



Scientific Drilling

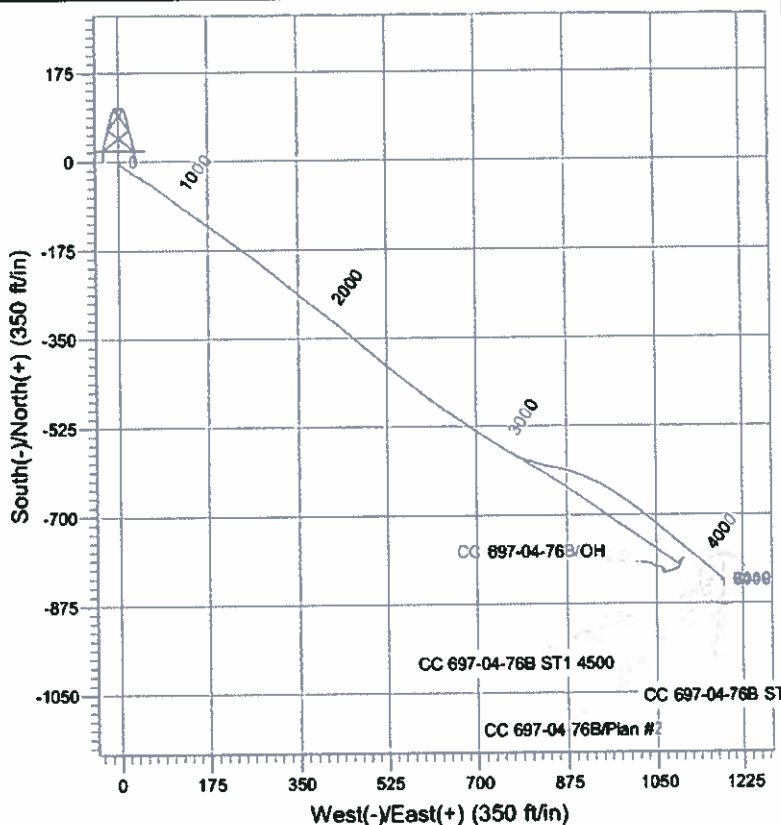
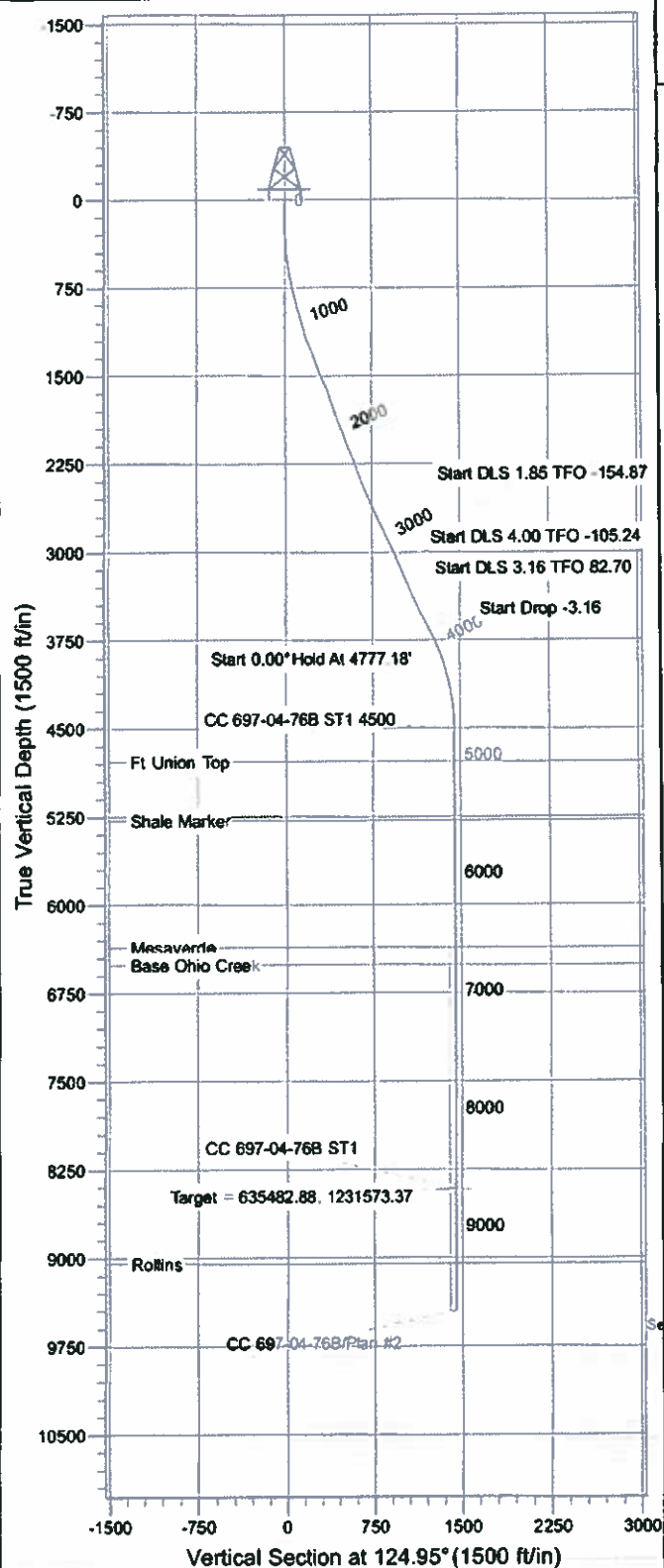
Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 697-04D Pad



