



Project: HOBBS, NORTH
Site: NORTH HOBBS GRAYBURG-SA UNIT
Well: NHU (G/SA) 958-19
Wellbore: ST00
Design: ACTUAL
Rig: H&P 340 - KB - 16.5



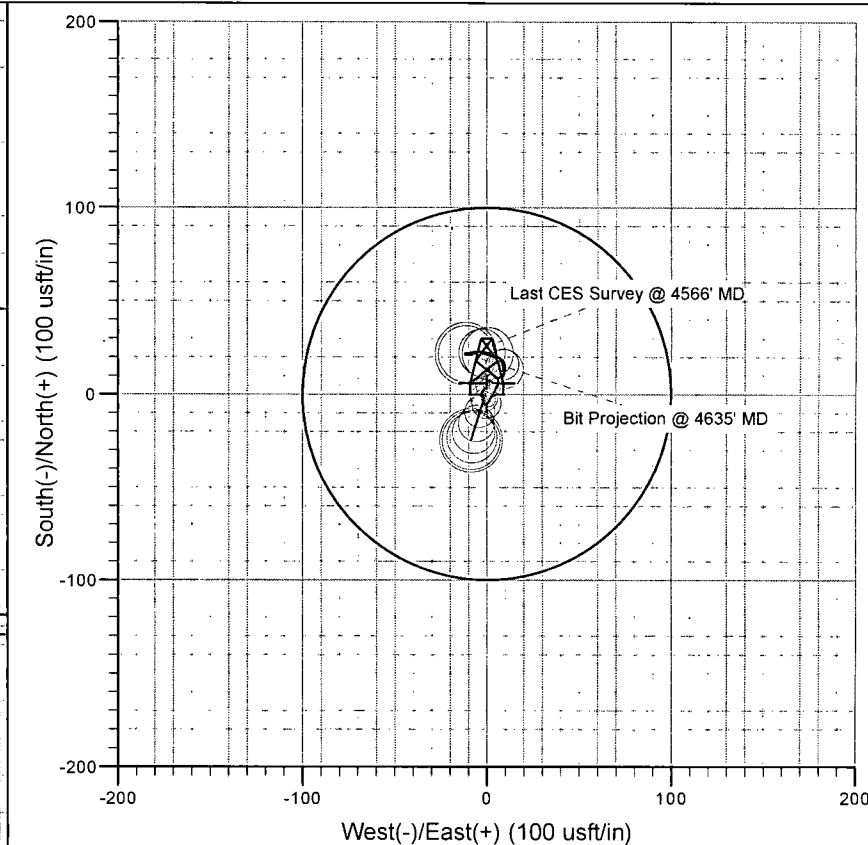
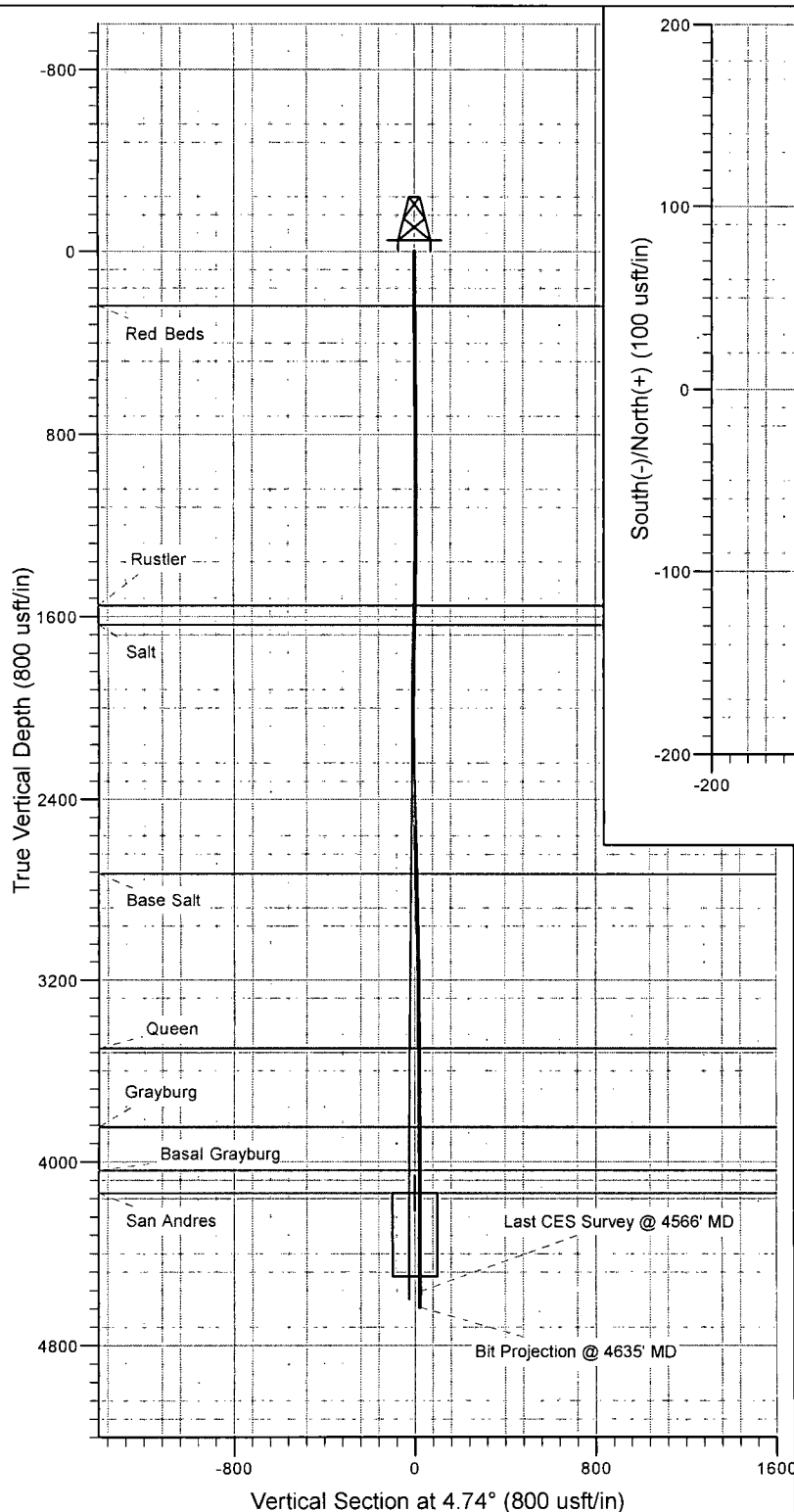
CATHEDRAL

