



HOBBS OCD

MAY 01 2017

RECEIVED

COG Operating LLC

Lea County, NM (NAD-27 2015)

Pan Head Fee #24H

API #: 30-025-42820

SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N

PP: 330' FNL, 2290' FWL, Sec 11, T17S, R32E, Unit C

BHL: 944' FNL, 2285' FWL, Sec 14, T17S, R32E, Unit C

Design: BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C

Survey Report - Geographic

03 December, 2016



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4191.00usft (Silver Oak 3)
Site:	Pan Head Fee #24H	MD Reference:	KB @ 4191.00usft (Silver Oak 3)
Well:	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N	North Reference:	Grid
Wellbore:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM (NAD-27 2015)		
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	Pan Head Fee #24H		
Site Position:		Northing:	675,800.70 usft
From:	Map	Easting:	682,787.70 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	32° 51' 23.198 N
		Longitude:	103° 44' 17.127 W
		Grid Convergence:	0.32 °

Well	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N		
Well Position	+N/-S	0.00 usft	Northing: 675,800.70 usft
	+E/-W	0.00 usft	Easting: 682,787.70 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 51' 23.198 N
		Longitude:	103° 44' 17.127 W
		Ground Level:	4,173.00 usft

Wellbore	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	11/2/2016	7.15
			Dip Angle (°) 60.62
			Field Strength (nT) 48,354

Design	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 178.71

Survey Program	Date 12/2/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	2,769.00	Scientific Gyro #1 (BHL: 965' FNL, 2286' F	Scientific Gyro
2,769.00	12,833.00	TDS MWD #2 (BHL: 965' FNL, 2286' FWL	MWD
			Description
			Scientific Drilling Intl
			MWD - Standard

