



Project: Lea County, NM
Site: North Hobbs G/SA Unit
Well: NHU 13-653
Depth Reference: GL 3675.2' + 17.5' KB @ 3692.70usft (Trinidad 435)
SHL Northing: 634663.91
SHL Easting: 847559.56
Rig: Trinidad 435
Plan: plan1



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	Vsect	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 3.00
2403.91	18.12	7.87	2393.89	93.79	12.97	3.00	7.87	94.69	Start 1643.71 hold at 2403.91 MD
4047.61	18.12	7.87	3956.11	600.11	82.97	0.00	0.00	605.82	Start Drop -3.00
4651.52	0.00	0.00	4550.00	693.90	95.94	3.00	180.00	700.50	Start 1450.00 hold at 4651.52 MD
6101.52	0.00	0.00	6000.00	693.90	95.94	0.00	0.00	700.50	TD at 6101.52' MD

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation
282.70	282.70	Triassic Red Beds
1512.70	1512.70	Rustler
1632.70	1632.70	SALT
2732.70	2760.39	Yates
2972.70	3012.91	Seven Rivers
3472.70	3538.99	Queen
3762.70	3844.12	Grayburg
4032.70	4127.67	San Andres (Zone 1)
4202.70	4302.27	San Andres (Zone 3 upper)
4522.70	4624.22	San Andres (Zone 3 lower)
4762.70	4864.22	San Andres (ROZ_A)
5452.70	5554.22	Glorieta

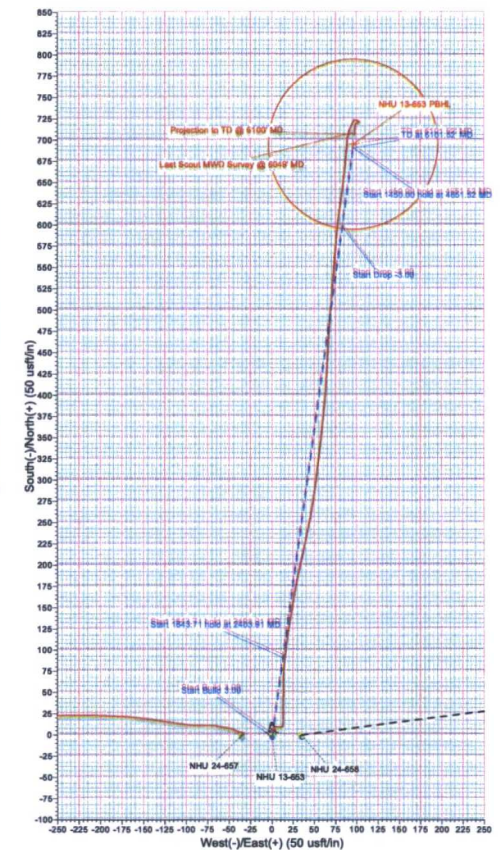
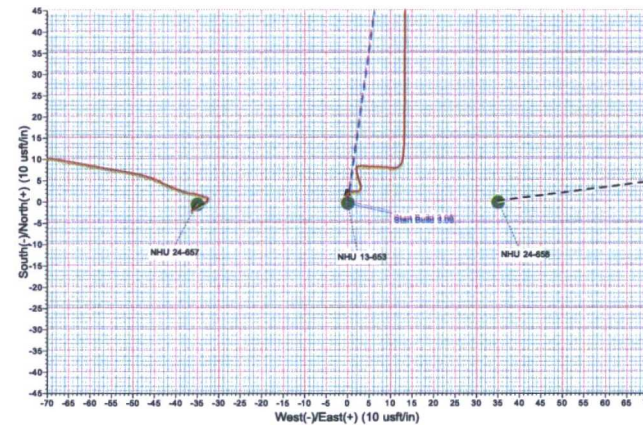
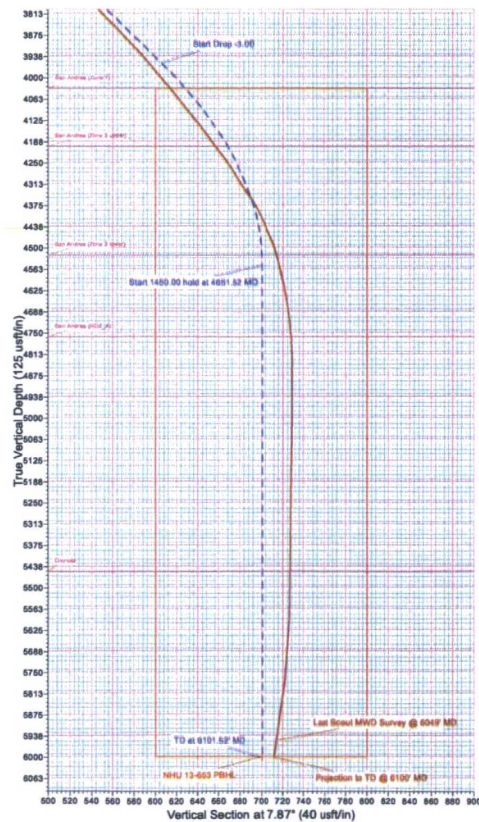
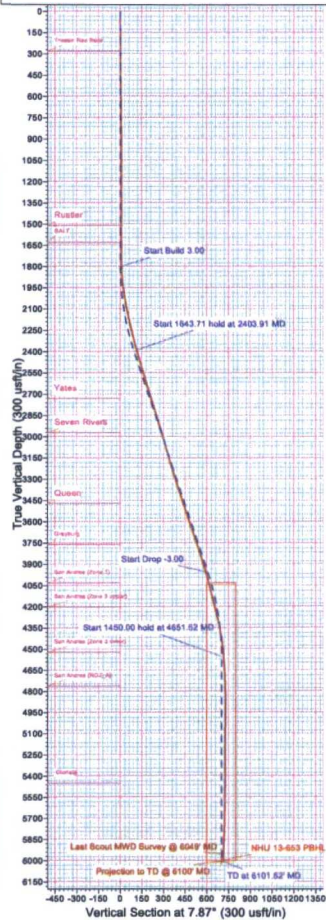
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
NHU 13-653 PBHL	6000.00	693.90	95.94	635357.81	847655.50



