

COG Operating L L C

Eddy County, NM (NAD 27 NME)

Sec. 35, T 22 S. , R 31 E

Tankless Federal Com 2H

30.015-44434

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

11 December, 2017

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Site:	Sec. 35, T 22 S. , R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Project	Eddy County, NM (NAD 27 NME)		
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		Sec. 35, T 22 S. , R 31 E			
Site Position:		Northing:	488,322.5000 usft	Latitude:	32.341126
From:	Map	Easting:	682,820.6000 usft	Longitude:	-103.741382
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.32 °

Well	Tankless Federal Com 2H, ACTIVE					
Well Position	+N/-S	0.00 ft	Northing:	488,322.5000 usft	Latitude:	32.341126
	+E/-W	0.00 ft	Easting:	682,820.6000 usft	Longitude:	-103.741382
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,446.40 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/2/2017	7.00	60.13	48,177

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	1.03	

Survey Program	Date 12/11/2017				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	9,520.00	Keeper Gyros (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2	
9,657.00	17,557.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	488,322.5000	682,820.6000	32.341126	-103.741382
100.00	0.25	66.07	100.00	0.09	0.20	488,322.5885	682,820.7995	32.341126	-103.741381
125.00	0.14	136.98	125.00	0.09	0.27	488,322.5883	682,820.8702	32.341126	-103.741381
150.00	0.14	107.13	150.00	0.06	0.32	488,322.5570	682,820.9202	32.341126	-103.741381
175.00	0.20	135.13	175.00	0.02	0.38	488,322.5171	682,820.9802	32.341126	-103.741381
200.00	0.32	143.14	200.00	-0.07	0.45	488,322.4303	682,821.0528	32.341125	-103.741381
225.00	0.37	115.23	225.00	-0.16	0.57	488,322.3400	682,821.1677	32.341125	-103.741380
250.00	0.39	85.48	250.00	-0.19	0.73	488,322.3123	682,821.3256	32.341125	-103.741380
275.00	0.34	81.04	275.00	-0.17	0.88	488,322.3306	682,821.4836	32.341125	-103.741379
300.00	0.29	62.77	300.00	-0.13	1.01	488,322.3711	682,821.6132	32.341125	-103.741379
325.00	0.13	68.06	325.00	-0.09	1.10	488,322.4106	682,821.6957	32.341125	-103.741379

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandriil Freedom)
Site:	Sec. 35, T 22 S., R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandriil Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
350.00	0.17	45.09	350.00	-0.05	1.15	488,322.4474	682,821.7483	32.341125	-103.741378
375.00	0.15	132.80	375.00	-0.05	1.20	488,322.4514	682,821.7986	32.341125	-103.741378
400.00	0.26	121.29	400.00	-0.10	1.27	488,322.3997	682,821.8711	32.341125	-103.741378
425.00	0.30	124.82	425.00	-0.17	1.37	488,322.3328	682,821.9733	32.341125	-103.741378
450.00	0.30	104.67	450.00	-0.22	1.49	488,322.2789	682,822.0903	32.341125	-103.741377
475.00	0.36	97.45	475.00	-0.25	1.63	488,322.2521	682,822.2315	32.341125	-103.741377
500.00	0.35	95.91	500.00	-0.27	1.79	488,322.2341	682,822.3853	32.341125	-103.741376
525.00	0.34	98.10	524.99	-0.28	1.93	488,322.2158	682,822.5347	32.341125	-103.741376
550.00	0.34	89.47	549.99	-0.29	2.08	488,322.2060	682,822.6823	32.341125	-103.741375
575.00	0.30	76.34	574.99	-0.28	2.22	488,322.2221	682,822.8201	32.341125	-103.741375
600.00	0.27	70.78	599.99	-0.24	2.34	488,322.2570	682,822.9393	32.341125	-103.741375
625.00	0.23	65.83	624.99	-0.20	2.44	488,322.2969	682,823.0407	32.341125	-103.741374
650.00	0.13	100.55	649.99	-0.19	2.51	488,322.3123	682,823.1144	32.341125	-103.741374
675.00	0.06	44.67	674.99	-0.18	2.55	488,322.3164	682,823.1515	32.341125	-103.741374
700.00	0.19	195.38	699.99	-0.21	2.55	488,322.2857	682,823.1497	32.341125	-103.741374
725.00	0.27	162.97	724.99	-0.31	2.56	488,322.1895	682,823.1559	32.341125	-103.741374
750.00	0.38	143.40	749.99	-0.43	2.62	488,322.0666	682,823.2226	32.341124	-103.741374
775.00	0.34	138.34	774.99	-0.56	2.72	488,321.9446	682,823.3213	32.341124	-103.741373
800.00	0.29	158.88	799.99	-0.67	2.79	488,321.8302	682,823.3935	32.341124	-103.741373
825.00	0.19	180.04	824.99	-0.77	2.82	488,321.7297	682,823.4162	32.341123	-103.741373
850.00	0.29	213.10	849.99	-0.86	2.78	488,321.6352	682,823.3816	32.341123	-103.741373
875.00	0.30	205.94	874.99	-0.98	2.72	488,321.5234	682,823.3185	32.341123	-103.741373
900.00	0.39	203.85	899.99	-1.11	2.66	488,321.3867	682,823.2554	32.341122	-103.741374
925.00	0.43	208.94	924.99	-1.27	2.58	488,321.2268	682,823.1756	32.341122	-103.741374
950.00	0.42	207.52	949.99	-1.44	2.49	488,321.0634	682,823.0879	32.341122	-103.741374
975.00	0.44	202.15	974.99	-1.61	2.41	488,320.8933	682,823.0094	32.341121	-103.741374
1,000.00	0.55	202.69	999.99	-1.81	2.33	488,320.6937	682,822.9269	32.341121	-103.741375
1,025.00	0.61	198.84	1,024.99	-2.04	2.24	488,320.4570	682,822.8376	32.341120	-103.741375
1,050.00	0.44	190.96	1,049.99	-2.26	2.18	488,320.2368	682,822.7764	32.341119	-103.741375
1,075.00	0.50	180.32	1,074.98	-2.47	2.16	488,320.0335	682,822.7575	32.341119	-103.741375
1,100.00	0.43	179.15	1,099.98	-2.67	2.16	488,319.8306	682,822.7583	32.341118	-103.741375
1,125.00	0.33	180.64	1,124.98	-2.84	2.16	488,319.6648	682,822.7589	32.341118	-103.741375
1,150.00	0.29	201.68	1,149.98	-2.97	2.13	488,319.5341	682,822.7347	32.341117	-103.741375
1,175.00	0.39	204.40	1,174.98	-3.10	2.08	488,319.3978	682,822.6762	32.341117	-103.741375
1,200.00	0.32	222.89	1,199.98	-3.23	1.99	488,319.2691	682,822.5936	32.341117	-103.741376
1,225.00	0.52	214.07	1,224.98	-3.38	1.88	488,319.1240	682,822.4825	32.341116	-103.741376
1,250.00	0.61	218.50	1,249.98	-3.57	1.74	488,318.9259	682,822.3361	32.341116	-103.741377
1,275.00	0.47	213.85	1,274.98	-3.76	1.60	488,318.7366	682,822.1961	32.341115	-103.741377
1,300.00	0.41	219.62	1,299.98	-3.92	1.48	488,318.5825	682,822.0820	32.341115	-103.741377
1,325.00	0.36	214.37	1,324.98	-4.05	1.38	488,318.4488	682,821.9806	32.341114	-103.741378
1,350.00	0.47	217.91	1,349.98	-4.20	1.27	488,318.3031	682,821.8733	32.341114	-103.741378
1,375.00	0.46	228.53	1,374.98	-4.34	1.14	488,318.1557	682,821.7351	32.341114	-103.741379
1,400.00	0.60	219.93	1,399.97	-4.51	0.98	488,317.9889	682,821.5759	32.341113	-103.741379
1,425.00	0.64	216.54	1,424.97	-4.72	0.81	488,317.7763	682,821.4087	32.341113	-103.741380
1,450.00	0.63	210.53	1,449.97	-4.95	0.66	488,317.5458	682,821.2558	32.341112	-103.741380
1,475.00	0.65	204.20	1,474.97	-5.20	0.53	488,317.2980	682,821.1278	32.341111	-103.741381
1,500.00	0.54	192.61	1,499.97	-5.45	0.44	488,317.0537	682,821.0440	32.341111	-103.741381
1,525.00	0.40	206.73	1,524.97	-5.64	0.38	488,316.8608	682,820.9790	32.341110	-103.741381
1,550.00	0.50	224.30	1,549.97	-5.80	0.26	488,316.7048	682,820.8636	32.341110	-103.741381
1,575.00	0.61	218.71	1,574.97	-5.98	0.10	488,316.5229	682,820.7041	32.341109	-103.741382
1,600.00	0.62	218.83	1,599.96	-6.19	-0.06	488,316.3137	682,820.5361	32.341109	-103.741382
1,625.00	0.68	215.11	1,624.96	-6.41	-0.23	488,316.0870	682,820.3660	32.341108	-103.741383
1,650.00	0.76	206.54	1,649.96	-6.68	-0.39	488,315.8173	682,820.2066	32.341107	-103.741384
1,675.00	0.65	195.76	1,674.96	-6.97	-0.51	488,315.5325	682,820.0940	32.341106	-103.741384
1,700.00	0.46	209.24	1,699.96	-7.19	-0.59	488,315.3084	682,820.0064	32.341106	-103.741384

