



HOBBS OCD

SEP 29 2016

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OCCIDENTAL PERMIAN LTD

**NORTH HOBBS UNIT
SEC. 24, T18S, R37E
NHU 19-673**

NHU 19-673

Survey: MWD SURVEY

Standard Survey Report

21 March, 2016





GEOGUIDANCE DRILLING

Survey Report



Company:	OCCIDENTAL PERMIAN LTD	Local Co-ordinate Reference:	Well NHU 19-673
Project:	NORTH HOBBS UNIT	TVD Reference:	NHU 19-673 @ 3685.1usft (H&P 340)
Site:	SEC. 24, T18S, R37E	MD Reference:	NHU 19-673 @ 3685.1usft (H&P 340)
Well:	NHU 19-673	North Reference:	Grid
Wellbore:	NHU 19-673	Survey Calculation Method:	Minimum Curvature
Design:	NHU 19-673	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 19-673, SUR. N 632700.24 E 849280.92		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,685.1 usft
		Latitude:	32° 44' 3.269 N
		Longitude:	103° 11' 50.957 W
		Ground Level:	3,668.6 usft

Wellbore	NHU 19-673		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	3/15/2016	6.95
			Dip Angle
			(°)
			60.61
			Field Strength
			(nT)
			48,409

Design	NHU 19-673		
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
			(°)
			89.21

Survey Program	Date 3/21/2016		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
194.0	4,815.0	MWD SURVEY (NHU 19-673)	MWD+IGRF
			Description
			OWSG MWD + IGRF or WMM

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(usft)	(°)	(°)	(usft)	(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
194.0	0.48	40.96	194.0	0.6	0.5	0.5	0.25	0.25	0.00
376.0	0.70	103.32	376.0	0.9	2.1	2.1	0.35	0.12	34.26
558.0	4.40	95.30	557.8	0.0	10.2	10.2	2.04	2.03	-4.41
742.0	7.90	92.10	740.7	-1.1	29.8	29.8	1.91	1.90	-1.74
907.0	9.60	87.80	903.8	-1.0	54.9	54.9	1.10	1.03	-2.61
1,087.0	12.80	93.60	1,080.3	-1.6	89.8	89.8	1.88	1.78	3.22
1,266.0	15.20	88.10	1,254.0	-2.1	133.1	133.0	1.53	1.34	-3.07
1,446.0	18.70	90.50	1,426.2	-1.6	185.5	185.5	1.98	1.94	1.33
1,523.0	18.59	90.67	1,499.1	-1.8	210.1	210.1	0.16	-0.14	0.22



GEOGUIDANCE DRILLING

Survey Report



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Project: NORTH HOBBS UNIT
Site: SEC. 24, T18S, R37E
Well: NHU 19-673
Wellbore: NHU 19-673
Design: NHU 19-673

Local Co-ordinate Reference: Well NHU 19-673
TVD Reference: NHU 19-673 @ 3685.1usft (H&P 340)
MD Reference: NHU 19-673 @ 3685.1usft (H&P 340)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
1,691.0	17.50	91.80	1,658.8	-2.9	262.2	262.1	0.67	-0.65	0.55
1,871.0	21.41	90.71	1,828.5	-4.0	322.1	322.0	2.18	2.17	-0.49
2,051.0	22.54	92.51	1,995.5	-5.9	389.4	389.3	0.73	0.63	1.00
2,231.0	22.10	86.93	2,162.0	-5.6	457.7	457.6	1.20	-0.24	-3.10
2,410.0	23.30	88.20	2,327.1	-2.7	526.7	526.6	0.72	0.67	0.71
2,590.0	21.75	85.96	2,493.4	0.8	595.6	595.5	0.98	-0.86	-1.24
2,770.0	21.85	88.10	2,660.5	4.2	662.3	662.3	0.44	0.06	1.19
2,949.0	19.47	85.78	2,828.0	7.5	725.4	725.4	1.41	-1.33	-1.30
3,129.0	16.70	84.33	2,999.1	12.3	781.0	781.1	1.56	-1.54	-0.81
3,309.0	16.40	89.70	3,171.6	15.0	832.2	832.3	0.87	-0.17	2.98
3,489.0	14.24	88.24	3,345.2	15.8	879.7	879.8	1.22	-1.20	-0.81
3,669.0	15.34	86.14	3,519.3	18.1	925.6	925.8	0.68	0.61	-1.17
3,849.0	13.34	86.85	3,693.7	20.8	970.1	970.3	1.12	-1.11	0.39
4,029.0	11.82	86.45	3,869.3	23.1	1,009.2	1,009.5	0.85	-0.84	-0.22
4,209.0	11.16	85.12	4,045.7	25.7	1,045.0	1,045.2	0.40	-0.37	-0.74
4,389.0	11.82	83.06	4,222.1	29.4	1,080.6	1,080.9	0.43	0.37	-1.14
4,569.0	11.29	85.12	4,398.5	33.1	1,116.5	1,116.9	0.37	-0.29	1.14
4,749.0	11.56	87.54	4,574.9	35.4	1,152.1	1,152.5	0.31	0.15	1.34
4,815.0	11.56	87.54	4,639.6	36.0	1,165.3	1,165.7	0.00	0.00	0.00
Projected to TD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
244.2	244.2	Top Red Beds			
1,531.6	1,507.3	Rustler (Base Red Beds)			
1,667.8	1,636.7	Top Salt			
2,826.0	2,712.6	Base Salt (Yates)			
3,627.4	3,479.1	Queen			
3,944.4	3,786.6	Grayburg			
4,126.4	3,964.7	Basal Grayburg			
4,232.6	4,068.9	San Andres			

