



HOBBS OCD

OCT 13 2016

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OCCIDENTAL PERMIAN LTD

**NORTH HOBBS UNIT
SEC. 24, T18S, R37E
NHU 24-663**

NHU 24-663

Survey: NHU 24-663 SURVEYS

Standard Survey Report

29 March, 2016



GEOGUIDANCE
DRILLING SERVICES, INC.



GEOGUIDANCE DRILLING

Survey Report



Company:	OCCIDENTAL PERMIAN LTD	Local Co-ordinate Reference:	Well NHU 24-663
Project:	NORTH HOBBS UNIT	TVD Reference:	NHU 24-663 @ 3690.7usft (H&P 340)
Site:	SEC. 24, T18S, R37E	MD Reference:	NHU 24-663 @ 3690.7usft (H&P 340)
Well:	NHU 24-663	North Reference:	Grid
Wellbore:	NHU 24-663	Survey Calculation Method:	Minimum Curvature
Design:	NHU 24-663	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. 24, T18S, R37E		
Site Position:		Northing:	632,000.00 usft
From:	Map	Easting:	847,000.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 43' 56.582 N
		Longitude:	103° 12' 17.743 W
		Grid Convergence:	0.61 °

Well	NHU 24-663, SUR. N 634728.59 E 848094.29		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,690.7 usft
		Latitude:	32° 44' 23.463 N
		Longitude:	103° 12' 4.593 W
		Ground Level:	3,674.2 usft

Wellbore	NHU 24-663				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/14/2016	6.95	60.61	48,412

Design	NHU 24-663				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	221.17	

Survey Program	Date 3/29/2016				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
172.0	4,729.0	NHU 24-663 SURVEYS (NHU 24-663)	MWD+IGRF	OWSG MWD + IGRF or WMM	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
172.0	0.79	30.35	172.0	1.0	0.6	-1.2	0.46	0.46	0.00	
354.0	0.31	315.71	354.0	2.5	0.9	-2.4	0.42	-0.26	-41.01	
533.0	3.50	243.60	532.9	0.4	-4.3	2.6	1.91	1.78	-40.28	
714.0	7.80	223.00	713.0	-11.1	-17.7	20.0	2.59	2.38	-11.38	
910.0	10.50	217.10	906.5	-35.0	-37.5	51.1	1.46	1.38	-3.01	
1,089.0	14.00	220.60	1,081.4	-64.5	-61.5	89.0	2.00	1.96	1.96	
1,269.0	17.71	221.19	1,254.5	-101.7	-93.7	138.2	2.06	2.06	0.33	
1,449.0	17.40	218.86	1,426.1	-143.2	-128.6	192.5	0.43	-0.17	-1.29	
1,522.0	16.52	218.07	1,495.9	-159.9	-141.8	213.7	1.25	-1.21	-1.08	



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Wellbore:	NHU 24-663	Survey Calculation Method:	Minimum Curvature
Design:	NHU 24-663	Database:	EDM 5000.1 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)	
1,687.0	15.42	217.19	1,654.6	-195.8	-169.6	259.0	0.68	-0.67	-0.53	
1,867.0	14.90	220.57	1,828.3	-232.5	-199.1	306.0	0.57	-0.29	1.88	
2,046.0	15.03	219.43	2,001.2	-267.9	-228.8	352.3	0.18	0.07	-0.64	
2,226.0	15.11	220.80	2,175.0	-303.7	-258.9	399.0	0.20	0.04	0.76	
2,406.0	14.24	216.97	2,349.2	-339.1	-287.6	444.6	0.72	-0.48	-2.13	
2,586.0	12.79	216.22	2,524.2	-372.9	-312.7	486.5	0.81	-0.81	-0.42	
2,766.0	16.10	220.22	2,698.5	-408.0	-340.6	531.3	1.92	1.84	2.22	
2,946.0	14.24	221.14	2,872.2	-443.8	-371.3	578.4	1.04	-1.03	0.51	
3,126.0	13.84	220.62	3,046.8	-476.8	-399.8	622.1	0.23	-0.22	-0.29	
3,306.0	11.95	220.84	3,222.3	-507.2	-426.0	662.3	1.05	-1.05	0.12	
3,486.0	11.34	224.57	3,398.6	-533.9	-450.6	698.6	0.54	-0.34	2.07	
3,666.0	8.39	222.51	3,575.9	-556.2	-471.9	729.4	1.65	-1.64	-1.14	
3,846.0	10.33	224.26	3,753.5	-577.4	-492.1	758.6	1.09	1.08	0.97	
4,026.0	8.96	222.38	3,930.9	-599.4	-512.8	788.7	0.78	-0.76	-1.04	
4,206.0	8.31	218.95	4,108.9	-619.8	-530.4	815.8	0.46	-0.36	-1.91	
4,385.0	8.66	220.35	4,285.9	-640.2	-547.3	842.2	0.23	0.20	0.78	
4,565.0	8.09	217.45	4,464.0	-660.5	-563.8	868.3	0.39	-0.32	-1.61	
4,675.0	8.88	222.02	4,572.8	-673.0	-574.1	884.6	0.94	0.72	4.15	
4,729.0	8.88	222.02	4,626.2	-679.2	-579.7	892.9	0.00	0.00	0.00	
SURVEY STRAIGHT LINED TO TD										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
304.8	304.8	Top Red Beds				
1,537.7	1,511.0	Rustler (Base Red Beds)				
1,669.3	1,637.5	Top Salt				
2,799.5	2,730.7	Base Salt				
3,568.6	3,479.7	Queen				
3,882.4	3,789.3	Grayburg				
4,051.4	3,956.0	Basal Grayburg				
4,151.1	4,054.6	San Andres				