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandrell Freedom)
Site:	Sec. 35, T 22 S. , R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandrell Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,725.00	0.54	216.91	1,724.96	-7.37	-0.71	488,315.1267	682,819.8867	32.341105	-103.741385
1,750.00	0.68	218.04	1,749.96	-7.58	-0.88	488,314.9156	682,819.7245	32.341105	-103.741385
1,775.00	0.90	216.22	1,774.95	-7.86	-1.08	488,314.6404	682,819.5171	32.341104	-103.741386
1,800.00	0.86	211.93	1,799.95	-8.18	-1.30	488,314.3228	682,819.3018	32.341103	-103.741386
1,825.00	0.84	205.68	1,824.95	-8.50	-1.48	488,313.9984	682,819.1232	32.341102	-103.741387
1,850.00	0.62	197.93	1,849.95	-8.80	-1.60	488,313.7045	682,819.0021	32.341101	-103.741387
1,875.00	0.68	209.28	1,874.94	-9.05	-1.71	488,313.4465	682,818.8879	32.341101	-103.741388
1,900.00	0.68	212.52	1,899.94	-9.31	-1.86	488,313.1920	682,818.7356	32.341100	-103.741388
1,925.00	0.81	210.42	1,924.94	-9.59	-2.03	488,312.9145	682,818.5664	32.341099	-103.741389
1,950.00	0.78	215.22	1,949.94	-9.88	-2.22	488,312.6231	682,818.3788	32.341098	-103.741389
1,975.00	0.89	214.80	1,974.94	-10.18	-2.43	488,312.3247	682,818.1699	32.341098	-103.741390
2,000.00	0.91	213.25	1,999.93	-10.50	-2.65	488,311.9992	682,817.9502	32.341097	-103.741391
2,025.00	0.98	211.31	2,024.93	-10.85	-2.87	488,311.6505	682,817.7303	32.341096	-103.741392
2,050.00	1.03	211.09	2,049.92	-11.22	-3.10	488,311.2754	682,817.5031	32.341095	-103.741392
2,075.00	1.09	205.66	2,074.92	-11.63	-3.32	488,310.8687	682,817.2841	32.341094	-103.741393
2,100.00	1.16	203.37	2,099.92	-12.08	-3.52	488,310.4221	682,817.0808	32.341092	-103.741394
2,125.00	1.16	202.23	2,124.91	-12.54	-3.72	488,309.9555	682,816.8847	32.341091	-103.741394
2,150.00	1.17	201.80	2,149.91	-13.02	-3.91	488,309.4843	682,816.6941	32.341090	-103.741395
2,175.00	1.00	196.64	2,174.90	-13.46	-4.06	488,309.0383	682,816.5369	32.341089	-103.741396
2,200.00	0.94	199.67	2,199.90	-13.86	-4.19	488,308.6362	682,816.4054	32.341088	-103.741396
2,225.00	0.79	188.68	2,224.89	-14.23	-4.29	488,308.2727	682,816.3103	32.341087	-103.741396
2,250.00	0.67	170.67	2,249.89	-14.54	-4.29	488,307.9581	682,816.3080	32.341086	-103.741396
2,275.00	0.69	165.42	2,274.89	-14.83	-4.23	488,307.6682	682,816.3696	32.341085	-103.741396
2,300.00	0.70	165.59	2,299.89	-15.13	-4.15	488,307.3746	682,816.4455	32.341084	-103.741396
2,325.00	0.70	161.86	2,324.89	-15.42	-4.07	488,307.0815	682,816.5311	32.341083	-103.741396
2,350.00	0.68	157.27	2,349.89	-15.70	-3.96	488,306.7996	682,816.6359	32.341082	-103.741395
2,375.00	0.73	152.07	2,374.88	-15.98	-3.83	488,306.5221	682,816.7678	32.341082	-103.741395
2,400.00	0.73	153.10	2,399.88	-16.26	-3.69	488,306.2393	682,816.9145	32.341081	-103.741394
2,425.00	0.67	150.34	2,424.88	-16.53	-3.54	488,305.9703	682,817.0589	32.341080	-103.741394
2,450.00	0.72	151.42	2,449.88	-16.79	-3.39	488,305.7053	682,817.2064	32.341079	-103.741393
2,475.00	0.78	150.28	2,474.88	-17.08	-3.23	488,305.4196	682,817.3659	32.341079	-103.741393
2,500.00	0.78	145.55	2,499.87	-17.37	-3.05	488,305.1315	682,817.5465	32.341078	-103.741392
2,525.00	0.76	141.67	2,524.87	-17.64	-2.85	488,304.8611	682,817.7456	32.341077	-103.741392
2,550.00	0.80	142.35	2,549.87	-17.91	-2.65	488,304.5929	682,817.9550	32.341076	-103.741391
2,575.00	0.93	142.63	2,574.87	-18.21	-2.42	488,304.2935	682,818.1848	32.341076	-103.741390
2,600.00	1.02	137.93	2,599.86	-18.53	-2.14	488,303.9670	682,818.4570	32.341075	-103.741389
2,625.00	1.08	136.27	2,624.86	-18.87	-1.83	488,303.6316	682,818.7690	32.341074	-103.741388
2,650.00	1.14	133.68	2,649.85	-19.21	-1.49	488,303.2896	682,819.1117	32.341073	-103.741387
2,675.00	1.19	136.73	2,674.85	-19.57	-1.13	488,302.9288	682,819.4695	32.341072	-103.741386
2,700.00	1.18	134.87	2,699.84	-19.94	-0.77	488,302.5582	682,819.8298	32.341071	-103.741385
2,725.00	1.26	135.31	2,724.84	-20.32	-0.39	488,302.1812	682,820.2056	32.341070	-103.741384
2,750.00	1.28	132.98	2,749.83	-20.70	0.00	488,301.7954	682,820.6032	32.341069	-103.741382
2,775.00	1.37	131.01	2,774.82	-21.09	0.43	488,301.4090	682,821.0330	32.341068	-103.741381
2,800.00	1.41	130.38	2,799.82	-21.49	0.89	488,301.0136	682,821.4928	32.341066	-103.741380
2,825.00	1.56	124.60	2,824.81	-21.88	1.41	488,300.6211	682,822.0072	32.341065	-103.741378
2,850.00	1.62	121.29	2,849.80	-22.26	1.99	488,300.2443	682,822.5893	32.341064	-103.741376
2,875.00	1.62	119.04	2,874.79	-22.61	2.60	488,299.8892	682,823.2002	32.341063	-103.741374
2,900.00	1.57	123.48	2,899.78	-22.97	3.19	488,299.5288	682,823.7948	32.341062	-103.741372
2,925.00	1.59	123.03	2,924.77	-23.35	3.77	488,299.1508	682,824.3713	32.341061	-103.741370
2,950.00	1.63	119.82	2,949.76	-23.72	4.37	488,298.7849	682,824.9705	32.341060	-103.741368
2,975.00	1.42	119.01	2,974.75	-24.04	4.95	488,298.4579	682,825.5499	32.341059	-103.741367
3,000.00	0.98	119.97	2,999.75	-24.30	5.41	488,298.2009	682,826.0060	32.341059	-103.741365
3,025.00	0.59	123.23	3,024.74	-24.48	5.70	488,298.0235	682,826.2989	32.341058	-103.741364
3,050.00	0.42	117.38	3,049.74	-24.59	5.89	488,297.9108	682,826.4879	32.341058	-103.741364
3,075.00	0.31	141.70	3,074.74	-24.68	6.01	488,297.8156	682,826.6112	32.341058	-103.741363