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	675,800.70	682,787.70	32° 51' 23.198 N	103° 44' 17.127 W
100.00	0.19	260.46	100.00	-0.03	-0.16	675,800.67	682,787.53	32° 51' 23.198 N	103° 44' 17.129 W
125.00	0.25	253.10	125.00	-0.05	-0.26	675,800.64	682,787.44	32° 51' 23.197 N	103° 44' 17.130 W
150.00	0.25	245.92	150.00	-0.09	-0.36	675,800.61	682,787.34	32° 51' 23.197 N	103° 44' 17.131 W
175.00	0.15	301.26	175.00	-0.09	-0.44	675,800.60	682,787.26	32° 51' 23.197 N	103° 44' 17.132 W
200.00	0.19	290.19	200.00	-0.06	-0.50	675,800.63	682,787.19	32° 51' 23.197 N	103° 44' 17.133 W
225.00	0.19	245.87	225.00	-0.06	-0.58	675,800.63	682,787.12	32° 51' 23.197 N	103° 44' 17.134 W
250.00	0.24	225.14	250.00	-0.12	-0.65	675,800.58	682,787.04	32° 51' 23.197 N	103° 44' 17.135 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4191.00usft (Silver Oak 3)
Site:	Pan Head Fee #24H	MD Reference:	KB @ 4191.00usft (Silver Oak 3)
Well:	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N	North Reference:	Grid
Wellbore:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
275.00	0.25	265.03	275.00	-0.16	-0.75	675,800.53	682,786.95	32° 51' 23.196 N	103° 44' 17.136 W
300.00	0.30	257.15	300.00	-0.18	-0.86	675,800.52	682,786.83	32° 51' 23.196 N	103° 44' 17.137 W
325.00	0.29	219.67	325.00	-0.24	-0.97	675,800.45	682,786.73	32° 51' 23.196 N	103° 44' 17.138 W
350.00	0.14	241.47	350.00	-0.31	-1.04	675,800.39	682,786.66	32° 51' 23.195 N	103° 44' 17.139 W
375.00	0.17	247.54	375.00	-0.34	-1.10	675,800.36	682,786.60	32° 51' 23.195 N	103° 44' 17.140 W
400.00	0.16	231.73	400.00	-0.37	-1.16	675,800.32	682,786.54	32° 51' 23.194 N	103° 44' 17.141 W
425.00	0.18	263.64	425.00	-0.40	-1.23	675,800.30	682,786.47	32° 51' 23.194 N	103° 44' 17.141 W
450.00	0.28	258.08	450.00	-0.41	-1.32	675,800.28	682,786.37	32° 51' 23.194 N	103° 44' 17.143 W
475.00	0.25	242.27	475.00	-0.45	-1.43	675,800.24	682,786.26	32° 51' 23.194 N	103° 44' 17.144 W
500.00	0.24	251.37	500.00	-0.49	-1.53	675,800.20	682,786.17	32° 51' 23.193 N	103° 44' 17.145 W
525.00	0.31	260.51	525.00	-0.52	-1.65	675,800.17	682,786.05	32° 51' 23.193 N	103° 44' 17.146 W
550.00	0.16	242.11	550.00	-0.55	-1.74	675,800.15	682,785.95	32° 51' 23.193 N	103° 44' 17.147 W
575.00	0.25	235.33	575.00	-0.60	-1.82	675,800.10	682,785.88	32° 51' 23.192 N	103° 44' 17.148 W
600.00	0.39	213.16	600.00	-0.70	-1.91	675,800.00	682,785.78	32° 51' 23.191 N	103° 44' 17.149 W
625.00	0.37	209.18	625.00	-0.84	-2.00	675,799.85	682,785.70	32° 51' 23.190 N	103° 44' 17.150 W
650.00	0.51	210.79	649.99	-1.01	-2.09	675,799.69	682,785.60	32° 51' 23.188 N	103° 44' 17.152 W
675.00	0.41	201.21	674.99	-1.19	-2.18	675,799.51	682,785.51	32° 51' 23.186 N	103° 44' 17.153 W
700.00	0.40	213.71	699.99	-1.34	-2.26	675,799.35	682,785.43	32° 51' 23.185 N	103° 44' 17.154 W
725.00	0.43	210.80	724.99	-1.49	-2.36	675,799.20	682,785.34	32° 51' 23.183 N	103° 44' 17.155 W
750.00	0.44	209.91	749.99	-1.66	-2.46	675,799.04	682,785.24	32° 51' 23.182 N	103° 44' 17.156 W
775.00	0.35	209.34	774.99	-1.81	-2.54	675,798.89	682,785.15	32° 51' 23.180 N	103° 44' 17.157 W
800.00	0.42	197.85	799.99	-1.96	-2.61	675,798.73	682,785.09	32° 51' 23.179 N	103° 44' 17.158 W
825.00	0.33	186.62	824.99	-2.12	-2.64	675,798.57	682,785.05	32° 51' 23.177 N	103° 44' 17.158 W
850.00	0.23	162.23	849.99	-2.24	-2.64	675,798.46	682,785.06	32° 51' 23.176 N	103° 44' 17.158 W
875.00	0.24	154.58	874.99	-2.34	-2.60	675,798.36	682,785.10	32° 51' 23.175 N	103° 44' 17.158 W
900.00	0.35	179.85	899.99	-2.46	-2.58	675,798.24	682,785.12	32° 51' 23.174 N	103° 44' 17.157 W
925.00	0.36	174.02	924.99	-2.61	-2.57	675,798.08	682,785.13	32° 51' 23.172 N	103° 44' 17.157 W
950.00	0.23	173.50	949.99	-2.74	-2.55	675,797.95	682,785.14	32° 51' 23.171 N	103° 44' 17.157 W
975.00	0.26	174.47	974.99	-2.85	-2.54	675,797.85	682,785.15	32° 51' 23.170 N	103° 44' 17.157 W
1,000.00	0.38	179.79	999.99	-2.99	-2.54	675,797.71	682,785.16	32° 51' 23.169 N	103° 44' 17.157 W
1,025.00	0.49	179.30	1,024.99	-3.18	-2.53	675,797.52	682,785.16	32° 51' 23.167 N	103° 44' 17.157 W
1,050.00	0.33	180.84	1,049.99	-3.36	-2.53	675,797.34	682,785.16	32° 51' 23.165 N	103° 44' 17.157 W
1,075.00	0.35	187.17	1,074.99	-3.50	-2.54	675,797.19	682,785.15	32° 51' 23.163 N	103° 44' 17.157 W
1,100.00	0.30	188.65	1,099.99	-3.64	-2.56	675,797.05	682,785.13	32° 51' 23.162 N	103° 44' 17.157 W
1,125.00	0.36	190.39	1,124.99	-3.79	-2.59	675,796.91	682,785.11	32° 51' 23.161 N	103° 44' 17.158 W
1,150.00	0.31	190.79	1,149.98	-3.93	-2.61	675,796.77	682,785.08	32° 51' 23.159 N	103° 44' 17.158 W
1,175.00	0.39	209.31	1,174.98	-4.07	-2.67	675,796.63	682,785.03	32° 51' 23.158 N	103° 44' 17.159 W
1,200.00	0.34	203.96	1,199.98	-4.21	-2.74	675,796.48	682,784.95	32° 51' 23.156 N	103° 44' 17.159 W
1,225.00	0.36	198.89	1,224.98	-4.35	-2.80	675,796.34	682,784.90	32° 51' 23.155 N	103° 44' 17.160 W
1,250.00	0.38	211.16	1,249.98	-4.50	-2.86	675,796.20	682,784.83	32° 51' 23.154 N	103° 44' 17.161 W
1,275.00	0.49	196.05	1,274.98	-4.67	-2.94	675,796.02	682,784.76	32° 51' 23.152 N	103° 44' 17.162 W
1,300.00	0.38	205.48	1,299.98	-4.85	-3.00	675,795.84	682,784.69	32° 51' 23.150 N	103° 44' 17.162 W
1,325.00	0.59	205.02	1,324.98	-5.04	-3.09	675,795.65	682,784.60	32° 51' 23.148 N	103° 44' 17.164 W
1,350.00	0.43	208.15	1,349.98	-5.24	-3.19	675,795.45	682,784.50	32° 51' 23.146 N	103° 44' 17.165 W
1,375.00	0.38	205.05	1,374.98	-5.40	-3.27	675,795.30	682,784.42	32° 51' 23.145 N	103° 44' 17.166 W
1,400.00	0.42	204.07	1,399.98	-5.56	-3.34	675,795.14	682,784.35	32° 51' 23.143 N	103° 44' 17.167 W
1,425.00	0.36	202.63	1,424.98	-5.71	-3.41	675,794.98	682,784.28	32° 51' 23.142 N	103° 44' 17.167 W
1,450.00	0.45	205.69	1,449.98	-5.88	-3.48	675,794.82	682,784.21	32° 51' 23.140 N	103° 44' 17.168 W
1,475.00	0.39	206.23	1,474.98	-6.04	-3.56	675,794.66	682,784.13	32° 51' 23.138 N	103° 44' 17.169 W
1,500.00	0.35	234.33	1,499.98	-6.16	-3.66	675,794.53	682,784.03	32° 51' 23.137 N	103° 44' 17.170 W
1,525.00	0.54	243.84	1,524.98	-6.26	-3.83	675,794.44	682,783.86	32° 51' 23.136 N	103° 44' 17.172 W
1,550.00	0.54	237.70	1,549.97	-6.37	-4.04	675,794.32	682,783.66	32° 51' 23.135 N	103° 44' 17.175 W