HOBBS OCD

SEP 08 2015

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3 0-025-42454



Azimuths to Grid North
True North: -0.62°
Total Correction to Grid North: 6.35°

Magnetic Field
Strength: 48584.1snT
Dip Angle: 60.63°
Date: 3/23/2015
Model: IGRF2010

SEP 14 2015

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well NHU (G/SA) 958-19
Project:	HOBBS, NORTH	TVD Reference:	Original KB @ 3667.3usft (H&P 340 - KB - 16.5)
Site:	NORTH HOBBS GRAYBURG-SA UNIT	MD Reference:	Original KB @ 3667.3usft (H&P 340 - KB - 16.5)
Well:	NHU (G/SA) 958-19	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) 958-19		
Well Position	+N/-S	0.0 usft	Northing: 632,958.66 usft
	+E/-W	0.0 usft	Easting: 854,286.21 usft
Position Uncertainty	1.0 usft	Wellhead Elevation:	3,650.8 usft
		Ground Level:	3,650.8 usft

Wellbore	ST00				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	3/23/2015	6.97	60.63	48,584

Design	Final				
Audit Notes:					
Version:	0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	4.74	

Survey Program	Date	6/8/2015			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
16.5	1,495.0	Gyro (ST00)	GYRO-MWD_A019Ga	OWSG Gyro MWD	
1,607.0	4,635.0	Survey #2 (ST00)	MWD+HDGM+AX+SAG_B01	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	
16.5	0.00	0.00	16.5	0.0	0.0	0.0	0.00	0.00	
100.0	0.39	66.47	100.0	0.1	0.3	0.1	0.47	0.47	
200.0	0.60	54.14	200.0	0.6	1.0	0.6	0.23	0.21	
300.0	0.77	19.74	300.0	1.5	1.6	1.6	0.44	0.17	
400.0	0.60	15.31	400.0	2.6	2.0	2.8	0.18	-0.17	
500.0	0.60	29.63	500.0	3.6	2.4	3.8	0.15	0.00	
600.0	0.72	18.60	600.0	4.6	2.9	4.9	0.17	0.12	
700.0	0.64	343.53	700.0	5.8	2.9	6.0	0.42	-0.08	
800.0	0.50	311.44	800.0	6.6	2.4	6.8	0.34	-0.14	
900.0	0.26	222.24	900.0	6.7	1.9	6.9	0.56	-0.24	
1,000.0	0.17	118.52	1,000.0	6.5	1.9	6.6	0.34	-0.09	