Well Details: CC 697-04-76B

TVD Reference: GL 8629' & RKB 30' @ 8659.00ft (H&P) Ground Level: 8629.00
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.00 0.00 636347.37 1230412.51 39° 32' 55.869 N 108° 13' 46.143 W G

T M Azimuths to True North
Magnetic North: 10.37°
Magnetic Field
Strength: 52158.8snT
Dip Angle: 65.72°
Date: 2/16/2012
Model: IGRF2010



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4781.00	5058.18	Ft Union Top
5281.00	5558.18	Shale Marker
6359.00	6636.18	Mesaverde
6509.00	6786.18	Base Ohio Creek
9049.00	9326.18	Rollins

Plan: Plan #2

18:14, February 17 2012

Created By: Rex Hall

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

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	3155.00	25.59	122.80	2984.53	-580.41	739.01	0.00	0.00	926.77	
2	3200.00	24.84	121.96	3025.25	-570.88	755.20	1.85	-154.87	945.93	
3	3426.76	24.00	100.00	3232.15	-603.97	841.21	4.00	-105.24	1035.49	
4	3861.82	28.95	129.17	3623.10	-686.24	1010.79	3.16	82.70	1221.62	
5	4777.18	0.00	0.00	4500.00	-829.22	1186.31	3.16	180.00	1447.39	CC 697-04-76B ST1 4500
6	8591.18	0.00	0.00	8414.00	-829.22	1186.31	0.00	0.00	1447.39	CC 697-04-76B ST1
7	9726.18	0.00	0.00	9449.00	-829.22	1186.31	0.00	0.00	1447.39	

OXY USA RMAT

**Garfield County, CO NAD27
Cascade Creek 697-04D Pad
CC 697-04-76B - Slot G**

ST-1

Plan: Plan #2

Standard Planning Report

17 February, 2012

Scientific Drilling Planning Report

Database:	Rockies Compass Server	Local Co-ordinate Reference:	Well CC 697-04-76B - Slot G
Company:	OXY USA RMAT	TVD Reference:	GL 8629' & RKB 30' @ 8659.00ft (H&P)
Project:	Garfield County, CO NAD27	MD Reference:	GL 8629' & RKB 30' @ 8659.00ft (H&P)
Site:	Cascade Creek 697-04D Pad	North Reference:	True
Well:	CC 697-04-76B	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST-1		
Design:	Plan #2		

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	Cascade Creek 697-04D Pad				
Site Position:		Northing:	635,530.62 usft	Latitude:	39° 32' 47.760 N
From:	Map	Easting:	1,230,276.10 usft	Longitude:	108° 13' 47.570 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.72 °

Well	CC 697-04-76B - Slot G					
Well Position	+N/-S	820.48 ft	Northing:	636,347.37 usft	Latitude:	39° 32' 55.869 N
	+E/-W	111.81 ft	Easting:	1,230,412.51 usft	Longitude:	108° 13' 46.143 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	8,629.00 ft

Wellbore	ST-1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/16/2012	10.38	65.72	52,159

Design	Plan #2
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Audit Notes:

Version:	Phase:	PROTOTYPE	Tie On Depth:	3,155.00
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Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	124.95

