



Oxy USA Inc.

**Lea County, NM
Ramsay Fed Com
Ramsay Fed Com #2**

Wellbore #1

Design: Surveys

Standard Survey Report

15 April, 2019





Survey Report



Company: Oxy USA Inc.
Project: Lea County, NM

Site: Ramsay Fed Com

Well: Ramsay Fed Com #2

Wellbore: Wellbore #1

Design: Surveys

Local Co-ordinate Reference: Well Ramsay Fed Com #2
TVD Reference: GL 3192.2' + 17.5' KB @ 3209.70usft (Trinidad 417)
MD Reference: GL 3192.2' + 17.5' KB @ 3209.70usft (Trinidad 417)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 Single User Db

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Ramsay Fed Com				
Site Position:		Northing:	433,003.30 usft	Latitude:	32° 11' 2.709 N
From:	Map	Easting:	892,311.81 usft	Longitude:	103° 3' 55.061 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.68 °

Well	Ramsay Fed Com #2					
Well Position	+N/-S	0.00 usft	Northing:	433,003.30 usft	Latitude:	32° 11' 2.709 N
	+E/-W	0.00 usft	Easting:	892,311.81 usft	Longitude:	103° 3' 55.061 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,192.20 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/21/2019	6.37	59.85	48,005.30000000

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	350.20	

Survey Program	Date 4/15/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
17.50	1,177.00	Gyrodata Gyro (Wellbore #1)	GYD_G003_GC+DROP+	Gyrodata Stationary Tool drop on BHA on open h	
1,300.00	8,570.00	Scout MWD (Wellbore #1)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17.50	0.00	0.00	17.50	0.00	0.00	0.00	0.00	0.00	0.00
Ground Level at 17.50' MD									
147.40	0.58	282.40	147.40	0.14	-0.64	0.25	0.45	0.45	0.00
333.40	0.92	287.69	333.38	0.80	-2.98	1.29	0.19	0.18	2.84
515.40	0.91	286.59	515.36	1.65	-5.76	2.61	0.01	-0.01	-0.60
697.20	0.84	265.02	697.14	1.95	-8.47	3.36	0.18	-0.04	-11.86
879.20	0.98	252.57	879.11	1.37	-11.29	3.27	0.13	0.08	-6.84



