

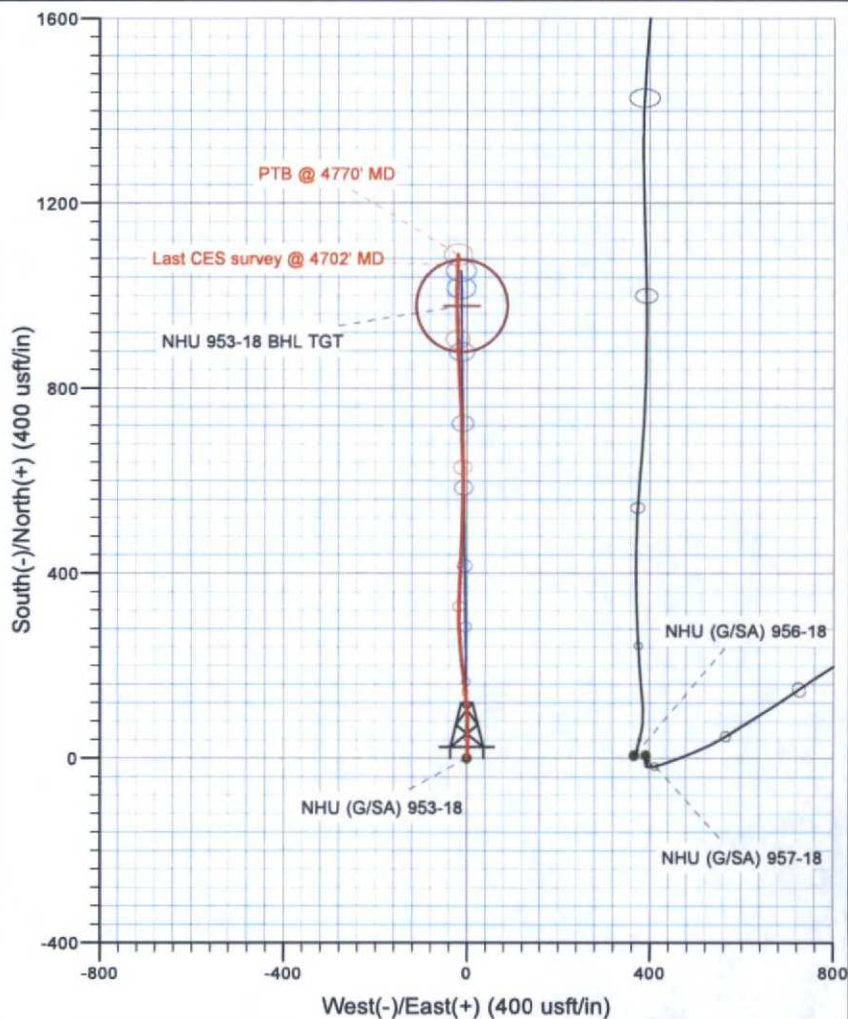
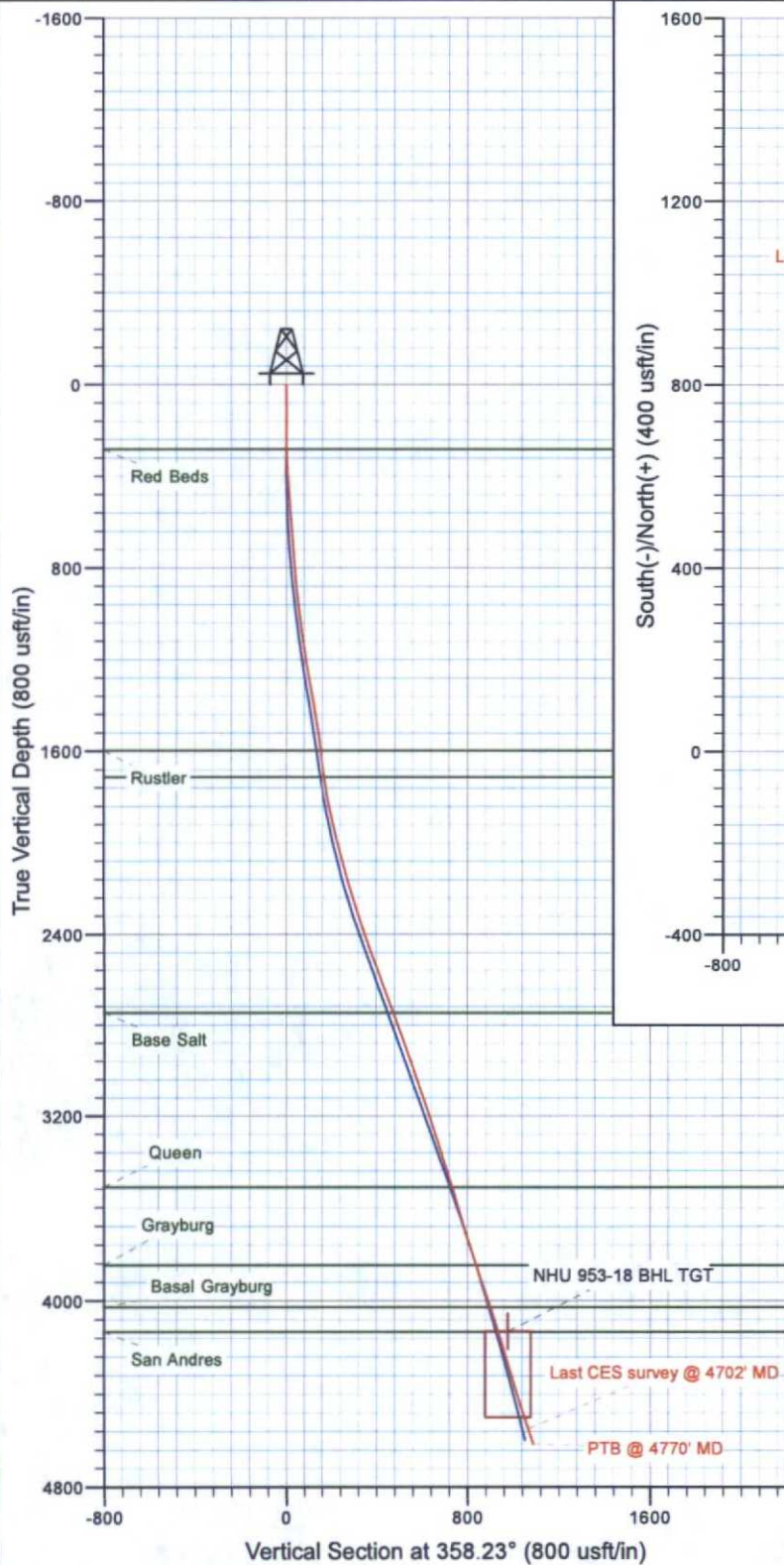


