



30-025-41542

Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well King Tut Federal Well No. 1H
Project:	Lea County, New Mexico	TVD Reference:	RKB=3539.9+26 @ 3565.90usft (Independence 205)
Site:	King Tut Federal	MD Reference:	RKB=3539.9+26 @ 3565.90usft (Independence 205)
Well:	King Tut Federal Well No. 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Project	Lea County, New Mexico		
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		

HOBBSON

Site	King Tut Federal		
Site Position:		Northing:	435,225.50 usft
From:	Map	Easting:	694,114.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.19499500
		Longitude:	-103.70582159
		Grid Convergence:	0.33 °

FEB 13 2015

RECEIVED

Well	King Tut Federal Well No. 1H, Surf Loc 190 FNL 330 FWL Sect 30		
Well Position	+N/-S	0.00 usft	Northing: 435,183.90 usft
	+E/-W	0.00 usft	Easting: 689,287.40 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.19495712
		Longitude:	-103.72142515
		Ground Level:	3,539.90 usft

Wellbore	Original hole		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	6/26/2014	7.28
			60.06
			48,279

Design	Surveys Original hole		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			179.36

Survey Program	Date 8/15/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
211.00	4,487.00 svys (Original hole)		MWD
4,639.00	18,083.00 MWD (Original hole)		MWD
			Description
			MWD - Standard
			MWD - Standard

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude	
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting			
(usft)			(usft)			(usft)	(usft)			
0.00	0.00	0.00	0.00	0.00	0.00	435,183.90	689,287.40	32.19495712	-103.72142515	
211.00	1.20	77.30	210.98	0.49	2.16	435,184.39	689,289.55	32.19495842	-103.72141818	
Surveys										
322.00	0.30	56.00	321.97	0.90	3.53	435,184.80	689,290.93	32.19495954	-103.72141372	
767.00	1.10	97.30	766.94	1.01	8.73	435,184.91	689,296.13	32.19495976	-103.72139690	
981.00	0.60	116.00	980.92	0.26	11.78	435,184.16	689,299.17	32.19495765	-103.72138708	
1,227.00	1.10	122.00	1,226.89	-1.56	14.94	435,182.34	689,302.33	32.19495261	-103.72137689	
2,121.00	0.60	114.30	2,120.79	-8.03	26.48	435,175.87	689,313.88	32.19493463	-103.72133970	
2,497.00	0.70	107.30	2,496.76	-9.52	30.47	435,174.38	689,317.86	32.19493046	-103.72132684	

