



HOBBS OCD

AUG 08 2016

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OCCIDENTAL PERMIAN LTD

NORTH HOBBS UNIT

SEC. 24, T18S, R37E

NHU 24-659

NHU 24-659

Survey: NHU 24-659 SURVEYS

Standard Survey Report

04 April, 2016



GEOGUIDANCE
DRILLING SERVICES, INC.



GEOGUIDANCE DRILLING

Survey Report



Company:	OCCIDENTAL PERMIAN LTD	Local Co-ordinate Reference:	Well NHU 24-659
Project:	NORTH HOBBS UNIT	TVD Reference:	NHU 24-659 @ 3690.9usft (H&P 340)
Site:	SEC. 24, T18S, R37E	MD Reference:	NHU 24-659 @ 3690.9usft (H&P 340)
Well:	NHU 24-659	North Reference:	Grid
Wellbore:	NHU 24-659	Survey Calculation Method:	Minimum Curvature
Design:	NHU 24-659	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' 58.582 N
		Longitude:	103° 12' 17.743 W
		Grid Convergence:	0.61 °

Well	NHU 24-659, SUR. N 634783.59 E 848093.66		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,690.9 usft
		Latitude:	32° 44' 24.007 N
		Longitude:	103° 12' 4.593 W
		Ground Level:	3,674.4 usft

Wellbore	NHU 24-659		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	3/23/2016	6.95
			Dip Angle (°)
			60.61
			Field Strength (nT)
			48,410

Design	NHU 24-659		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°)
			88.78

Survey Program	Date 4/2/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
172.0	4,960.0	NHU 24-659 SURVEYS (NHU 24-659)	MWD+IGRF
			Description
			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	1.23	266.28	172.0	-0.1	-1.8	-1.8	0.72	0.72	0.00
354.0	0.39	267.16	354.0	-0.3	-4.4	-4.4	0.46	-0.46	0.48
537.0	3.10	102.40	536.9	-1.4	-0.2	-0.2	1.90	1.48	-90.03
719.0	8.40	106.10	717.9	-6.1	17.4	17.3	2.92	2.91	2.03
916.0	13.30	102.90	911.3	-15.2	53.3	53.0	2.51	2.49	-1.62
1,096.0	18.00	103.80	1,084.6	-26.4	100.5	100.0	2.61	2.61	0.50
1,275.0	22.50	102.10	1,252.5	-40.2	160.9	160.0	2.54	2.51	-0.95
1,455.0	27.13	103.22	1,415.8	-56.8	234.6	233.3	2.59	2.57	0.62
1,570.0	25.71	103.55	1,518.8	-68.7	284.4	282.8	1.24	-1.23	0.29



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Wellbore:	NHU 24-659	Survey Calculation Method:	Minimum Curvature
Design:	NHU 24-659	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)
1,755.0	25.97	100.69	1,685.3	-85.6	363.2	361.3	0.69	0.14	-1.55
1,935.0	27.60	89.40	1,846.1	-92.5	443.7	441.6	2.96	0.91	-6.27
2,115.0	28.04	91.02	2,005.3	-92.8	527.7	525.6	0.49	0.24	0.90
2,294.0	29.36	91.14	2,162.3	-94.4	613.6	611.5	0.74	0.74	0.07
2,474.0	27.30	88.60	2,320.8	-94.3	699.0	696.8	1.33	-1.14	-1.41
2,654.0	27.38	88.52	2,480.7	-92.2	781.6	779.5	0.05	0.04	-0.04
2,834.0	26.59	89.97	2,641.1	-91.1	863.3	861.2	0.57	-0.44	0.81
3,014.0	24.79	89.44	2,803.3	-90.7	941.3	939.2	1.01	-1.00	-0.29
3,194.0	22.00	88.30	2,968.4	-89.4	1,012.8	1,010.6	1.57	-1.55	-0.63
3,374.0	18.82	89.40	3,137.1	-88.0	1,075.5	1,073.4	1.78	-1.77	0.61
3,554.0	17.84	88.21	3,308.0	-86.9	1,132.1	1,130.0	0.58	-0.54	-0.66
3,734.0	18.50	87.90	3,479.0	-85.0	1,188.2	1,186.1	0.37	0.37	-0.17
3,914.0	17.01	88.08	3,650.4	-83.0	1,243.1	1,241.0	0.83	-0.83	0.10
4,094.0	15.56	87.80	3,823.2	-81.2	1,293.5	1,291.5	0.81	-0.81	-0.16
4,273.0	13.80	87.30	3,996.4	-79.3	1,338.8	1,336.8	0.99	-0.98	-0.28
4,453.0	12.70	86.70	4,171.6	-77.2	1,380.0	1,378.1	0.62	-0.61	-0.33
4,633.0	12.10	86.00	4,347.4	-74.7	1,418.6	1,416.7	0.34	-0.33	-0.39
4,813.0	11.50	86.70	4,523.6	-72.4	1,455.3	1,453.5	0.34	-0.33	0.39
4,891.0	11.50	86.70	4,600.0	-71.5	1,470.9	1,469.0	0.00	0.00	0.00
Projected TD TVD Target									
4,975.0	11.50	86.70	4,682.3	-70.5	1,487.6	1,485.7	0.00	0.00	0.00
Projected to TD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
261.9	-3,429.0	Top Red Beds			
1,585.8	-2,157.8	Rustler (Base Red Beds)			
1,703.4	-2,052.0	Top Salt			
2,932.9	-961.0	Base Salt			
3,735.6	-210.4	Queen			
4,050.3	90.2	Grayburg			
4,229.4	263.2	Basal Grayburg			
4,349.6	379.9	San Andres			