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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,061.00	1.05	238.47	1,060.89	0.03	-14.19	2.45	0.14	0.04	-7.76
1,177.00	1.00	237.84	1,176.87	-1.06	-15.95	1.67	0.04	-0.04	-0.54
1,300.00	0.79	233.32	1,299.85	-2.14	-17.54	0.88	0.18	-0.17	-3.67
First Scout MWD Survey at 1300.0' MD									
1,489.00	0.84	194.82	1,488.84	-4.26	-18.94	-0.97	0.29	0.03	-20.37
1,615.00	1.41	333.25	1,614.82	-3.77	-19.87	-0.33	1.68	0.45	109.87
1,741.00	3.87	339.40	1,740.68	1.60	-22.07	5.33	1.96	1.95	4.88
1,867.00	6.20	349.42	1,866.19	12.27	-24.81	16.31	1.97	1.85	7.95
1,993.00	7.78	352.76	1,991.25	27.42	-27.14	31.64	1.29	1.25	2.65
2,182.00	7.60	358.82	2,178.55	52.60	-29.01	56.78	0.44	-0.10	3.21
2,371.00	7.96	4.54	2,365.81	78.15	-28.23	81.81	0.45	0.19	3.03
2,498.00	7.65	358.56	2,491.64	95.36	-27.75	98.69	0.68	-0.24	-4.71
2,688.00	6.99	3.39	2,680.09	119.55	-27.38	122.46	0.47	-0.35	2.54
2,813.00	6.55	349.77	2,804.23	134.16	-28.20	137.00	1.33	-0.35	-10.90
2,939.00	7.25	350.21	2,929.31	149.06	-30.82	152.14	0.56	0.56	0.35
3,065.00	6.33	348.28	3,054.43	163.70	-33.59	167.03	0.75	-0.73	-1.53
3,191.00	7.52	349.68	3,179.51	178.61	-36.48	182.22	0.95	0.94	1.11
3,317.00	8.88	350.47	3,304.22	196.32	-39.56	200.19	1.08	1.08	0.63
3,443.00	8.48	350.47	3,428.77	215.07	-42.71	219.20	0.32	-0.32	0.00
3,569.00	7.34	349.86	3,553.57	232.15	-45.67	236.54	0.91	-0.90	-0.48
3,694.00	8.53	349.33	3,677.37	249.13	-48.79	253.80	0.95	0.95	-0.42
3,820.00	7.78	347.93	3,802.10	266.65	-52.30	271.66	0.62	-0.60	-1.11
3,946.00	7.30	347.57	3,927.01	282.81	-55.81	288.18	0.38	-0.38	-0.29
4,072.00	7.96	348.01	4,051.89	299.16	-59.34	304.89	0.53	0.52	0.35
4,198.00	7.47	349.07	4,176.75	315.73	-62.71	321.80	0.40	-0.39	0.84
4,325.00	7.43	351.09	4,302.68	331.95	-65.55	338.27	0.21	-0.03	1.59
4,450.00	8.13	349.42	4,426.53	348.63	-68.42	355.18	0.59	0.56	-1.34
4,576.00	9.10	348.54	4,551.11	367.15	-72.04	374.05	0.78	0.77	-0.70
4,702.00	7.87	349.33	4,675.72	385.39	-75.61	392.64	0.98	-0.98	0.63
4,828.00	9.19	352.58	4,800.33	403.85	-78.51	411.32	1.11	1.05	2.58
4,954.00	10.24	356.28	4,924.52	425.00	-80.54	432.51	0.97	0.83	2.94
5,079.00	9.93	356.80	5,047.59	446.85	-81.86	454.26	0.26	-0.25	0.42
5,206.00	9.71	356.98	5,172.73	468.48	-83.04	475.78	0.17	-0.17	0.14
5,332.00	9.19	357.24	5,297.02	489.14	-84.08	496.31	0.41	-0.41	0.21
5,458.00	8.70	357.86	5,421.49	508.71	-84.92	515.74	0.40	-0.39	0.49
5,584.00	8.00	356.89	5,546.15	526.99	-85.75	533.90	0.57	-0.56	-0.77
5,710.00	8.22	351.53	5,670.89	544.66	-87.55	551.61	0.62	0.17	-4.25
5,836.00	6.90	350.56	5,795.79	561.03	-90.12	568.18	1.05	-1.05	-0.77
5,962.00	6.33	351.18	5,920.95	575.36	-92.43	582.70	0.46	-0.45	0.49
6,087.00	5.89	349.77	6,045.24	588.48	-94.62	596.00	0.37	-0.35	-1.13
6,213.00	5.41	349.77	6,170.63	600.69	-96.83	608.41	0.38	-0.38	0.00
6,340.00	4.88	348.72	6,297.12	611.88	-98.95	619.79	0.42	-0.42	-0.83