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandrift Freedom)
Site:	Sec. 35, T 22 S., R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandrift Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,100.00	0.06	211.54	3,099.74	-24.75	6.05	488,297.7514	682,826.6463	32.341057	-103.741363
3,125.00	0.14	289.67	3,124.74	-24.75	6.01	488,297.7505	682,826.6107	32.341057	-103.741363
3,150.00	0.24	272.25	3,149.74	-24.74	5.93	488,297.7629	682,826.5296	32.341057	-103.741363
3,175.00	0.26	306.32	3,174.74	-24.70	5.83	488,297.7985	682,826.4316	32.341058	-103.741364
3,200.00	0.32	293.78	3,199.74	-24.64	5.72	488,297.8603	682,826.3220	32.341058	-103.741364
3,225.00	0.53	283.10	3,224.74	-24.59	5.55	488,297.9146	682,826.1455	32.341058	-103.741365
3,250.00	0.58	282.54	3,249.74	-24.53	5.31	488,297.9683	682,825.9094	32.341058	-103.741365
3,275.00	0.61	283.12	3,274.74	-24.47	5.06	488,298.0260	682,825.6562	32.341058	-103.741366
3,300.00	0.57	278.38	3,299.74	-24.43	4.80	488,298.0743	682,825.4036	32.341058	-103.741367
3,325.00	0.69	278.30	3,324.73	-24.39	4.53	488,298.1142	682,825.1316	32.341058	-103.741368
3,350.00	0.79	271.04	3,349.73	-24.36	4.21	488,298.1390	682,824.8104	32.341059	-103.741369
3,375.00	0.90	267.41	3,374.73	-24.37	3.84	488,298.1333	682,824.4419	32.341059	-103.741370
3,400.00	0.91	267.51	3,399.73	-24.38	3.45	488,298.1158	682,824.0474	32.341058	-103.741371
3,425.00	0.93	269.80	3,424.72	-24.39	3.05	488,298.1064	682,823.6462	32.341058	-103.741373
3,450.00	1.00	268.64	3,449.72	-24.40	2.63	488,298.1006	682,823.2252	32.341058	-103.741374
3,475.00	1.07	262.81	3,474.72	-24.43	2.18	488,298.0662	682,822.7755	32.341058	-103.741376
3,500.00	1.13	261.75	3,499.71	-24.50	1.70	488,298.0016	682,822.3000	32.341058	-103.741377
3,525.00	1.10	259.70	3,524.71	-24.58	1.22	488,297.9233	682,821.8199	32.341058	-103.741379
3,550.00	1.12	253.21	3,549.70	-24.69	0.75	488,297.8098	682,821.3499	32.341058	-103.741380
3,575.00	1.08	237.18	3,574.70	-24.89	0.32	488,297.6115	682,820.9180	32.341057	-103.741382
3,600.00	1.03	227.46	3,599.69	-25.17	-0.05	488,297.3319	682,820.5545	32.341056	-103.741383
3,625.00	1.04	218.05	3,624.69	-25.50	-0.35	488,297.0013	682,820.2491	32.341055	-103.741384
3,650.00	1.03	209.89	3,649.69	-25.87	-0.60	488,296.6279	682,819.9972	32.341054	-103.741385
3,675.00	1.07	196.02	3,674.68	-26.29	-0.78	488,296.2087	682,819.8209	32.341053	-103.741385
3,700.00	1.11	182.23	3,699.68	-26.76	-0.85	488,295.7424	682,819.7470	32.341052	-103.741385
3,725.00	0.99	169.62	3,724.67	-27.21	-0.82	488,295.2880	682,819.7765	32.341051	-103.741385
3,750.00	0.49	150.67	3,749.67	-27.52	-0.73	488,294.9823	682,819.8678	32.341050	-103.741385
3,775.00	0.26	66.14	3,774.67	-27.59	-0.63	488,294.9121	682,819.9720	32.341050	-103.741385
3,800.00	0.41	27.64	3,799.67	-27.49	-0.53	488,295.0143	682,820.0654	32.341050	-103.741384
3,825.00	0.39	21.76	3,824.67	-27.33	-0.46	488,295.1725	682,820.1384	32.341050	-103.741384
3,850.00	0.41	22.73	3,849.67	-27.17	-0.40	488,295.3340	682,820.2045	32.341051	-103.741384
3,875.00	0.38	21.47	3,874.67	-27.01	-0.33	488,295.4937	682,820.2694	32.341051	-103.741384
3,900.00	0.47	35.08	3,899.67	-26.85	-0.24	488,295.6547	682,820.3587	32.341052	-103.741383
3,925.00	0.46	39.17	3,924.67	-26.68	-0.12	488,295.8165	682,820.4810	32.341052	-103.741383
3,950.00	0.50	61.23	3,949.67	-26.55	0.04	488,295.9468	682,820.6400	32.341053	-103.741382
3,975.00	0.72	88.57	3,974.66	-26.50	0.29	488,296.0032	682,820.8927	32.341053	-103.741382
4,000.00	0.88	103.74	3,999.66	-26.54	0.64	488,295.9615	682,821.2362	32.341053	-103.741381
4,025.00	0.94	107.80	4,024.66	-26.65	1.02	488,295.8532	682,821.6179	32.341052	-103.741379
4,050.00	1.03	108.86	4,049.65	-26.78	1.43	488,295.7179	682,822.0258	32.341052	-103.741378
4,075.00	1.12	104.98	4,074.65	-26.92	1.87	488,295.5821	682,822.4745	32.341052	-103.741377
4,100.00	1.31	107.47	4,099.64	-27.07	2.38	488,295.4332	682,822.9831	32.341051	-103.741375
4,125.00	1.40	110.74	4,124.64	-27.26	2.94	488,295.2392	682,823.5413	32.341051	-103.741373
4,150.00	1.50	110.28	4,149.63	-27.48	3.53	488,295.0177	682,824.1338	32.341050	-103.741371
4,175.00	1.40	108.55	4,174.62	-27.69	4.13	488,294.8071	682,824.7303	32.341049	-103.741369
4,200.00	1.26	107.87	4,199.61	-27.87	4.68	488,294.6256	682,825.2814	32.341049	-103.741367
4,225.00	0.92	83.38	4,224.61	-27.94	5.14	488,294.5644	682,825.7424	32.341049	-103.741366
4,250.00	0.69	50.36	4,249.61	-27.82	5.46	488,294.6835	682,826.0577	32.341049	-103.741365
4,275.00	0.83	19.57	4,274.61	-27.55	5.63	488,294.9502	682,826.2343	32.341050	-103.741364
4,300.00	0.92	16.52	4,299.60	-27.19	5.75	488,295.3132	682,826.3520	32.341051	-103.741364
4,325.00	0.92	13.77	4,324.60	-26.80	5.86	488,295.7006	682,826.4568	32.341052	-103.741364
4,350.00	0.93	11.12	4,349.60	-26.41	5.94	488,296.0946	682,826.5437	32.341053	-103.741363
4,375.00	0.93	4.49	4,374.59	-26.00	6.00	488,296.4959	682,826.5987	32.341054	-103.741363
4,400.00	1.06	2.80	4,399.59	-25.57	6.03	488,296.9292	682,826.6259	32.341055	-103.741363
4,425.00	1.03	353.51	4,424.59	-25.12	6.01	488,297.3834	682,826.6118	32.341056	-103.741363
4,450.00	0.98	357.86	4,449.58	-24.68	5.98	488,297.8203	682,826.5784	32.341058	-103.741363

