



HOBBS OCD
DEC 12 2018
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Oxy USA

Lea County, NM
South Hobbs G/SA Unit
SHU 288

Wellbore #1

Design: Surveys

Standard Survey Report

11 October, 2018





Project: Lea County, NM
Site: South Hobbs G/SA Unit
Well: SHU 288
Depth Reference: GL 3628.9' + 13.5' KB @ 3642.40usft (Savanna 417)
SHL Northing: 617206.26
SHL Easting: 854548.58
Rig: Savanna 417
Plan: plan2



SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1600.00	0.00	0.00	1600.00	0.00	0.00	0.00	0.00	0.00	Start Build 1.00
2200.00	0.00	7.63	2198.90	31.11	4.17	1.00	7.63	31.39	Start 1086.10 hold at 2200.00 MD
3286.10	6.00	7.63	3279.05	143.83	19.25	0.00	0.00	144.92	Start Drop -1.00
3886.10	0.00	0.00	3877.95	174.74	23.42	1.00	180.00	176.30	Start 648.45 hold at 3886.10 MD
4534.54	0.00	0.00	4526.40	174.74	23.42	0.00	0.00	176.30	Start 686.00 hold at 4534.54 MD
5200.54	0.00	0.00	5192.40	174.74	23.42	0.00	0.00	176.30	TD @ 5200.54' MD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1571.25	1571.25	Rustler
1575.64	1575.64	Salt
2735.60	2739.85	Yates
2941.46	2946.65	Seven Rivers
3470.46	3478.26	Queen
3784.30	3792.44	Grayburg
4071.29	4079.43	San Andres 1
4128.67	4136.81	Sa2 C Upper
4439.76	4447.90	Sa3 K
4738.61	4746.75	Roz A

