



Oxy USA Inc.

**Lea County, NM
North Hobbs G/SA Unit
NHU 24-685**

Wellbore #1

Survey: Scout MWD

HOBBS OGD

FEB 28 2018

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Standard Survey Report

08 February, 2018

*Provide signature page for
directional survey*





Project: Lea County, NM
Site: North Hobbs G/SA Unit
Well: NHU 24-685
Depth Reference: GL 3669.4' + 17.5' KB @ 3686.90usft (Trinidad 435)
SHL Northing: 630326.44
SHL Easting: 846278.50
Rig: Trinidad 435
Plan: plan2



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSeet	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
2050.00	5.00	129.14	2049.68	-6.88	8.45	2.00	129.14	10.90	Start 1741.98 hold at 2050.00 MD
3791.96	5.00	129.14	3785.01	-102.72	126.21	0.00	0.00	162.72	Start Drop -2.00
4041.96	0.00	0.00	4034.70	-109.60	134.66	2.00	180.00	173.62	Start 1065.30 hold at 4041.96 MD
5107.26	0.00	0.00	5100.00	-109.60	134.66	0.00	0.00	173.62	TD @ 5107.26' MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
226.90	226.90	Triassic Red Beds
1546.90	1546.90	Rustler
1656.90	1656.90	SALT
2786.90	2790.03	Yates
3026.90	3030.95	Seven Rivers
3566.90	3573.01	Queen
3876.90	3884.08	Grayburg
4146.90	4154.16	San Andres (Zone 1)
4316.90	4324.16	San Andres (Zone 3 upper)
4576.90	4584.16	San Andres (Zone 3 lower)
4826.90	4834.16	San Andres (ROZ_A)