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
4,729.0	4,626.2	-679.2	-579.7	SURVEY STRAIGHT LINED TO TD	

Checked By: _____ Approved By: _____ Date: _____

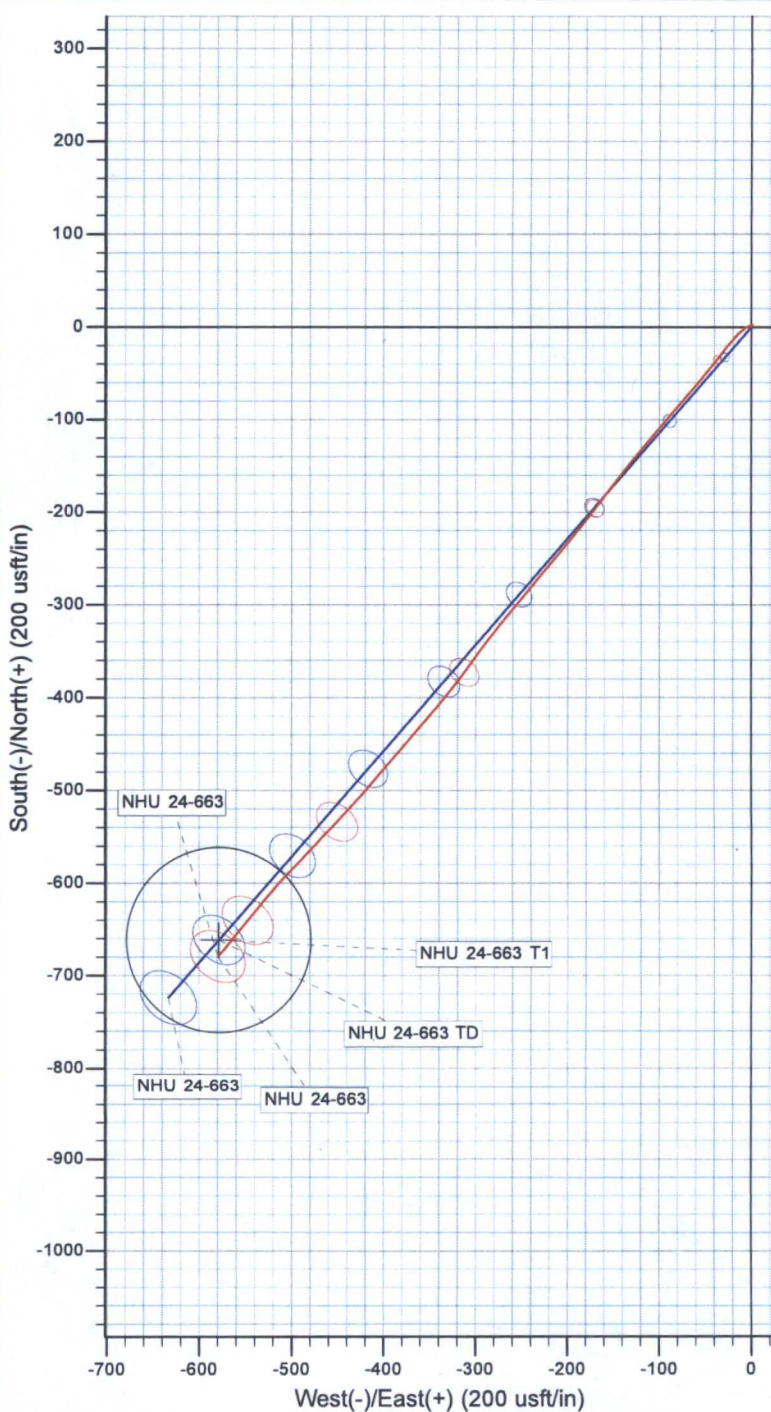
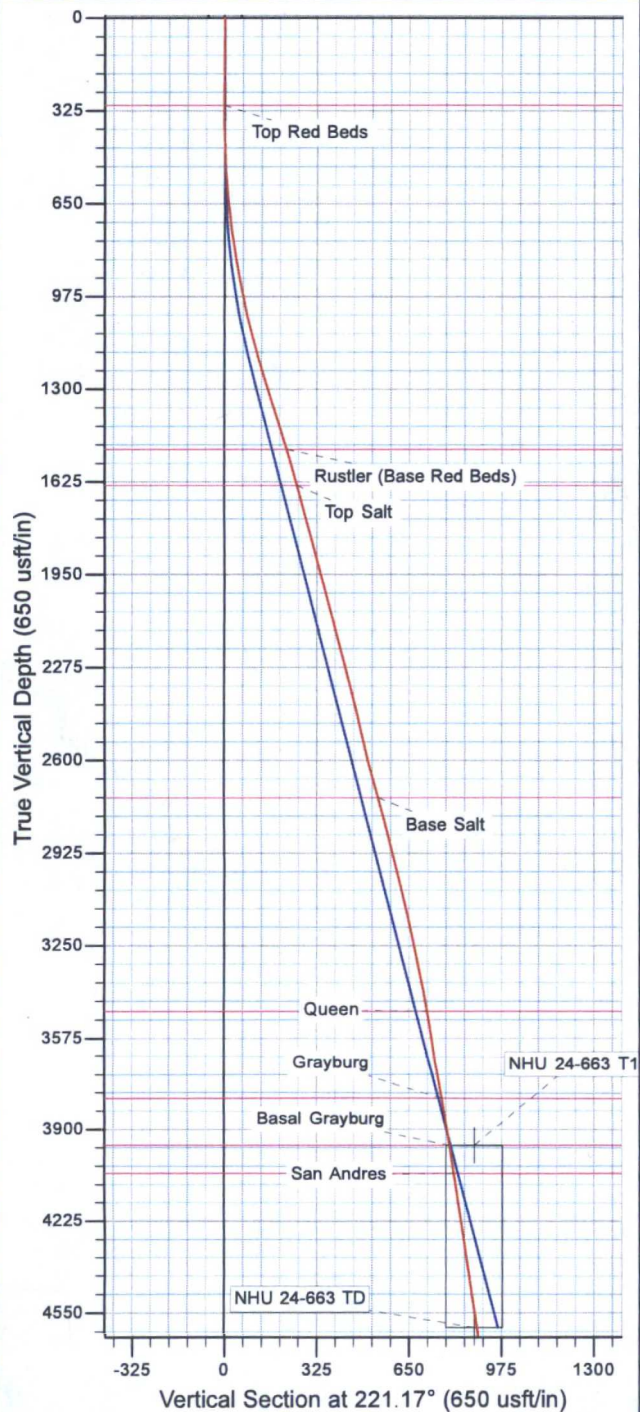


OCCIDENTAL PERMIAN LTD

Project: NORTH HOBBS UNIT
 Site: SEC. 24, T18S, R37E
 Well: NHU 24-663
 Wellpath: NHU 24-663
 Design: NHU 24-663



Azimuths to Grid North
 True North: -0.61°
 Magnetic North: 6.34°
 Magnetic Field
 Strength: 48412.1snT
 Dip Angle: 60.61°
 Date: 3/14/2016
 Model: IGRF2015



LEGEND

- NHU 24-663, NHU 24-663, 031416 V4 V0
- NHU 24-663
- NHU 24-663 SURVEYS

SECTION DETAILS

No plan data is available