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Site:	King Tut Federal	MD Reference:	RKB=3539.9+26 @ 3565.90usft (Independence 205)
Well:	King Tut Federal Well No. 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,779.00	1.00	218.30	2,778.74	-11.97	30.59	435,171.93	689,317.98	32.19492374	-103.72132649
3,076.00	1.30	102.00	3,075.71	-14.70	32.28	435,169.20	689,319.67	32.19491620	-103.72132108
3,170.00	1.40	109.00	3,169.69	-15.30	34.41	435,168.60	689,321.80	32.19491453	-103.72131421
3,546.00	1.40	99.00	3,545.58	-17.51	43.29	435,166.39	689,330.68	32.19490831	-103.72128555
3,720.00	1.60	117.30	3,719.52	-18.96	47.54	435,164.94	689,334.94	32.19490426	-103.72127181
3,814.00	1.50	129.40	3,813.48	-20.34	49.66	435,163.56	689,337.06	32.19490043	-103.72126500
3,908.00	1.70	129.30	3,907.45	-22.00	51.69	435,161.90	689,339.09	32.19489582	-103.72125847
4,003.00	1.60	129.30	4,002.41	-23.74	53.81	435,160.16	689,341.20	32.19489103	-103.72125165
4,190.00	1.70	130.30	4,189.33	-27.18	57.94	435,156.72	689,345.34	32.19488148	-103.72123835
4,284.00	2.00	132.30	4,283.28	-29.19	60.22	435,154.71	689,347.61	32.19487593	-103.72123103
4,378.00	1.90	140.30	4,377.23	-31.49	62.43	435,152.41	689,349.82	32.19486957	-103.72122393
4,472.00	2.20	135.30	4,471.17	-33.97	64.69	435,149.93	689,352.09	32.19486271	-103.72121666
4,487.00	1.90	139.00	4,486.16	-34.37	65.06	435,149.53	689,352.45	32.19486163	-103.72121548
4,639.00	2.30	130.70	4,638.05	-38.26	69.02	435,145.64	689,356.42	32.19485087	-103.72120273
MWD surveys									
4,733.00	1.20	140.50	4,732.01	-40.25	71.08	435,143.65	689,358.48	32.19484537	-103.72119612
4,828.00	0.70	246.70	4,827.00	-41.24	71.18	435,142.66	689,358.58	32.19484263	-103.72119582
4,922.00	0.70	223.90	4,920.99	-41.88	70.25	435,142.02	689,357.65	32.19484088	-103.72119882
5,016.00	0.50	224.20	5,014.99	-42.59	69.57	435,141.31	689,356.97	32.19483895	-103.72120105
5,110.00	0.50	208.00	5,108.98	-43.25	69.09	435,140.65	689,356.49	32.19483715	-103.72120261
5,204.00	0.50	220.30	5,202.98	-43.92	68.63	435,139.98	689,356.03	32.19483530	-103.72120410
5,298.00	0.50	216.10	5,296.98	-44.57	68.13	435,139.33	689,355.52	32.19483354	-103.72120575
5,392.00	0.70	234.40	5,390.97	-45.23	67.42	435,138.67	689,354.81	32.19483172	-103.72120805
5,487.00	0.70	240.40	5,485.97	-45.86	66.44	435,138.04	689,353.84	32.19483002	-103.72121122
5,581.00	0.70	235.10	5,579.96	-46.47	65.47	435,137.43	689,352.87	32.19482835	-103.72121437
5,675.00	0.70	242.10	5,673.95	-47.07	64.49	435,136.83	689,351.89	32.19482673	-103.72121754
5,769.00	0.90	237.20	5,767.94	-47.74	63.37	435,136.16	689,350.76	32.19482491	-103.72122120
5,863.00	0.50	244.30	5,861.93	-48.31	62.38	435,135.59	689,349.77	32.19482333	-103.72122441
5,957.00	0.70	229.10	5,955.93	-48.87	61.57	435,135.03	689,348.97	32.19482182	-103.72122702
6,051.00	0.50	265.30	6,049.92	-49.28	60.73	435,134.62	689,348.12	32.19482071	-103.72122975
6,146.00	0.50	249.90	6,144.92	-49.45	59.93	435,134.45	689,347.32	32.19482024	-103.72123235
6,240.00	0.90	251.30	6,238.91	-49.83	58.84	435,134.07	689,346.24	32.19481922	-103.72123586
6,334.00	0.90	249.20	6,332.90	-50.33	57.45	435,133.57	689,344.85	32.19481787	-103.72124036
6,428.00	0.90	234.10	6,426.89	-51.02	56.16	435,132.87	689,343.56	32.19481598	-103.72124454
6,522.00	0.70	268.90	6,520.88	-51.47	54.99	435,132.43	689,342.39	32.19481478	-103.72124833
6,616.00	0.70	261.10	6,614.88	-51.57	53.85	435,132.33	689,341.25	32.19481452	-103.72125203
6,710.00	1.10	259.40	6,708.86	-51.82	52.40	435,132.08	689,339.79	32.19481384	-103.72125673
6,804.00	1.10	256.20	6,802.85	-52.20	50.63	435,131.70	689,338.03	32.19481282	-103.72126244
6,898.00	0.90	284.30	6,896.83	-52.24	49.04	435,131.66	689,336.44	32.19481275	-103.72126758
6,992.00	1.10	265.70	6,990.82	-52.12	47.43	435,131.78	689,334.82	32.19481310	-103.72127280
7,086.00	0.70	268.50	7,084.81	-52.21	45.95	435,131.69	689,333.35	32.19481289	-103.72127757
7,180.00	1.10	271.30	7,178.79	-52.20	44.48	435,131.70	689,331.87	32.19481293	-103.72128234
7,274.00	0.90	261.10	7,272.78	-52.29	42.85	435,131.61	689,330.24	32.19481270	-103.72128761
7,368.00	1.10	262.50	7,366.77	-52.53	41.22	435,131.37	689,328.62	32.19481208	-103.72129287
7,462.00	1.20	260.80	7,460.75	-52.80	39.36	435,131.10	689,326.75	32.19481136	-103.72129890
7,556.00	1.20	258.70	7,554.73	-53.15	37.42	435,130.75	689,324.81	32.19481043	-103.72130517
7,650.00	1.20	250.20	7,648.71	-53.68	35.53	435,130.22	689,322.92	32.19480901	-103.72131130
7,736.00	1.40	238.60	7,734.68	-54.53	33.78	435,129.37	689,321.18	32.19480669	-103.72131695
7,802.00	3.30	184.50	7,800.63	-56.84	32.95	435,127.06	689,320.34	32.19480034	-103.72131970
7,834.00	6.90	179.20	7,832.50	-59.69	32.90	435,124.21	689,320.30	32.19479253	-103.72131990
7,865.00	10.20	179.60	7,863.15	-64.29	32.95	435,119.61	689,320.34	32.19477987	-103.72131984
7,896.00	12.70	176.80	7,893.53	-70.44	33.16	435,113.46	689,320.55	32.19476296	-103.72131927
7,928.00	15.10	175.00	7,924.59	-78.11	33.71	435,105.79	689,321.11	32.19474188	-103.72131760

