



Oxy USA Inc.

Lea County, NM

North Hobbs G/SA Unit Section 3

NHU 33-695

Wellbore #1

HOBBS OCD

MAY 21 2019

RECEIVED

Design: Surveys

Standard Survey Report

07 January, 2019





Project: Lea County, NM
Site: North Hobbs G/SA Unit Section 33
Well: NHU 33-695
Depth Reference: GL 3644.1' + 17.5' KB @ 3661.60usft (Trinidad 417)
SHL Northing: 623450.01
SHL Easting: 862621.86
Rig: Trinidad 417
Plan: plan3



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
2936.74	48.73	80.39	2686.11	150.51	888.67	2.00	80.39	901.33	Start 602.28 hold at 2936.74 MD
3539.01	48.73	80.39	3098.89	223.75	1321.09	0.00	0.00	1339.90	Start Drop -1.50
4454.66	33.00	80.39	3800.00	321.52	1898.40	1.50	180.00	1925.44	Start 486.93 hold at 4454.66 MD
4921.59	33.00	80.39	4191.80	363.99	2149.14	0.00	0.00	2179.75	Start 357.71 hold at 4921.59 MD
5279.30	33.00	80.39	4491.60	396.52	2341.23	0.00	0.00	2374.57	TD @ 5279.30' MD

FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
1590.85	1611.75	Rustler
1677.37	1704.53	Salt
2669.98	2913.31	Yates
2872.72	3209.02	Seven Rivers
3414.81	3974.54	Queen
3723.68	4382.94	Grayburg
4021.44	4718.70	San Andres 1
4345.46	5105.05	SA3 K

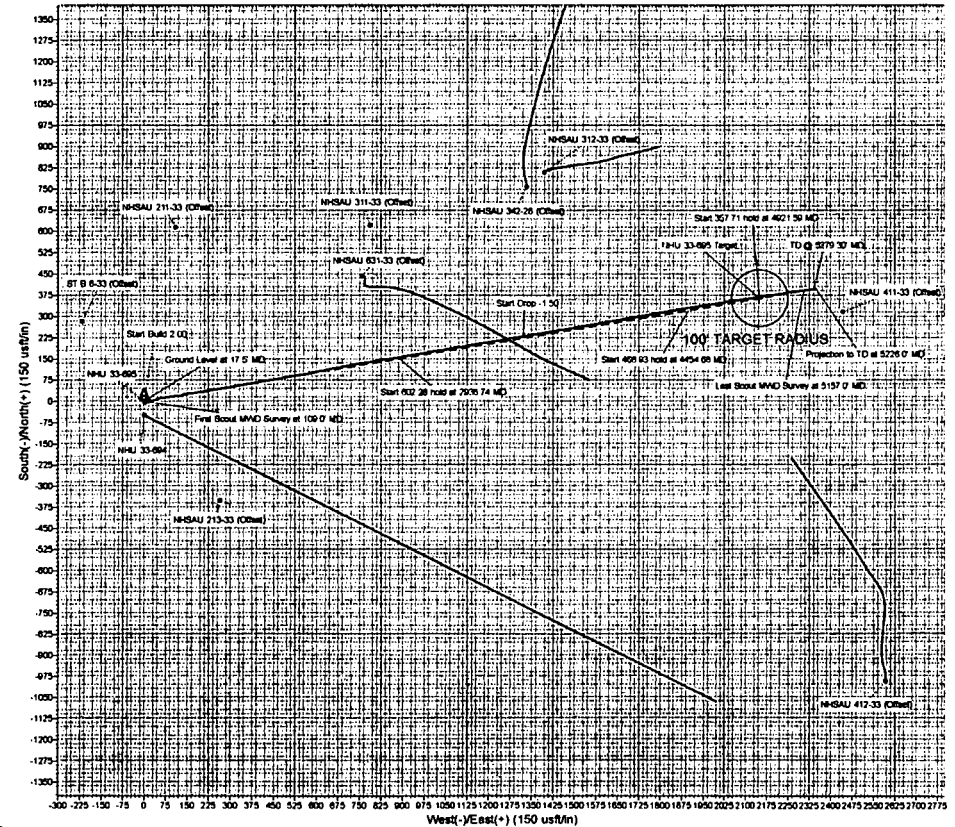
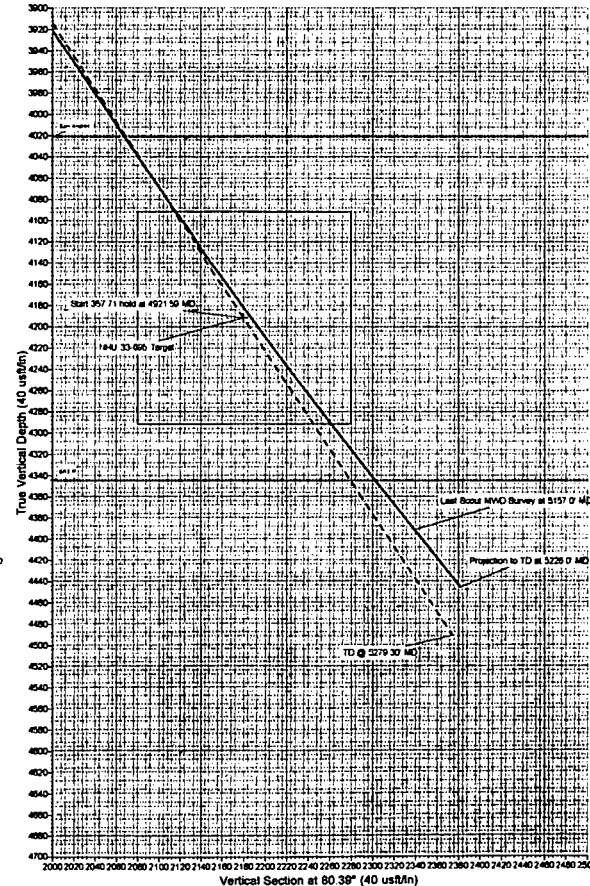
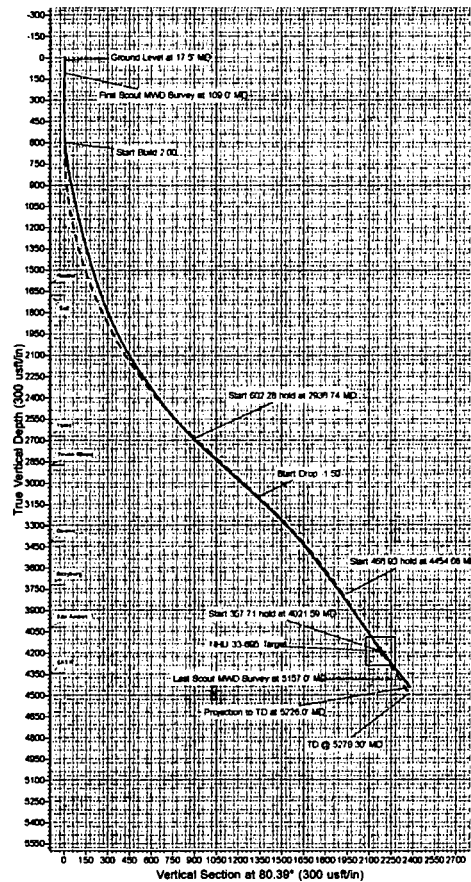
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
NHU 33-695 Target	4191.60	363.99	2149.14	623814.00	864771.00	Circle (Radius: 100.00)



