.75	1.74	1.20	3.24
2,662.00	23.74	281.11	2,542.17	80.88	-713.10	717.68	1.16	0.54	2.57
Last Survey in 14 3/4" Hole									
2,788.00	22.73	280.75	2,657.95	90.31	-761.91	767.23	0.81	-0.80	-0.29
First SDI Production MWD Survey									
2,883.00	21.81	279.16	2,745.86	96.54	-797.36	803.16	1.16	-0.97	-1.67
2,978.00	20.05	278.64	2,834.59	101.80	-830.89	837.07	1.86	-1.85	-0.55
3,073.00	20.05	278.11	2,923.83	106.54	-863.11	869.62	0.19	0.00	-0.56
3,167.00	20.31	276.88	3,012.06	110.77	-895.26	902.04	0.53	0.28	-1.31
3,262.00	20.75	276.61	3,101.03	114.68	-928.34	935.36	0.47	0.46	-0.28
3,357.00	22.34	275.38	3,189.39	118.31	-963.04	970.24	1.74	1.67	-1.29
3,451.00	21.81	273.98	3,276.50	121.20	-998.25	1,005.55	0.79	-0.56	-1.49
3,546.00	21.02	272.84	3,364.94	123.27	-1,032.87	1,040.18	0.94	-0.83	-1.20
3,641.00	20.66	273.19	3,453.72	125.04	-1,066.62	1,073.92	0.40	-0.38	0.37
3,736.00	20.22	276.00	3,542.74	127.69	-1,099.68	1,107.07	1.13	-0.46	2.96
3,830.00	19.08	274.95	3,631.27	130.72	-1,131.14	1,138.67	1.27	-1.21	-1.12
3,925.00	19.79	278.02	3,720.86	134.30	-1,162.54	1,170.27	1.31	0.75	3.23
4,020.00	20.49	277.32	3,810.05	138.66	-1,194.96	1,202.97	0.78	0.74	-0.74
4,114.00	21.81	277.76	3,897.71	143.12	-1,228.58	1,236.88	1.41	1.40	0.47
4,209.00	22.25	276.26	3,985.78	147.46	-1,263.94	1,272.51	0.75	0.46	-1.58
4,304.00	21.37	275.74	4,073.98	151.15	-1,299.04	1,307.80	0.95	-0.93	-0.55
4,398.00	21.02	275.91	4,161.62	154.60	-1,332.85	1,341.79	0.38	-0.37	0.18
4,493.00	21.02	276.88	4,250.30	158.40	-1,366.72	1,375.86	0.37	0.00	1.02