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4191.00usft (Silver Oak 3)
Site:	Pan Head Fee #24H	MD Reference:	KB @ 4191.00usft (Silver Oak 3)
Well:	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N	North Reference:	Grid
Wellbore:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,575.00	0.47	233.21	1,574.97	-6.50	-4.22	675,794.20	682,783.48	32° 51' 23.134 N	103° 44' 17.177 W
1,600.00	0.65	216.48	1,599.97	-6.67	-4.38	675,794.02	682,783.31	32° 51' 23.132 N	103° 44' 17.179 W
1,625.00	0.52	258.25	1,624.97	-6.81	-4.58	675,793.89	682,783.12	32° 51' 23.131 N	103° 44' 17.181 W
1,650.00	0.47	254.51	1,649.97	-6.86	-4.79	675,793.84	682,782.91	32° 51' 23.130 N	103° 44' 17.184 W
1,675.00	0.55	247.45	1,674.97	-6.93	-5.00	675,793.76	682,782.70	32° 51' 23.130 N	103° 44' 17.186 W
1,700.00	0.58	252.91	1,699.97	-7.02	-5.23	675,793.68	682,782.46	32° 51' 23.129 N	103° 44' 17.189 W
1,725.00	0.60	254.90	1,724.97	-7.09	-5.48	675,793.61	682,782.22	32° 51' 23.128 N	103° 44' 17.192 W
1,750.00	0.55	254.29	1,749.96	-7.15	-5.72	675,793.54	682,781.97	32° 51' 23.128 N	103° 44' 17.195 W
1,775.00	0.48	261.14	1,774.96	-7.20	-5.94	675,793.49	682,781.76	32° 51' 23.127 N	103° 44' 17.197 W
1,800.00	0.41	270.01	1,799.96	-7.22	-6.13	675,793.48	682,781.56	32° 51' 23.127 N	103° 44' 17.199 W
1,825.00	0.31	258.57	1,824.96	-7.23	-6.29	675,793.46	682,781.41	32° 51' 23.127 N	103° 44' 17.201 W
1,850.00	0.21	290.99	1,849.96	-7.23	-6.40	675,793.47	682,781.30	32° 51' 23.127 N	103° 44' 17.202 W
1,875.00	0.22	291.90	1,874.96	-7.19	-6.48	675,793.50	682,781.21	32° 51' 23.127 N	103° 44' 17.203 W
1,900.00	0.20	301.82	1,899.96	-7.15	-6.57	675,793.54	682,781.13	32° 51' 23.128 N	103° 44' 17.204 W
1,925.00	0.32	266.71	1,924.96	-7.13	-6.67	675,793.56	682,781.02	32° 51' 23.128 N	103° 44' 17.206 W
1,950.00	0.18	295.08	1,949.96	-7.12	-6.78	675,793.57	682,780.92	32° 51' 23.128 N	103° 44' 17.207 W
1,975.00	0.16	314.88	1,974.96	-7.08	-6.84	675,793.61	682,780.86	32° 51' 23.128 N	103° 44' 17.208 W
2,000.00	0.14	238.21	1,999.96	-7.07	-6.89	675,793.62	682,780.81	32° 51' 23.128 N	103° 44' 17.208 W
2,025.00	0.15	86.18	2,024.96	-7.09	-6.88	675,793.61	682,780.81	32° 51' 23.128 N	103° 44' 17.208 W
2,050.00	0.18	67.71	2,049.96	-7.07	-6.81	675,793.63	682,780.88	32° 51' 23.128 N	103° 44' 17.207 W
2,075.00	0.23	66.30	2,074.96	-7.03	-6.73	675,793.66	682,780.96	32° 51' 23.129 N	103° 44' 17.206 W
2,100.00	0.33	75.91	2,099.96	-7.00	-6.62	675,793.70	682,781.08	32° 51' 23.129 N	103° 44' 17.205 W
2,125.00	0.46	73.72	2,124.96	-6.95	-6.45	675,793.74	682,781.25	32° 51' 23.130 N	103° 44' 17.203 W
2,150.00	0.46	78.38	2,149.96	-6.90	-6.25	675,793.79	682,781.44	32° 51' 23.130 N	103° 44' 17.201 W
2,175.00	0.55	80.84	2,174.96	-6.86	-6.04	675,793.83	682,781.66	32° 51' 23.130 N	103° 44' 17.198 W
2,200.00	0.45	88.15	2,199.96	-6.84	-5.82	675,793.85	682,781.87	32° 51' 23.131 N	103° 44' 17.196 W
2,225.00	0.57	85.39	2,224.96	-6.83	-5.60	675,793.87	682,782.10	32° 51' 23.131 N	103° 44' 17.193 W
2,250.00	0.60	91.87	2,249.96	-6.82	-5.34	675,793.87	682,782.35	32° 51' 23.131 N	103° 44' 17.190 W
2,275.00	0.60	88.93	2,274.95	-6.82	-5.08	675,793.87	682,782.61	32° 51' 23.131 N	103° 44' 17.187 W
2,300.00	0.67	84.11	2,299.95	-6.81	-4.81	675,793.89	682,782.89	32° 51' 23.131 N	103° 44' 17.184 W
2,325.00	0.75	84.62	2,324.95	-6.78	-4.50	675,793.92	682,783.20	32° 51' 23.131 N	103° 44' 17.180 W
2,350.00	0.73	85.23	2,349.95	-6.75	-4.18	675,793.95	682,783.52	32° 51' 23.131 N	103° 44' 17.176 W
2,375.00	0.73	89.08	2,374.95	-6.73	-3.86	675,793.96	682,783.84	32° 51' 23.132 N	103° 44' 17.173 W
2,400.00	0.72	86.57	2,399.94	-6.72	-3.54	675,793.98	682,784.15	32° 51' 23.132 N	103° 44' 17.169 W
2,425.00	0.67	86.97	2,424.94	-6.70	-3.24	675,793.99	682,784.46	32° 51' 23.132 N	103° 44' 17.165 W
2,450.00	0.69	91.27	2,449.94	-6.70	-2.94	675,794.00	682,784.75	32° 51' 23.132 N	103° 44' 17.162 W
2,475.00	0.71	91.62	2,474.94	-6.71	-2.64	675,793.99	682,785.06	32° 51' 23.132 N	103° 44' 17.158 W
2,500.00	0.58	88.48	2,499.94	-6.71	-2.36	675,793.99	682,785.34	32° 51' 23.132 N	103° 44' 17.155 W
2,525.00	0.48	94.08	2,524.94	-6.71	-2.13	675,793.98	682,785.57	32° 51' 23.132 N	103° 44' 17.152 W
2,550.00	0.29	91.84	2,549.94	-6.72	-1.96	675,793.97	682,785.74	32° 51' 23.132 N	103° 44' 17.150 W
2,575.00	0.26	93.67	2,574.94	-6.73	-1.84	675,793.97	682,785.86	32° 51' 23.132 N	103° 44' 17.149 W
2,600.00	0.18	96.66	2,599.94	-6.73	-1.74	675,793.96	682,785.95	32° 51' 23.131 N	103° 44' 17.148 W
2,625.00	0.15	107.65	2,624.93	-6.75	-1.67	675,793.95	682,786.02	32° 51' 23.131 N	103° 44' 17.147 W
2,650.00	0.12	119.29	2,649.93	-6.77	-1.62	675,793.92	682,786.08	32° 51' 23.131 N	103° 44' 17.146 W
2,675.00	0.24	73.30	2,674.93	-6.77	-1.55	675,793.93	682,786.15	32° 51' 23.131 N	103° 44' 17.146 W
2,700.00	0.15	57.80	2,699.93	-6.74	-1.47	675,793.96	682,786.23	32° 51' 23.131 N	103° 44' 17.145 W
2,725.00	0.07	121.15	2,724.93	-6.73	-1.43	675,793.97	682,786.27	32° 51' 23.131 N	103° 44' 17.144 W
2,750.00	0.10	108.02	2,749.93	-6.74	-1.39	675,793.95	682,786.30	32° 51' 23.131 N	103° 44' 17.144 W
2,769.00	0.05	38.85	2,768.93	-6.74	-1.37	675,793.95	682,786.32	32° 51' 23.131 N	103° 44' 17.144 W
Tie-In to Phoenix Gyro									