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Well:	King Tut Federal Well No. 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,959.00	18.10	176.10	7,954.30	-86.94	34.39	435,096.96	689,321.79	32.19471760	-103.72131557
7,990.00	20.80	178.90	7,983.53	-97.25	34.83	435,086.65	689,322.22	32.19468926	-103.72131436
8,022.00	23.20	179.60	8,013.19	-109.23	34.98	435,074.67	689,322.38	32.19465631	-103.72131408
8,053.00	26.40	179.20	8,041.33	-122.23	35.12	435,061.67	689,322.52	32.19462057	-103.72131387
8,085.00	28.70	180.30	8,069.70	-137.03	35.18	435,046.87	689,322.57	32.19457989	-103.72131396
8,091.00	29.15	180.30	8,074.95	-139.93	35.16	435,043.97	689,322.56	32.19457191	-103.72131406
330 Hard line intercept @ 8091 MD									
8,116.00	31.00	180.30	8,096.59	-152.46	35.10	435,031.44	689,322.49	32.19453748	-103.72131450
8,147.00	33.80	179.20	8,122.76	-169.07	35.18	435,014.83	689,322.57	32.19449183	-103.72131455
8,179.00	36.20	178.20	8,148.97	-187.41	35.60	434,996.49	689,322.99	32.19444138	-103.72131353
8,210.00	39.10	177.80	8,173.51	-206.34	36.26	434,977.56	689,323.66	32.19438936	-103.72131173
8,241.00	41.70	180.30	8,197.12	-226.42	36.58	434,957.48	689,323.98	32.19433415	-103.72131106
8,273.00	45.40	181.30	8,220.31	-248.46	36.27	434,935.44	689,323.66	32.19427356	-103.72131249
8,304.00	49.10	182.00	8,241.35	-271.21	35.61	434,912.69	689,323.00	32.19421104	-103.72131504
8,336.00	51.60	181.30	8,261.76	-295.84	34.90	434,888.06	689,322.30	32.19414335	-103.72131777
8,367.00	54.20	180.60	8,280.46	-320.56	34.49	434,863.34	689,321.89	32.19407541	-103.72131954
8,399.00	56.70	179.60	8,298.61	-346.91	34.45	434,836.99	689,321.85	32.19400297	-103.72132017
8,430.00	58.80	178.90	8,315.15	-373.12	34.80	434,810.78	689,322.19	32.19393091	-103.72131953
8,461.00	62.30	178.20	8,330.39	-400.11	35.48	434,783.79	689,322.88	32.19385673	-103.72131781
8,493.00	66.00	177.80	8,344.34	-428.88	36.49	434,755.02	689,323.88	32.19377761	-103.72131509
8,524.00	69.50	177.80	8,356.08	-457.55	37.59	434,726.35	689,324.99	32.19369880	-103.72131206
8,556.00	72.50	176.80	8,366.49	-487.77	39.02	434,696.13	689,326.41	32.19361571	-103.72130800
8,596.00	76.20	175.30	8,377.28	-526.18	41.68	434,657.72	689,329.07	32.19351006	-103.72130012
8,628.00	79.50	176.40	8,384.02	-557.38	43.94	434,626.52	689,331.33	32.19342427	-103.72129338
8,659.00	82.90	177.80	8,388.76	-587.97	45.48	434,595.93	689,332.88	32.19334016	-103.72128894
8,690.00	86.60	178.50	8,391.60	-618.82	46.48	434,565.08	689,333.88	32.19325535	-103.72128629
8,722.00	88.50	178.90	8,392.96	-650.78	47.21	434,533.12	689,334.60	32.19316748	-103.72128453
8,753.00	90.30	179.60	8,393.29	-681.77	47.61	434,502.13	689,335.01	32.19308228	-103.72128379
8,785.00	91.00	179.90	8,392.93	-713.77	47.75	434,470.13	689,335.15	32.19299432	-103.72128393
8,879.00	90.10	178.50	8,392.02	-807.75	49.06	434,376.15	689,336.46	32.19273595	-103.72128141
8,973.00	89.60	178.50	8,392.27	-901.72	51.52	434,282.18	689,338.92	32.19247761	-103.72127519
9,067.00	91.80	178.50	8,391.12	-995.68	53.98	434,188.22	689,341.38	32.19221930	-103.72126896
9,161.00	91.70	177.80	8,388.25	-1,089.58	57.02	434,094.32	689,344.41	32.19196112	-103.72126089
9,255.00	90.80	179.20	8,386.20	-1,183.53	59.48	434,000.37	689,346.87	32.19170285	-103.72125466
9,349.00	89.40	181.00	8,386.04	-1,277.52	59.31	433,906.38	689,346.71	32.19144448	-103.72125692
9,443.00	89.70	183.10	8,386.77	-1,371.45	55.95	433,812.45	689,343.35	32.19118633	-103.72126952
9,537.00	89.40	182.00	8,387.51	-1,465.35	51.77	433,718.55	689,339.16	32.19092827	-103.72128477
9,631.00	91.50	182.40	8,386.77	-1,559.28	48.16	433,624.62	689,335.56	32.19067014	-103.72129816
9,725.00	90.30	180.30	8,385.30	-1,653.23	45.95	433,530.67	689,333.34	32.19041191	-103.72130704
9,819.00	88.20	178.50	8,386.53	-1,747.21	46.93	433,436.69	689,334.33	32.19015356	-103.72130559
9,914.00	88.90	177.10	8,388.93	-1,842.11	50.58	433,341.79	689,337.97	32.18989265	-103.72129555
10,008.00	90.40	175.00	8,389.51	-1,935.87	57.05	433,248.03	689,344.45	32.18963480	-103.72127635
10,102.00	89.00	175.70	8,390.00	-2,029.56	64.67	433,154.34	689,352.07	32.18937715	-103.72125344
10,196.00	89.20	174.60	8,391.47	-2,123.21	72.62	433,060.69	689,360.01	32.18911959	-103.72122948
10,290.00	88.70	176.40	8,393.20	-2,216.90	79.99	432,967.00	689,367.39	32.18886194	-103.72120737
10,384.00	88.00	176.40	8,395.90	-2,310.67	85.89	432,873.23	689,373.29	32.18860407	-103.72119002
10,478.00	89.90	178.50	8,397.63	-2,404.56	90.07	432,779.34	689,377.47	32.18834594	-103.72117824
10,572.00	88.70	175.70	8,398.78	-2,498.42	94.83	432,685.48	689,382.22	32.18808785	-103.72116459
10,667.00	91.00	177.50	8,399.02	-2,593.24	100.46	432,590.66	689,387.86	32.18782711	-103.72114813
10,761.00	90.10	175.30	8,398.12	-2,687.04	106.36	432,496.86	689,393.76	32.18756917	-103.72113078
10,855.00	91.00	174.60	8,397.22	-2,780.67	114.64	432,403.23	689,402.03	32.18731166	-103.72110576
10,949.00	90.80	176.10	8,395.74	-2,874.35	122.25	432,309.55	689,409.65	32.18705404	-103.72108286
11,043.00	91.80	179.20	8,393.61	-2,968.23	126.11	432,215.67	689,413.50	32.18679591	-103.72107213