Project: HOBBS, NORTH
Site: NORTH HOBBS GRAYBURG-SA UNIT
Well: NHU (G/SA) 953-18
Wellbore: ST00
Design: Final
Rig: H&P 340

HOBBS OCD

NOV 06 2015

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Azimuths to Grid North
True North: -0.62°
Magnetic North: 6.51°

Magnetic Field
Strength: 48510.7nT
Dip Angle: 60.83°
Date: 7/31/2015
Model: HDGM

DEC 09 2015

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well NHU (G/SA) 953-18
Project:	HOBBS, NORTH	TVD Reference:	DFE @ 3677.3usft
Site:	NORTH HOBBS GRAYBURG-SA UNIT	MD Reference:	DFE @ 3677.3usft
Well:	NHU (G/SA) 953-18	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Project	HOBBS, NORTH, North America, North West Hobbs, 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		Using geodetic scale factor

Site		NORTH HOBBS GRAYBURG-SA UNIT			
Site Position:		Northing:	635,270.89 usft	Latitude:	32° 44' 28.21 N
From:	Map	Easting:	853,897.68 usft	Longitude:	103° 10' 56.59 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.62 °

Well	NHU (G/SA) 953-18					
Well Position	+N/-S	0.0 usft	Northing:	635,718.82 usft	Latitude:	32° 44' 32.66 N
	+E/-W	0.0 usft	Easting:	853,717.11 usft	Longitude:	103° 10' 58.65 W
Position Uncertainty		1.0 usft	Wellhead Elevation:	3,660.8 usft	Ground Level:	3,660.8 usft

Wellbore	ST00				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/31/2015	7.13	60.83	48,511

Design	Final				
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	358.23	

Survey Program	Date	8/4/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
112.0	4,770.0	Survey #1 (ST00)	MWD+HDGM+AX+SAG_B0(	OWSG MWD + HDGM + Axial Corr + Sag Correction	