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandriil Freedom)
Site:	Sec. 35, T 22 S., R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandriil Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,475.00	1.01	356.36	4,474.58	-24.25	5.96	488,298.2538	682,826.5565	32.341059	-103.741363
4,500.00	0.98	353.00	4,499.57	-23.81	5.92	488,298.6859	682,826.5164	32.341060	-103.741363
4,525.00	0.93	349.12	4,524.57	-23.40	5.85	488,299.0973	682,826.4521	32.341061	-103.741364
4,550.00	1.10	349.89	4,549.57	-22.97	5.77	488,299.5328	682,826.3716	32.341062	-103.741364
4,575.00	1.03	347.18	4,574.56	-22.51	5.68	488,299.9882	682,826.2797	32.341064	-103.741364
4,600.00	1.17	352.70	4,599.56	-22.04	5.60	488,300.4604	682,826.1974	32.341065	-103.741364
4,625.00	1.03	348.64	4,624.55	-21.57	5.52	488,300.9339	682,826.1207	32.341066	-103.741365
4,650.00	1.18	357.15	4,649.55	-21.09	5.46	488,301.4113	682,826.0636	32.341067	-103.741365
4,675.00	1.19	358.20	4,674.54	-20.57	5.44	488,301.9279	682,826.0427	32.341069	-103.741365
4,700.00	1.24	359.95	4,699.54	-20.04	5.43	488,302.4578	682,826.0343	32.341070	-103.741365
4,725.00	1.11	352.28	4,724.53	-19.53	5.40	488,302.9683	682,826.0015	32.341072	-103.741365
4,750.00	1.18	353.68	4,749.53	-19.04	5.34	488,303.4641	682,825.9407	32.341073	-103.741365
4,775.00	1.22	352.84	4,774.52	-18.52	5.28	488,303.9840	682,825.8791	32.341075	-103.741365
4,800.00	1.25	356.49	4,799.52	-17.98	5.23	488,304.5203	682,825.8293	32.341076	-103.741366
4,825.00	1.26	354.35	4,824.51	-17.43	5.19	488,305.0660	682,825.7855	32.341078	-103.741366
4,850.00	1.24	352.55	4,849.50	-16.89	5.12	488,305.6077	682,825.7234	32.341079	-103.741366
4,875.00	1.14	352.25	4,874.50	-16.38	5.05	488,306.1224	682,825.6548	32.341080	-103.741366
4,900.00	1.33	359.21	4,899.49	-15.84	5.02	488,306.6589	682,825.6172	32.341082	-103.741366
4,925.00	1.18	355.72	4,924.49	-15.29	4.99	488,307.2057	682,825.5940	32.341083	-103.741366
4,950.00	1.25	4.32	4,949.48	-14.77	5.00	488,307.7343	682,825.5954	32.341085	-103.741366
4,975.00	1.30	3.49	4,974.47	-14.21	5.03	488,308.2893	682,825.6332	32.341086	-103.741366
5,000.00	1.32	0.96	4,999.47	-13.64	5.06	488,308.8603	682,825.6553	32.341088	-103.741366
5,025.00	1.35	358.69	5,024.46	-13.06	5.05	488,309.4426	682,825.6533	32.341090	-103.741366
5,050.00	1.33	1.09	5,049.45	-12.47	5.05	488,310.0271	682,825.6521	32.341091	-103.741366
5,075.00	1.31	1.05	5,074.45	-11.90	5.06	488,310.6029	682,825.6629	32.341093	-103.741366
5,100.00	1.30	3.90	5,099.44	-11.33	5.09	488,311.1716	682,825.6874	32.341094	-103.741366
5,125.00	1.29	2.91	5,124.44	-10.76	5.12	488,311.7355	682,825.7210	32.341096	-103.741366
5,150.00	1.33	0.59	5,149.43	-10.19	5.14	488,312.3067	682,825.7383	32.341097	-103.741366
5,175.00	1.34	359.70	5,174.42	-9.61	5.14	488,312.8891	682,825.7397	32.341099	-103.741366
5,200.00	1.30	1.19	5,199.42	-9.04	5.14	488,313.4650	682,825.7441	32.341101	-103.741366
5,225.00	1.38	359.89	5,224.41	-8.45	5.15	488,314.0495	682,825.7494	32.341102	-103.741366
5,250.00	1.36	1.27	5,249.40	-7.85	5.16	488,314.6472	682,825.7554	32.341104	-103.741366
5,275.00	1.39	2.25	5,274.39	-7.25	5.17	488,315.2468	682,825.7739	32.341106	-103.741366
5,300.00	1.38	2.44	5,299.39	-6.65	5.20	488,315.8505	682,825.7986	32.341107	-103.741365
5,325.00	1.30	5.46	5,324.38	-6.07	5.24	488,316.4336	682,825.8384	32.341109	-103.741365
5,350.00	1.31	3.52	5,349.37	-5.50	5.28	488,317.0011	682,825.8829	32.341110	-103.741365
5,375.00	1.31	4.70	5,374.37	-4.93	5.32	488,317.5712	682,825.9239	32.341112	-103.741365
5,400.00	1.34	4.55	5,399.36	-4.35	5.37	488,318.1474	682,825.9705	32.341114	-103.741365
5,425.00	1.36	2.83	5,424.35	-3.76	5.41	488,318.7351	682,826.0083	32.341115	-103.741365
5,450.00	1.29	3.78	5,449.35	-3.19	5.44	488,319.3122	682,826.0415	32.341117	-103.741365
5,475.00	1.40	4.17	5,474.34	-2.60	5.48	488,319.8976	682,826.0823	32.341118	-103.741364
5,500.00	1.29	2.81	5,499.33	-2.02	5.52	488,320.4833	682,826.1183	32.341120	-103.741364
5,525.00	1.38	2.80	5,524.33	-1.44	5.55	488,321.0650	682,826.1468	32.341122	-103.741364
5,550.00	1.31	2.62	5,549.32	-0.85	5.57	488,321.6512	682,826.1746	32.341123	-103.741364
5,575.00	1.38	3.91	5,574.31	-0.26	5.61	488,322.2370	682,826.2081	32.341125	-103.741364
5,600.00	1.26	3.79	5,599.31	0.31	5.65	488,322.8116	682,826.2468	32.341126	-103.741364
5,625.00	1.38	0.73	5,624.30	0.89	5.67	488,323.3869	682,826.2688	32.341128	-103.741364
5,650.00	1.38	1.96	5,649.29	1.49	5.68	488,323.9887	682,826.2830	32.341130	-103.741364
5,675.00	1.41	1.26	5,674.28	2.10	5.70	488,324.5971	682,826.3000	32.341131	-103.741364
5,700.00	1.38	1.05	5,699.28	2.71	5.71	488,325.2056	682,826.3123	32.341133	-103.741364
5,725.00	1.38	2.39	5,724.27	3.31	5.73	488,325.8074	682,826.3304	32.341135	-103.741364
5,750.00	1.38	6.83	5,749.26	3.91	5.78	488,326.4071	682,826.3787	32.341136	-103.741363
5,775.00	1.33	4.44	5,774.26	4.50	5.84	488,326.9952	682,826.4370	32.341138	-103.741363
5,800.00	1.39	3.78	5,799.25	5.09	5.88	488,327.5871	682,826.4795	32.341139	-103.741363
5,825.00	1.36	4.10	5,824.24	5.69	5.92	488,328.1855	682,826.5207	32.341141	-103.741363