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Site:	King Tut Federal	MD Reference:	RKB=3539.9+26 @ 3565.90usft (Independence 205)
Well:	King Tut Federal Well No. 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,137.00	89.90	181.00	8,392.21	-3,062.21	125.94	432,121.69	689,413.34	32.18653757	-103.72107439
11,231.00	90.30	180.30	8,392.05	-3,156.21	124.88	432,027.69	689,412.27	32.18627921	-103.72107956
11,325.00	89.90	182.00	8,391.89	-3,250.18	122.99	431,933.72	689,410.39	32.18602091	-103.72108739
11,419.00	89.90	183.10	8,392.05	-3,344.09	118.81	431,839.81	689,406.20	32.18576285	-103.72110264
11,513.00	89.60	182.00	8,392.46	-3,437.99	114.63	431,745.91	689,402.02	32.18550478	-103.72111788
11,607.00	90.60	183.40	8,392.30	-3,531.89	110.20	431,652.01	689,397.59	32.18524676	-103.72113392
11,702.00	89.20	182.70	8,392.46	-3,626.75	105.14	431,557.15	689,392.54	32.18498607	-103.72115200
11,796.00	89.00	184.50	8,393.94	-3,720.55	99.24	431,463.35	689,386.64	32.18472832	-103.72117280
11,890.00	89.90	181.30	8,394.84	-3,814.41	94.49	431,369.49	689,381.88	32.18447039	-103.72118990
11,984.00	90.10	182.00	8,394.84	-3,908.37	91.78	431,275.53	689,379.18	32.18421214	-103.72120037
12,077.00	91.00	182.70	8,393.95	-4,001.29	87.97	431,182.61	689,375.36	32.18395679	-103.72121441
12,171.00	91.30	185.20	8,392.06	-4,095.04	81.50	431,088.86	689,368.89	32.18369919	-103.72123705
12,265.00	89.70	183.80	8,391.24	-4,188.74	74.12	430,995.16	689,361.52	32.18344173	-103.72126261
12,360.00	88.90	184.80	8,392.40	-4,283.46	67.00	430,900.44	689,354.39	32.18318146	-103.72128737
12,454.00	88.70	184.10	8,394.37	-4,377.16	59.71	430,806.74	689,347.10	32.18292402	-103.72131266
12,548.00	89.00	184.10	8,396.26	-4,470.90	52.99	430,713.00	689,340.38	32.18266645	-103.72133611
12,642.00	90.10	182.70	8,397.00	-4,564.72	47.41	430,619.17	689,334.81	32.18240861	-103.72135585
12,737.00	91.00	180.60	8,396.08	-4,659.67	44.68	430,524.22	689,332.07	32.18214765	-103.72136643
12,831.00	91.80	178.90	8,393.79	-4,753.64	45.09	430,430.26	689,332.48	32.18188934	-103.72136684
12,925.00	92.40	177.50	8,390.34	-4,847.53	48.04	430,336.37	689,335.43	32.18163121	-103.72135903
13,019.00	89.70	176.40	8,388.62	-4,941.37	53.04	430,242.53	689,340.43	32.18137318	-103.72134459
13,113.00	90.60	176.10	8,388.37	-5,035.17	59.19	430,148.73	689,346.58	32.18111525	-103.72132645
13,207.00	91.80	175.70	8,386.41	-5,128.90	65.91	430,054.99	689,353.30	32.18085747	-103.72130645
13,301.00	91.00	176.80	8,384.11	-5,222.67	72.05	429,961.23	689,359.45	32.18059962	-103.72128831
13,395.00	88.70	177.50	8,384.35	-5,316.55	76.72	429,867.35	689,364.12	32.18034150	-103.72127494