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4191.00usft (Silver Oak 3)
Site:	Pan Head Fee #24H	MD Reference:	KB @ 4191.00usft (Silver Oak 3)
Well:	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N	North Reference:	Grid
Wellbore:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,877.00	0.50	295.60	2,876.93	-6.50	-1.77	675,794.19	682,785.93	32° 51' 23.134 N	103° 44' 17.148 W
First TDS MWD Survey									
2,908.00	0.50	310.70	2,907.93	-6.35	-1.99	675,794.34	682,785.70	32° 51' 23.135 N	103° 44' 17.151 W
3,001.00	1.50	332.50	3,000.92	-5.01	-2.86	675,795.69	682,784.83	32° 51' 23.149 N	103° 44' 17.161 W
3,095.00	2.40	356.50	3,094.86	-1.95	-3.55	675,798.74	682,784.15	32° 51' 23.179 N	103° 44' 17.169 W
3,189.00	3.10	3.00	3,188.75	2.55	-3.54	675,803.24	682,784.16	32° 51' 23.223 N	103° 44' 17.168 W
3,282.00	4.60	6.80	3,281.54	8.76	-2.96	675,809.46	682,784.73	32° 51' 23.285 N	103° 44' 17.161 W
3,377.00	5.40	14.30	3,376.18	16.88	-1.41	675,817.57	682,786.29	32° 51' 23.365 N	103° 44' 17.142 W
3,470.00	6.90	18.80	3,468.64	26.41	1.47	675,827.10	682,789.17	32° 51' 23.459 N	103° 44' 17.108 W
3,563.00	6.00	17.20	3,561.05	36.34	4.71	675,837.03	682,792.41	32° 51' 23.557 N	103° 44' 17.069 W
3,657.00	7.00	17.50	3,654.45	46.50	7.89	675,847.19	682,795.58	32° 51' 23.658 N	103° 44' 17.031 W
3,751.00	8.00	29.80	3,747.65	57.64	12.86	675,858.33	682,800.55	32° 51' 23.768 N	103° 44' 16.972 W
3,845.00	7.40	29.80	3,840.80	68.56	19.12	675,869.26	682,806.81	32° 51' 23.875 N	103° 44' 16.898 W
3,938.00	6.80	29.10	3,933.09	78.57	24.77	675,879.27	682,812.47	32° 51' 23.974 N	103° 44' 16.831 W
4,032.00	6.30	27.00	4,026.47	88.03	29.82	675,888.73	682,817.52	32° 51' 24.067 N	103° 44' 16.772 W
4,126.00	6.20	26.90	4,119.92	97.15	34.46	675,897.85	682,822.15	32° 51' 24.157 N	103° 44' 16.717 W
4,219.00	6.00	27.00	4,212.39	105.96	38.94	675,906.66	682,826.63	32° 51' 24.244 N	103° 44' 16.664 W
4,315.00	5.70	25.40	4,307.89	114.74	43.26	675,915.43	682,830.96	32° 51' 24.331 N	103° 44' 16.612 W
4,409.00	7.10	23.40	4,401.30	124.29	47.57	675,924.98	682,835.26	32° 51' 24.425 N	103° 44' 16.561 W
4,503.00	7.10	23.20	4,494.58	134.96	52.17	675,935.65	682,839.86	32° 51' 24.530 N	103° 44' 16.507 W
4,598.00	6.90	22.80	4,588.87	145.62	56.69	675,946.31	682,844.38	32° 51' 24.636 N	103° 44' 16.453 W
4,693.00	6.50	22.00	4,683.22	155.86	60.92	675,956.56	682,848.61	32° 51' 24.737 N	103° 44' 16.403 W
4,787.00	6.20	21.40	4,776.65	165.52	64.76	675,966.22	682,852.46	32° 51' 24.832 N	103° 44' 16.357 W
4,883.00	6.00	20.90	4,872.10	175.04	68.44	675,975.73	682,856.14	32° 51' 24.926 N	103° 44' 16.313 W
4,977.00	7.30	27.90	4,965.47	184.90	72.99	675,985.60	682,860.68	32° 51' 25.023 N	103° 44' 16.259 W
5,072.00	7.20	27.20	5,059.71	195.53	78.53	675,996.23	682,866.23	32° 51' 25.128 N	103° 44' 16.193 W
5,168.00	6.90	28.20	5,154.98	205.97	84.01	676,006.66	682,871.70	32° 51' 25.231 N	103° 44' 16.129 W
5,263.00	6.70	27.70	5,249.32	215.90	89.28	676,016.60	682,876.98	32° 51' 25.329 N	103° 44' 16.066 W
5,356.00	6.50	27.60	5,341.70	225.37	94.24	676,026.06	682,881.94	32° 51' 25.423 N	103° 44' 16.007 W
5,450.00	6.20	27.30	5,435.12	234.60	99.04	676,035.29	682,886.73	32° 51' 25.514 N	103° 44' 15.950 W
5,543.00	4.00	34.60	5,527.75	241.73	103.18	676,042.42	682,890.88	32° 51' 25.584 N	103° 44' 15.901 W
5,638.00	2.20	31.30	5,622.61	246.01	106.01	676,046.71	682,893.71	32° 51' 25.626 N	103° 44' 15.868 W
5,731.00	2.20	27.70	5,715.54	249.12	107.77	676,049.82	682,895.46	32° 51' 25.657 N	103° 44' 15.847 W
5,794.00	2.30	26.80	5,778.49	251.32	108.90	676,052.01	682,896.60	32° 51' 25.679 N	103° 44' 15.834 W