Survey									
Measured	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
112.0	0.30	308.40	112.0	0.2	-0.2	0.2	0.27	0.27	
232.0	0.20	351.10	232.0	0.6	-0.5	0.6	0.17	-0.08	
413.0	4.50	7.10	412.8	7.9	0.3	7.9	2.38	2.38	
593.0	4.60	0.40	592.2	22.2	1.2	22.1	0.30	0.06	
773.0	4.00	358.50	771.7	35.7	1.1	35.6	0.34	-0.33	
953.0	6.90	1.20	950.9	52.8	1.2	52.7	1.62	1.61	
1,133.0	8.00	358.60	1,129.4	76.1	1.1	76.0	0.64	0.61	
1,313.0	10.60	356.10	1,307.0	105.1	-0.3	105.1	1.46	1.44	
1,493.0	9.10	354.00	1,484.3	135.8	-2.9	135.8	0.86	-0.83	
1,542.0	8.50	354.10	1,532.8	143.3	-3.7	143.3	1.22	-1.22	
1,653.0	7.60	354.30	1,642.7	158.7	-5.3	158.8	0.81	-0.81	
1,833.0	11.10	351.00	1,820.2	187.7	-9.2	187.9	1.97	1.94	

Survey Report

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Project: HOBBS, NORTH
Site: NORTH HOBBS GRAYBURG-SA UNIT
Well: NHU (G/SA) 953-18
Wellbore: ST00
Design: Final

Local Co-ordinate Reference: Well NHU (G/SA) 953-18
TVD Reference: DFE @ 3677.3usft
MD Reference: DFE @ 3677.3usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
2,013.0	14.30	355.50	1,995.8	227.0	-13.6	227.3	1.86	1.78	
2,193.0	16.30	356.00	2,169.4	274.3	-17.1	274.7	1.11	1.11	
2,372.0	18.80	1.10	2,340.1	328.3	-18.3	328.7	1.64	1.40	
2,552.0	19.80	4.00	2,510.0	387.7	-15.7	388.0	0.77	0.56	
2,732.0	20.20	2.20	2,679.1	449.1	-12.3	449.3	0.41	0.22	
2,912.0	20.10	2.70	2,848.1	511.1	-9.7	511.1	0.11	-0.06	
3,092.0	19.10	359.20	3,017.7	571.4	-8.6	571.4	0.86	-0.56	
3,272.0	18.30	359.00	3,188.2	629.1	-9.5	629.1	0.45	-0.44	
3,451.0	17.90	358.20	3,358.3	684.7	-10.9	684.7	0.26	-0.22	
3,631.0	16.80	359.20	3,530.1	738.4	-12.1	738.4	0.63	-0.61	
3,811.0	17.60	356.00	3,702.1	791.5	-14.4	791.6	0.69	0.44	
3,991.0	18.80	357.10	3,873.1	847.7	-17.8	847.8	0.69	0.67	
4,171.0	18.70	357.70	4,043.5	905.5	-20.4	905.7	0.12	-0.06	
4,348.0	16.60	359.00	4,212.2	959.1	-22.0	959.3	1.21	-1.19	
4,531.0	17.60	0.30	4,387.1	1,012.9	-22.3	1,013.1	0.58	0.55	
4,702.0	18.80	2.80	4,549.5	1,066.3	-20.8	1,066.4	0.84	0.70	Last CES survey @ 4702' MD
4,770.0	18.80	2.80	4,613.9	1,088.2	-19.7	1,088.3	0.00	0.00	PTB @ 4770' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
NHU 953-18 BHL TGT	0.00	0.00	4,132.0	977.9	-11.6	636,696.76	853,705.55	32° 44' 42.34 N	103° 10' 58.66 W
- actual wellpath misses target center by 42.6usft at 4277.2usft MD (4144.5 TVD, 938.4 N, -21.5 E)									
- Circle (radius 100.0)									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
282.3	282.3	Red Beds			
1,607.2	1,597.3	Rustler			
1,723.4	1,712.3	Top Salt			
2,804.6	2,747.3	Base Salt			
3,612.4	3,512.3	Queen			
3,963.8	3,847.3	Grayburg			
4,153.9	4,027.3	Basal Grayburg			
4,264.4	4,132.3	San Andres			

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,702.0	4,549.5	1,066.3	-20.8	Last CES survey @ 4702' MD
4,770.0	4,613.9	1,088.2	-19.7	PTB @ 4770' MD

Checked By: _____ Approved By: _____ Date: _____