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North Reference: True
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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)
4,588.00	19.96	276.79	4,339.29	162.36	-1,399.73	1,409.11	1.12	-1.12	-0.09
4,683.00	20.75	278.37	4,428.35	166.72	-1,432.48	1,442.15	1.01	0.83	1.66
4,777.00	21.37	279.25	4,516.07	171.90	-1,465.86	1,475.90	0.74	0.66	0.94
4,872.00	21.46	277.93	4,604.52	177.08	-1,500.16	1,510.56	0.52	0.09	-1.39
4,967.00	20.05	277.49	4,693.35	181.60	-1,533.52	1,544.21	1.49	-1.48	-0.46
5,061.00	18.99	277.23	4,781.95	185.63	-1,564.67	1,575.62	1.13	-1.13	-0.28
5,156.00	17.67	275.65	4,872.12	188.99	-1,594.35	1,605.49	1.48	-1.39	-1.66
5,251.00	16.80	275.21	4,962.86	191.66	-1,622.37	1,633.63	0.93	-0.92	-0.46
5,346.00	16.00	274.33	5,053.99	193.89	-1,649.10	1,660.44	0.88	-0.84	-0.93
5,440.00	15.48	278.81	5,144.47	196.79	-1,674.41	1,685.92	1.41	-0.55	4.77
5,535.00	15.12	280.04	5,236.10	200.89	-1,699.14	1,710.96	0.51	-0.38	1.29
5,630.00	13.45	280.57	5,328.16	205.08	-1,722.21	1,734.35	1.76	-1.76	0.56
5,724.00	13.19	279.95	5,419.63	208.94	-1,743.52	1,755.95	0.32	-0.28	-0.66
5,819.00	11.52	281.19	5,512.43	212.65	-1,763.50	1,776.23	1.78	-1.76	1.31
5,914.00	9.85	281.62	5,605.78	216.13	-1,780.76	1,793.78	1.76	-1.76	0.45
6,009.00	9.50	282.24	5,699.43	219.43	-1,796.39	1,809.67	0.38	-0.37	0.65
6,103.00	7.83	277.58	5,792.35	221.92	-1,810.31	1,823.79	1.93	-1.78	-4.96
6,198.00	6.51	280.31	5,886.61	223.74	-1,822.03	1,835.64	1.43	-1.39	2.87
6,293.00	5.54	286.28	5,981.08	225.99	-1,831.73	1,845.53	1.21	-1.02	6.28
6,387.00	5.28	284.00	6,074.67	228.30	-1,840.28	1,854.29	0.36	-0.28	-2.43
6,482.00	3.87	276.53	6,169.36	229.73	-1,847.71	1,861.83	1.61	-1.48	-7.86
6,577.00	3.87	276.97	6,264.14	230.48	-1,854.07	1,868.24	0.03	0.00	0.46
6,672.00	3.61	276.00	6,358.94	231.18	-1,860.23	1,874.43	0.28	-0.27	-1.02
6,766.00	3.52	273.45	6,452.76	231.66	-1,866.06	1,880.28	0.19	-0.10	-2.71
6,861.00	4.04	262.29	6,547.55	231.39	-1,872.28	1,886.43	0.95	0.55	-11.75
6,956.00	4.22	250.86	6,642.31	229.80	-1,878.90	1,892.83	0.89	0.19	-12.03
7,051.00	3.69	264.05	6,737.08	228.33	-1,885.24	1,898.97	1.10	-0.56	13.88
7,145.00	3.43	262.82	6,830.90	227.67	-1,891.04	1,904.65	0.29	-0.28	-1.31
7,240.00	3.34	260.09	6,925.74	226.84	-1,896.59	1,910.07	0.19	-0.09	-2.87
7,335.00	3.17	267.74	7,020.58	226.26	-1,901.94	1,915.32	0.49	-0.18	8.05
7,430.00	2.99	262.20	7,115.45	225.82	-1,907.02	1,920.32	0.37	-0.19	-5.83
7,524.00	2.99	264.66	7,209.32	225.26	-1,911.89	1,925.09	0.14	0.00	2.62
7,619.00	3.08	264.13	7,304.19	224.76	-1,916.89	1,930.01	0.10	0.09	-0.56
7,714.00	2.99	261.32	7,399.05	224.13	-1,921.88	1,934.90	0.18	-0.09	-2.96
7,808.00	3.25	256.14	7,492.91	223.12	-1,926.89	1,939.76	0.41	0.28	-5.51
7,903.00	3.17	251.30	7,587.77	221.63	-1,932.00	1,944.66	0.30	-0.08	-5.09
7,997.00	3.17	254.91	7,681.62	220.12	-1,936.97	1,949.43	0.21	0.00	3.84
8,092.00	3.25	254.91	7,776.47	218.74	-1,942.10	1,954.38	0.08	0.08	0.00
8,187.00	3.43	258.95	7,871.31	217.49	-1,947.49	1,959.60	0.31	0.19	4.25
8,282.00	3.43	257.72	7,966.14	216.34	-1,953.06	1,965.00	0.08	0.00	-1.29
8,377.00	3.25	265.80	8,060.98	215.54	-1,958.52	1,970.33	0.53	-0.19	8.51
8,471.00	3.78	272.31	8,154.80	215.47	-1,964.27	1,976.04	0.70	0.56	6.93
8,566.00	3.87	269.67	8,249.59	215.58	-1,970.61	1,982.35	0.21	0.09	-2.78



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8,661.00	3.61	260.79	8,344.39	215.08	-1,976.77	1,988.41	0.67	-0.27	-9.35
8,756.00	4.04	258.51	8,439.18	213.94	-1,983.00	1,994.48	0.48	0.45	-2.40
8,850.00	4.48	255.35	8,532.92	212.35	-1,989.80	2,001.05	0.53	0.47	-3.36
8,945.00	4.66	254.73	8,627.62	210.39	-1,997.11	2,008.10	0.20	0.19	-0.65
8,983.00	4.66	254.47	8,665.49	209.57	-2,000.08	2,010.96	0.06	0.00	-0.68
Last SDI Production MWD Survey									
9,040.00	4.66	254.47	8,722.30	208.33	-2,004.55	2,015.25	0.00	0.00	0.00
Projection To TD - BHL = 629996.21, 1227346.54									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
553.00	551.41	3.87	-33.18	Last SDI Gyro Survey
618.00	615.53	5.05	-43.76	First SDI MWD Survey
2,662.00	2,542.17	80.88	-713.10	Last Survey in 14 3/4" Hole
2,788.00	2,657.95	90.31	-761.91	First SDI Production MWD Survey
8,983.00	8,665.49	209.57	-2,000.08	Last SDI Production MWD Survey
9,040.00	8,722.30	208.33	-2,004.55	Projection To TD
9,040.00	8,722.30	208.33	-2,004.55	BHL = 629996.21, 1227346.54

Checked By: _____

Approved By: _____

Date: _____