



HOBBS OCD

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OCCIDENTAL PERMIAN LTD

NORTH HOBBS UNIT

SEC. 33, T18S, R38E

NHU 33-693

NHU 33-693

Survey: NHU 33-693 MWD SURVEYS

Standard Survey Report

22 June, 2016



GEOGUIDANCE
DRILLING SERVICES, INC.



GEOGUIDANCE DRILLING

Survey Report



Company:	OCCIDENTAL PERMIAN LTD	Local Co-ordinate Reference:	Well NHU 33-693
Project:	NORTH HOBBS UNIT	TVD Reference:	NHU 33-693 @ 3652.6usft (H&P 340)
Site:	SEC. 33, T18S, R38E	MD Reference:	NHU 33-693 @ 3652.6usft (H&P 340)
Well:	NHU 33-693	North Reference:	Grid
Wellbore:	NHU 33-693	Survey Calculation Method:	Minimum Curvature
Design:	NHU 33-693	Database:	EDM 5000.1 Single User Db

Project	NORTH HOBBS UNIT		
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	SEC. 33, T18S, R38E		
Site Position:		Northing:	621,000.00 usft
From:	Map	Easting:	864,000.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 42' 5.919 N
		Longitude:	103° 9' 0.200 W
		Grid Convergence:	0.64 °

Well	NHU 33-693, SUR. N 620982.08 E 861764.81		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,652.6 usft
		Latitude:	32° 42' 5.988 N
		Longitude:	103° 9' 26.356 W
		Ground Level:	3,636.1 usft

Wellbore	NHU 33-693		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	6/10/2016	6.90
			Dip Angle
			60.58
			Field Strength
			48,369

Design	NHU 33-693		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			137.94

Survey Program	Date 6/22/2016		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
197.0	5,740.0	NHU 33-693 MWD SURVEYS (NHU 33-69	MWD+IGRF
			Description
			OWSG MWD + IGRF or WMM

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
197.0	1.10	216.00	197.0	-1.5	-1.1	0.4	0.56	0.56	0.00
378.0	4.40	143.90	377.8	-8.5	2.0	7.7	2.32	1.82	-39.83
559.0	10.80	143.60	557.1	-27.8	16.1	31.5	3.54	3.54	-0.17
741.0	14.80	135.30	734.6	-58.1	42.6	71.7	2.41	2.20	-4.56
905.0	18.80	138.50	891.5	-92.8	74.9	119.0	2.50	2.44	1.95
1,085.0	24.90	134.60	1,058.5	-141.2	121.1	185.9	3.48	3.39	-2.17
1,265.0	29.10	136.50	1,218.9	-199.5	178.3	267.6	2.38	2.33	1.06
1,445.0	34.63	136.96	1,371.7	-268.7	243.3	362.5	3.08	3.07	0.26
1,555.0	34.41	136.83	1,462.3	-314.2	285.9	424.9	0.21	-0.20	-0.12



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Wellbore:	NHU 33-693	Survey Calculation Method:	Minimum Curvature
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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)
1,754.0	36.70	141.40	1,624.2	-401.8	361.5	540.5	1.76	1.15	2.30
1,934.0	40.39	140.96	1,765.0	-489.1	431.8	652.4	2.06	2.05	-0.24
2,113.0	42.28	142.54	1,899.4	-582.0	505.0	770.4	1.21	1.06	0.88
2,293.0	40.30	138.02	2,034.7	-673.3	580.8	889.0	1.99	-1.10	-2.51
2,473.0	38.02	133.89	2,174.3	-755.1	659.7	1,002.5	1.92	-1.27	-2.29
2,653.0	38.19	135.25	2,315.9	-833.0	738.8	1,113.4	0.48	0.09	0.76
2,833.0	39.24	135.78	2,456.3	-913.3	817.7	1,225.9	0.61	0.58	0.29
3,012.0	37.88	136.17	2,596.3	-993.6	895.2	1,337.4	0.77	-0.76	0.22
3,192.0	36.12	136.18	2,740.1	-1,071.7	970.3	1,445.7	0.98	-0.98	0.01
3,372.0	34.67	136.88	2,886.8	-1,147.4	1,042.0	1,549.9	0.84	-0.81	0.39
3,552.0	32.96	137.10	3,036.3	-1,220.6	1,110.3	1,650.0	0.95	-0.95	0.12
3,732.0	30.17	137.93	3,189.7	-1,290.1	1,174.0	1,744.2	1.57	-1.55	0.46
3,912.0	25.75	139.07	3,348.6	-1,353.2	1,229.9	1,828.6	2.47	-2.46	0.63
4,092.0	22.90	140.44	3,512.6	-1,409.8	1,277.8	1,902.7	1.61	-1.58	0.76
4,272.0	21.18	141.84	3,679.5	-1,462.3	1,320.2	1,970.1	1.00	-0.96	0.78
4,452.0	19.03	140.83	3,848.5	-1,510.7	1,358.9	2,031.9	1.21	-1.19	-0.56
4,632.0	14.77	132.99	4,020.7	-1,549.1	1,394.2	2,084.1	2.68	-2.37	-4.36
4,812.0	11.07	133.40	4,196.1	-1,576.6	1,423.6	2,124.2	2.06	-2.06	0.23
4,992.0	11.21	134.42	4,372.7	-1,600.7	1,448.6	2,158.9	0.13	0.08	0.57
5,172.0	11.03	136.66	4,549.4	-1,625.5	1,472.9	2,193.6	0.26	-0.10	1.24
5,351.0	11.25	136.74	4,725.0	-1,650.7	1,496.7	2,228.1	0.12	0.12	0.04
5,531.0	11.34	140.08	4,901.5	-1,677.0	1,520.0	2,263.4	0.37	0.05	1.86
5,666.0	11.43	141.80	5,033.8	-1,697.7	1,536.8	2,290.0	0.26	0.07	1.27
Final MWD Survey									
5,733.5	11.43	141.80	5,100.0	-1,708.2	1,545.1	2,303.3	0.00	0.00	0.00
Projected Straight Line Final Target TVD									
5,740.0	11.43	141.80	5,106.4	-1,709.2	1,545.9	2,304.6	0.00	0.00	0.00
Projected Final MD TD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
280.6	280.6	Top Red Beds			
1,755.7	1,625.6	Rustler (Base Red Beds)			
1,950.6	1,777.6	Top Salt			
3,427.5	2,932.6	Base Salt (Yates)			
4,303.2	3,708.6	Queen			
4,661.8	4,049.6	Grayburg			
4,828.8	4,212.6	Basal Grayburg			
4,936.8	4,318.6	San Andres			



