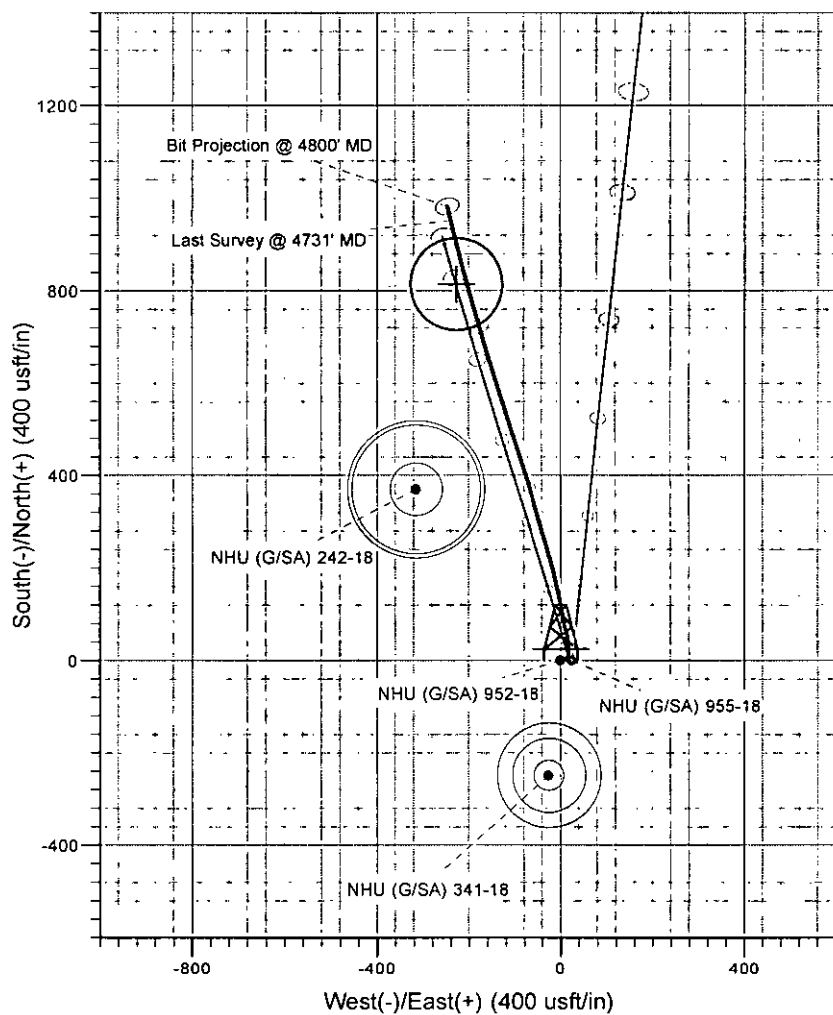
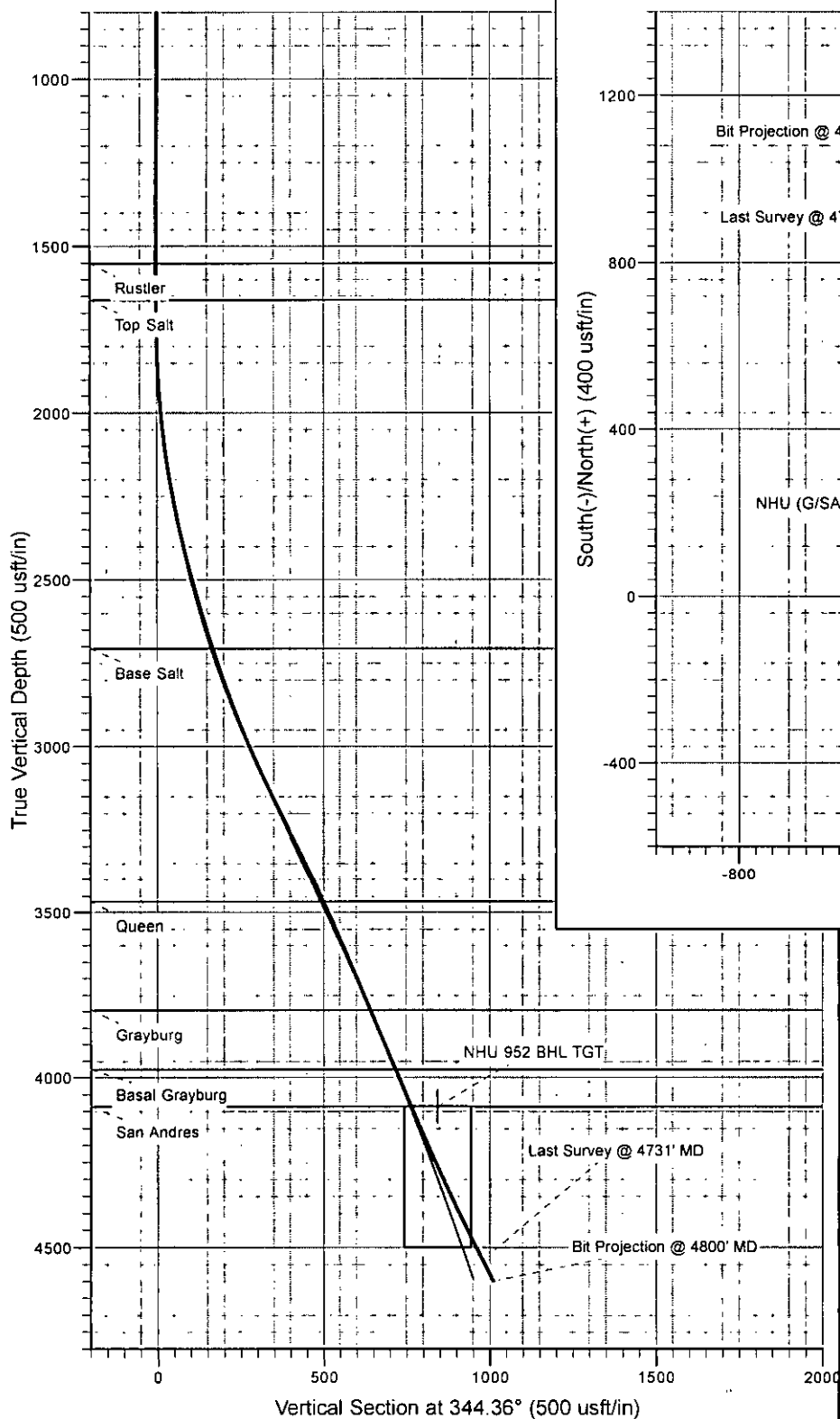