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Site:	Sec. 35, T 22 S. , R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,850.00	1.44	3.21	5,849.23	6.30	5.96	488,328.7951	682,826.5595	32.341143	-103.741363
5,875.00	1.43	3.05	5,874.23	6.92	5.99	488,329.4202	682,826.5936	32.341144	-103.741363
5,900.00	1.44	2.14	5,899.22	7.55	6.02	488,330.0456	682,826.6220	32.341146	-103.741362
5,925.00	1.29	359.52	5,924.21	8.14	6.03	488,330.6409	682,826.6313	32.341148	-103.741362
5,950.00	1.18	357.80	5,949.21	8.68	6.02	488,331.1796	682,826.6191	32.341149	-103.741362
5,975.00	1.13	344.30	5,974.20	9.17	5.94	488,331.6741	682,826.5425	32.341151	-103.741363
6,000.00	1.20	321.78	5,999.20	9.62	5.71	488,332.1171	682,826.3138	32.341152	-103.741363
6,025.00	1.30	305.26	6,024.19	9.99	5.32	488,332.4865	682,825.9203	32.341153	-103.741365
6,050.00	1.30	301.05	6,049.18	10.30	4.85	488,332.7965	682,825.4458	32.341154	-103.741366
6,075.00	1.38	297.08	6,074.18	10.58	4.33	488,333.0798	682,824.9348	32.341155	-103.741368
6,100.00	1.34	300.36	6,099.17	10.86	3.81	488,333.3646	682,824.4145	32.341155	-103.741370
6,125.00	1.34	299.21	6,124.16	11.15	3.31	488,333.6550	682,823.9072	32.341156	-103.741371
6,150.00	1.35	300.79	6,149.16	11.45	2.80	488,333.9484	682,823.3990	32.341157	-103.741373
6,175.00	1.37	301.34	6,174.15	11.75	2.29	488,334.2546	682,822.8908	32.341158	-103.741374
6,200.00	1.30	299.25	6,199.14	12.05	1.79	488,334.5486	682,822.3881	32.341159	-103.741376
6,225.00	1.24	299.89	6,224.14	12.32	1.31	488,334.8219	682,821.9062	32.341159	-103.741378
6,250.00	1.21	300.90	6,249.13	12.59	0.85	488,335.0923	682,821.4451	32.341160	-103.741379
6,275.00	1.12	294.61	6,274.12	12.83	0.40	488,335.3296	682,820.9965	32.341161	-103.741381
6,300.00	1.03	286.27	6,299.12	12.99	-0.04	488,335.4943	682,820.5587	32.341161	-103.741382
6,325.00	1.02	283.53	6,324.12	13.11	-0.47	488,335.6093	682,820.1266	32.341162	-103.741383
6,350.00	0.83	250.31	6,349.11	13.10	-0.86	488,335.6004	682,819.7398	32.341162	-103.741385
6,375.00	0.89	219.49	6,374.11	12.89	-1.15	488,335.3895	682,819.4458	32.341161	-103.741386
6,400.00	0.92	202.50	6,399.11	12.55	-1.35	488,335.0542	682,819.2456	32.341160	-103.741386
6,425.00	0.99	191.58	6,424.10	12.16	-1.47	488,334.6572	682,819.1254	32.341159	-103.741387
6,450.00	1.00	188.53	6,449.10	11.73	-1.55	488,334.2299	682,819.0497	32.341158	-103.741387
6,475.00	1.07	190.78	6,474.10	11.28	-1.63	488,333.7849	682,818.9737	32.341157	-103.741387
6,500.00	1.05	187.40	6,499.09	10.83	-1.70	488,333.3284	682,818.9005	32.341155	-103.741387
6,525.00	1.10	190.01	6,524.09	10.36	-1.77	488,332.8650	682,818.8293	32.341154	-103.741388
6,550.00	1.04	187.95	6,549.08	9.90	-1.84	488,332.4039	682,818.7562	32.341153	-103.741388
6,575.00	1.05	187.36	6,574.08	9.45	-1.90	488,331.9521	682,818.6955	32.341152	-103.741388
6,600.00	1.08	184.22	6,599.07	8.99	-1.95	488,331.4899	682,818.6488	32.341150	-103.741388
6,625.00	1.12	184.09	6,624.07	8.51	-1.99	488,331.0112	682,818.6140	32.341149	-103.741388
6,650.00	1.12	180.03	6,649.06	8.02	-2.00	488,330.5232	682,818.5965	32.341148	-103.741388
6,675.00	1.14	181.64	6,674.06	7.53	-2.01	488,330.0303	682,818.5892	32.341146	-103.741389
6,700.00	1.32	185.93	6,699.05	7.00	-2.05	488,329.4953	682,818.5524	32.341145	-103.741389
6,725.00	1.32	180.55	6,724.05	6.42	-2.08	488,328.9209	682,818.5199	32.341143	-103.741389
6,750.00	1.36	178.45	6,749.04	5.84	-2.07	488,328.3364	682,818.5251	32.341142	-103.741389
6,775.00	1.32	179.90	6,774.03	5.25	-2.07	488,327.7519	682,818.5336	32.341140	-103.741389
6,800.00	1.27	178.24	6,799.03	4.69	-2.06	488,327.1870	682,818.5427	32.341138	-103.741389
6,825.00	1.31	179.02	6,824.02	4.12	-2.04	488,326.6244	682,818.5561	32.341137	-103.741389
6,850.00	1.34	181.52	6,849.01	3.55	-2.05	488,326.0464	682,818.5532	32.341135	-103.741389
6,875.00	1.31	176.31	6,874.01	2.97	-2.04	488,325.4691	682,818.5638	32.341134	-103.741389
6,900.00	1.35	177.87	6,899.00	2.39	-2.01	488,324.8896	682,818.5932	32.341132	-103.741389
6,925.00	1.32	178.37	6,923.99	1.81	-1.99	488,324.3074	682,818.6123	32.341131	-103.741389
6,950.00	1.32	176.72	6,948.99	1.23	-1.96	488,323.7321	682,818.6370	32.341129	-103.741388
6,975.00	1.33	177.70	6,973.98	0.65	-1.93	488,323.1547	682,818.6651	32.341127	-103.741388
7,000.00	1.32	180.63	6,998.97	0.08	-1.93	488,322.5769	682,818.6736	32.341126	-103.741388
7,025.00	1.22	178.14	7,023.97	-0.48	-1.92	488,322.0230	682,818.6790	32.341124	-103.741388
7,050.00	1.26	179.35	7,048.96	-1.02	-1.91	488,321.4821	682,818.6908	32.341123	-103.741388
7,075.00	1.27	179.52	7,073.96	-1.57	-1.90	488,320.9302	682,818.6962	32.341121	-103.741388
7,100.00	1.22	178.72	7,098.95	-2.11	-1.90	488,320.3871	682,818.7045	32.341120	-103.741388
7,125.00	1.20	180.66	7,123.94	-2.64	-1.89	488,319.8593	682,818.7074	32.341118	-103.741388
7,150.00	1.22	180.04	7,148.94	-3.17	-1.90	488,319.3314	682,818.7042	32.341117	-103.741388
7,175.00	1.30	182.20	7,173.93	-3.72	-1.91	488,318.7819	682,818.6932	32.341115	-103.741388
7,200.00	1.29	180.53	7,198.93	-4.28	-1.92	488,318.2171	682,818.6797	32.341114	-103.741388