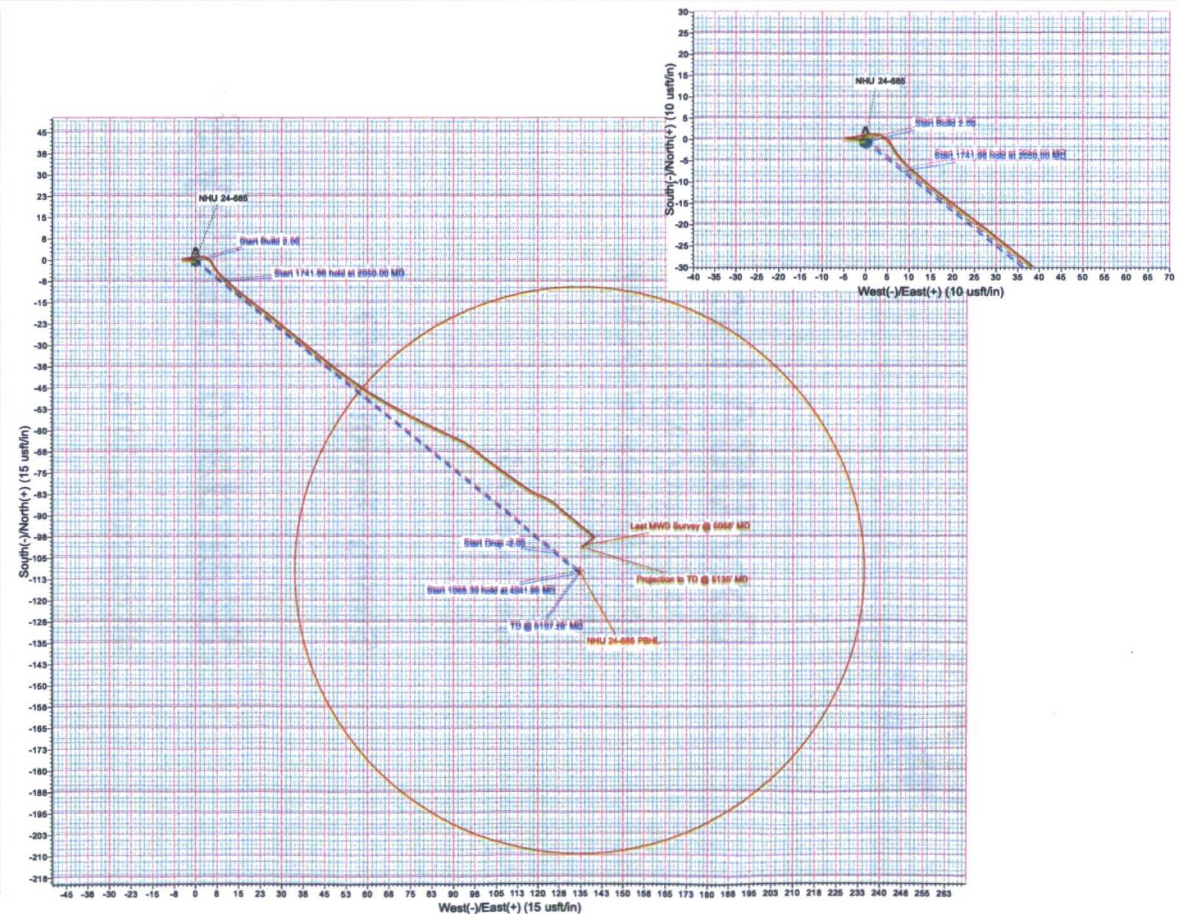
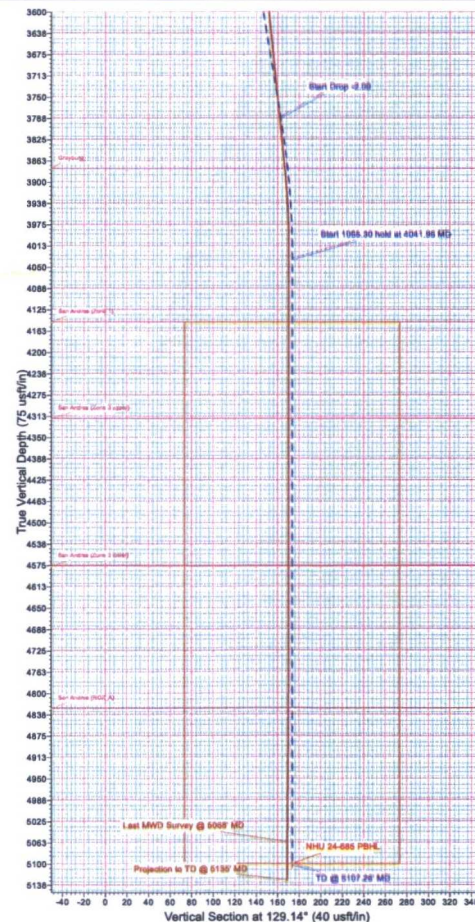
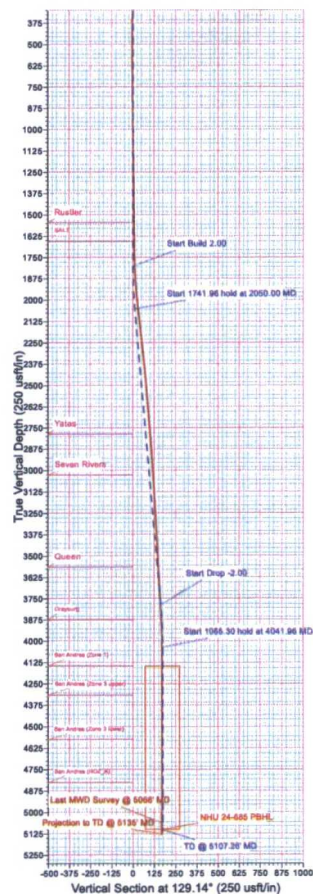
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
NHU 24-685 PBHL	5100.00	-109.60	134.66	630216.84	846413.16



Azimuths to Grid North
True North: -0.61°
Magnetic North: 6.29°

Magnetic Field
Strength: 48198.7nT
Dip Angle: 60.77°
Date: 11/03/2017
Model: HDGM





Survey Report



Company:	Oxy USA Inc.	Local Co-ordinate Reference:	Well NHU 24-685
Project:	Lea County, NM	TVD Reference:	GL 3669.4' + 17.5' KB @ 3686.90usft (Trinidad 435)
Site:	North Hobbs G/SA Unit	MD Reference:	GL 3669.4' + 17.5' KB @ 3686.90usft (Trinidad 435)
Well:	NHU 24-685	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	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											
Site Position:			Northing:			634,663.65 usft			Latitude:			32° 44' 22.880 N					
From:			Map			Easting:			847,524.56 usft			Longitude:			103° 12' 11.270 W		
Position Uncertainty:			0.00 usft			Slot Radius:			13-3/16 "			Grid Convergence:			0.61 °		

Well	NHU 24-685					
Well Position	+N/-S	0.00 usft	Northing:	630,326.44 usft	Latitude:	32° 43' 40.101 N
	+E/-W	0.00 usft	Easting:	846,278.50 usft	Longitude:	103° 12' 26.396 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,669.40 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/03/17	6.90	60.77	48,198.70000000

