



NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 3 2017

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COG Operating L L C

Eddy County, NM (NAD 27 NME)

Sec. 36, T 22 S. , R 31 E

Bultaco State 3H

30-015-43670

Wellbore #1

Survey: IDS MWD Surveys

Survey Report - Geographic

27 October, 2016





Integrity Directional Services, LLC

Survey Report - Geographic



Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 36, T 22 S. , R 31 E
Well: Bultaco State 3H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Bultaco State 3H
TVD Reference: KB=26' @ 3504.70ft (Scandril Freedom)
MD Reference: KB=26' @ 3504.70ft (Scandril Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

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. 36, T 22 S. , R 31 E		
Site Position:		Northing:	488,159.7000 usft
From:	Map	Easting:	687,573.2000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 20' 26.177 N
		Longitude:	103° 43' 33.590 W
		Grid Convergence:	0.32 °

Well	Bultaco State 3H		
Well Position	+N/-S	0.00 ft	Northing: 488,159.7000 usft
	+E/-W	0.00 ft	Easting: 687,573.2000 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 20' 26.177 N
		Longitude:	103° 43' 33.590 W
		Ground Level:	3,478.70 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2015	8/23/2016	7.12	60.16	48,075

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	357.51	

Survey Program	Date 10/27/2016				
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
113.00	15,447.00	IDS MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map		
Depth	(°)	(°)	Depth	(ft)	(ft)	Northing	Easting	Latitude	Longitude
(ft)			(ft)			(usft)	(usft)		
0.00	0.00	0.00	0.00	0.00	0.00	488,159.7000	687,573.2000	32° 20' 26.177 N	103° 43' 33.590 W
113.00	0.80	94.20	113.00	-0.06	0.79	488,159.6423	687,573.9867	32° 20' 26.177 N	103° 43' 33.581 W
First IDS MWD Survey									
143.00	0.40	81.10	142.99	-0.06	1.10	488,159.6431	687,574.2991	32° 20' 26.177 N	103° 43' 33.577 W
232.00	0.40	72.40	231.99	0.09	1.70	488,159.7851	687,574.9021	32° 20' 26.178 N	103° 43' 33.570 W
318.00	0.80	38.80	317.99	0.64	2.36	488,160.3438	687,575.5644	32° 20' 26.184 N	103° 43' 33.562 W
406.00	0.70	39.10	405.98	1.54	3.09	488,161.2397	687,576.2884	32° 20' 26.192 N	103° 43' 33.554 W
493.00	0.80	62.10	492.97	2.24	3.96	488,161.9363	687,577.1603	32° 20' 26.199 N	103° 43' 33.544 W
581.00	0.80	57.70	580.96	2.85	5.02	488,162.5521	687,578.2225	32° 20' 26.205 N	103° 43' 33.531 W
668.00	0.40	71.50	667.96	3.27	5.82	488,162.9730	687,579.0239	32° 20' 26.209 N	103° 43' 33.522 W
716.00	0.80	63.00	715.96	3.48	6.28	488,163.1783	687,579.4814	32° 20' 26.211 N	103° 43' 33.517 W
846.00	0.80	43.50	845.94	4.55	7.71	488,164.2486	687,580.9147	32° 20' 26.222 N	103° 43' 33.500 W



