

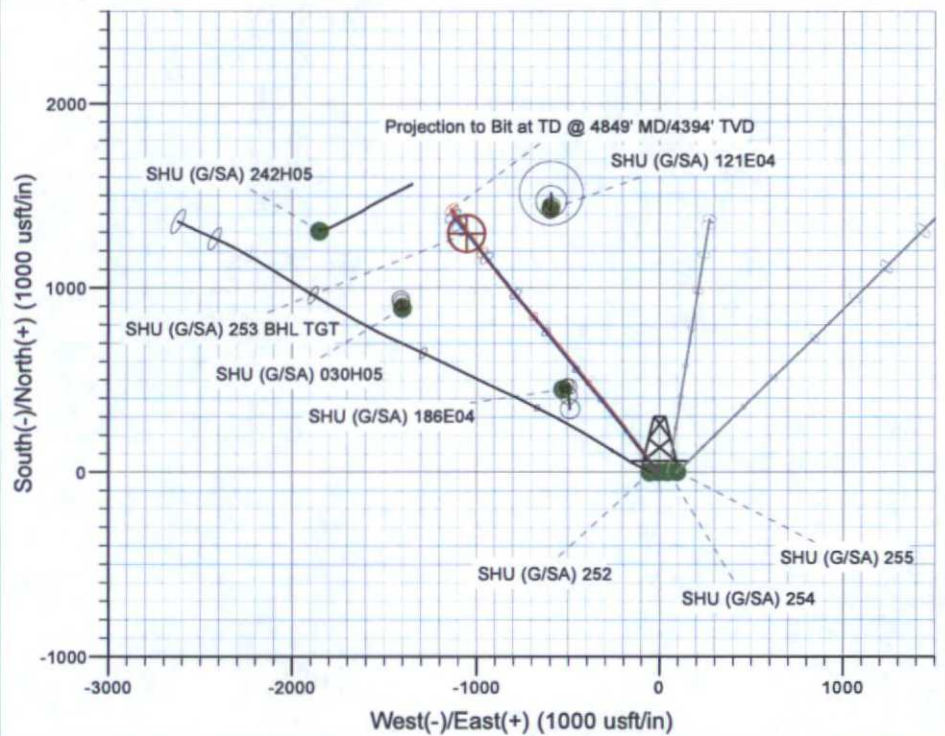
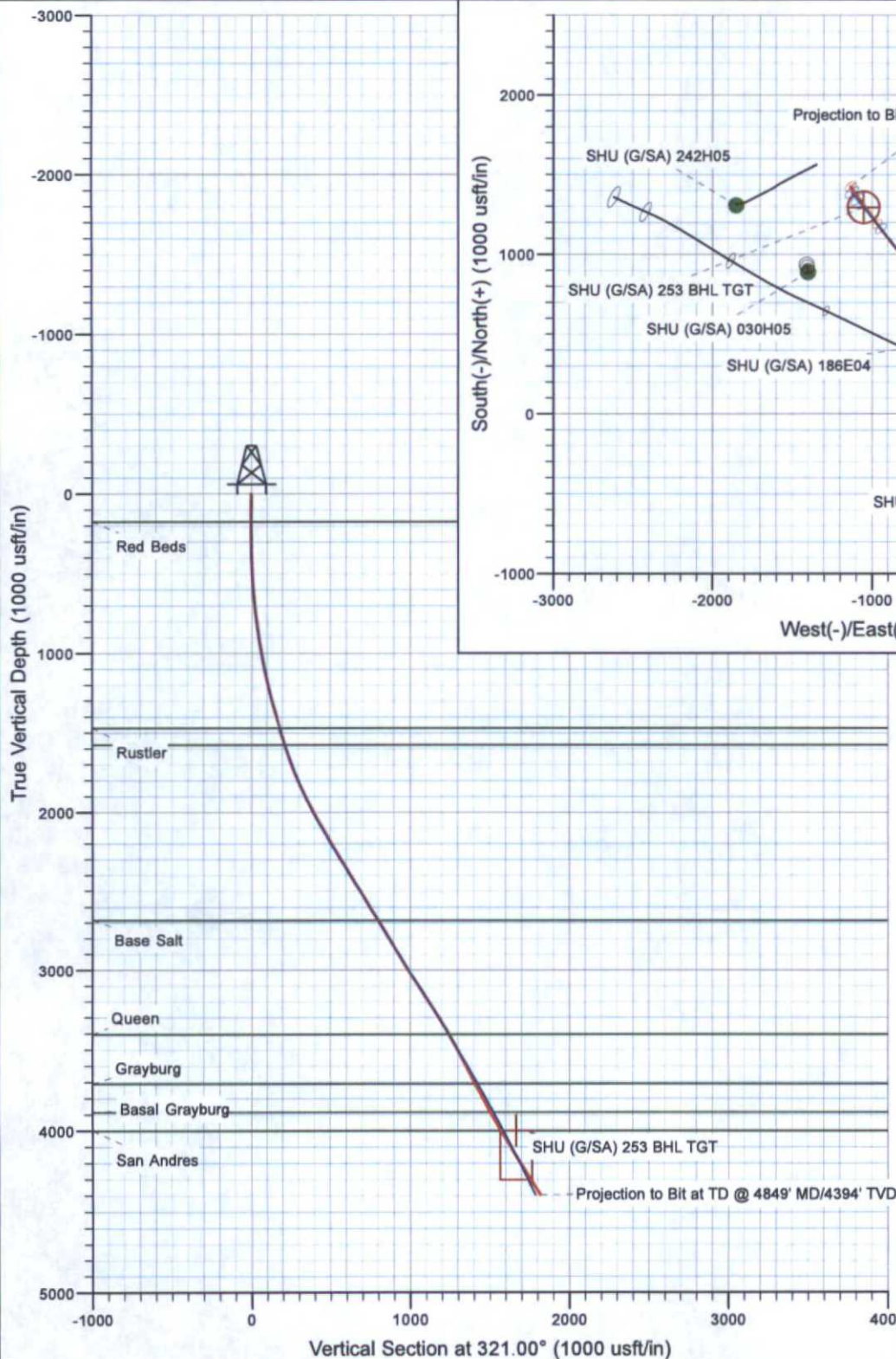


