



Project: Lea County, NM
Site: North Hobbs G/SA Unit
Well: NHU 23-671
Depth Reference: GL 3683.2' + 12.5' KB @ 3695.70usft (Precision 194)
SHL Northing: 630627.18
SHL Easting: 841694.18
Rig: Precision 194
Plan: plan2



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5395.70	0.00	0.00	5395.70	0.00	0.00	0.00	0.00	0.00	TD at 5395.70' MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1666.31	1666.31	Rustler
1705.05	1705.05	Salt
2939.16	2939.16	Yates
3178.22	3178.22	Seven Rivers
3730.45	3730.45	Queen
4061.14	4061.14	Grayburg
4330.29	4330.29	San Andres 1
4798.39	4798.39	SA3 K
5041.97	5041.97	SA ROZ A

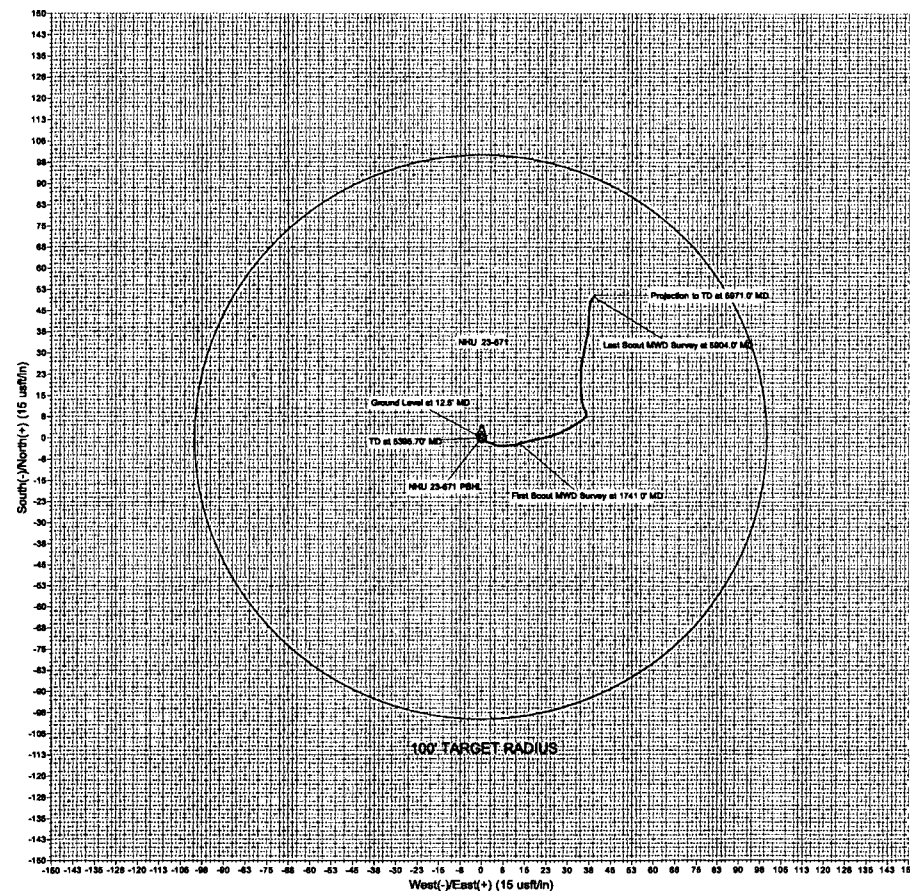
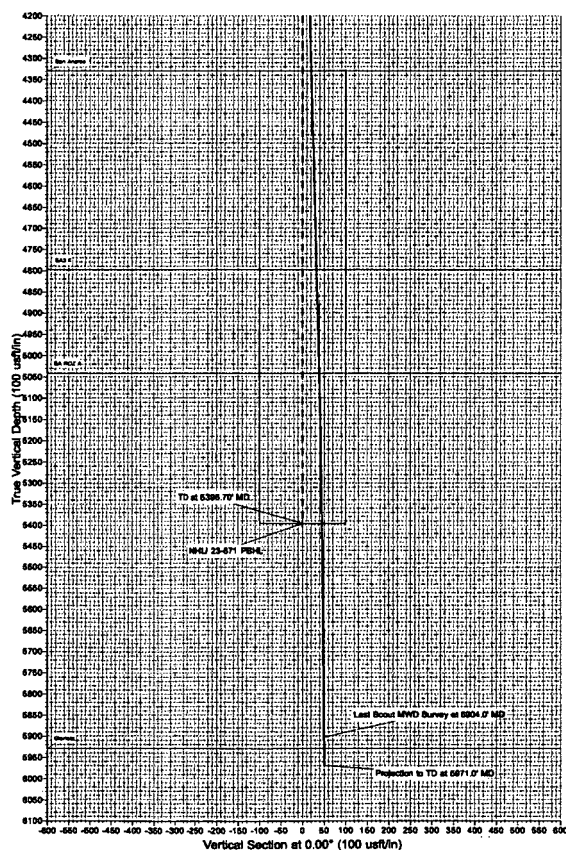
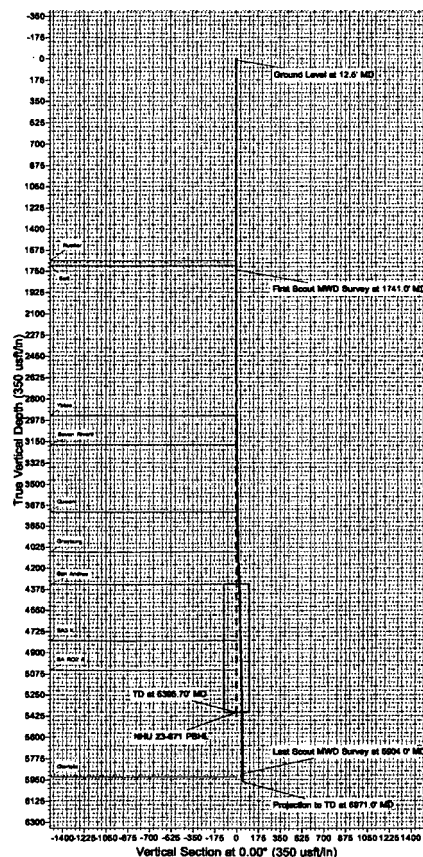
DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
NHU 23-671 PBHL	5395.70	0.00	0.00	630627.18	841694.18	Circle (Radius: 100.00)