5,825.00	1.40	4.90	5,809.47	252.25	109.21	676,052.95	682,896.91	32° 51' 25.688 N	103° 44' 15.830 W
5,857.00	1.70	251.10	5,841.47	252.49	108.80	676,053.18	682,896.49	32° 51' 25.690 N	103° 44' 15.835 W
5,885.00	3.30	226.30	5,869.44	251.80	107.82	676,052.49	682,895.52	32° 51' 25.683 N	103° 44' 15.846 W
5,916.00	5.20	210.70	5,900.35	249.97	106.46	676,050.67	682,894.15	32° 51' 25.665 N	103° 44' 15.862 W
5,948.00	8.40	193.90	5,932.13	246.45	105.16	676,047.15	682,892.85	32° 51' 25.631 N	103° 44' 15.878 W
5,979.00	12.00	187.80	5,962.63	241.06	104.17	676,041.76	682,891.87	32° 51' 25.577 N	103° 44' 15.890 W
6,011.00	15.50	181.20	5,993.71	233.49	103.63	676,034.18	682,891.33	32° 51' 25.503 N	103° 44' 15.897 W
6,042.00	18.90	177.60	6,023.32	224.33	103.76	676,025.02	682,891.45	32° 51' 25.412 N	103° 44' 15.896 W
6,073.00	21.60	176.40	6,052.41	213.61	104.33	676,014.31	682,892.02	32° 51' 25.306 N	103° 44' 15.890 W
6,104.00	24.30	176.40	6,080.95	201.55	105.08	676,002.25	682,892.78	32° 51' 25.186 N	103° 44' 15.882 W
6,134.00	26.90	177.80	6,108.00	188.61	105.73	675,989.30	682,893.43	32° 51' 25.058 N	103° 44' 15.875 W
6,166.00	29.80	178.60	6,136.16	173.42	106.21	675,974.12	682,893.90	32° 51' 24.908 N	103° 44' 15.870 W
6,197.00	32.80	178.60	6,162.65	157.32	106.60	675,958.02	682,894.29	32° 51' 24.749 N	103° 44' 15.867 W
6,228.00	35.60	178.20	6,188.28	139.91	107.09	675,940.60	682,894.78	32° 51' 24.576 N	103° 44' 15.862 W
6,260.00	37.80	178.00	6,213.94	120.79	107.72	675,921.49	682,895.42	32° 51' 24.387 N	103° 44' 15.856 W
6,292.00	40.70	179.60	6,238.72	100.56	108.14	675,901.25	682,895.83	32° 51' 24.187 N	103° 44' 15.853 W
6,323.00	43.70	181.60	6,261.68	79.74	107.91	675,880.43	682,895.60	32° 51' 23.981 N	103° 44' 15.857 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4191.00usft (Silver Oak 3)
Site:	Pan Head Fee #24H	MD Reference:	KB @ 4191.00usft (Silver Oak 3)
Well:	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N	North Reference:	Grid
Wellbore:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,354.00	44.70	184.00	6,283.91	58.16	106.85	675,858.85	682,894.54	32° 51' 23.767 N	103° 44' 15.871 W
6,385.00	44.90	183.90	6,305.90	36.36	105.34	675,837.06	682,893.04	32° 51' 23.552 N	103° 44' 15.890 W
6,416.00	46.10	180.20	6,327.63	14.28	104.56	675,814.97	682,892.26	32° 51' 23.333 N	103° 44' 15.900 W
6,447.00	47.40	178.00	6,348.88	-8.30	104.92	675,792.40	682,892.62	32° 51' 23.110 N	103° 44' 15.898 W
6,479.00	47.60	177.90	6,370.50	-31.88	105.76	675,768.82	682,893.46	32° 51' 22.877 N	103° 44' 15.889 W
6,511.00	47.50	177.90	6,392.09	-55.47	106.63	675,745.22	682,894.33	32° 51' 22.643 N	103° 44' 15.881 W
6,542.00	47.60	178.10	6,413.02	-78.33	107.43	675,722.36	682,895.12	32° 51' 22.417 N	103° 44' 15.873 W
6,573.00	49.90	179.20	6,433.46	-101.63	107.97	675,699.06	682,895.67	32° 51' 22.186 N	103° 44' 15.868 W
6,604.00	53.40	179.30	6,452.69	-125.94	108.29	675,674.76	682,895.99	32° 51' 21.946 N	103° 44' 15.866 W
6,635.00	56.20	178.60	6,470.55	-151.26	108.76	675,649.44	682,896.45	32° 51' 21.695 N	103° 44' 15.862 W
6,666.00	58.70	176.90	6,487.23	-177.37	109.79	675,623.33	682,897.48	32° 51' 21.437 N	103° 44' 15.852 W
6,697.00	63.20	176.40	6,502.28	-204.41	111.37	675,596.28	682,899.07	32° 51' 21.169 N	103° 44' 15.835 W
6,729.00	68.00	177.20	6,515.50	-233.50	113.00	675,567.19	682,900.69	32° 51' 20.881 N	103° 44' 15.818 W
6,760.00	71.90	179.30	6,526.13	-262.60	113.88	675,538.09	682,901.57	32° 51' 20.593 N	103° 44' 15.809 W
6,791.00	75.50	180.30	6,534.82	-292.35	113.98	675,508.35	682,901.68	32° 51' 20.299 N	103° 44' 15.810 W
6,823.00	79.60	180.50	6,541.72	-323.59	113.76	675,477.11	682,901.46	32° 51' 19.990 N	103° 44' 15.815 W