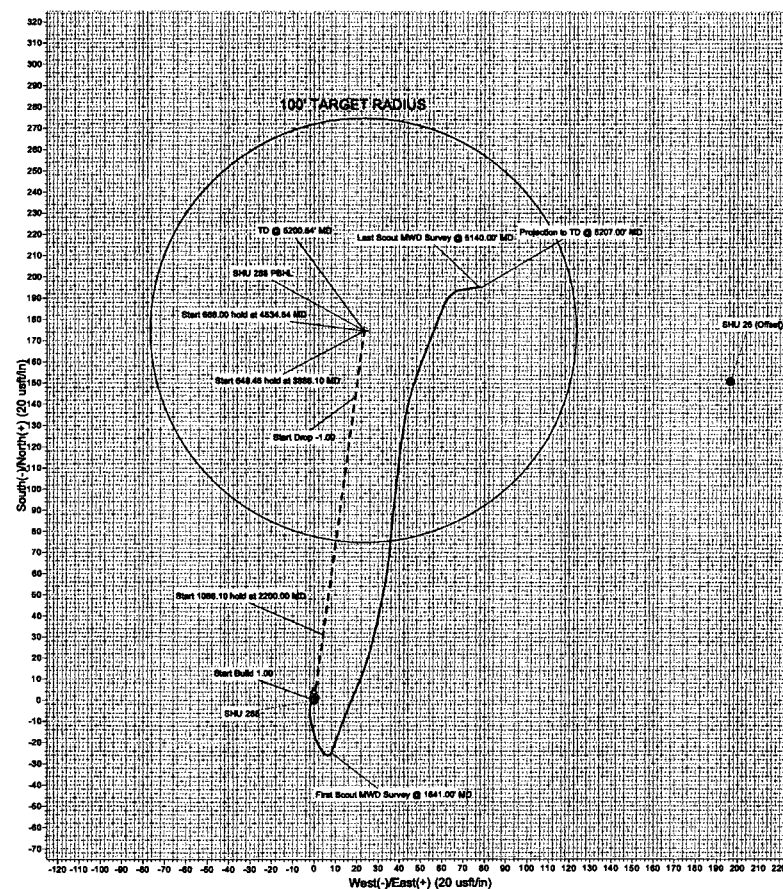
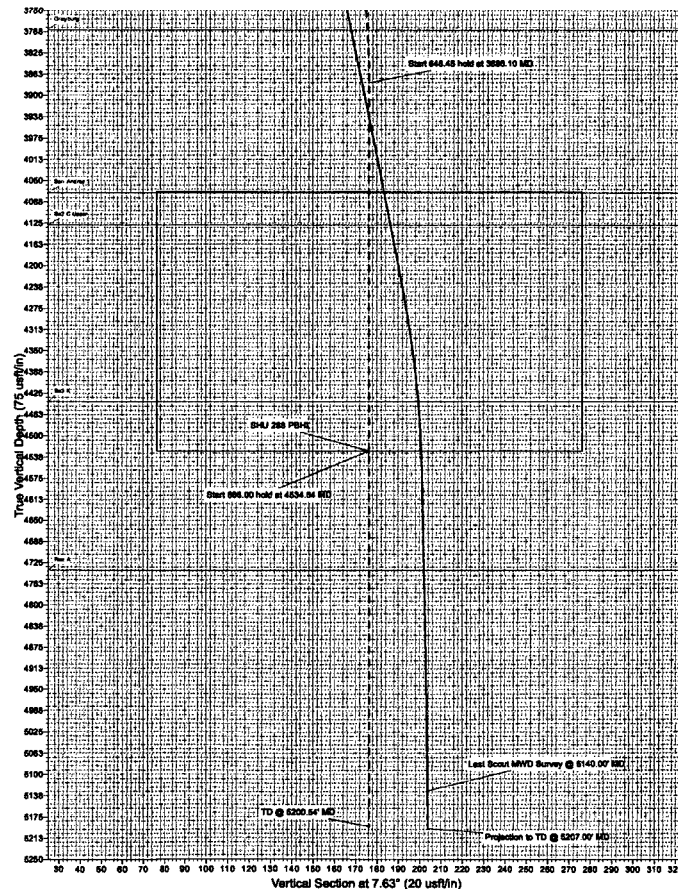
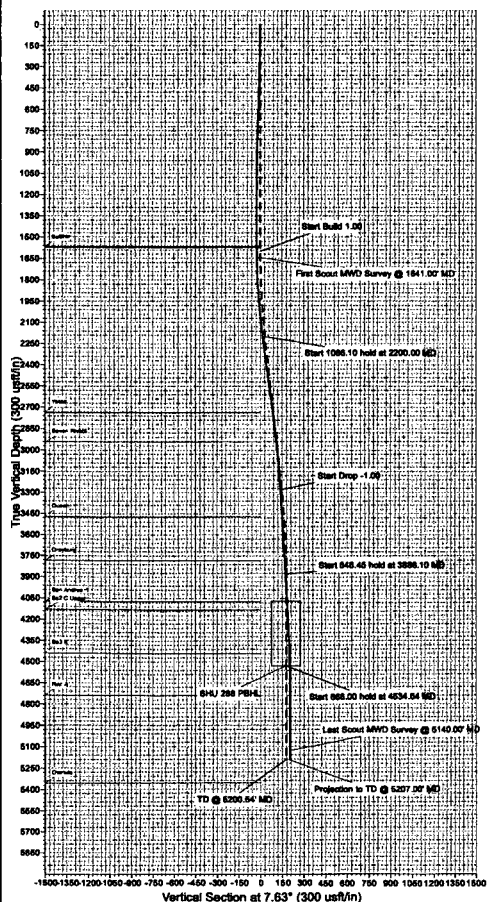
DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
SHU 288 PBHL	4526.40	174.74	23.42	617381.00	854572.00	Circle (Radius: 100.00)



Azimuths to Grid North
True North: -0.62°
Magnetic North: 6.18°

Magnetic Field
Strength: 48121.6nT
Dip Angle: 60.73°
Date: 09/16/2016
Model: HDGM





Survey Report



Company:	Oxy USA	Local Co-ordinate Reference:	Well SHU 288
Project:	Lea County, NM	TVD Reference:	GL 3628.9' + 13.5' KB @ 3642.40usft (Savanna 417)
Site:	South Hobbs G/SA Unit	MD Reference:	GL 3628.9' + 13.5' KB @ 3642.40usft (Savanna 417)
Well:	SHU 288	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 Single User Db

Project	Lea County, 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		

Site		South Hobbs G/SA Unit			
Site Position:		Northing:	616,257.52 usft	Latitude:	32° 41' 19.686 N
From:	Map	Easting:	857,718.46 usft	Longitude:	103° 10' 14.307 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.63 °

Well	SHU 288					
Well Position	+N-S	0.00 usft	Northing:	617,206.26 usft	Latitude:	32° 41' 29.415 N
	+E-W	0.00 usft	Easting:	854,548.58 usft	Longitude:	103° 10' 51.271 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,628.90 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	09/16/18	6.80	60.73	48,121.60000000