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Wellbore: Wellbore #1

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Database: EDM 5000.14 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,466.00	3.69	334.48	6,422.77	620.79	-101.74	629.05	1.26	-0.94	-11.30
6,592.00	2.81	346.08	6,548.57	627.45	-104.23	636.04	0.87	-0.70	9.21
6,717.00	1.85	351.53	6,673.46	632.42	-105.27	641.11	0.79	-0.77	4.36
6,843.00	2.02	348.98	6,799.39	636.61	-105.99	645.36	0.15	0.13	-2.02
6,969.00	1.49	330.35	6,925.33	640.22	-107.23	649.12	0.61	-0.42	-14.79
7,095.00	1.32	330.96	7,051.29	642.91	-108.74	652.04	0.14	-0.13	0.48
7,221.00	1.10	319.19	7,177.26	645.09	-110.24	654.44	0.26	-0.17	-9.34
7,347.00	0.79	300.20	7,303.25	646.45	-111.78	656.04	0.35	-0.25	-15.07
7,473.00	0.66	292.73	7,429.24	647.16	-113.20	656.99	0.13	-0.10	-5.93
7,599.00	0.57	284.91	7,555.23	647.60	-114.47	657.64	0.10	-0.07	-6.21
7,788.00	0.70	273.39	7,744.22	647.91	-116.53	658.30	0.10	0.07	-6.10
7,914.00	3.47	209.94	7,870.13	644.66	-119.20	655.54	2.55	2.20	-50.36
8,040.00	1.89	199.04	7,995.99	639.39	-121.79	650.79	1.31	-1.25	-8.65
8,166.00	6.37	197.63	8,121.63	630.76	-124.58	642.76	3.56	3.56	-1.12
8,292.00	6.99	203.96	8,246.78	617.09	-129.81	630.18	0.76	0.49	5.02
8,418.00	5.23	208.53	8,372.06	605.04	-135.67	619.30	1.45	-1.40	3.63
8,478.00	5.67	207.65	8,431.79	600.01	-138.35	614.80	0.75	0.73	-1.47
8,501.00	5.71	206.86	8,454.67	597.98	-139.40	612.98	0.38	0.17	-3.43
Last Scout MWD Survey at 8501.0' MD									
8,553.13	5.71	206.86	8,506.55	593.35	-141.74	608.82	0.00	0.00	0.00
Ramsay Fed Com p5 PBHL									
8,570.00	5.71	206.86	8,523.33	591.86	-142.50	607.48	0.00	0.00	0.00
Projection to TD at 8570.0' MD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
17.50	17.50	0.00	0.00	Ground Level at 17.50' MD
1,300.00	1,299.85	-2.14	-17.54	First Scout MWD Survey at 1300.0' MD
8,501.00	8,454.67	597.98	-139.40	Last Scout MWD Survey at 8501.0' MD
8,570.00	8,523.33	591.86	-142.50	Projection to TD at 8570.0' MD

Checked By: _____ Approved By: _____ Date: _____



Project: Lea County, NM
Site: Ramsay Fed Com
Well: Ramsay Fed Com #2
Depth Reference: GL 3192.2' + 17.5' KB @ 3209.70usft (Trinidad 417)
SHL Northing: 433003.30
SHL Easting: 892311.81
Rig: Trinidad 417
Plan: plan5



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Deg	TFace	VFace	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1600.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	Start Build 1.50
2181.72	8.43	350.20	2158.70	40.83	-7.02	1.50	350.20	41.23	Start 3549.08 held at 2181.72 MD
5710.78	8.43	350.20	5670.49	553.07	-95.87	0.00	0.00	561.27	Start Drop -1.00
8553.36	0.00	0.00	8510.00	814.01	-106.10	1.00	180.00	823.11	Start 2000.00 held at 8553.36 MD
8553.36	0.00	0.00	8510.00	814.01	-106.10	0.00	0.00	823.11	TD at 8553.36 MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1245.00	1245.00	Rustler
1410.00	1410.00	Salado
2658.00	2663.44	Tansil
2904.00	2914.14	Yates
3099.00	3111.27	7 Rivers
3635.00	3653.12	Queen
4039.00	4061.53	Grayburg
4277.00	4302.12	San Andres
5441.00	5478.83	Glorieta
5797.00	5838.51	Yeso
6310.00	6353.32	Tubb
6575.00	6618.36	Drinkard
6824.00	6867.36	Abo
7613.00	7656.36	Wolfcamp
7745.00	7788.36	Woodford
8092.00	8135.36	Devonian
8241.00	8284.36	Devonian Chert

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting
Ramsay Fed Com p5 PBHL	8510.00	614.01	-106.10	433617.31	892205.71



Azimuths to Grid North
True North: -0.68°
Magnetic North: 5.80°
Magnetic Field
Strength: 48000.3anT
Dip Angle: 59.85°
Date: 3/21/2019
Model: HDGM