6,854.00	84.20	181.10	6,546.09	-354.27	113.33	675,446.43	682,901.03	32° 51' 19.686 N	103° 44' 15.822 W
6,914.43	88.35	180.56	6,550.01	-414.55	112.46	675,386.14	682,900.16	32° 51' 19.090 N	103° 44' 15.836 W
As-Drilled PP									
6,921.00	88.80	180.50	6,550.18	-421.12	112.40	675,379.58	682,900.10	32° 51' 19.025 N	103° 44' 15.837 W
7,015.00	90.80	179.40	6,550.51	-515.11	112.48	675,285.58	682,900.18	32° 51' 18.095 N	103° 44' 15.842 W
7,109.00	91.00	179.70	6,549.03	-609.10	113.22	675,191.60	682,900.92	32° 51' 17.165 N	103° 44' 15.840 W
7,202.00	91.00	180.00	6,547.41	-702.08	113.46	675,098.61	682,901.16	32° 51' 16.245 N	103° 44' 15.843 W
7,295.00	90.40	180.40	6,546.27	-795.08	113.14	675,005.62	682,900.83	32° 51' 15.325 N	103° 44' 15.853 W
7,388.00	90.70	180.90	6,545.38	-888.06	112.08	674,912.63	682,899.78	32° 51' 14.404 N	103° 44' 15.872 W
7,481.00	89.70	179.90	6,545.05	-981.06	111.44	674,819.64	682,899.13	32° 51' 13.484 N	103° 44' 15.886 W
7,575.00	89.90	180.30	6,545.38	-1,075.06	111.27	674,725.64	682,898.97	32° 51' 12.554 N	103° 44' 15.894 W
7,668.00	89.10	179.70	6,546.19	-1,168.05	111.27	674,632.64	682,898.97	32° 51' 11.634 N	103° 44' 15.900 W
7,762.00	89.00	180.30	6,547.75	-1,262.04	111.27	674,538.65	682,898.97	32° 51' 10.704 N	103° 44' 15.906 W
7,856.00	88.90	180.80	6,549.47	-1,356.02	110.37	674,444.68	682,898.06	32° 51' 9.774 N	103° 44' 15.923 W
7,950.00	89.40	179.30	6,550.87	-1,450.01	110.29	674,350.69	682,897.98	32° 51' 8.844 N	103° 44' 15.930 W
8,044.00	89.90	180.90	6,551.44	-1,544.00	110.12	674,256.69	682,897.82	32° 51' 7.914 N	103° 44' 15.938 W
8,137.00	89.00	179.00	6,552.34	-1,636.99	110.20	674,163.70	682,897.90	32° 51' 6.994 N	103° 44' 15.943 W
8,230.00	89.60	180.80	6,553.47	-1,729.98	110.37	674,070.71	682,898.06	32° 51' 6.074 N	103° 44' 15.948 W
8,323.00	89.50	180.10	6,554.20	-1,822.97	109.64	673,977.72	682,897.33	32° 51' 5.154 N	103° 44' 15.962 W
8,416.00	89.60	177.70	6,554.93	-1,915.95	111.42	673,884.75	682,899.12	32° 51' 4.234 N	103° 44' 15.947 W
8,510.00	89.80	178.20	6,555.42	-2,009.89	114.78	673,790.81	682,902.48	32° 51' 3.304 N	103° 44' 15.914 W
8,603.00	89.70	178.70	6,555.83	-2,102.85	117.30	673,697.84	682,904.99	32° 51' 2.384 N	103° 44' 15.891 W
8,697.00	89.40	179.70	6,556.57	-2,196.84	118.61	673,603.86	682,906.31	32° 51' 1.454 N	103° 44' 15.882 W
8,790.00	90.20	178.60	6,556.89	-2,289.82	119.99	673,510.87	682,907.69	32° 51' 0.534 N	103° 44' 15.872 W
8,883.00	90.10	179.30	6,556.65	-2,382.81	121.70	673,417.89	682,909.39	32° 50' 59.614 N	103° 44' 15.858 W
8,977.00	90.50	178.00	6,556.16	-2,476.78	123.91	673,323.92	682,911.61	32° 50' 58.684 N	103° 44' 15.838 W
9,070.00	90.40	179.00	6,555.43	-2,569.74	126.34	673,230.95	682,914.04	32° 50' 57.764 N	103° 44' 15.816 W
9,163.00	90.30	179.80	6,554.86	-2,662.73	127.32	673,137.96	682,915.01	32° 50' 56.844 N	103° 44' 15.810 W
9,256.00	90.90	180.80	6,553.89	-2,755.73	126.83	673,044.97	682,914.53	32° 50' 55.923 N	103° 44' 15.822 W
9,349.00	90.30	179.20	6,552.91	-2,848.72	126.83	672,951.98	682,914.53	32° 50' 55.003 N	103° 44' 15.820 W
9,443.00	90.50	179.60	6,552.25	-2,942.71	127.82	672,857.99	682,915.51	32° 50' 54.073 N	103° 44' 15.823 W
9,536.00	90.50	180.40	6,551.44	-3,035.71	127.82	672,764.99	682,915.51	32° 50' 53.153 N	103° 44' 15.829 W
9,631.00	89.30	178.90	6,551.61	-3,130.70	128.40	672,670.00	682,916.09	32° 50' 52.213 N	103° 44' 15.829 W
9,724.00	89.40	179.50	6,552.66	-3,223.68	129.69	672,577.01	682,917.39	32° 50' 51.293 N	103° 44' 15.820 W
9,817.00	89.40	180.10	6,553.64	-3,316.68	130.02	672,484.02	682,917.71	32° 50' 50.373 N	103° 44' 15.822 W