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	126.51	

Survey Program	Date	02/08/18			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
175.00	5,135.00	Scout MWD (Wellbore #1)	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	
175.00	0.88	266.30	174.99	-0.09	-1.34	-1.03	0.50	0.50	0.00	
360.00	0.83	277.20	359.97	-0.01	-4.09	-3.28	0.09	-0.03	5.89	
544.00	0.52	89.20	543.97	0.17	-4.58	-3.78	0.73	-0.17	93.48	
727.00	0.83	79.70	726.95	0.42	-2.44	-2.21	0.18	0.17	-5.19	
911.00	0.96	73.90	910.93	1.08	0.35	-0.36	0.09	0.07	-3.15	
1,096.00	1.01	109.80	1,095.91	0.96	3.37	2.14	0.33	0.03	19.41	
1,286.00	0.61	152.40	1,285.89	-0.50	5.42	4.65	0.37	-0.21	22.42	
1,475.00	0.79	150.20	1,474.87	-2.53	6.53	6.75	0.10	0.10	-1.16	



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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)
1,496.00	0.79	147.90	1,495.87	-2.77	6.68	7.02	0.15	0.00	-10.95
1,635.00	0.83	142.00	1,634.86	-4.38	7.81	8.88	0.07	0.03	-4.24
1,760.00	0.74	135.60	1,759.85	-5.67	8.93	10.55	0.10	-0.07	-5.12
1,885.00	3.78	132.50	1,884.74	-9.03	12.54	15.45	2.43	2.43	-2.48
2,011.00	6.81	127.40	2,010.18	-16.38	21.53	27.05	2.43	2.40	-4.05
2,137.00	6.37	129.50	2,135.35	-25.36	32.86	41.50	0.40	-0.35	1.67
2,262.00	6.15	129.40	2,259.61	-34.02	43.39	55.11	0.18	-0.18	-0.08
2,388.00	6.06	126.00	2,384.89	-42.21	53.98	68.50	0.30	-0.07	-2.70
2,515.00	4.65	120.80	2,511.33	-48.79	63.83	80.33	1.17	-1.11	-4.09
2,641.00	4.87	118.60	2,636.90	-53.96	72.91	90.71	0.23	0.17	-1.75
2,764.00	4.48	116.50	2,759.49	-58.61	81.80	100.61	0.35	-0.32	-1.71
2,890.00	4.17	113.90	2,885.13	-62.66	90.39	109.93	0.29	-0.25	-2.06
3,015.00	4.00	130.30	3,009.82	-67.32	97.87	118.72	0.94	-0.14	13.12
3,141.00	3.64	126.60	3,135.54	-72.55	104.43	127.10	0.35	-0.29	-2.94
3,267.00	3.20	125.60	3,261.31	-76.98	110.50	134.62	0.35	-0.35	-0.79
3,392.00	2.94	121.40	3,386.13	-80.68	116.07	141.30	0.27	-0.21	-3.36
3,517.00	2.98	113.40	3,510.97	-83.64	121.79	147.65	0.33	0.03	-6.40
3,644.00	3.12	131.34	3,637.79	-87.24	127.42	154.31	0.76	0.11	14.13
3,770.00	3.07	130.73	3,763.61	-91.70	132.55	161.10	0.05	-0.04	-0.48
3,895.00	2.98	127.13	3,888.43	-95.85	137.68	167.68	0.17	-0.07	-2.88
4,021.00	0.26	265.73	4,014.38	-97.85	140.00	170.74	2.52	-2.16	110.00
4,146.00	0.04	183.46	4,139.38	-97.91	139.72	170.55	0.21	-0.18	-65.82
4,271.00	0.04	71.84	4,264.38	-97.94	139.76	170.60	0.05	0.00	-89.30
4,398.00	0.04	104.81	4,391.38	-97.94	139.84	170.67	0.02	0.00	25.96
4,513.00	0.04	15.15	4,506.38	-97.91	139.89	170.69	0.05	0.00	-77.97
4,648.00	0.08	329.89	4,641.38	-97.78	139.85	170.59	0.04	0.03	-33.53
4,774.00	0.70	217.48	4,767.38	-98.32	139.34	170.49	0.58	0.49	-89.21
4,900.00	0.87	240.24	4,893.36	-99.40	138.04	170.09	0.28	0.13	18.06
5,026.00	0.79	233.30	5,019.35	-100.40	136.52	169.46	0.10	-0.06	-5.51
5,068.00	0.70	235.90	5,061.35	-100.71	136.07	169.29	0.23	-0.21	6.19
Last MWD Survey @ 5068' MD									
5,135.00	0.70	235.90	5,128.34	-101.17	135.39	169.02	0.00	0.00	0.00
Projection to TD @ 5135' MD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,068.00	5,061.35	-100.71	136.07	Last MWD Survey @ 5068' MD
5,135.00	5,128.34	-101.17	135.39	Projection to TD @ 5135' MD



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Checked By: _____ Approved By: _____ Date: _____