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Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,666.0	5,033.8	-1,697.7	1,536.8	Final MWD Survey
5,733.5	5,100.0	-1,708.2	1,545.1	Projected Straight Line Final Target TVD
5,740.0	5,106.4	-1,709.2	1,545.9	Projected Final MD TD

Checked By: _____	Approved By: _____	Date: _____
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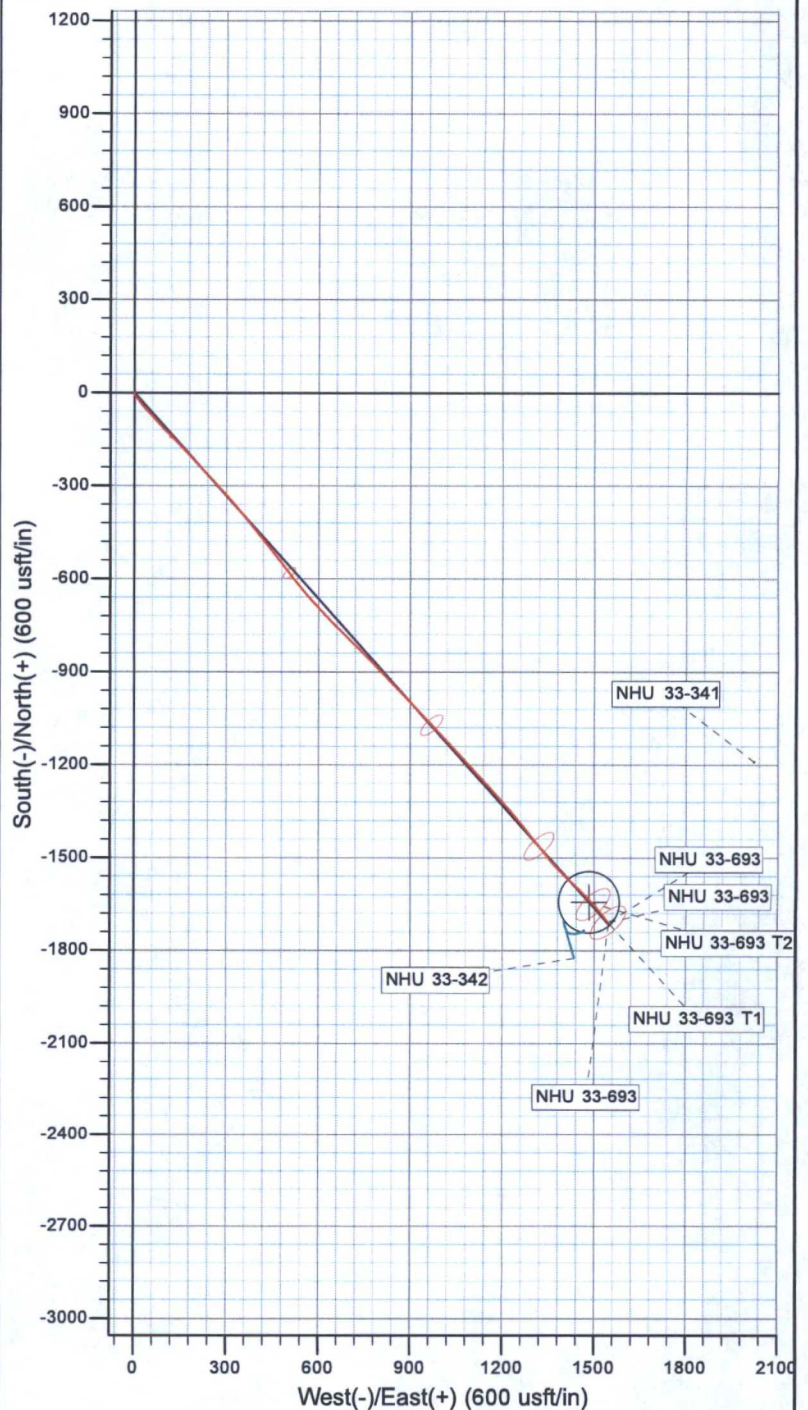
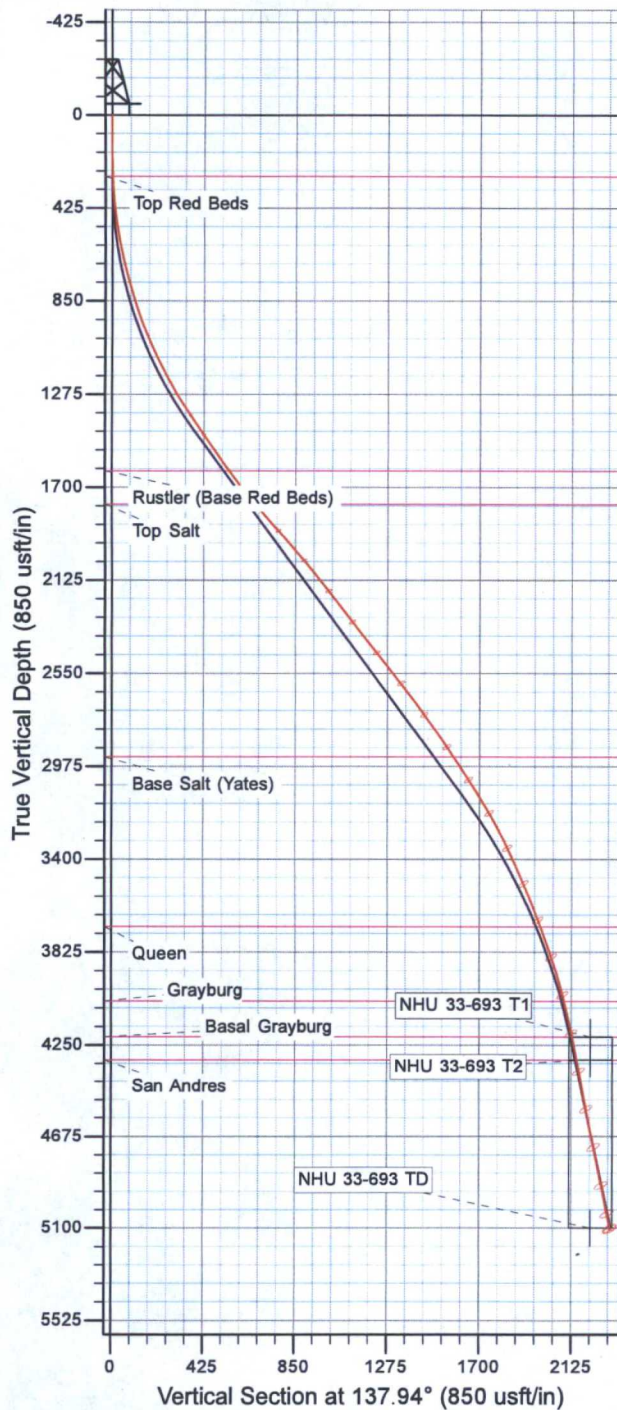


OCCIDENTAL PERMIAN LTD

Project: NORTH HOBBS UNIT
 Site: SEC. 33, T18S, R38E
 Well: NHU 33-693
 Wellpath: NHU 33-693
 Design: NHU 33-693



Azimuths to Grid North
 True North: -0.63°
 Magnetic North: 6.27°
 Magnetic Field
 Strength: 48369.2snT
 Dip Angle: 60.58°
 Date: 6/10/2016
 Model: IGRF2015



LEGEND

- ✕ NHU 33-693, NHU 33-693, 061616 V2 V0
- NHU 33-342, NHU 33-342, NHU 33-342 V0
- △ NHU 33-341, NHU 33-341, NHU 33-341 V0
- NHU 33-693
- NHU 33-693 MWD SURVEYS

SECTION DETAILS

No plan data is available