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
3,155.00	25.59	122.80	2,984.53	-560.41	739.01	0.00	0.00	0.00	0.00	
3,200.00	24.84	121.96	3,025.25	-570.88	755.20	1.85	-1.67	-1.87	-154.87	
3,426.76	24.00	100.00	3,232.15	-603.97	841.21	4.00	-0.37	-9.68	-105.24	
3,861.82	28.95	129.17	3,623.10	-686.24	1,010.79	3.16	1.14	6.70	82.70	
4,777.18	0.00	0.00	4,500.00	-829.22	1,186.31	3.16	-3.16	0.00	180.00	CC 697-04-76B ST1
8,691.18	0.00	0.00	8,414.00	-829.22	1,186.31	0.00	0.00	0.00	0.00	CC 697-04-76B ST1
9,726.18	0.00	0.00	9,449.00	-829.22	1,186.31	0.00	0.00	0.00	0.00	

Scientific Drilling Planning Report

Database:	Rockies Compass Server	Local Co-ordinate Reference:	Well CC 697-04-768 - Slot G
Company:	OXY USA RMAT	TVD Reference:	GL 8629' & RKB 30' @ 8659.00ft (H&P)
Project:	Garfield County, CO NAD27	MD Reference:	GL 8629' & RKB 30' @ 8659.00ft (H&P)
Site:	Cascade Creek 697-04D Pad	North Reference:	True
Well:	CC 697-04-768	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST-1		
Design:	Plan #2		