13,490.00	90.40	178.20	8,385.10	-5,411.48	80.29	429,772.42	689,367.68	32.18008050	-103.72126516
13,584.00	90.10	178.90	8,384.69	-5,505.44	82.67	429,678.46	689,370.06	32.17982216	-103.72125920
13,678.00	91.10	178.90	8,383.71	-5,599.42	84.47	429,584.48	689,371.87	32.17956380	-103.72125510
13,772.00	88.50	178.20	8,384.03	-5,693.38	86.85	429,490.52	689,374.25	32.17930548	-103.72124914
13,866.00	90.10	177.80	8,385.18	-5,787.31	90.13	429,396.59	689,377.53	32.17904722	-103.72124027
13,960.00	90.80	177.10	8,384.44	-5,881.22	94.31	429,302.68	689,381.71	32.17878903	-103.72122848
14,054.00	89.90	176.80	8,383.87	-5,975.08	99.31	429,208.82	689,386.71	32.17853094	-103.72121404
14,148.00	89.90	175.70	8,384.03	-6,068.88	105.46	429,115.02	689,392.86	32.17827300	-103.72119590
14,242.00	88.50	176.40	8,385.35	-6,162.64	111.94	429,021.26	689,399.33	32.17801516	-103.72117669
14,336.00	89.70	176.10	8,386.82	-6,256.43	118.08	428,927.47	689,405.48	32.17775726	-103.72115855
14,430.00	91.30	175.70	8,386.00	-6,350.18	124.80	428,833.72	689,412.20	32.17749944	-103.72113856
14,525.00	90.60	177.10	8,384.43	-6,444.98	130.77	428,738.92	689,418.16	32.17723876	-103.72112103
14,619.00	89.70	176.40	8,384.18	-6,538.82	136.10	428,645.08	689,423.49	32.17698071	-103.72110553
14,713.00	90.80	175.30	8,383.77	-6,632.57	142.90	428,551.33	689,430.29	32.17672290	-103.72108527
14,807.00	89.40	176.40	8,383.61	-6,726.32	149.70	428,457.58	689,437.10	32.17646509	-103.72106501
14,901.00	91.80	176.10	8,382.62	-6,820.11	155.85	428,363.79	689,443.24	32.17620718	-103.72104687
14,995.00	90.40	176.80	8,380.82	-6,913.91	161.67	428,269.99	689,449.06	32.17594925	-103.72102979
15,089.00	89.60	178.20	8,380.82	-7,007.82	165.77	428,176.08	689,453.16	32.17569105	-103.72101826
15,183.00	88.90	179.60	8,382.05	-7,101.79	167.57	428,082.11	689,454.97	32.17543271	-103.72101416
15,278.00	89.70	179.20	8,383.21	-7,196.78	168.57	427,987.12	689,455.96	32.17517159	-103.72101269
15,372.00	89.70	180.60	8,383.70	-7,290.77	168.73	427,893.13	689,456.13	32.17491320	-103.72101389
15,466.00	91.00	179.90	8,383.13	-7,384.77	168.32	427,799.13	689,455.72	32.17465483	-103.72101694
15,559.00	90.30	181.00	8,382.07	-7,477.76	167.59	427,706.14	689,454.98	32.17439923	-103.72102101
15,654.00	91.50	180.30	8,380.58	-7,572.74	166.51	427,611.16	689,453.91	32.17413816	-103.72102624
15,748.00	89.70	181.00	8,379.60	-7,666.72	165.45	427,517.18	689,452.84	32.17387982	-103.72103142
15,842.00	88.30	181.70	8,381.24	-7,760.68	163.23	427,423.22	689,450.63	32.17362158	-103.72104030
15,936.00	89.40	181.70	8,383.12	-7,854.61	160.44	427,329.29	689,447.84	32.17336341	-103.72105104
16,030.00	89.90	181.00	8,383.70	-7,948.59	158.23	427,235.31	689,445.62	32.17310513	-103.72105993