Project: HOBBS, NORTH
Site: NORTH HOBBS GRAYBURG-SA UNIT
Well: NHU (G/SA) 952-18
Wellbore: ST00
Design: Final
Rig: H&P 340



30-025-42478



Azimuths to Grid North
True North: -0.62°
Magnetic North: 6.56°

Magnetic Field
Strength: 48537.3snT
Dip Angle: 60.83°
Date: 1/6/2015
Model: HDGM

OCT 07 2015

Cathedral Energy Services
Survey Report

HOBBS OCD

SEP 23 2015

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well NHU (G/SA) 952-18
Project:	HOBBS, NORTH	TVD Reference:	DFE @ 3676.0usft
Site:	NORTH HOBBS GRAYBURG-SA UNIT	MD Reference:	DFE @ 3676.0usft
Well:	NHU (G/SA) 952-18	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
From:	Map	Easting:	853,897.68 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 44' 28.21 N
		Longitude:	103° 10' 56.59 W
		Grid Convergence:	0.62 °

Well	NHU (G/SA) 952-18		
Well Position	+N/-S	0.0 usft	Northing: 635,699.41 usft
	+E/-W	0.0 usft	Easting: 852,695.13 usft
Position Uncertainty	1.0 usft	Wellhead Elevation:	3,659.5 usft
		Latitude:	32° 44' 32.58 N
		Longitude:	103° 11' 10.61 W
		Ground Level:	3,659.5 usft

Wellbore	ST00		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	1/6/2015	7.18
			Dip Angle
			(°)
			60.83
			Field Strength
			(nT)
			48,537

Design	Final		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	1,468.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			344.36

Survey Program	Date	7/2/2015		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	1,468.0	MS gyro surveys (Gyro surveys)	MWD+HDGM+AX+SAG_B0(	OWSG MWD + HDGM + Axial Corr + Sag Correction
1,653.0	4,800.0	Survey #1 (ST00)	MWD+HDGM+AX+SAG_B0(	OWSG MWD + HDGM + Axial Corr + Sag Correction