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandrell Freedom)
Site:	Sec. 35, T 22 S. , R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandrell Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,225.00	1.29	182.07	7,223.92	-4.85	-1.93	488,317.6544	682,818.6669	32.341112	-103.741388
7,250.00	1.31	181.75	7,248.91	-5.41	-1.95	488,317.0876	682,818.6480	32.341111	-103.741389
7,275.00	1.31	181.38	7,273.91	-5.98	-1.97	488,316.5163	682,818.6324	32.341109	-103.741389
7,300.00	1.26	183.54	7,298.90	-6.54	-1.99	488,315.9562	682,818.6085	32.341108	-103.741389
7,325.00	1.20	181.28	7,323.90	-7.08	-2.01	488,315.4202	682,818.5857	32.341106	-103.741389
7,350.00	1.25	182.31	7,348.89	-7.61	-2.03	488,314.8860	682,818.5689	32.341105	-103.741389
7,375.00	1.28	187.48	7,373.88	-8.16	-2.08	488,314.3367	682,818.5215	32.341103	-103.741389
7,400.00	1.39	187.70	7,398.88	-8.74	-2.16	488,313.7593	682,818.4446	32.341102	-103.741389
7,425.00	1.35	179.75	7,423.87	-9.34	-2.19	488,313.1644	682,818.4052	32.341100	-103.741389
7,450.00	1.12	176.83	7,448.86	-9.87	-2.18	488,312.6259	682,818.4200	32.341098	-103.741389
7,475.00	1.12	181.23	7,473.86	-10.36	-2.17	488,312.1377	682,818.4283	32.341097	-103.741389
7,500.00	1.22	183.03	7,498.85	-10.87	-2.19	488,311.6276	682,818.4090	32.341096	-103.741389
7,525.00	1.24	183.71	7,523.85	-11.41	-2.22	488,311.0919	682,818.3774	32.341094	-103.741390
7,550.00	1.27	187.10	7,548.84	-11.95	-2.27	488,310.5471	682,818.3257	32.341093	-103.741390
7,575.00	1.25	185.56	7,573.84	-12.50	-2.34	488,310.0007	682,818.2650	32.341091	-103.741390
7,600.00	1.31	187.74	7,598.83	-13.05	-2.40	488,309.4462	682,818.2001	32.341090	-103.741390
7,625.00	1.35	182.58	7,623.82	-13.63	-2.45	488,308.8688	682,818.1483	32.341088	-103.741390
7,650.00	1.15	179.04	7,648.82	-14.18	-2.46	488,308.3238	682,818.1393	32.341087	-103.741390
7,675.00	1.15	186.52	7,673.81	-14.68	-2.49	488,307.8237	682,818.1150	32.341085	-103.741390
7,700.00	1.22	187.22	7,698.81	-15.19	-2.55	488,307.3104	682,818.0531	32.341084	-103.741391
7,725.00	1.25	187.53	7,723.80	-15.72	-2.62	488,306.7760	682,817.9839	32.341082	-103.741391
7,750.00	1.39	186.23	7,748.79	-16.30	-2.68	488,306.2043	682,817.9152	32.341081	-103.741391
7,775.00	1.19	182.46	7,773.79	-16.86	-2.73	488,305.6435	682,817.8712	32.341079	-103.741391
7,800.00	1.38	186.69	7,798.78	-17.41	-2.78	488,305.0851	682,817.8250	32.341078	-103.741391
7,825.00	1.27	180.41	7,823.78	-17.99	-2.81	488,304.5091	682,817.7879	32.341076	-103.741392
7,850.00	1.32	188.02	7,848.77	-18.55	-2.85	488,303.9469	682,817.7458	32.341075	-103.741392
7,875.00	1.35	188.00	7,873.76	-19.13	-2.94	488,303.3701	682,817.6646	32.341073	-103.741392
7,900.00	1.29	185.31	7,898.76	-19.70	-3.00	488,302.7983	682,817.5976	32.341071	-103.741392
7,925.00	1.34	188.10	7,923.75	-20.27	-3.07	488,302.2287	682,817.5304	32.341070	-103.741392
7,950.00	1.43	189.76	7,948.74	-20.87	-3.16	488,301.6319	682,817.4363	32.341068	-103.741393
7,975.00	1.52	187.50	7,973.73	-21.50	-3.26	488,300.9957	682,817.3401	32.341066	-103.741393
8,000.00	1.59	183.84	7,998.72	-22.18	-3.33	488,300.3209	682,817.2736	32.341065	-103.741393
8,025.00	1.41	178.60	8,023.72	-22.83	-3.34	488,299.6674	682,817.2579	32.341063	-103.741393
8,050.00	1.27	179.81	8,048.71	-23.42	-3.33	488,299.0828	682,817.2663	32.341061	-103.741393
8,075.00	1.28	182.22	8,073.70	-23.97	-3.34	488,298.5268	682,817.2564	32.341060	-103.741393
8,100.00	1.46	183.78	8,098.70	-24.57	-3.38	488,297.9299	682,817.2246	32.341058	-103.741393
8,125.00	1.52	183.90	8,123.69	-25.22	-3.42	488,297.2813	682,817.1811	32.341056	-103.741394
8,150.00	1.65	184.73	8,148.68	-25.91	-3.47	488,296.5918	682,817.1288	32.341054	-103.741394
8,175.00	1.59	183.69	8,173.67	-26.61	-3.52	488,295.8870	682,817.0768	32.341052	-103.741394
8,200.00	1.65	179.97	8,198.66	-27.32	-3.55	488,295.1810	682,817.0547	32.341051	-103.741394
8,225.00	1.38	165.34	8,223.65	-27.97	-3.47	488,294.5298	682,817.1311	32.341049	-103.741394
8,250.00	1.13	147.03	8,248.64	-28.47	-3.26	488,294.0318	682,817.3414	32.341047	-103.741393
8,275.00	1.00	128.62	8,273.64	-28.81	-2.95	488,293.6888	682,817.6460	32.341046	-103.741392
8,300.00	1.03	138.68	8,298.63	-29.12	-2.64	488,293.3839	682,817.9648	32.341046	-103.741391
8,325.00	1.03	152.19	8,323.63	-29.48	-2.38	488,293.0164	682,818.2180	32.341045	-103.741390
8,350.00	1.18	155.06	8,348.63	-29.92	-2.17	488,292.5842	682,818.4314	32.341043	-103.741390
8,375.00	1.23	153.92	8,373.62	-30.39	-1.94	488,292.1098	682,818.6579	32.341042	-103.741389
8,400.00	1.23	157.43	8,398.61	-30.88	-1.72	488,291.6210	682,818.8789	32.341041	-103.741388
8,425.00	1.23	147.95	8,423.61	-31.35	-1.48	488,291.1458	682,819.1242	32.341039	-103.741387
8,450.00	0.86	154.01	8,448.60	-31.75	-1.25	488,290.7497	682,819.3488	32.341038	-103.741387
8,475.00	0.99	166.47	8,473.60	-32.13	-1.12	488,290.3711	682,819.4816	32.341037	-103.741386
8,500.00	1.07	171.41	8,498.60	-32.57	-1.03	488,289.9303	682,819.5670	32.341036	-103.741386
8,525.00	1.23	167.55	8,523.59	-33.06	-0.94	488,289.4375	682,819.6597	32.341035	-103.741386
8,550.00	1.14	161.66	8,548.59	-33.56	-0.80	488,288.9394	682,819.7958	32.341033	-103.741385
8,575.00	1.00	163.18	8,573.58	-34.01	-0.66	488,288.4946	682,819.9372	32.341032	-103.741385