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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
936.00	0.70	40.80	935.94	5.42	8.51	488,165.1205	687,581.7064	32° 20' 26.231 N	103° 43' 33.491 W
1,026.00	0.70	42.30	1,025.93	6.24	9.24	488,165.9433	687,582.4356	32° 20' 26.239 N	103° 43' 33.482 W
1,115.00	0.70	44.10	1,114.92	7.04	9.98	488,166.7358	687,583.1799	32° 20' 26.246 N	103° 43' 33.473 W
1,205.00	1.00	48.70	1,204.91	7.95	10.95	488,167.6490	687,584.1525	32° 20' 26.255 N	103° 43' 33.462 W
1,294.00	0.80	42.20	1,293.90	8.92	11.95	488,168.6218	687,585.1533	32° 20' 26.265 N	103° 43' 33.450 W
1,384.00	1.00	38.50	1,383.89	10.00	12.86	488,169.7019	687,586.0642	32° 20' 26.276 N	103° 43' 33.439 W
1,475.00	0.90	49.90	1,474.88	11.08	13.91	488,170.7837	687,587.1052	32° 20' 26.286 N	103° 43' 33.427 W
1,565.00	0.40	54.80	1,564.87	11.72	14.70	488,171.4201	687,587.9026	32° 20' 26.293 N	103° 43' 33.418 W
1,655.00	0.01	6.50	1,654.87	11.91	14.96	488,171.6090	687,588.1602	32° 20' 26.294 N	103° 43' 33.415 W
1,745.00	0.20	315.70	1,744.87	12.03	14.85	488,171.7292	687,588.0514	32° 20' 26.296 N	103° 43' 33.416 W
1,839.00	0.20	352.80	1,838.87	12.31	14.72	488,172.0094	687,587.9162	32° 20' 26.298 N	103° 43' 33.418 W
1,933.00	0.20	346.70	1,932.87	12.63	14.66	488,172.3318	687,587.8579	32° 20' 26.302 N	103° 43' 33.418 W
2,027.00	0.30	30.80	2,026.87	13.00	14.75	488,172.7028	687,587.9462	32° 20' 26.305 N	103° 43' 33.417 W
2,120.00	0.30	25.20	2,119.87	13.43	14.97	488,173.1323	687,588.1745	32° 20' 26.309 N	103° 43' 33.415 W
2,214.00	0.40	7.60	2,213.87	13.98	15.12	488,173.6802	687,588.3227	32° 20' 26.315 N	103° 43' 33.413 W
2,307.00	0.40	22.30	2,306.86	14.60	15.29	488,174.3023	687,588.4888	32° 20' 26.321 N	103° 43' 33.411 W
2,400.00	0.40	7.90	2,399.86	15.22	15.46	488,174.9242	687,588.6566	32° 20' 26.327 N	103° 43' 33.409 W
2,494.00	0.60	28.90	2,493.86	15.98	15.74	488,175.6801	687,588.9396	32° 20' 26.335 N	103° 43' 33.406 W
2,588.00	0.90	17.60	2,587.85	17.11	16.20	488,176.8147	687,589.4007	32° 20' 26.346 N	103° 43' 33.400 W
2,682.00	1.00	25.50	2,681.84	18.56	16.78	488,178.2587	687,589.9770	32° 20' 26.360 N	103° 43' 33.393 W
2,775.00	0.60	5.30	2,774.83	19.78	17.17	488,179.4760	687,590.3714	32° 20' 26.372 N	103° 43' 33.389 W
2,869.00	0.50	359.90	2,868.82	20.68	17.22	488,180.3763	687,590.4161	32° 20' 26.381 N	103° 43' 33.388 W
2,963.00	0.70	351.10	2,962.82	21.65	17.13	488,181.3537	687,590.3266	32° 20' 26.391 N	103° 43' 33.389 W
3,056.00	0.90	4.20	3,055.81	22.94	17.09	488,182.6434	687,590.2922	32° 20' 26.403 N	103° 43' 33.389 W
3,150.00	0.50	308.00	3,149.80	23.93	16.82	488,183.6321	687,590.0230	32° 20' 26.413 N	103° 43' 33.392 W
3,243.00	0.60	302.40	3,242.80	24.44	16.09	488,184.1429	687,589.2921	32° 20' 26.418 N	103° 43' 33.401 W
3,336.00	0.60	300.70	3,335.79	24.95	15.26	488,184.6524	687,588.4623	32° 20' 26.423 N	103° 43' 33.410 W