Survey Annotations

Measured	Vertical	Local Coordinates		Comment
Depth	Depth	+N/-S	+E/-W	
(usft)	(usft)	(usft)	(usft)	
4,891.0	4,600.0	-71.5	1,470.9	Projected TD TVD Target
4,975.0	4,682.3	-70.5	1,487.6	Projected to TD

Checked By: _____ Approved By: _____ Date: _____



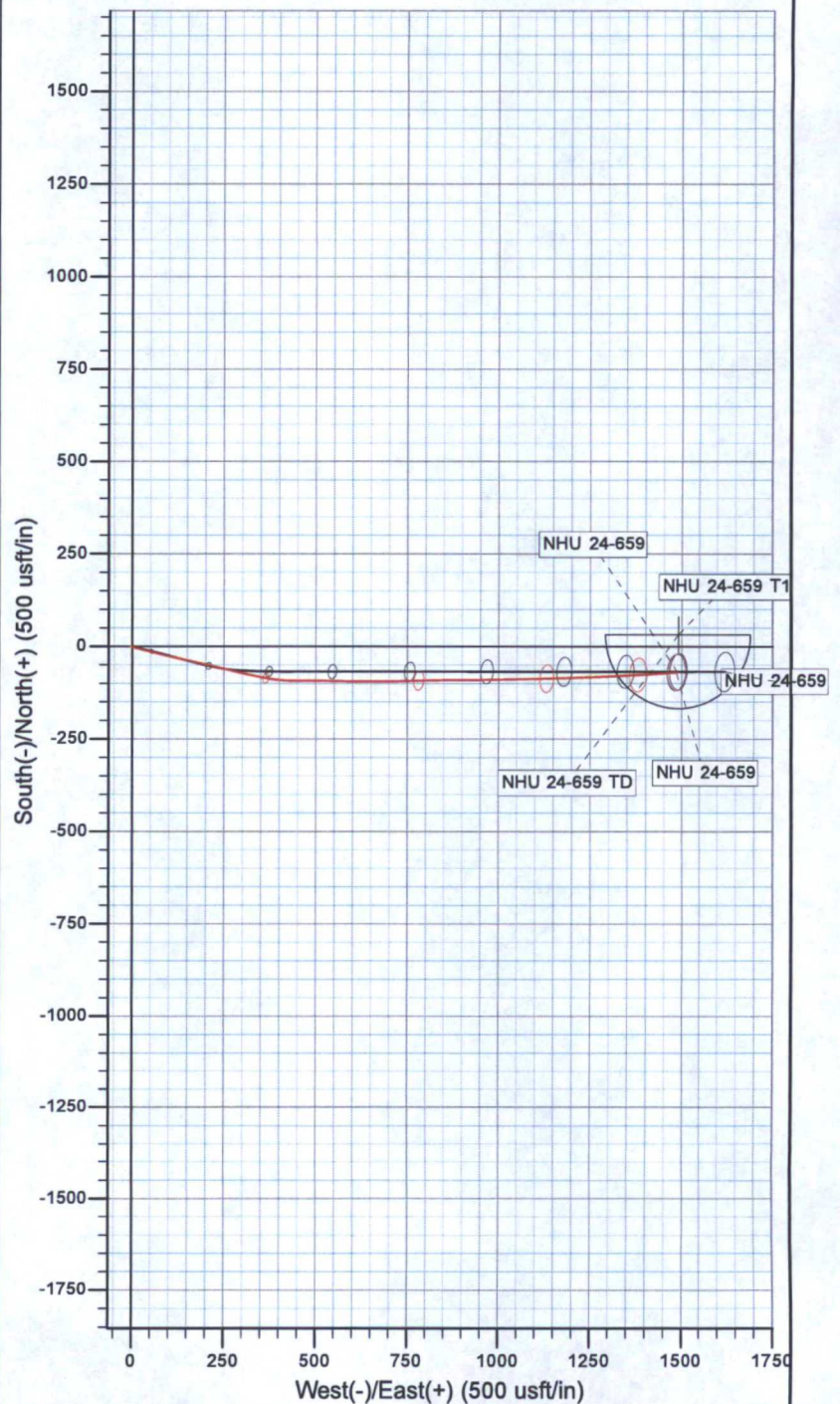
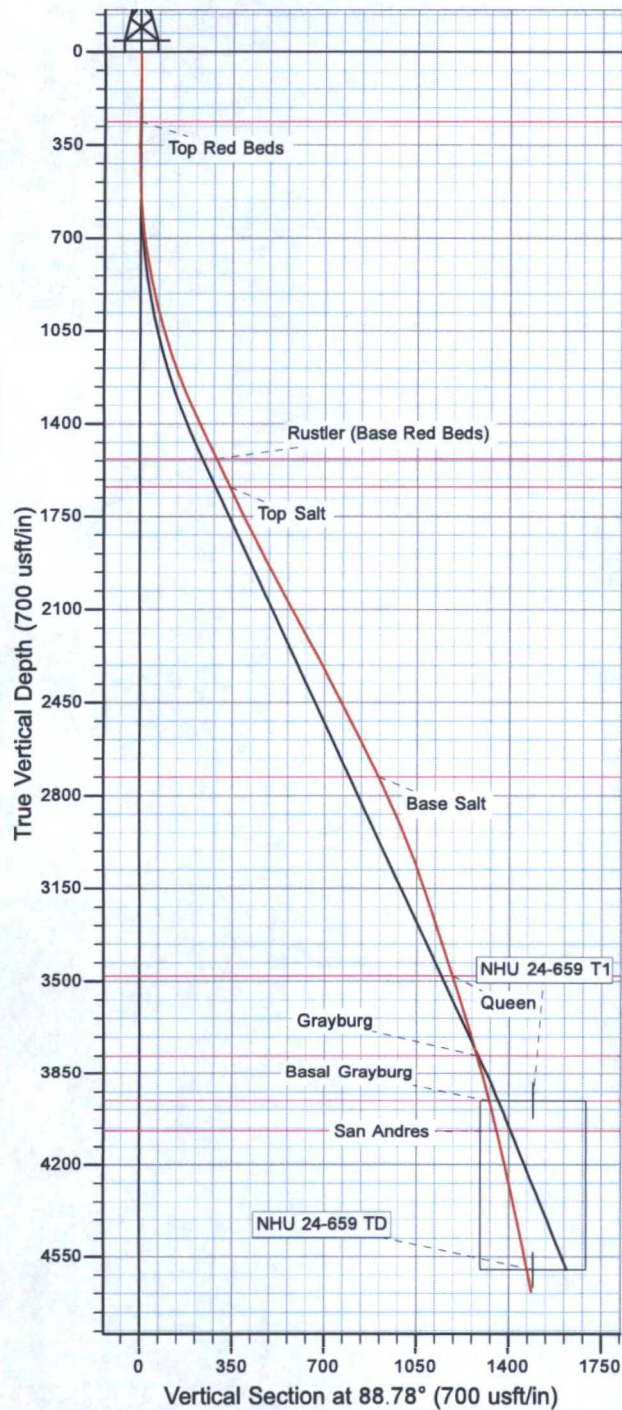
OCCIDENTAL PERMIAN LTD

Project: NORTH HOBBS UNIT
Site: SEC. 24, T18S, R37E
Well: NHU 24-659
Wellpath: NHU 24-659
Design: NHU 24-659



Azimuths to Grid North
True North: -0.61°
Magnetic North: 6.34°

Magnetic Field
Strength: 48409.6snT
Dip Angle: 60.61°
Date: 3/23/2016
Model: IGRF2015



LEGEND

- NHU 24-659, NHU 24-659, 032316 V4 V0
- NHU 24-659
- NHU 24-659 SURVEYS

SECTION DETAILS

No plan data is available