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Site:	Sec. 35, T 22 S., R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,600.00	0.95	169.93	8,598.58	-34.42	-0.56	488,288.0817	682,820.0365	32.341031	-103.741385
8,625.00	0.97	178.45	8,623.58	-34.83	-0.52	488,287.6661	682,820.0785	32.341030	-103.741384
8,650.00	1.11	179.13	8,648.57	-35.29	-0.51	488,287.2124	682,820.0879	32.341029	-103.741384
8,675.00	1.22	171.11	8,673.57	-35.79	-0.47	488,286.7074	682,820.1327	32.341027	-103.741384
8,700.00	0.98	176.40	8,698.56	-36.27	-0.41	488,286.2311	682,820.1872	32.341026	-103.741384
8,725.00	1.05	188.17	8,723.56	-36.71	-0.43	488,285.7909	682,820.1681	32.341025	-103.741384
8,750.00	1.19	196.68	8,748.55	-37.18	-0.54	488,285.3155	682,820.0611	32.341023	-103.741385
8,775.00	1.32	183.55	8,773.55	-37.72	-0.63	488,284.7795	682,819.9687	32.341022	-103.741385
8,800.00	1.19	183.05	8,798.54	-38.27	-0.66	488,284.2328	682,819.9371	32.341020	-103.741385
8,825.00	1.02	183.21	8,823.54	-38.75	-0.69	488,283.7514	682,819.9108	32.341019	-103.741385
8,850.00	1.04	187.94	8,848.53	-39.20	-0.73	488,283.3046	682,819.8670	32.341018	-103.741385
8,875.00	0.95	175.61	8,873.53	-39.63	-0.75	488,282.8732	682,819.8515	32.341017	-103.741385
8,900.00	0.91	124.35	8,898.53	-39.95	-0.57	488,282.5545	682,820.0313	32.341016	-103.741385
8,925.00	1.15	95.95	8,923.52	-40.08	-0.16	488,282.4165	682,820.4447	32.341015	-103.741383
8,950.00	0.95	89.16	8,948.52	-40.11	0.30	488,282.3936	682,820.9015	32.341015	-103.741382
8,975.00	0.66	100.79	8,973.52	-40.13	0.65	488,282.3696	682,821.2501	32.341015	-103.741381
9,000.00	0.62	116.70	8,998.51	-40.22	0.91	488,282.2819	682,821.5124	32.341015	-103.741380
9,025.00	0.76	128.61	9,023.51	-40.38	1.16	488,282.1177	682,821.7628	32.341015	-103.741379
9,050.00	0.76	113.00	9,048.51	-40.55	1.44	488,281.9494	682,822.0450	32.341014	-103.741378
9,075.00	0.68	120.90	9,073.51	-40.69	1.72	488,281.8085	682,822.3249	32.341014	-103.741377
9,100.00	0.72	145.50	9,098.51	-40.90	1.94	488,281.6028	682,822.5412	32.341013	-103.741377
9,125.00	1.09	141.76	9,123.50	-41.21	2.18	488,281.2866	682,822.7773	32.341012	-103.741376
9,150.00	1.14	134.71	9,148.50	-41.58	2.50	488,280.9249	682,823.1012	32.341011	-103.741375
9,175.00	1.20	148.00	9,173.49	-41.97	2.82	488,280.5279	682,823.4167	32.341010	-103.741374
9,200.00	1.38	145.48	9,198.49	-42.44	3.13	488,280.0579	682,823.7260	32.341009	-103.741373
9,225.00	1.32	155.02	9,223.48	-42.95	3.42	488,279.5488	682,824.0182	32.341007	-103.741372
9,250.00	1.54	154.52	9,248.47	-43.52	3.68	488,278.9846	682,824.2843	32.341006	-103.741371
9,275.00	1.65	155.02	9,273.46	-44.15	3.98	488,278.3550	682,824.5808	32.341004	-103.741370
9,300.00	1.47	156.37	9,298.45	-44.77	4.26	488,277.7350	682,824.8614	32.341002	-103.741369
9,325.00	1.55	164.22	9,323.44	-45.38	4.48	488,277.1159	682,825.0819	32.341001	-103.741368
9,350.00	1.23	151.96	9,348.44	-45.95	4.70	488,276.5536	682,825.2999	32.340999	-103.741368
9,375.00	1.37	88.13	9,373.43	-46.17	5.12	488,276.3266	682,825.7248	32.340999	-103.741366
9,400.00	1.28	78.76	9,398.42	-46.11	5.70	488,276.3907	682,826.2974	32.340999	-103.741365
9,425.00	1.48	82.07	9,423.42	-46.01	6.29	488,276.4897	682,826.8910	32.340999	-103.741363
9,450.00	1.46	89.61	9,448.41	-45.96	6.93	488,276.5364	682,827.5293	32.340999	-103.741361
9,475.00	1.69	86.26	9,473.40	-45.94	7.62	488,276.5626	682,828.2156	32.340999	-103.741358
9,500.00	1.61	76.89	9,498.39	-45.83	8.33	488,276.6663	682,828.9255	32.340999	-103.741356
9,520.00	1.36	91.20	9,518.38	-45.78	8.84	488,276.7251	682,829.4364	32.341000	-103.741354
9,657.00	1.50	100.56	9,655.34	-46.14	12.22	488,276.3624	682,832.8246	32.340999	-103.741343
First MWD Survey @ 9657'MD									
9,688.00	3.90	46.56	9,686.31	-45.49	13.39	488,277.0131	682,833.9893	32.341000	-103.741340
9,719.00	7.20	35.36	9,717.16	-43.18	15.28	488,279.3230	682,835.8796	32.341007	-103.741333
9,750.00	10.50	29.76	9,747.79	-39.14	17.81	488,283.3606	682,838.4066	32.341018	-103.741325
9,797.00	15.60	26.06	9,793.56	-29.74	22.71	488,292.7618	682,843.3118	32.341043	-103.741309
9,844.00	20.00	24.06	9,838.30	-16.72	28.77	488,305.7846	682,849.3680	32.341079	-103.741289
9,891.00	24.70	20.46	9,881.76	-0.17	35.48	488,322.3342	682,856.0814	32.341125	-103.741267
9,937.00	30.00	18.36	9,922.60	19.77	42.47	488,342.2681	682,863.0684	32.341179	-103.741244
9,984.00	34.90	16.06	9,962.25	43.86	49.89	488,366.3563	682,870.4939	32.341245	-103.741220
10,031.00	40.00	16.16	9,999.55	71.30	57.82	488,393.8037	682,878.4229	32.341321	-103.741194
10,103.60	48.20	15.27	10,051.65	119.91	71.47	488,442.4049	682,892.0673	32.341454	-103.741149
Tankless Fed Com 2H FTP									
10,124.00	50.50	15.06	10,064.93	134.84	75.51	488,457.3393	682,896.1144	32.341495	-103.741135
10,131.32	51.32	14.83	10,069.55	140.33	76.98	488,462.8287	682,897.5795	32.341510	-103.741130
Hardline Crossing @ 10131.32'MD									
10,171.00	55.80	13.66	10,093.11	171.26	84.82	488,493.7633	682,905.4230	32.341595	-103.741104

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Site:	Sec. 35, T 22 S. , R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,219.00	62.30	13.86	10,117.79	211.23	94.61	488,533.7254	682,915.2116	32.341705	-103.741072
10,266.00	68.70	14.06	10,137.27	252.71	104.93	488,575.2082	682,925.5256	32.341819	-103.741038
10,313.00	72.40	13.76	10,152.91	295.72	115.58	488,618.2191	682,936.1763	32.341937	-103.741003
10,344.00	75.60	13.06	10,161.46	324.70	122.49	488,647.2021	682,943.0849	32.342016	-103.740980
10,375.00	77.80	12.56	10,168.59	354.12	129.17	488,676.6179	682,949.7728	32.342097	-103.740958
10,406.00	80.40	10.76	10,174.45	383.93	135.32	488,706.4269	682,955.9221	32.342179	-103.740937
10,437.00	84.10	8.56	10,178.63	414.20	140.47	488,736.7014	682,961.0726	32.342262	-103.740920
10,499.00	87.30	6.96	10,183.28	475.45	148.82	488,797.9509	682,969.4174	32.342430	-103.740892
10,593.00	89.90	4.86	10,185.58	568.91	158.49	488,891.4099	682,979.0910	32.342687	-103.740859
10,687.00	89.90	4.66	10,185.74	662.59	166.29	488,985.0853	682,986.8913	32.342944	-103.740832
10,780.00	90.10	4.46	10,185.74	755.29	173.69	489,077.7907	682,994.2850	32.343199	-103.740806
10,874.00	87.70	2.56	10,187.54	849.09	179.44	489,171.5857	683,000.0388	32.343457	-103.740786
10,968.00	88.30	2.26	10,190.82	942.95	183.39	489,265.4446	683,003.9890	32.343715	-103.740771
11,063.00	89.60	2.16	10,192.57	1,037.86	187.05	489,360.3557	683,007.6517	32.343976	-103.740758
11,156.00	89.30	359.96	10,193.46	1,130.83	188.77	489,453.3295	683,009.3720	32.344231	-103.740751
11,250.00	90.10	359.66	10,193.95	1,224.83	188.46	489,547.3267	683,009.0603	32.344489	-103.740750
11,343.00	91.30	359.56	10,192.81	1,317.82	187.83	489,640.3157	683,008.4274	32.344745	-103.740750
11,436.00	91.00	358.96	10,190.95	1,410.79	186.63	489,733.2885	683,007.2265	32.345001	-103.740753
11,529.00	92.20	359.16	10,188.35	1,503.74	185.10	489,826.2378	683,005.7014	32.345256	-103.740756
11,622.00	90.20	358.46	10,186.40	1,596.70	183.17	489,919.1919	683,003.7703	32.345512	-103.740760
11,717.00	88.00	357.96	10,187.90	1,691.63	180.20	490,014.1275	683,000.8035	32.345773	-103.740768
11,811.00	88.40	357.96	10,190.85	1,785.52	176.86	490,108.0212	682,997.4591	32.346031	-103.740778
11,905.00	89.80	357.76	10,192.32	1,879.45	173.35	490,201.9414	682,993.9495	32.346289	-103.740787
11,998.00	88.80	358.16	10,193.46	1,972.38	170.04	490,294.8740	682,990.6392	32.346545	-103.740796
12,092.00	89.00	358.46	10,195.27	2,066.32	167.27	490,388.8155	682,987.8675	32.346803	-103.740804
12,186.00	89.20	357.96	10,196.74	2,160.26	164.33	490,482.7575	682,984.9316	32.347061	-103.740811
12,280.00	90.80	358.06	10,196.74	2,254.20	161.07	490,576.6975	682,981.6676	32.347319	-103.740820
12,373.00	89.70	358.46	10,196.34	2,347.16	158.24	490,669.6520	682,978.8438	32.347575	-103.740828
12,467.00	89.90	357.86	10,196.66	2,441.11	155.23	490,763.6023	682,975.8257	32.347833	-103.740836
12,560.00	89.90	359.66	10,196.83	2,534.08	153.21	490,856.5763	682,973.8132	32.348089	-103.740841
12,654.00	90.50	0.96	10,196.50	2,628.08	153.72	490,950.5718	682,974.3218	32.348347	-103.740837
12,747.00	90.90	1.06	10,195.36	2,721.06	155.36	491,043.5500	682,975.9609	32.348603	-103.740830
12,841.00	91.20	0.66	10,193.64	2,815.03	156.77	491,137.5231	682,977.3716	32.348861	-103.740824
12,935.00	91.00	0.16	10,191.84	2,909.01	157.44	491,231.5029	682,978.0441	32.349119	-103.740820
13,028.00	89.30	0.76	10,191.59	3,002.00	158.19	491,324.4955	682,978.7907	32.349375	-103.740816
13,121.00	88.50	0.66	10,193.38	3,094.98	159.34	491,417.4703	682,979.9429	32.349631	-103.740811
13,215.00	89.40	1.26	10,195.10	3,188.95	160.92	491,511.4397	682,981.5176	32.349889	-103.740804
13,309.00	90.00	2.36	10,195.59	3,282.90	163.89	491,605.3895	682,984.4865	32.350147	-103.740793
13,402.00	88.60	1.86	10,196.73	3,375.82	167.31	491,698.3167	682,987.9103	32.350402	-103.740780
13,495.00	88.60	2.16	10,199.00	3,468.74	170.57	491,791.2315	682,991.1712	32.350658	-103.740768
13,589.00	89.70	0.76	10,200.39	3,562.69	172.97	491,885.1866	682,993.5657	32.350916	-103.740758
13,682.00	90.30	0.86	10,200.39	3,655.68	174.28	491,978.1767	682,994.8804	32.351172	-103.740752
13,776.00	88.80	0.86	10,201.13	3,749.67	175.69	492,072.1604	682,996.2912	32.351430	-103.740746
13,870.00	88.10	359.46	10,203.68	3,843.63	175.95	492,166.1225	682,996.5538	32.351688	-103.740744
13,963.00	88.60	0.06	10,206.35	3,936.59	175.56	492,259.0822	682,996.1644	32.351944	-103.740743
14,057.00	88.40	358.86	10,208.81	4,030.55	174.68	492,353.0439	682,995.2789	32.352202	-103.740744
14,151.00	88.90	359.36	10,211.03	4,124.51	173.22	492,447.0057	682,993.8193	32.352460	-103.740747
14,245.00	89.40	0.16	10,212.42	4,218.50	172.83	492,540.9933	682,993.4256	32.352719	-103.740747
14,358.00	88.90	359.26	10,214.10	4,311.49	172.25	492,633.9776	682,992.8538	32.353029	-103.740747
14,452.00	89.70	359.36	10,215.25	4,405.47	171.12	492,727.9628	682,991.7219	32.353288	-103.740749
14,546.00	90.60	0.76	10,215.00	4,499.47	171.22	492,821.9589	682,991.8203	32.353546	-103.740747
14,640.00	89.90	358.76	10,214.59	4,593.46	170.83	492,915.9516	682,991.4266	32.353804	-103.740746
14,734.00	90.30	359.36	10,214.43	4,687.45	169.28	493,009.9380	682,989.8845	32.354063	-103.740750
14,827.00	88.60	358.46	10,215.32	4,781.42	167.52	493,103.9124	682,988.1156	32.354318	-103.740754
14,920.00	88.90	358.86	10,217.35	4,875.37	165.34	493,197.8643	682,985.9413	32.354574	-103.740759