Azimuths to Grid North
True North: -0.60°
Magnetic North: 6.20°

Magnetic Field
Strength: 48068.7nT
Dip Angle: 60.72°
Date: 11/12/2018
Model: HDGM





Oxy USA Inc.

**Lea County, NM
North Hobbs G/SA Unit
NHU 23-671**

Wellbore #1

Design: Surveys

Standard Survey Report

17 December, 2018

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Survey Report



Company:	Oxy USA Inc.	Local Co-ordinate Reference:	Well NHU 23-671
Project:	Lea County, NM	TVD Reference:	GL 3683.2' + 12.5' KB @ 3695.70usft (Precision 194)
Site:	North Hobbs G/SA Unit	MD Reference:	GL 3683.2' + 12.5' KB @ 3695.70usft (Precision 194)
Well:	NHU 23-671	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 23-671					
Well Position	+N/-S	0.00 usft	Northing:	630,627.18 usft	Latitude:	32° 43' 43.555 N
	+E/-W	0.00 usft	Easting:	841,694.18 usft	Longitude:	103° 13' 20.015 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,683.20 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/12/2018	6.80	60.72	48,068.70000000

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	0.00	

Survey Program	Date 12/2/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
12.50	1,594.00	Gyrodata Gyro (Wellbore #1)	GYD_G003_GC+DROP+	Gyrodata Stationary Tool drop on BHA on open h	
1,741.00	5,971.00	Scout MWD Survey (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	
12.50	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	
Ground Level at 12.5' MD										
44.00	0.27	172.18	44.00	-0.07	0.01	-0.07	0.86	0.86	0.00	
166.00	0.33	142.15	166.00	-0.64	0.26	-0.64	0.14	0.05	-24.61	
347.00	0.41	105.04	346.99	-1.22	1.21	-1.22	0.14	0.04	-20.50	
526.00	0.49	108.79	525.99	-1.63	2.55	-1.63	0.05	0.04	2.09	
709.00	0.33	115.90	708.98	-2.11	3.77	-2.11	0.09	-0.09	3.89	