3,430.00	0.60	288.70	3,429.79	25.36	14.37	488,185.0615	687,587.5729	32° 20' 26.428 N	103° 43' 33.421 W
3,523.00	0.70	285.30	3,522.78	25.67	13.36	488,185.3675	687,586.5637	32° 20' 26.431 N	103° 43' 33.433 W
3,617.00	0.40	262.80	3,616.78	25.78	12.48	488,185.4779	687,585.6844	32° 20' 26.432 N	103° 43' 33.443 W
3,710.00	0.40	162.30	3,709.78	25.43	12.26	488,185.1279	687,585.4610	32° 20' 26.428 N	103° 43' 33.445 W
3,805.00	1.10	148.20	3,804.77	24.34	12.84	488,184.0370	687,586.0423	32° 20' 26.417 N	103° 43' 33.439 W
3,898.00	1.20	136.90	3,897.75	22.87	13.98	488,182.5673	687,587.1781	32° 20' 26.403 N	103° 43' 33.426 W
3,991.00	1.70	142.20	3,990.72	21.07	15.49	488,180.7662	687,588.6890	32° 20' 26.385 N	103° 43' 33.408 W
4,084.00	1.40	142.60	4,083.69	19.07	17.02	488,178.7737	687,590.2245	32° 20' 26.365 N	103° 43' 33.390 W
4,178.00	1.20	150.10	4,177.66	17.31	18.21	488,177.0082	687,591.4127	32° 20' 26.348 N	103° 43' 33.377 W
4,271.00	1.80	138.80	4,270.63	15.36	19.66	488,175.0650	687,592.8602	32° 20' 26.328 N	103° 43' 33.360 W
4,364.00	1.40	141.40	4,363.59	13.38	21.33	488,173.0781	687,594.5311	32° 20' 26.309 N	103° 43' 33.341 W
4,458.00	0.10	87.30	4,457.58	12.48	22.13	488,172.1845	687,595.3294	32° 20' 26.300 N	103° 43' 33.331 W
4,620.00	0.40	329.40	4,619.58	12.98	21.98	488,172.6779	687,595.1828	32° 20' 26.305 N	103° 43' 33.333 W
4,714.00	0.20	347.70	4,713.58	13.42	21.78	488,173.1206	687,594.9808	32° 20' 26.309 N	103° 43' 33.335 W
4,807.00	0.30	326.90	4,806.58	13.78	21.61	488,173.4832	687,594.8133	32° 20' 26.313 N	103° 43' 33.337 W
4,902.00	0.40	329.00	4,901.58	14.28	21.31	488,173.9758	687,594.5067	32° 20' 26.317 N	103° 43' 33.341 W
4,996.00	0.40	344.20	4,995.58	14.87	21.05	488,174.5727	687,594.2483	32° 20' 26.323 N	103° 43' 33.344 W
5,089.00	0.40	336.40	5,088.57	15.48	20.83	488,175.1826	687,594.0300	32° 20' 26.329 N	103° 43' 33.346 W
5,182.00	0.50	330.20	5,181.57	16.13	20.50	488,175.8322	687,593.6984	32° 20' 26.336 N	103° 43' 33.350 W
5,276.00	0.40	340.00	5,275.57	16.80	20.18	488,176.4964	687,593.3823	32° 20' 26.342 N	103° 43' 33.354 W
5,371.00	0.50	335.60	5,370.57	17.49	19.90	488,177.1855	687,593.0977	32° 20' 26.349 N	103° 43' 33.357 W
5,464.00	0.50	330.50	5,463.56	18.21	19.53	488,177.9082	687,592.7302	32° 20' 26.356 N	103° 43' 33.361 W
5,557.00	0.50	315.60	5,556.56	18.85	19.05	488,178.5513	687,592.2465	32° 20' 26.363 N	103° 43' 33.367 W
5,650.00	0.40	315.90	5,649.56	19.37	18.54	488,179.0744	687,591.7367	32° 20' 26.368 N	103° 43' 33.373 W
5,744.00	0.50	317.70	5,743.55	19.91	18.03	488,179.6134	687,591.2323	32° 20' 26.373 N	103° 43' 33.379 W
5,838.00	0.40	327.50	5,837.55	20.49	17.58	488,180.1935	687,590.7800	32° 20' 26.379 N	103° 43' 33.384 W
5,932.00	0.40	326.60	5,931.55	21.04	17.22	488,180.7441	687,590.4230	32° 20' 26.385 N	103° 43' 33.388 W
6,025.00	0.40	311.50	6,024.55	21.53	16.80	488,181.2302	687,590.0012	32° 20' 26.389 N	103° 43' 33.393 W