Azimuths to Grid North
True North: -0.61°
Magnetic North: 6.31°

Magnetic Field
Strength: 48204.4snT
Dip Angle: 60.77°
Date: 2017/10/18
Model: HDGM



Oxy USA Inc.

Lea County, NM

North Hobbs G/SA Unit

NHU 13-653

Wellbore #1

Survey: Scout MWD

Standard Survey Report

22 November, 2017



a business unit of Turbo Drill Industries, Inc.

Survey Report



Company:	Oxy USA Inc.	Local Co-ordinate Reference:	Well NHU 13-653
Project:	Lea County, NM	TVD Reference:	GL 3675.2' + 17.5' KB @ 3692.70usft (Trinidad 435)
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Well:	NHU 13-653	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 13-653				
Well Position	+N/-S	0.00 usft	Northing:	634,663.91 usft	Latitude:	32° 44' 22.879 N
	+E/-W	0.00 usft	Easting:	847,559.56 usft	Longitude:	103° 12' 10.860 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,675.20 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2017/10/18	6.92	60.77	48,204.40000000

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	7.87	

Survey Program	Date 2017/11/22			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
178.00	6,100.00	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	
178.00	0.75	348.98	177.99	1.14	-0.22	1.10	0.42	0.42	0.00	
363.00	1.23	93.13	362.98	2.22	1.53	2.41	0.86	0.26	56.30	
547.00	0.92	343.79	546.96	3.53	3.09	3.92	0.96	-0.17	-59.42	
730.00	0.97	341.07	729.93	6.41	2.18	6.65	0.04	0.03	-1.49	
913.00	0.26	64.74	912.92	8.05	2.05	8.26	0.53	-0.39	45.72	
1,097.00	0.57	89.08	1,096.92	8.25	3.34	8.63	0.19	0.17	13.23	
1,284.00	0.70	97.08	1,283.91	8.12	5.40	8.78	0.08	0.07	4.28	
1,463.00	0.84	89.17	1,462.89	8.00	7.80	9.00	0.10	0.08	-4.42	