Azimuths to Grid North
True North: -0.64°
Magnetic North: 6.15°

Magnetic Field
Strength: 48102.5nT
Dip Angle: 60.73°
Date: 12/23/2018
Model: HDGM





Survey Report



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

Site: North Hobbs G/SA Unit Section 33

Well: NHU 33-695

Wellbore: Wellbore #1

Design: Surveys

Local Co-ordinate Reference: Well NHU 33-695

TVD Reference: GL 3644.1' + 17.5' KB @ 3661.60usft (Trinidad 417)

MD Reference: GL 3644.1' + 17.5' KB @ 3661.60usft (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	North Hobbs G/SA Unit Section 33				
Site Position:		Northing:	623,400.01 usft	Latitude:	32° 42' 29.815 N
From:	Map	Easting:	862,622.48 usft	Longitude:	103° 9' 16.006 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.64 °

Well	NHU 33-695					
Well Position	+N/-S	0.00 usft	Northing:	623,450.01 usft	Latitude:	32° 42' 30.310 N
	+E/-W	0.00 usft	Easting:	862,621.86 usft	Longitude:	103° 9' 16.007 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,644.10 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/23/2018	6.78	60.73	48,102.50000000

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	80.39	

Survey Program	Date 1/7/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
17.50	5,226.00	Scout MWD Surveys (Wellbore #1)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	

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)
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 17.5' MD									
109.00	0.75	179.80	109.00	-0.60	0.00	-0.10	0.82	0.82	0.00
First Scout MWD Survey at 109.0' MD									
233.00	1.01	178.92	232.98	-2.50	0.03	-0.39	0.21	0.21	-0.71
415.00	1.54	184.46	414.94	-6.55	-0.13	-1.23	0.30	0.29	3.04
535.00	1.89	94.64	534.90	-8.31	1.71	0.30	2.03	0.29	-74.85
656.00	5.49	69.67	655.64	-6.46	9.13	7.92	3.19	2.98	-20.64