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well King Tut Federal Well No. 1H
Project:	Lea County, New Mexico	TVD Reference:	RKB=3539.9+26 @ 3565.90usft (Independence 205)
Site:	King Tut Federal	MD Reference:	RKB=3539.9+26 @ 3565.90usft (Independence 205)
Well:	King Tut Federal Well No. 1H	North Reference:	Grid
Wellbore:	Original hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original hole	Database:	EDM 5000.1 Ddatabase

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
16,124.00	90.10	179.90	8,383.70	-8,042.58	157.49	427,141.32	689,444.89	32.17284676	-103.72106404
16,218.00	90.80	178.50	8,382.96	-8,136.57	158.80	427,047.33	689,446.20	32.17258838	-103.72106153
16,313.00	90.40	178.90	8,381.96	-8,231.54	160.96	426,952.36	689,448.35	32.17232729	-103.72105631
16,407.00	89.20	179.90	8,382.29	-8,325.53	161.94	426,858.37	689,449.34	32.17206891	-103.72105486
16,501.00	88.30	180.60	8,384.34	-8,419.50	161.53	426,764.40	689,448.93	32.17181059	-103.72105791
16,595.00	89.90	179.90	8,385.82	-8,513.49	161.12	426,670.41	689,448.52	32.17155225	-103.72106096
16,689.00	91.10	179.20	8,385.00	-8,607.48	161.86	426,576.42	689,449.26	32.17129387	-103.72106031
16,783.00	90.10	180.60	8,384.02	-8,701.47	162.02	426,482.43	689,449.42	32.17103549	-103.72106150
16,877.00	90.60	180.60	8,383.44	-8,795.46	161.04	426,388.44	689,448.44	32.17077714	-103.72106641
16,971.00	92.40	179.90	8,380.98	-8,889.42	160.63	426,294.48	689,448.03	32.17051885	-103.72106947
17,065.00	90.80	179.90	8,378.36	-8,983.38	160.79	426,200.52	689,448.19	32.17026057	-103.72107066
17,160.00	89.00	181.70	8,378.52	-9,078.37	159.47	426,105.53	689,446.86	32.16999949	-103.72107670
17,254.00	89.70	181.70	8,379.59	-9,172.32	156.68	426,011.58	689,444.07	32.16974128	-103.72108744
17,348.00	90.80	181.30	8,379.18	-9,266.28	154.22	425,917.62	689,441.61	32.16948302	-103.72109711
17,442.00	90.10	180.60	8,378.44	-9,360.27	152.66	425,823.63	689,440.06	32.16922470	-103.72110388
17,536.00	88.30	180.30	8,379.75	-9,454.25	151.92	425,729.65	689,439.32	32.16896636	-103.72110799
17,630.00	89.20	179.60	8,381.80	-9,548.23	152.00	425,635.67	689,439.40	32.16870803	-103.72110946
17,724.00	89.70	179.20	8,382.70	-9,642.22	152.99	425,541.68	689,440.38	32.16844965	-103.72110800
17,819.00	89.90	178.50	8,383.04	-9,737.20	154.90	425,446.70	689,442.29	32.16818853	-103.72110359
17,913.00	90.30	178.20	8,382.87	-9,831.16	157.60	425,352.74	689,445.00	32.16793021	-103.72109657
18,034.00	89.70	177.80	8,382.87	-9,952.08	161.82	425,231.82	689,449.22	32.16759773	-103.72108514
18,083.00	89.70	177.80	8,383.13	-10,001.05	163.71	425,182.85	689,451.10	32.16746311	-103.72107997
Survey projected to 18083.00 MD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
211.00	210.98	0.49	2.16	Surveys
4,639.00	4,638.05	-38.26	69.02	MWD surveys
8,091.00	8,074.95	-139.93	35.16	330 Hard line intercept @ 8091 MD
18,083.00	8,383.13	-10,001.05	163.71	Survey projected to 18083.00 MD