Survey Report



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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)
1,568.00	0.75	96.64	1,567.88	7.94	9.25	9.13	0.13	-0.09	7.11
1,694.00	0.66	95.76	1,693.87	7.77	10.80	9.17	0.07	-0.07	-0.70
1,820.00	1.10	43.47	1,819.86	8.57	12.35	10.18	0.69	0.35	-41.50
1,945.00	7.38	0.40	1,944.47	17.48	13.23	19.13	5.30	5.02	-34.46
2,070.00	11.96	0.31	2,067.66	38.47	13.36	39.94	3.66	3.66	-0.07
2,195.00	12.26	0.93	2,189.88	64.69	13.64	65.95	0.26	0.24	0.50
2,321.00	14.33	6.64	2,312.50	93.56	15.66	94.83	1.94	1.64	4.53
2,446.00	16.40	8.75	2,433.03	126.37	20.14	127.94	1.72	1.66	1.69
2,572.00	16.62	9.89	2,553.83	161.70	25.94	163.73	0.31	0.17	0.90
2,698.00	16.31	12.71	2,674.67	196.72	32.93	199.37	0.68	-0.25	2.24
2,823.00	16.70	12.27	2,794.52	231.39	40.60	234.77	0.33	0.31	-0.35
2,949.00	15.69	9.54	2,915.52	265.88	47.28	269.85	1.00	-0.80	-2.17
3,075.00	16.44	7.17	3,036.60	300.37	52.33	304.71	0.79	0.60	-1.88
3,201.00	16.48	6.29	3,157.43	335.83	56.51	340.40	0.20	0.03	-0.70
3,326.00	17.76	6.11	3,276.89	372.41	60.48	377.18	1.02	1.02	-0.14
3,452.00	17.58	3.92	3,396.95	410.50	63.83	415.37	0.55	-0.14	-1.74
3,577.00	17.93	2.69	3,515.99	448.55	66.02	453.37	0.41	0.28	-0.98
3,703.00	18.73	4.27	3,635.60	488.10	68.44	492.88	0.75	0.63	1.25
3,829.00	17.76	4.62	3,755.26	527.43	71.49	532.25	0.77	-0.77	0.28
3,955.00	17.10	4.18	3,875.48	565.06	74.39	569.93	0.53	-0.52	-0.35
4,080.00	14.95	6.38	3,995.62	599.42	77.52	604.39	1.79	-1.72	1.76
4,204.00	14.42	8.84	4,115.57	630.57	81.67	635.81	0.66	-0.43	1.98
4,331.00	12.79	5.94	4,239.00	660.18	85.56	665.68	1.39	-1.28	-2.28
4,457.00	11.08	4.00	4,362.27	686.13	87.84	691.70	1.39	-1.36	-1.54
4,583.00	6.73	10.42	4,486.73	705.48	90.03	711.16	3.54	-3.45	5.10
4,632.00	4.26	25.19	4,535.50	709.95	91.32	715.77	5.77	-5.04	30.14
4,744.00	3.65	22.73	4,647.23	717.01	94.47	723.19	0.57	-0.54	-2.20
4,932.00	0.53	83.72	4,835.09	722.62	97.65	729.19	1.82	-1.66	32.44
5,121.00	1.23	112.02	5,024.07	721.96	100.39	728.90	0.43	0.37	14.97
5,309.00	0.84	118.97	5,212.04	720.53	103.47	727.91	0.22	-0.21	3.70
5,497.00	0.84	265.30	5,400.03	719.75	103.30	727.12	0.86	0.00	77.84
5,685.00	1.23	253.79	5,588.00	719.08	99.99	725.99	0.23	0.21	-6.12
5,873.00	2.11	180.93	5,775.94	715.05	98.00	721.74	1.12	0.47	-38.76
6,049.00	2.51	182.33	5,951.79	707.96	97.79	714.68	0.23	0.23	0.80
Last Scout MWD Survey @ 6049' MD									
6,100.00	2.51	182.33	6,002.74	705.73	97.70	712.46	0.00	0.00	0.00
Projection to TD @ 6100' MD									

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Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,049.00	5,951.79	707.96	97.79	Last Scout MWD Survey @ 6049' MD
6,100.00	6,002.74	705.73	97.70	Projection to TD @ 6100' MD

Checked By: _____ Approved By: _____ Date: _____