Planned 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
100.00	0.12	167.37	100.00	-0.10	0.02	0.07	0.12	0.12	0.00
200.00	0.66	151.51	200.00	-0.53	0.19	0.46	0.55	0.54	-15.86
300.00	2.45	145.98	299.96	-2.59	1.48	2.70	1.79	1.79	-5.52
400.00	4.70	133.19	399.76	-7.41	5.46	8.72	2.37	2.25	-12.79
500.00	7.31	126.81	499.21	-13.91	13.54	19.07	2.69	2.61	-6.38
600.00	9.32	120.65	598.14	-22.04	25.64	33.84	2.20	2.01	-6.17
700.00	11.54	122.13	696.49	-31.33	41.12	51.65	2.24	2.22	1.48
800.00	13.14	121.82	794.15	-42.60	59.39	73.08	1.60	1.60	-0.31
900.00	14.08	127.75	891.41	-56.05	78.36	96.33	1.68	0.94	5.93
1,000.00	16.08	127.52	987.85	-72.22	99.23	122.70	2.00	2.00	-0.23
1,100.00	17.08	126.31	1,083.82	-89.12	121.70	150.81	1.06	1.00	-1.20
1,200.00	19.87	125.57	1,178.70	-107.56	147.30	182.35	2.81	2.80	-0.74
1,300.00	21.48	125.98	1,271.97	-128.59	176.59	218.41	1.61	1.61	0.40
1,400.00	20.79	126.24	1,365.22	-149.95	205.71	254.51	0.70	-0.69	0.26
1,500.00	22.15	125.75	1,458.80	-170.98	234.64	290.28	1.38	1.36	-0.49
1,600.00	23.63	127.51	1,550.47	-194.28	266.51	329.74	1.63	1.48	1.76
1,700.00	21.91	129.27	1,642.43	-218.82	297.19	368.95	1.86	-1.73	1.76
1,800.00	18.50	129.89	1,736.21	-240.93	323.89	403.50	3.41	-3.40	0.62
1,900.00	20.01	129.73	1,830.97	-261.40	348.38	435.30	1.51	1.51	-0.16
2,000.00	21.03	127.22	1,924.49	-283.53	376.02	470.63	1.34	1.01	-2.51
2,100.00	21.42	127.32	2,017.70	-305.34	404.93	506.82	0.40	0.39	0.10
2,200.00	23.06	130.25	2,110.30	-328.94	434.37	544.47	1.98	1.64	2.93
2,300.00	22.49	130.45	2,202.47	-354.09	463.91	583.09	0.58	-0.57	0.19
2,400.00	20.40	129.03	2,295.58	-377.37	491.96	619.42	2.15	-2.09	-1.42
2,500.00	20.65	129.86	2,389.30	-399.59	518.85	654.19	0.39	0.25	0.84
2,600.00	22.74	128.66	2,482.20	-423.00	547.50	691.08	2.13	2.08	-1.20
2,700.00	24.36	127.79	2,573.83	-447.73	579.00	731.07	1.67	1.63	-0.87
2,800.00	25.60	127.00	2,664.43	-473.50	612.56	773.33	1.28	1.24	-0.79
2,900.00	26.04	125.27	2,754.34	-499.26	647.95	817.10	0.87	0.44	-1.73
3,000.00	25.46	124.10	2,844.40	-523.98	683.69	860.66	0.77	-0.58	-1.17
3,100.00	25.28	123.16	2,934.87	-547.55	719.20	903.17	0.44	-0.18	-0.94
3,155.00	25.59	122.80	2,984.53	-560.41	739.01	926.77	0.63	0.56	-0.65
Start DLS 1.85 TFO -154.87									
3,200.00	24.84	121.96	3,025.25	-570.68	755.20	945.93	1.85	-1.67	-1.87
Start DLS 4.00 TFO -105.24									
3,300.00	24.08	112.47	3,116.31	-589.60	791.89	986.84	4.00	-0.76	-9.49
3,400.00	23.93	102.63	3,207.69	-601.84	830.55	1,025.53	4.00	-0.15	-9.84
3,426.76	24.00	100.00	3,232.15	-603.97	841.21	1,035.49	4.00	0.25	-9.83
Start DLS 3.16 TFO 82.70									
3,500.00	24.40	105.57	3,298.96	-610.62	870.45	1,063.26	3.16	0.54	7.61
3,600.00	25.25	112.83	3,389.74	-624.44	910.01	1,103.61	3.16	0.86	7.26
3,700.00	26.44	119.56	3,479.76	-643.70	949.05	1,146.64	3.16	1.19	6.73
3,800.00	27.91	125.69	3,568.73	-669.34	987.44	1,192.22	3.16	1.47	6.13
3,861.82	28.95	129.17	3,623.10	-686.24	1,010.79	1,221.62	3.16	1.68	5.63
Start Drop -3.16									
3,900.00	27.74	129.17	3,656.70	-697.69	1,024.85	1,239.69	3.16	-3.16	0.00
4,000.00	24.58	129.17	3,746.44	-725.53	1,059.03	1,283.66	3.16	-3.16	0.00
4,100.00	21.42	129.17	3,838.48	-750.21	1,089.31	1,322.62	3.16	-3.16	0.00
4,200.00	18.26	129.17	3,932.54	-771.64	1,115.62	1,356.46	3.16	-3.16	0.00
4,300.00	15.09	129.17	4,028.32	-789.76	1,137.86	1,385.07	3.16	-3.16	0.00
4,400.00	11.93	129.17	4,125.54	-804.51	1,155.97	1,408.37	3.16	-3.16	0.00
4,500.00	8.77	129.17	4,223.90	-815.88	1,169.90	1,426.28	3.16	-3.16	0.00
4,600.00	5.60	129.17	4,323.10	-823.76	1,179.59	1,438.75	3.16	-3.16	0.00
4,700.00	2.44	129.17	4,422.84	-828.19	1,185.03	1,445.75	3.16	-3.16	0.00

Scientific Drilling Planning Report

Database: Rockies Compass Server
Company: OXY USA RMAT
Project: Garfield County, CO NAD27
Site: Cascade Creek 697-04D Pad
Well: CC 697-04-76B
Wellbore: ST-1
Design: Plan #2

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

Well CC 697-04-76B - Slot G
GL 8629' & RKB 30' @ 8659.00ft (H&P)
GL 8629' & RKB 30' @ 8659.00ft (H&P)
True
Minimum Curvature