COG Operating LLC

Well: King Tut Federal Well No. 1H
Site: King Tut Federal
Project: Lea County, New Mexico
Design: rev1
Rig: Independence 205

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	7085.00	0.70	288.50	7084.81	-52.21	45.95	0.00	0.00	52.71	Survey @ 7085.00 MD
2	7832.25	0.70	288.50	7831.00	-52.44	38.84	0.00	0.00	52.85	KOP Begin 10°/100' build/turn
3	7882.76	5.00	178.30	7881.45	-54.65	36.60	10.00	-98.15	55.06	Begin 10°/100' build
4	8734.26	90.15	178.30	8404.46	-626.68	53.57	10.00	0.00	627.23	Begin 3°/100' turn
5	8779.32	90.15	179.65	8404.35	-871.73	54.38	3.00	90.04	672.28	Begin 90.15° lateral
6	18145.34	90.15	179.65	8380.00	-1007.55	111.28	0.00	0.00	698.16	PBHL/TO

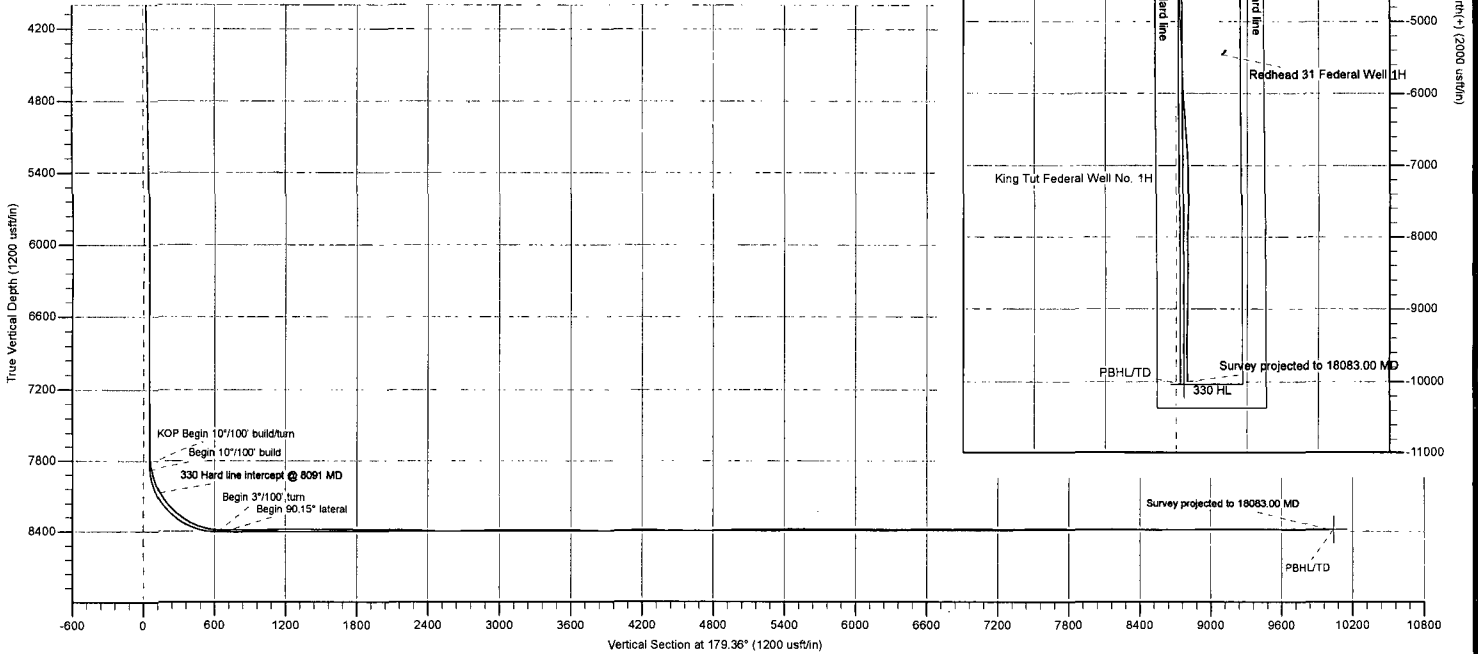
Surface Location: RKB=3539.9+26 @ 3565 90usft (Independence 205)
US State Plane 1927 (Exact solution)
New Mexico East 3001
Northing: 425183.90 Easting: 689287.40 Longitude: 32.19495712
Latitude: -103.72142515
Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Add 6.95°