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	Comment
		+N/-S (usft)	+E/-W (usft)
4,815.0	4,639.6	36.0	1,165.3
Projected to TD			

Checked By: _____ Approved By: _____ Date: _____



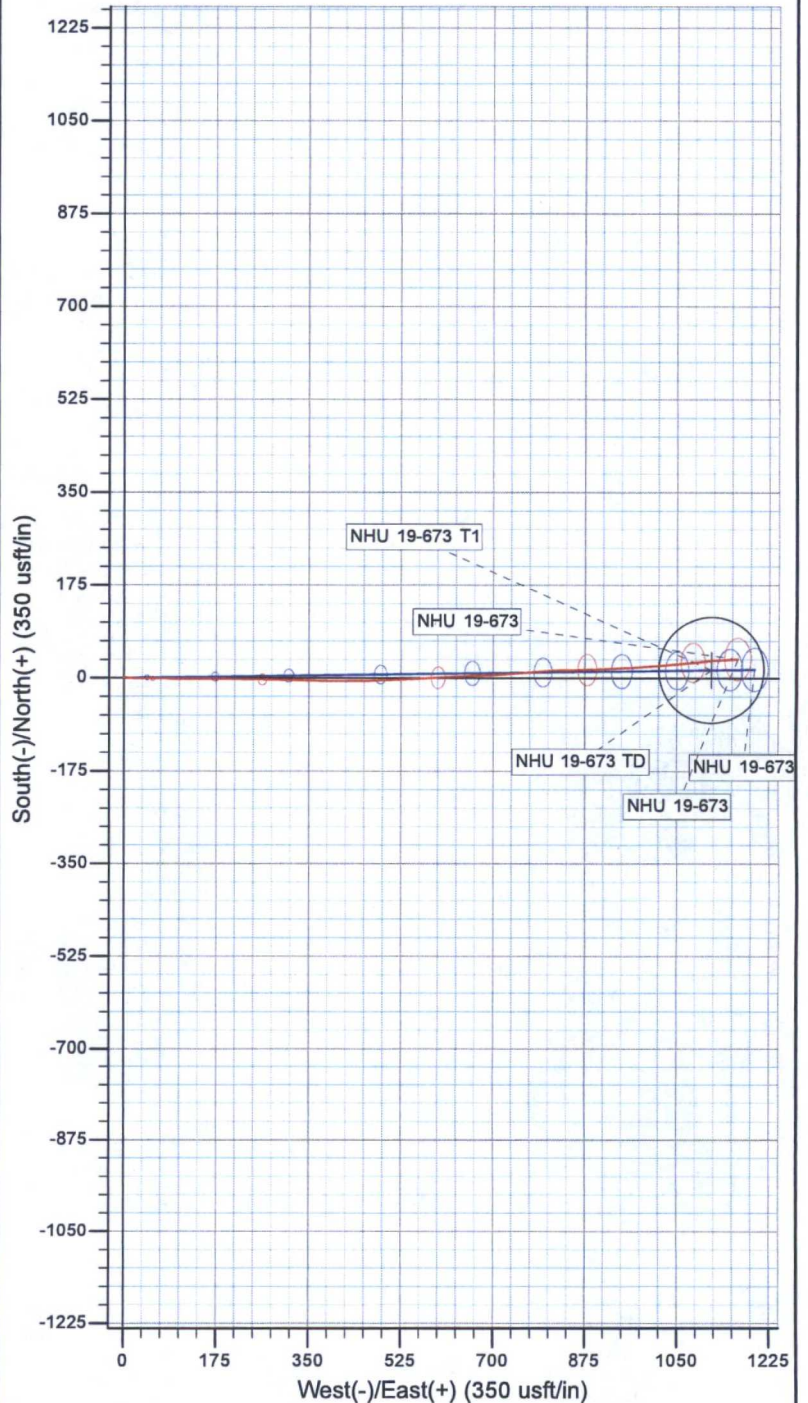
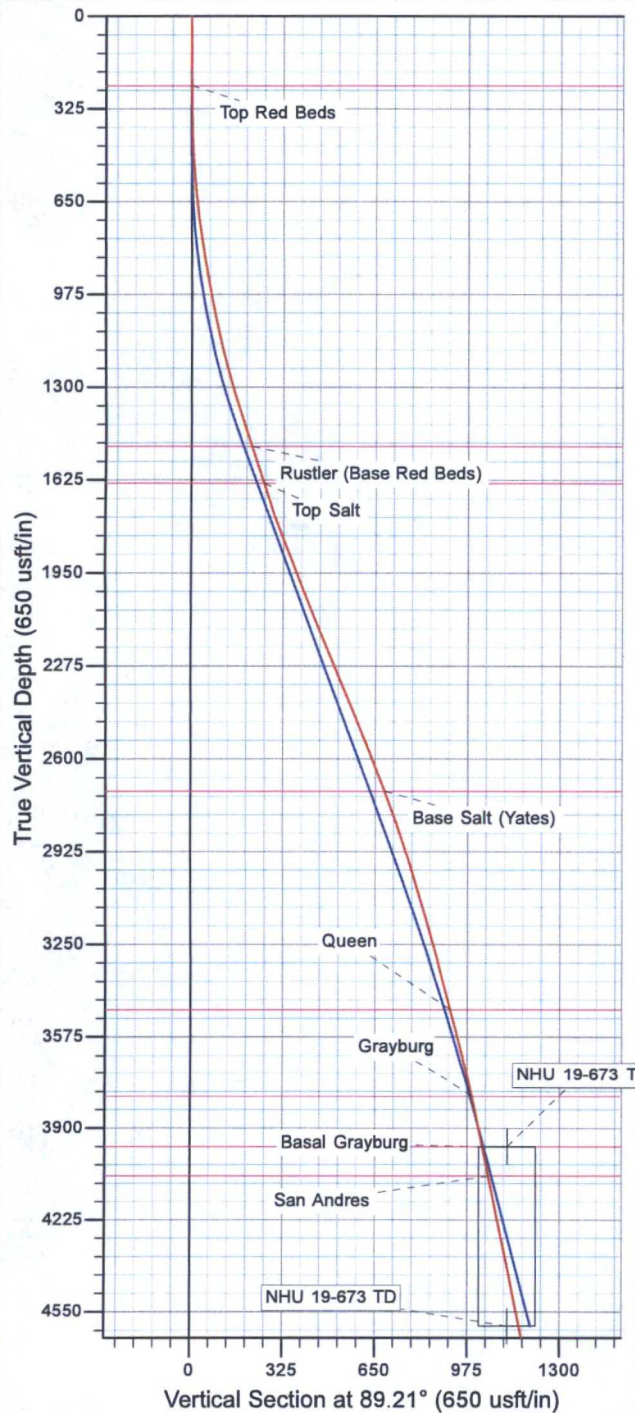
OCCIDENTAL PERMIAN LTD

Project: NORTH HOBBS UNIT
Site: SEC. 24, T18S, R37E
Well: NHU 19-673
Wellpath: NHU 19-673
Design: NHU 19-673



Azimuths to Grid North
True North: -0.61°
Magnetic North: 6.33°

Magnetic Field
Strength: 48408.9snT
Dip Angle: 60.61°
Date: 3/15/2016
Model: IGRF2015



LEGEND

- NHU 19-673, NHU 19-673, 031516 V4 V0
- NHU 19-673
- MWD SURVEY

SECTION DETAILS

No plan data is available