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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)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
890.00	0.31	108.73	889.98	-2.50	4.70	-2.50	0.02	-0.01	-3.96
1,058.00	0.43	99.47	1,057.98	-2.74	5.75	-2.74	0.08	0.07	-5.51
1,236.00	0.74	88.15	1,235.97	-2.82	7.56	-2.82	0.19	0.17	-6.36
1,415.00	0.87	83.55	1,414.95	-2.63	10.07	-2.63	0.08	0.07	-2.57
1,594.00	0.65	84.71	1,593.94	-2.38	12.43	-2.38	0.12	-0.12	0.65
1,741.00	0.26	17.10	1,740.93	-1.99	13.36	-1.99	0.41	-0.27	-45.99
First Scout MWD Survey at 1741.0' MD									
1,920.00	0.18	48.65	1,919.93	-1.41	13.69	-1.41	0.08	-0.04	17.63
2,098.00	0.26	177.15	2,097.93	-1.63	13.92	-1.63	0.22	0.04	72.19
2,277.00	0.53	64.65	2,276.93	-1.68	14.68	-1.68	0.38	0.15	-62.85
2,456.00	1.10	78.45	2,455.91	-0.98	17.12	-0.98	0.33	0.32	7.71
2,634.00	1.49	78.18	2,633.86	-0.17	21.06	-0.17	0.22	0.22	-0.15
2,813.00	1.67	71.24	2,812.79	1.15	25.80	1.15	0.15	0.10	-3.88
2,991.00	1.80	58.49	2,990.71	3.44	30.64	3.44	0.23	0.07	-7.16
3,170.00	0.18	74.40	3,169.68	4.99	33.31	4.99	0.91	-0.91	8.89
3,349.00	0.66	54.89	3,348.68	5.66	34.42	5.66	0.28	0.27	-10.90
3,527.00	1.10	44.08	3,526.65	7.47	36.45	7.47	0.26	0.25	-6.07
3,706.00	0.70	291.32	3,705.64	9.11	36.63	9.11	0.85	-0.22	-62.99
3,884.00	0.88	351.26	3,883.63	10.85	35.41	10.85	0.45	0.10	33.67
4,063.00	1.14	352.23	4,062.60	13.98	34.96	13.98	0.15	0.15	0.54
4,242.00	1.45	359.43	4,241.55	18.00	34.69	18.00	0.20	0.17	4.02
4,421.00	1.63	1.72	4,420.49	22.81	34.75	22.81	0.11	0.10	1.28
4,599.00	1.49	8.75	4,598.42	27.63	35.18	27.63	0.13	-0.08	3.95
4,778.00	1.49	13.49	4,777.36	32.19	36.07	32.19	0.07	0.00	2.65
4,956.00	1.49	8.31	4,955.30	36.74	36.95	36.74	0.08	0.00	-2.91
5,135.00	1.19	1.98	5,134.25	40.90	37.35	40.90	0.19	-0.17	-3.54
5,314.00	0.70	0.58	5,313.23	43.85	37.42	43.85	0.27	-0.27	-0.78
5,493.00	0.66	9.19	5,492.22	45.96	37.60	45.96	0.06	-0.02	4.81
5,672.00	0.57	14.46	5,671.21	47.84	37.99	47.84	0.06	-0.05	2.94
5,851.00	0.53	40.57	5,850.20	49.33	38.75	49.33	0.14	-0.02	14.59
5,904.00	0.75	42.15	5,903.19	49.77	39.14	49.77	0.42	0.42	2.98
Last Scout MWD Survey at 5904.0' MD									
5,971.00	0.75	42.15	5,970.19	50.42	39.73	50.42	0.00	0.00	0.00
Projection to TD at 5971.0' MD									



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Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12.50	12.50	0.00	0.00	Ground Level at 12.5' MD
1,741.00	1,740.93	-1.99	13.36	First Scout MWD Survey at 1741.0' MD
5,904.00	5,903.19	49.77	39.14	Last Scout MWD Survey at 5904.0' MD
5,971.00	5,970.19	50.42	39.73	Projection to TD at 5971.0' MD

Checked By: _____	Approved By: _____	Date: _____
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