Azimuths to Grid North
True North: -0.33°
Magnetic North: 6.95°
Magnetic Field
Strength: 48278.7nT
Dip Angle: 60.08°
Date: 6/26/2014
Model: IGRF2010

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
210.98	211.00	1.20	77.30	0.49	2.16	-0.46	2.21	Surveys
4638.05	4639.00	2.30	130.70	-38.26	69.02	39.03	88.54	MWD surveys
8074.95	8091.00	28.15	180.30	-139.93	35.16	140.32	220.36	330 Hard line intercept @ 8091 MD
8363.13	18083.00	89.70	177.80	-10001.05	163.71	10002.25	10091.47	Survey projected to 18083.00 MD



11:38, August 15 2014

Vertical Section at 179.36° (1200 usft/in)



DIRECTIONAL REPORT

WELLNAME: KING TUT FEDERAL #1H

FIELD: COTTON DRAW

AFE NO.: 003646

WELL ID NO.: 30-025-41542

API NO.: 30-025-41542

SURVEY TYPE: TD

MD:

ANGLE:

AZIMUTH:

TVD:

N/S:

E/W:

VS:

TARGET:

MEASURED DEPTH	INCLINATION ANGLE	AZIMUTH ANGLE	TVD	+NORTH -SOUTH	+EAST -WEST	VERTICAL SECTION	DOGLEG SEVERITY
211	1.20	77.30	211	0.49	2.15	0.49	0.57
322	0.30	56.00	322	0.90	3.53	0.90	0.83
767	1.10	97.30	767	1.01	8.73	1.01	0.20
981	0.60	116.00	981	0.26	11.78	0.26	0.26
1,227	1.10	122.00	1,227	-1.56	14.94	-1.56	0.21
2,121	0.60	114.30	2,121	-8.03	26.48	-8.03	0.06
2,497	0.70	107.30	2,497	-9.52	30.47	-9.52	0.03
2,779	1.00	218.30	2,779	-11.97	30.59	-11.97	0.50
3,076	1.30	102.00	3,076	-14.70	32.28	-14.70	0.66
3,170	1.40	109.00	3,170	-15.30	34.41	-15.30	0.20
3,546	1.40	99.00	3,546	-17.51	43.29	-17.51	0.07
3,720	1.60	117.30	3,720	-18.96	47.54	-18.96	0.30
3,814	1.50	129.40	3,813	-20.34	49.66	-20.34	0.36
3,908	1.70	129.30	3,907	-22.00	51.69	-22.00	0.21
4,003	1.60	129.30	4,002	-23.74	53.81	-23.74	0.10
4,190	1.70	130.30	4,189	-27.18	57.94	-27.18	0.06
4,284	2.00	132.30	4,283	-29.19	60.22	-29.19	0.33
4,378	1.90	140.30	4,377	-31.49	62.43	-31.49	0.31
4,472	2.20	135.30	4,471	-33.97	64.69	-33.97	0.37
4,487	1.90	139.00	4,486	-34.37	65.06	-34.37	2.19