Planned 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)
4,777.18	0.00	0.00	4,500.00	-829.22	1,186.31	1,447.39	3.16	-3.16	0.00
Start 0.90° Hold At 4777.18'									
4,800.00	0.00	0.00	4,522.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
4,900.00	0.00	0.00	4,622.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,000.00	0.00	0.00	4,722.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,058.18	0.00	0.00	4,781.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
Ft Union Top									
5,100.00	0.00	0.00	4,822.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,200.00	0.00	0.00	4,922.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,300.00	0.00	0.00	5,022.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,400.00	0.00	0.00	5,122.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,500.00	0.00	0.00	5,222.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,558.18	0.00	0.00	5,281.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
Shale Marker									
5,600.00	0.00	0.00	5,322.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,700.00	0.00	0.00	5,422.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,800.00	0.00	0.00	5,522.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
5,900.00	0.00	0.00	5,622.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,000.00	0.00	0.00	5,722.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,100.00	0.00	0.00	5,822.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,200.00	0.00	0.00	5,922.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,300.00	0.00	0.00	6,022.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,400.00	0.00	0.00	6,122.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,500.00	0.00	0.00	6,222.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,600.00	0.00	0.00	6,322.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,638.18	0.00	0.00	6,359.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
Mesaverde									
6,700.00	0.00	0.00	6,422.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,786.18	0.00	0.00	6,509.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
Base Ohio Creek									
6,800.00	0.00	0.00	6,522.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
6,900.00	0.00	0.00	6,622.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,000.00	0.00	0.00	6,722.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,100.00	0.00	0.00	6,822.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,200.00	0.00	0.00	6,922.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,300.00	0.00	0.00	7,022.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,400.00	0.00	0.00	7,122.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,500.00	0.00	0.00	7,222.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,600.00	0.00	0.00	7,322.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,700.00	0.00	0.00	7,422.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,800.00	0.00	0.00	7,522.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
7,900.00	0.00	0.00	7,622.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,000.00	0.00	0.00	7,722.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,100.00	0.00	0.00	7,822.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,200.00	0.00	0.00	7,922.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,300.00	0.00	0.00	8,022.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,400.00	0.00	0.00	8,122.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,500.00	0.00	0.00	8,222.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,600.00	0.00	0.00	8,322.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,691.18	0.00	0.00	8,414.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
Target = 835482.88, 1231573.37									
8,700.00	0.00	0.00	8,422.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,800.00	0.00	0.00	8,522.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
8,900.00	0.00	0.00	8,622.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,000.00	0.00	0.00	8,722.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00

Scientific Drilling Planning Report

Database:	Rockies Compass Server	Local Co-ordinate Reference:	Well CC 697-04-76B - Slot G
Company:	OXY USA RMAT	TVD Reference:	GL 8629' & RKB 30' @ 8659.00ft (H&P)
Project:	Garfield County, CO NAD27	MD Reference:	GL 8629' & RKB 30' @ 8659.00ft (H&P)
Site:	Cascade Creek 697-04D Pad	North Reference:	True
Well:	CC 697-04-76B	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST-1		
Design:	Plan #2		

Planned 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)
9,100.00	0.00	0.00	8,822.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,200.00	0.00	0.00	8,922.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,300.00	0.00	0.00	9,022.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,326.18	0.00	0.00	9,049.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
Rollins									
9,400.00	0.00	0.00	9,122.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,500.00	0.00	0.00	9,222.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,600.00	0.00	0.00	9,322.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,700.00	0.00	0.00	9,422.82	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
9,726.18	0.00	0.00	9,449.00	-829.22	1,186.31	1,447.39	0.00	0.00	0.00
PBHL = 635482.88, 1231573.37									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
CC 697-04-76B ST1 45' - plan hits target center - Point	0.00	0.00	4,500.00	-829.22	1,186.31	635,482.89	1,231,573.36	39° 32' 47.673 N	108° 13' 30.999 W
CC 697-04-76B ST1 - plan hits target center - Circle (radius 50.00)	0.00	0.00	8,414.00	-829.22	1,186.31	635,482.89	1,231,573.36	39° 32' 47.673 N	108° 13' 30.999 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,058.18	4,781.00	Fl Union Top		0.00	
5,558.18	5,281.00	Shale Marker		0.00	
6,636.18	6,359.00	Mesaverde		0.00	
6,786.18	6,509.00	Base Ohio Creek		0.00	
9,326.18	9,049.00	Rollins		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,155.00	2,984.53	-560.41	739.01	Start DLS 1.85 TFO -154.87
3,200.00	3,025.25	-570.88	755.20	Start DLS 4.00 TFO -105.24
3,426.76	3,232.15	-603.97	841.21	Start DLS 3.16 TFO 82.70
3,861.82	3,623.10	-686.24	1,010.79	Start Drop -3.16
4,777.18	4,500.00	-829.22	1,186.31	Start 0.00° Hold At 4777.18'
8,691.18	8,414.00	-829.22	1,186.31	Target = 635482.88, 1231573.37
9,726.18	9,449.00	-829.22	1,186.31	PBHL = 635482.88, 1231573.37