TDS
Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 4191.00usft (Silver Oak 3)
Site:	Pan Head Fee #24H	MD Reference:	KB @ 4191.00usft (Silver Oak 3)
Well:	SHL: 85' FSL, 2180' FWL, Sec 2, T17S, R32E, Unit N	North Reference:	Grid
Wellbore:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 965' FNL, 2286' FWL, Sec 14, T17S, R32E, Unit C	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,909.00	89.40	181.10	6,554.60	-3,408.67	129.06	672,392.03	682,916.75	32° 50' 49.463 N	103° 44' 15.839 W
10,004.00	89.40	179.50	6,555.60	-3,503.66	128.56	672,297.04	682,916.25	32° 50' 48.523 N	103° 44' 15.852 W
10,098.00	89.50	180.30	6,556.50	-3,597.65	128.72	672,203.04	682,916.42	32° 50' 47.593 N	103° 44' 15.856 W
10,192.00	91.00	180.20	6,556.09	-3,691.65	128.31	672,109.05	682,916.01	32° 50' 46.663 N	103° 44' 15.867 W
10,287.00	90.90	181.00	6,554.51	-3,786.63	127.32	672,014.07	682,915.01	32° 50' 45.723 N	103° 44' 15.885 W
10,381.00	91.60	179.90	6,552.46	-3,880.60	126.58	671,920.09	682,914.27	32° 50' 44.793 N	103° 44' 15.900 W
10,475.00	91.90	180.60	6,549.59	-3,974.56	126.17	671,826.14	682,913.86	32° 50' 43.863 N	103° 44' 15.911 W
10,570.00	89.80	179.60	6,548.18	-4,069.54	126.00	671,731.16	682,913.70	32° 50' 42.923 N	103° 44' 15.919 W
10,665.00	90.10	180.70	6,548.27	-4,164.54	125.75	671,636.16	682,913.45	32° 50' 41.983 N	103° 44' 15.928 W
10,759.00	90.00	178.50	6,548.18	-4,258.53	126.41	671,542.17	682,914.11	32° 50' 41.053 N	103° 44' 15.927 W
10,853.00	90.30	179.00	6,547.94	-4,352.51	128.46	671,448.19	682,916.16	32° 50' 40.123 N	103° 44' 15.909 W
10,948.00	90.20	180.20	6,547.52	-4,447.50	129.12	671,353.19	682,916.82	32° 50' 39.183 N	103° 44' 15.907 W
11,043.00	88.90	179.30	6,548.27	-4,542.49	129.54	671,258.20	682,917.23	32° 50' 38.243 N	103° 44' 15.909 W
11,137.00	89.60	180.50	6,549.50	-4,636.48	129.70	671,164.21	682,917.40	32° 50' 37.313 N	103° 44' 15.913 W
11,230.00	89.50	179.10	6,550.23	-4,729.48	130.03	671,071.23	682,917.72	32° 50' 36.393 N	103° 44' 15.915 W
11,324.00	90.00	179.90	6,550.64	-4,823.47	130.85	670,977.23	682,918.54	32° 50' 35.463 N	103° 44' 15.912 W
11,418.00	90.30	180.50	6,550.39	-4,917.47	130.52	670,883.23	682,918.22	32° 50' 34.533 N	103° 44' 15.922 W
11,511.00	89.70	179.00	6,550.39	-5,010.47	130.93	670,790.24	682,918.62	32° 50' 33.613 N	103° 44' 15.923 W
11,605.00	90.00	179.90	6,550.64	-5,104.46	131.83	670,696.24	682,919.52	32° 50' 32.683 N	103° 44' 15.919 W
11,697.00	89.90	180.60	6,550.72	-5,196.46	131.43	670,604.25	682,919.12	32° 50' 31.772 N	103° 44' 15.930 W
11,791.00	89.80	179.30	6,550.97	-5,290.46	131.51	670,510.25	682,919.20	32° 50' 30.842 N	103° 44' 15.935 W
11,884.00	90.40	180.10	6,550.80	-5,383.45	132.00	670,417.25	682,919.69	32° 50' 29.922 N	103° 44' 15.935 W
11,978.00	90.90	178.70	6,549.74	-5,477.44	132.98	670,323.26	682,920.68	32° 50' 28.992 N	103° 44' 15.930 W
12,072.00	91.50	179.30	6,547.77	-5,571.40	134.62	670,229.30	682,922.32	32° 50' 28.062 N	103° 44' 15.917 W
12,165.00	89.80	178.90	6,546.71	-5,664.38	136.08	670,136.32	682,923.78	32° 50' 27.142 N	103° 44' 15.906 W
12,260.00	90.20	179.70	6,546.71	-5,759.38	137.24	670,041.33	682,924.94	32° 50' 26.202 N	103° 44' 15.899 W
12,353.00	88.90	178.10	6,547.44	-5,852.35	139.03	669,948.35	682,926.72	32° 50' 25.282 N	103° 44' 15.884 W
12,447.00	89.50	178.80	6,548.76	-5,946.31	141.57	669,854.40	682,929.26	32° 50' 24.352 N	103° 44' 15.860 W
12,541.00	89.70	179.90	6,549.41	-6,040.30	142.64	669,760.41	682,930.33	32° 50' 23.422 N	103° 44' 15.854 W
12,636.00	89.10	179.10	6,550.41	-6,135.29	143.46	669,665.42	682,931.16	32° 50' 22.482 N	103° 44' 15.851 W
12,731.00	89.60	180.50	6,551.49	-6,230.28	143.80	669,570.43	682,931.49	32° 50' 21.542 N	103° 44' 15.853 W
12,762.00	89.80	181.10	6,551.65	-6,261.27	143.36	669,539.43	682,931.06	32° 50' 21.236 N	103° 44' 15.860 W
Last TDS MWD Survey									
12,833.00	89.80	181.10	6,551.90	-6,332.26	142.00	669,468.45	682,929.70	32° 50' 20.533 N	103° 44' 15.881 W
Projection to Bit/TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,769.00	2,768.93	-6.74	-1.37	Tie-In to Phoenix Gyro
2,877.00	2,876.93	-6.50	-1.77	First TDS MWD Survey
6,914.43	6,550.01	-414.55	112.46	As-Drilled PP
12,762.00	6,551.65	-6,261.27	143.36	Last TDS MWD Survey
12,833.00	6,551.90	-6,332.26	142.00	Projection to Bit/TD