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	7.63	

Survey Program	Date 10/11/18				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
44.79	1,508.02	Gyrodata Gyro (Wellbore #1)	GYD_G003_GC+DROP+H	Gyrodata Stationary Tool drop on BHA on open h	
1,641.00	5,207.00	Scout MWD (Wellbore #1)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
44.79	0.85	229.62	44.79	-0.22	-0.25	-0.25	1.90	1.90	0.00	
230.93	1.03	198.99	230.90	-2.69	-1.85	-2.91	0.28	0.10	-16.46	
416.45	1.77	170.92	416.37	-7.10	-1.94	-7.29	0.53	0.40	-15.13	
600.47	2.02	168.13	600.29	-13.08	-0.82	-13.07	0.14	0.14	-1.52	
784.14	1.77	156.16	783.86	-18.84	0.99	-18.54	0.25	-0.14	-6.52	
968.24	1.00	147.86	967.90	-22.80	2.99	-22.20	0.43	-0.42	-4.51	
1,159.80	0.79	133.41	1,159.44	-25.12	4.84	-24.26	0.16	-0.11	-7.54	



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Well:	SHU 288	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.14 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)
1,332.26	0.47	94.96	1,331.89	-26.00	6.41	-24.92	0.30	-0.19	-22.30
1,508.02	0.41	45.31	1,507.65	-25.62	7.57	-24.39	0.21	-0.03	-28.25
1,641.00	0.53	22.62	1,640.62	-24.72	8.15	-23.42	0.16	0.09	-17.06
First Scout MWD Survey @ 1641.00' MD									
1,813.00	2.64	17.96	1,812.55	-20.22	9.68	-18.75	1.23	1.23	-2.71
1,986.00	5.63	21.82	1,985.08	-8.55	14.06	-6.60	1.73	1.73	2.23
2,160.00	6.77	22.70	2,158.06	8.84	21.19	11.58	0.66	0.66	0.51
2,332.00	7.43	13.39	2,328.74	29.01	27.68	32.43	0.77	0.38	-5.41
2,505.00	8.00	11.54	2,500.18	51.69	32.68	55.57	0.36	0.33	-1.07
2,677.00	7.43	4.07	2,670.62	74.51	35.86	78.61	0.67	-0.33	-4.34
2,850.00	6.81	6.97	2,842.29	95.85	37.90	100.03	0.41	-0.36	1.68
3,023.00	4.79	5.83	3,014.39	113.22	39.88	117.51	1.17	-1.17	-0.66
3,196.00	4.22	8.73	3,186.86	126.69	41.58	131.09	0.35	-0.33	1.68
3,369.00	3.74	12.24	3,359.44	138.50	43.74	143.08	0.31	-0.28	2.03
3,542.00	3.43	19.01	3,532.10	148.91	46.62	153.78	0.30	-0.18	3.91
3,715.00	3.21	19.80	3,704.81	158.36	49.95	163.59	0.13	-0.13	0.46
3,887.00	3.21	20.95	3,876.54	167.39	53.30	172.98	0.04	0.00	0.67
4,060.00	3.12	22.00	4,049.28	176.27	56.80	182.26	0.06	-0.05	0.61
4,237.00	2.99	20.51	4,226.03	185.06	60.22	191.42	0.09	-0.07	-0.84
4,409.00	2.15	46.43	4,397.86	191.49	64.13	198.31	0.82	-0.49	15.07
4,582.00	1.14	87.65	4,570.79	193.80	68.20	201.14	0.86	-0.58	23.83
4,755.00	1.14	76.14	4,743.76	194.28	71.59	202.07	0.13	0.00	-6.65
4,927.00	0.84	82.82	4,915.73	194.85	74.50	203.02	0.19	-0.17	3.88
5,100.00	0.88	87.22	5,088.71	195.07	77.09	203.58	0.04	0.02	2.54
5,140.00	0.88	88.27	5,128.71	195.09	77.70	203.69	0.04	0.00	2.63
Last Scout MWD Survey @ 5140.00' MD									
5,207.00	0.88	88.27	5,195.70	195.13	78.73	203.85	0.00	0.00	0.00
Projection to TD @ 5207.00' MD									

Checked By: _____ Approved By: _____ Date: _____