Survey Report - Geographic

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Tankless Federal Com 2H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Site:	Sec. 35, T 22 S. , R 31 E	MD Reference:	KB=26 @ 3472.00ft (Scandril Freedom)
Well:	Tankless Federal Com 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,014.00	89.80	359.36	10,218.42	4,987.36	163.88	493,309.8455	682,984.4814	32.354832	-103.740762
15,108.00	88.50	357.76	10,219.81	5,081.31	161.52	493,403.8002	682,982.1198	32.355091	-103.740768
15,202.00	88.60	357.96	10,222.19	5,175.21	158.01	493,497.7043	682,978.6108	32.355349	-103.740778
15,296.00	89.70	358.46	10,223.58	5,269.16	155.08	493,591.6462	682,975.6751	32.355607	-103.740786
15,391.00	90.80	358.46	10,223.17	5,364.12	152.52	493,686.6093	682,973.1220	32.355868	-103.740792
15,486.00	89.10	358.86	10,223.25	5,459.09	150.30	493,781.5794	682,970.9005	32.356129	-103.740798
15,580.00	89.60	359.86	10,224.32	5,553.08	149.25	493,875.5659	682,969.8507	32.356388	-103.740799
15,673.00	88.50	359.06	10,225.86	5,646.06	148.37	493,968.5466	682,968.9744	32.356643	-103.740801
15,767.00	88.50	359.16	10,228.32	5,740.01	146.92	494,062.5028	682,967.5148	32.356901	-103.740804
15,860.00	89.20	359.46	10,230.19	5,832.99	145.80	494,155.4765	682,966.3951	32.357157	-103.740806
15,953.00	88.80	358.76	10,231.81	5,925.96	144.35	494,248.4502	682,964.9509	32.357413	-103.740809
16,046.00	89.60	359.06	10,233.11	6,018.94	142.58	494,341.4232	682,963.1819	32.357668	-103.740813
16,140.00	88.70	357.46	10,234.50	6,112.88	139.73	494,435.3653	682,960.3283	32.357926	-103.740820
16,233.00	90.10	356.76	10,235.48	6,205.75	135.04	494,528.2389	682,955.6397	32.358182	-103.740834
16,327.00	88.70	358.06	10,236.46	6,299.65	130.79	494,622.1332	682,951.3923	32.358440	-103.740846
16,422.00	89.60	357.96	10,237.87	6,394.58	127.49	494,717.0643	682,948.0938	32.358701	-103.740855
16,515.00	86.50	359.86	10,241.04	6,487.49	125.72	494,809.9778	682,946.3246	32.358956	-103.740859
16,609.00	86.20	0.16	10,247.02	6,581.30	125.74	494,903.7867	682,946.3409	32.359214	-103.740857
16,702.00	88.30	0.66	10,251.48	6,674.19	126.41	494,996.6715	682,947.0059	32.359470	-103.740853
16,796.00	89.00	1.36	10,253.70	6,768.14	128.06	495,090.6295	682,948.6625	32.359728	-103.740846
16,889.00	90.20	1.86	10,254.34	6,861.10	130.68	495,183.5883	682,951.2753	32.359983	-103.740836
16,983.00	90.90	1.86	10,253.44	6,955.05	133.73	495,277.5337	682,954.3262	32.360241	-103.740825
17,077.00	89.80	0.96	10,252.87	7,049.02	136.04	495,371.5009	682,956.6390	32.360500	-103.740815
17,171.00	88.00	0.16	10,254.67	7,142.99	136.96	495,465.4743	682,957.5577	32.360758	-103.740811
17,264.00	88.40	0.06	10,257.59	7,235.94	137.14	495,558.4278	682,957.7362	32.361014	-103.740808
17,358.00	89.80	0.26	10,259.07	7,329.93	137.40	495,652.4133	682,957.9987	32.361272	-103.740806
17,429.07	91.02	359.88	10,258.56	7,400.99	137.48	495,723.4768	682,958.0842	32.361467	-103.740804
Tankless Fed Com 2H LTP									
17,429.50	91.03	359.88	10,258.55	7,401.42	137.48	495,723.9097	682,958.0833	32.361468	-103.740804
Hardline Crossing @ 17429.50'MD									
17,451.00	91.40	359.76	10,258.10	7,422.92	137.42	495,745.4047	682,958.0150	32.361527	-103.740804
17,509.00	92.40	0.06	10,256.17	7,480.89	137.32	495,803.3718	682,957.9239	32.361687	-103.740803
Final MWD Survey @ 17509'MD									
17,557.00	92.40	0.06	10,254.16	7,528.84	137.37	495,851.3296	682,957.9741	32.361819	-103.740802
PTD @ 17557'MD - Tankless Fed Com 2H BHL									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9,657.00	9,655.34	-46.14	12.22	First MWD Survey @ 9657'MD
10,131.32	10,069.55	140.33	76.98	Hardline Crossing @ 10131.32'MD
17,429.50	10,258.55	7,401.42	137.48	Hardline Crossing @ 17429.50'MD
17,509.00	10,256.17	7,480.89	137.32	Final MWD Survey @ 17509'MD
17,557.00	10,254.16	7,528.84	137.37	PTD @ 17557'MD

Checked By: _____ Approved By: _____ Date: _____