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Formations /
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Comments
(usft)			(usft)			(usft)	(°/100usf	(°/100u	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.74	38.26	100.0	0.5	0.4	0.4	0.74	0.74	
200.0	1.28	66.56	200.0	1.5	1.8	0.9	0.72	0.54	
300.0	1.26	71.50	300.0	2.3	3.9	1.1	0.11	-0.02	
400.0	1.34	73.14	399.9	2.9	6.1	1.2	0.09	0.08	
500.0	0.89	77.98	499.9	3.4	7.9	1.2	0.46	-0.45	
600.0	0.75	78.78	599.9	3.7	9.3	1.1	0.14	-0.14	
700.0	0.89	80.50	699.9	4.0	10.7	0.9	0.14	0.14	
800.0	0.75	78.28	799.9	4.2	12.1	0.8	0.14	-0.14	
900.0	0.67	75.23	899.9	4.5	13.4	0.8	0.09	-0.08	
1,000.0	0.46	98.27	999.9	4.6	14.3	0.6	0.31	-0.21	
1,100.0	0.40	102.05	1,099.9	4.5	15.1	0.3	0.07	-0.06	

Cathedral Energy Services

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well NHU (G/SA) 952-18
Project:	HOBBS, NORTH	TVD Reference:	DFE @ 3676.0usft
Site:	NORTH HOBBS GRAYBURG-SA UNIT	MD Reference:	DFE @ 3676.0usft
Well:	NHU (G/SA) 952-18	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	Final	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
1,200.0	0.46	104.70	1,199.9	4.3	15.8	-0.1	0.06	0.06	
1,300.0	0.62	116.35	1,299.9	4.0	16.7	-0.7	0.19	0.16	
1,400.0	0.46	108.21	1,399.9	3.6	17.5	-1.3	0.18	-0.16	
1,468.0	0.24	97.35	1,467.9	3.5	17.9	-1.5	0.34	-0.32	
1,653.0	0.40	202.70	1,652.8	2.9	18.1	-2.1	0.28	0.09	
1,833.0	2.80	4.90	1,832.8	6.7	18.2	1.5	1.77	1.33	
2,013.0	5.80	2.50	2,012.3	20.1	19.0	14.3	1.67	1.67	
2,193.0	9.10	348.00	2,190.7	43.1	16.4	37.1	2.10	1.83	
2,373.0	13.40	347.90	2,367.2	77.5	9.1	72.2	2.39	2.39	
2,553.0	16.10	349.30	2,541.3	122.4	0.1	117.9	1.51	1.50	
2,733.0	18.20	346.80	2,713.3	174.3	-11.0	170.8	1.24	1.17	
2,913.0	20.70	343.30	2,883.0	232.2	-26.6	230.7	1.53	1.39	
3,093.0	24.20	344.50	3,049.3	298.2	-45.6	299.4	1.96	1.94	
3,273.0	27.20	342.80	3,211.5	373.1	-67.6	377.5	1.72	1.67	
3,454.0	25.80	342.40	3,373.5	450.1	-91.7	458.2	0.78	-0.77	
3,633.0	23.20	341.70	3,536.3	520.7	-114.6	532.4	1.46	-1.45	
3,813.0	23.10	342.80	3,701.9	588.1	-136.2	603.1	0.25	-0.06	
3,993.0	22.80	342.80	3,867.6	655.2	-156.9	673.2	0.17	-0.17	
4,173.0	22.90	343.70	4,033.5	722.1	-177.1	743.1	0.20	0.06	
4,353.0	24.20	344.30	4,198.5	791.3	-196.9	815.0	0.73	0.72	
4,533.0	25.80	345.10	4,361.6	864.6	-216.9	891.1	0.91	0.89	
4,712.0	27.50	346.20	4,521.6	942.4	-236.8	971.4	0.99	0.95	
4,731.0	27.60	345.90	4,538.4	950.9	-238.9	980.1	0.90	0.53	Last Survey @ 4731' MD
4,800.0	27.60	345.90	4,599.6	981.9	-246.7	1,012.1	0.00	0.00	Bit Projection @ 4800' MD