Checked By: _____	Approved By: _____	Date: _____
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PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

December 9, 2016

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Pan Head Fee 24H
85' FSL & 2180' FWL
Sec. 2, T17S, R32E
Lea County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

Very truly yours,

A handwritten signature in black ink, appearing to read "Chris Graham".

Chris Graham
Asst. Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 9th day of December, 2016.

A handwritten signature in black ink, appearing to read "Regina L. Garner".

Notary Public

Pan Head Fee 24H

Date	Depth	Deviation	Direction
11/17/2016	204	0.20	
11/17/2016	473	0.20	
11/18/2016	708	0.70	
11/18/2016	890	0.60	
11/18/2016	1107	0.40	
11/19/2016	1360	0.40	
11/19/2016	1607	0.70	
11/20/2016	2016	0.20	
11/21/2016	2537	0.50	
11/22/2016	2877	0.50	295.60
11/22/2016	2908	0.50	310.70
11/22/2016	3001	1.50	332.50
11/23/2016	3095	2.40	356.50
11/23/2016	3189	3.10	3.00
11/23/2016	3272	4.60	6.80
11/23/2016	3377	5.40	14.30
11/23/2016	3470	6.90	18.80
11/23/2016	3657	7.00	17.50
11/23/2016	3751	8.00	29.50
11/23/2016	3845	7.40	29.80
11/23/2016	3938	6.80	29.10
11/23/2016	4032	6.30	27.00
11/23/2016	4126	6.20	26.90
11/23/2016	4219	6.00	27.00
11/23/2016	4315	5.70	25.40
11/23/2016	4409	7.10	23.40
11/24/2016	4598	6.90	22.80
11/24/2016	4693	6.50	22.00
11/24/2016	4787	6.20	21.40
11/24/2016	4883	6.00	20.90
11/24/2016	4977	7.30	27.90
11/24/2016	5072	7.20	27.20
11/24/2016	5168	6.90	28.20
11/24/2016	5263	6.70	27.70
11/24/2016	5356	6.50	27.60
11/24/2016	5450	6.20	27.30
11/24/2016	5543	4.00	34.60
11/24/2016	5638	2.20	31.30
11/24/2016	5794	2.30	26.80
11/24/2016	5825	1.40	4.90
11/24/2016	5857	1.70	251.10
11/25/2016	5885	3.30	226.30

Date	Depth	Deviation	Direction
11/25/2016	5916	5.20	210.70
11/25/2016	5948	8.40	193.90
11/25/2016	6011	15.50	181.20
11/25/2016	6042	18.90	177.60
11/25/2016	6073	21.60	176.40
11/25/2016	6104	24.30	176.40
11/25/2016	6134	26.90	177.80
11/25/2016	6166	29.80	178.60
11/25/2016	6278	35.60	178.20
11/25/2016	6385	44.90	183.90
11/25/2016	6447	47.40	178.00
11/25/2016	6511	47.50	177.90
11/25/2016	6573	49.90	179.20
11/25/2016	6635	56.20	178.60
11/25/2016	6697	63.20	176.40
11/26/2016	6791	75.50	180.30
11/26/2016	6823	79.60	180.50
11/26/2016	6854	84.20	181.10
11/26/2016	6921	88.80	182.50
11/26/2016	7015	90.80	179.40
11/26/2016	7109	91.00	179.70
11/26/2016	7202	91.00	180.00
11/26/2016	7295	90.40	180.50
11/26/2016	7388	90.70	180.90
11/26/2016	7481	89.70	179.90
11/27/2016	7575	89.90	180.30
11/27/2016	7668	89.10	179.70
11/27/2016	7762	89.00	180.30
11/27/2016	7950	89.40	179.30
11/27/2016	8044	89.90	180.90
11/27/2016	8137	89.00	179.00
11/27/2016	8232	89.60	180.80
11/27/2016	8323	89.50	180.10
11/27/2016	8416	89.60	117.70
11/27/2016	8510	89.80	178.20
11/27/2016	8603	89.70	178.70
11/28/2016	8697	89.40	179.70
11/28/2016	8790	90.20	178.60
11/28/2016	8883	90.10	179.30
11/28/2016	9070	90.40	179.00
11/28/2016	9163	90.30	179.80
11/28/2016	9256	90.90	180.80
11/28/2016	9349	90.30	179.20
11/28/2016	9443	90.50	179.60
11/28/2016	9536	90.50	180.40

Date	Depth	Deviation	Direction
11/28/2016	9631	89.30	178.90
11/28/2016	9724	89.40	179.50
11/28/2016	9817	89.40	180.10
11/29/2016	9909	89.40	181.10
11/29/2016	10064	89.40	177.50
11/29/2016	10098	89.50	180.30
11/29/2016	10287	90.90	181.00
11/29/2016	10381	91.60	179.90
11/29/2016	10475	91.90	180.60
11/29/2016	10570	89.80	179.60
11/29/2016	10665	90.10	180.70
11/29/2016	10759	90.00	178.50
11/30/2016	10853	90.30	179.00
11/30/2016	11043	88.90	179.30
11/30/2016	11137	89.60	190.50
11/30/2016	11230	89.50	179.10
11/30/2016	11324	90.00	179.90
11/30/2016	11418	90.30	180.50
12/1/2016	11511	89.70	179.00
12/1/2016	11605	90.00	179.90
12/1/2016	11697	89.90	180.60
12/1/2016	11791	89.80	179.30
12/1/2016	11884	90.40	180.10
12/1/2016	11978	90.90	178.70
12/1/2016	12072	91.50	179.30
12/1/2016	12165	89.80	178.90
12/2/2016	12260	90.20	179.70
12/2/2016	12353	88.90	178.10
12/2/2016	12447	89.50	178.80
12/2/2016	12541	89.70	179.90
12/2/2016	12731	89.60	180.50
12/2/2016	12762	89.80	181.10