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Well:	NHU (G/SA) 958-19	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	
1,100.0	0.21	337.76	1,100.0	6.6	2.0	6.7	0.36	0.04		
1,200.0	0.64	246.65	1,200.0	6.5	1.4	6.6	0.68	0.43		
1,300.0	0.73	173.21	1,299.9	5.7	1.0	5.7	0.82	0.09		
1,400.0	0.38	224.67	1,399.9	4.8	0.8	4.9	0.58	-0.35		
1,495.0	1.13	197.47	1,494.9	3.7	0.3	3.7	0.85	0.79		
1,607.0	1.70	187.60	1,606.9	1.0	-0.2	1.0	0.55	0.51		
1,787.0	1.00	180.00	1,786.8	-3.2	-0.6	-3.3	0.40	-0.39		
1,967.0	0.20	155.30	1,966.8	-5.1	-0.5	-5.1	0.46	-0.44		
2,147.0	0.40	16.50	2,146.8	-4.8	-0.2	-4.8	0.31	0.11		
2,327.0	1.10	32.70	2,326.8	-2.7	1.0	-2.6	0.40	0.39		
2,507.0	2.20	29.10	2,506.7	1.8	3.6	2.0	0.61	0.61		
2,687.0	1.50	34.20	2,686.6	6.7	6.6	7.2	0.40	-0.39		
2,867.0	1.20	23.60	2,866.6	10.4	8.7	11.1	0.22	-0.17		
3,047.0	1.00	1.70	3,046.6	13.7	9.5	14.4	0.26	-0.11		
3,227.0	0.60	347.50	3,226.5	16.2	9.3	16.9	0.25	-0.22		
3,407.0	0.80	316.30	3,406.5	18.0	8.2	18.6	0.23	0.11		
3,587.0	0.80	295.30	3,586.5	19.5	6.2	19.9	0.16	0.00		
3,767.0	1.10	298.70	3,766.5	20.8	3.6	21.1	0.17	0.17		
3,947.0	1.00	281.40	3,946.5	22.0	0.5	21.9	0.18	-0.06		
4,127.0	1.00	277.30	4,126.4	22.5	-2.6	22.2	0.04	0.00		
4,307.0	1.00	265.70	4,306.4	22.6	-5.7	22.0	0.11	0.00		
4,487.0	1.00	252.80	4,486.4	22.0	-8.8	21.2	0.12	0.00		
4,566.0	1.00	270.10	4,565.4	21.8	-10.1	20.9	0.38	0.00	Last CES Survey @ 4566' MD	
4,635.0	1.00	270.10	4,634.4	21.8	-11.3	20.8	0.00	0.00	Bit Projection @ 4635' MD	

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Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
NHU 958-19 BHL TGT	0.00	0.00	4,137.0	0.0	0.0	632,958.66	854,286.21	32° 44' 5.29 N	103° 10' 52.34 W
- actual wellpath misses target center by 22.7usft at 4137.5usft MD (4136.9 TVD, 22.5 N, -2.8 E)									
- Circle (radius 100.0)									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
1,552.4	1,552.3	Rustler				
1,637.4	1,637.3	Salt				
2,727.7	2,727.3	Base Salt				
3,502.8	3,502.3	Queen				
3,847.8	3,847.3	Grayburg				
4,037.8	4,037.3	Basal Grayburg				
4,137.9	4,137.3	San Andres				

Design Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
4,566.0	4,565.4	21.8	-10.1	Last CES Survey @ 4566' MD
4,635.0	4,634.4	21.8	-11.3	Bit Projection @ 4635' MD

Checked By: _____	Approved By: _____	Date: _____
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