Survey Report



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Site:	North Hobbs G/SA Unit Section 33	MD Reference:	GL 3644.1' + 17.5' KB @ 3661.60usft (Trinidad 417)
Well:	NHU 33-695	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	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)
777.00	9.71	69.41	775.55	-0.86	24.12	23.64	3.49	3.49	-0.21
899.00	12.57	72.75	895.24	6.70	46.43	46.90	2.40	2.34	2.74
1,021.00	12.09	80.13	1,014.43	12.82	71.70	72.83	1.35	-0.39	6.05
1,145.00	13.10	85.58	1,135.45	16.13	98.51	99.82	1.26	0.81	4.40
1,270.00	14.42	79.61	1,256.86	20.03	127.94	129.49	1.55	1.06	-4.78
1,396.00	15.47	78.64	1,378.60	26.17	159.85	161.97	0.86	0.83	-0.77
1,522.00	16.84	81.10	1,499.62	32.30	194.36	197.02	1.22	1.09	1.95
1,568.00	16.92	81.54	1,543.64	34.32	207.56	210.38	0.33	0.17	0.96
1,712.00	19.65	80.92	1,680.36	41.23	252.20	255.55	1.90	1.90	-0.43
1,838.00	22.33	80.13	1,797.99	48.67	296.71	300.68	2.14	2.13	-0.63
1,964.00	25.05	78.46	1,913.36	58.11	346.44	351.28	2.22	2.16	-1.33
2,090.00	28.26	80.75	2,025.96	68.25	402.03	407.79	2.67	2.55	1.82
2,216.00	30.99	79.61	2,135.48	78.90	463.39	470.06	2.21	2.17	-0.90
2,341.00	34.02	80.92	2,240.88	90.22	529.59	537.22	2.49	2.42	1.05
2,467.00	35.12	77.50	2,344.64	103.63	599.79	608.67	1.77	0.87	-2.71
2,593.00	37.49	78.90	2,446.18	118.86	672.81	683.21	1.99	1.88	1.11
2,719.00	40.40	80.40	2,544.17	133.05	750.72	762.39	2.43	2.31	1.19
2,845.00	42.81	80.84	2,638.38	146.68	833.26	846.05	1.93	1.91	0.35
2,971.00	45.63	80.49	2,728.67	160.94	919.96	933.91	2.25	2.24	-0.28
3,097.00	47.12	79.96	2,815.60	176.43	1,009.84	1,025.12	1.22	1.18	-0.42
3,223.00	47.16	80.13	2,901.30	192.39	1,100.81	1,117.48	0.10	0.03	0.13
3,349.00	47.91	80.40	2,986.37	208.11	1,192.42	1,210.42	0.62	0.60	0.21
3,474.00	46.07	79.87	3,071.63	223.76	1,282.47	1,301.82	1.50	-1.47	-0.42
3,538.00	46.42	80.57	3,115.89	231.61	1,328.02	1,348.05	0.96	0.55	1.09
3,663.00	45.32	80.57	3,202.93	246.31	1,416.53	1,437.77	0.88	-0.88	0.00
3,790.00	43.38	80.31	3,293.74	261.05	1,504.07	1,526.54	1.53	-1.53	-0.20
3,916.00	39.87	79.78	3,387.91	275.51	1,586.49	1,610.22	2.80	-2.79	-0.42
4,042.00	36.92	79.96	3,486.65	289.27	1,663.52	1,688.47	2.34	-2.34	0.14
4,168.00	36.97	79.96	3,587.35	302.48	1,738.09	1,764.20	0.04	0.04	0.00
4,294.00	35.56	80.05	3,688.94	315.41	1,811.49	1,838.72	1.12	-1.12	0.07
4,420.00	34.59	80.66	3,792.06	327.55	1,882.87	1,911.13	0.82	-0.77	0.48
4,547.00	34.37	80.92	3,896.75	339.06	1,953.84	1,983.02	0.21	-0.17	0.20
4,672.00	34.02	81.10	4,000.14	350.03	2,023.23	2,053.27	0.29	-0.28	0.14
4,799.00	34.95	81.63	4,104.82	360.83	2,094.32	2,125.17	0.77	0.73	0.42
4,925.00	36.13	81.63	4,207.35	371.49	2,166.78	2,198.39	0.94	0.94	0.00
5,051.00	37.58	81.89	4,308.17	382.32	2,241.57	2,273.94	1.16	1.15	0.21
5,157.00	38.37	82.24	4,391.72	391.32	2,306.17	2,339.13	0.77	0.75	0.33
Last Scout MWD Survey at 5157.0' MD									
5,226.00	38.37	82.24	4,445.82	397.10	2,348.61	2,381.94	0.00	0.00	0.00
Projection to TD at 5226.0' MD									



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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 17.5' MD
109.00	109.00	-0.60	0.00	First Scout MWD Survey at 109.0' MD
5,157.00	4,391.72	391.32	2,306.17	Last Scout MWD Survey at 5157.0' MD
5,226.00	4,445.82	397.10	2,348.61	Projection to TD at 5226.0' MD

Checked By: _____ Approved By: _____ Date: _____