Project: HOBBS, SOUTH
Site: SOUTH HOBBS GRAYBURG-SA UNIT
Well: SHU (G/SA) 253
Wellbore: ST00
Design: Plan 1
Rig: H&P 340 - KB - 16.5



HOBBS OCD
NOV 19 2015

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Azimuths to Grid North
True North: -0.63°
Magnetic North: 6.47°

Magnetic Field
Strength: 48523.2nT
Dip Angle: 60.80°
Date: 8/13/2015
Model: HDGM

DEC 02 2015

Cathedral Energy Services

Survey Report

Company:	OXY USA PERMIAN EOR	Local Co-ordinate Reference:	Well SHU (G/SA) 253
Project:	HOBBS, SOUTH	TVD Reference:	Original KB @ 3625.4usft (H&P 340 - KB - 16.5)
Site:	SOUTH HOBBS GRAYBURG-SA UNIT	MD Reference:	Original KB @ 3625.4usft (H&P 340 - KB - 16.5)
Well:	SHU (G/SA) 253	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	HOBBS, SOUTH, North America, HOBBS, SOUTH - ALTURA HOBBS-OP		
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	SOUTH HOBBS GRAYBURG-SA UNIT				
Site Position:		Northing:	617,518.60 usft	Latitude:	32.692216
From:	Map	Easting:	859,408.09 usft	Longitude:	-103.165105
Position Uncertainty:	1.0 usft	Slot Radius:	600"	Grid Convergence:	0.63 °

Well	SHU (G/SA) 253					
Well Position	+N/-S	0.0 usft	Northing:	616,212.47 usft	Latitude:	32.688571
	+E/-W	0.0 usft	Easting:	861,257.19 usft	Longitude:	-103.159142
Position Uncertainty	1.0 usft	Wellhead Elevation:	3,608.9 usft	Ground Level:	3,608.9 usft	

Wellbore	ST00				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/13/2015	7.10	60.80	48,523

Design	FINAL			
Audit Notes:				
Version:	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	321.45

Survey Program	Date	8/16/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
203.0	4,849.0	Survey #1 (ST00)	MWD+HDGM+AX+SAG_B01	OWSG MWD + HDGM + Axial Corr + Sag Correction

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
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
175.4	0.26	66.60	175.4	0.2	0.4	-0.1	0.15	0.15	Red Beds
203.0	0.30	66.60	203.0	0.2	0.5	-0.1	0.15	0.15	
323.0	0.40	340.20	323.0	0.7	0.6	0.2	0.40	0.08	
444.0	2.20	320.50	444.0	2.9	-1.0	2.9	1.51	1.49	
623.0	5.00	316.10	622.6	11.2	-8.6	14.1	1.57	1.56	
803.0	7.50	318.00	801.5	25.6	-21.9	33.6	1.39	1.39	
983.0	9.70	318.20	979.5	45.6	-39.9	60.5	1.22	1.22	
1,163.0	12.60	324.20	1,156.1	72.8	-61.5	95.3	1.73	1.61	
1,343.0	16.10	324.20	1,330.4	109.0	-87.5	139.8	1.94	1.94	
1,473.0	17.60	321.30	1,454.8	139.0	-110.4	177.5	1.32	1.15	
1,489.3	17.50	321.44	1,470.4	142.8	-113.5	182.4	0.64	-0.59	Rustler
1,599.2	16.86	322.41	1,575.4	168.4	-133.5	214.9	0.64	-0.59	Top Salt

Cathedral Energy Services

Survey Report

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Project: HOBBS, SOUTH
Site: SOUTH HOBBS GRAYBURG-SA UNIT
Well: SHU (G/SA) 253
Wellbore: ST00
Design: FINAL

Local Co-ordinate Reference: Well SHU (G/SA) 253
TVD Reference: Original KB @ 3625.4usft (H&P 340 - KB - 16.5)
MD Reference: Original KB @ 3625.4usft (H&P 340 - KB - 16.5)
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
1,609.0	16.80	322.50	1,584.8	170.6	-135.2	217.7	0.64	-0.59	
1,789.0	22.20	321.40	1,754.4	217.9	-172.3	277.8	3.01	3.00	
1,969.0	26.50	320.70	1,918.3	275.6	-218.9	352.0	2.39	2.39	
2,149.0	30.00	320.60	2,076.9	341.4	-273.0	437.1	1.94	1.94	
2,329.0	30.00	321.50	2,232.7	411.4	-329.5	527.1	0.25	0.00	
2,509.0	31.60	319.90	2,387.3	482.7	-387.9	619.3	1.00	0.89	
2,689.0	31.80	321.30	2,540.5	555.8	-448.0	713.8	0.42	0.11	
2,859.1	31.42	322.06	2,685.4	625.8	-503.3	803.0	0.32	-0.22	Base Salt
2,869.0	31.40	322.10	2,693.8	629.8	-506.4	808.2	0.32	-0.22	
3,049.0	29.80	321.50	2,848.7	701.8	-563.1	899.8	0.90	-0.89	
3,229.0	32.40	318.10	3,002.9	772.7	-623.1	992.7	1.74	1.44	
3,408.0	33.00	319.30	3,153.5	845.4	-687.0	1,089.3	0.49	0.34	
3,588.0	31.70	320.10	3,305.6	918.8	-749.3	1,185.5	0.76	-0.72	
3,704.4	30.08	320.35	3,405.4	964.7	-787.5	1,245.2	1.39	-1.39	Queen
3,768.0	29.20	320.50	3,460.7	989.0	-807.5	1,276.7	1.39	-1.39	
3,948.0	27.60	321.00	3,619.0	1,055.3	-861.7	1,362.3	0.90	-0.89	
4,051.2	27.94	321.69	3,710.4	1,092.9	-891.7	1,410.4	0.46	0.33	Grayburg
4,128.0	28.20	322.20	3,778.1	1,121.3	-914.0	1,446.5	0.46	0.33	
4,250.6	29.77	323.04	3,885.4	1,168.5	-950.1	1,506.0	1.33	1.28	Basal Grayburg
4,307.0	30.50	323.40	3,934.1	1,191.2	-967.0	1,534.2	1.33	1.29	
4,384.0	30.76	323.62	4,000.4	1,222.7	-990.4	1,573.4	0.36	0.33	San Andres
4,487.0	31.10	323.90	4,088.8	1,265.4	-1,021.6	1,626.3	0.36	0.33	
4,667.0	32.50	324.50	4,241.7	1,342.4	-1,077.1	1,721.1	0.80	0.78	
4,782.0	33.30	324.90	4,338.3	1,393.4	-1,113.2	1,783.4	0.72	0.70	
4,849.0	33.30	324.90	4,394.3	1,423.4	-1,134.4	1,820.2	0.00	0.00	Projection to Bit at TD @ 4849' MD/4394' TVD

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Project:	HOBBS, SOUTH	TVD Reference:	Original KB @ 3625.4usft (H&P 340 - KB - 16.5)
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Well:	SHU (G/SA) 253	North Reference:	Grid
Wellbore:	ST00	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
SHU (G/SA) 253 BHL T	0.00	0.00	4,000.0	1,293.9	-1,051.6	617,506.48	860,205.48	32.692159	-103.162514
- actual wellpath misses target center by 81.0usft at 4431.8usft MD (4041.4 TVD, 1242.5 N, -1004.9 E)									
- Circle (radius 100.0)									

Formations

Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(usft)	(usft)			(°)	(°)
175.4	175.4	Red Beds			
1,489.3	1,470.4	Rustler			
1,599.2	1,575.4	Top Salt			
2,859.1	2,685.4	Base Salt			
3,704.4	3,405.4	Queen			
4,051.2	3,710.4	Grayburg			
4,250.6	3,885.4	Basal Grayburg			
4,384.0	4,000.4	San Andres			

Design Annotations

Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
4,849.0	4,394.3	1,423.4	-1,134.4	Projection to Bit at TD @ 4849' MD/4394' TVD

Checked By: _____ Approved By: _____ Date: _____