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Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,119.00	0.40	316.70	6,118.54	21.99	16.33	488,181.6864	687,589.5304	32° 20' 26.394 N	103° 43' 33.398 W
6,212.00	0.40	325.70	6,211.54	22.49	15.92	488,182.1909	687,589.1248	32° 20' 26.399 N	103° 43' 33.403 W
6,306.00	0.50	321.00	6,305.54	23.08	15.48	488,182.7807	687,588.6818	32° 20' 26.405 N	103° 43' 33.408 W
6,399.00	0.50	311.70	6,398.53	23.67	14.92	488,183.3660	687,588.1235	32° 20' 26.411 N	103° 43' 33.415 W
6,493.00	0.40	329.10	6,492.53	24.22	14.45	488,183.9204	687,587.6488	32° 20' 26.416 N	103° 43' 33.420 W
6,587.00	0.40	327.20	6,586.53	24.78	14.10	488,184.4777	687,587.3025	32° 20' 26.422 N	103° 43' 33.424 W
6,680.00	0.30	300.40	6,679.53	25.17	13.72	488,184.8738	687,586.9167	32° 20' 26.426 N	103° 43' 33.428 W
6,774.00	0.40	301.60	6,773.53	25.47	13.22	488,185.1703	687,586.4249	32° 20' 26.429 N	103° 43' 33.434 W
6,867.00	0.40	294.00	6,866.52	25.77	12.65	488,185.4724	687,585.8519	32° 20' 26.432 N	103° 43' 33.441 W
6,961.00	0.50	286.60	6,960.52	26.02	11.96	488,185.7230	687,585.1591	32° 20' 26.434 N	103° 43' 33.449 W
7,055.00	0.50	274.80	7,054.52	26.17	11.16	488,185.8745	687,584.3573	32° 20' 26.436 N	103° 43' 33.458 W
7,148.00	0.80	274.00	7,147.51	26.25	10.11	488,185.9538	687,583.3053	32° 20' 26.437 N	103° 43' 33.471 W
7,241.00	0.90	263.50	7,240.50	26.22	8.73	488,185.9164	687,581.9319	32° 20' 26.436 N	103° 43' 33.487 W
7,335.00	0.90	261.40	7,334.49	26.02	7.27	488,185.7224	687,580.4685	32° 20' 26.434 N	103° 43' 33.504 W
7,428.00	1.10	262.60	7,427.47	25.80	5.66	488,185.4982	687,578.8611	32° 20' 26.432 N	103° 43' 33.522 W
7,522.00	1.10	265.60	7,521.46	25.61	3.87	488,185.3128	687,577.0667	32° 20' 26.431 N	103° 43' 33.543 W
7,616.00	1.20	260.00	7,615.44	25.37	2.00	488,185.0726	687,575.1977	32° 20' 26.428 N	103° 43' 33.565 W
7,709.00	1.30	250.50	7,708.42	24.85	0.04	488,184.5514	687,573.2443	32° 20' 26.423 N	103° 43' 33.588 W
7,802.00	1.20	245.80	7,801.39	24.10	-1.84	488,183.8000	687,571.3616	32° 20' 26.416 N	103° 43' 33.610 W
7,896.00	1.20	238.20	7,895.37	23.18	-3.57	488,182.8779	687,569.6272	32° 20' 26.407 N	103° 43' 33.630 W
7,988.00	1.40	237.40	7,987.35	22.06	-5.34	488,181.7647	687,567.8617	32° 20' 26.396 N	103° 43' 33.651 W
8,082.00	0.70	172.00	8,081.34	20.88	-6.23	488,180.5774	687,566.9742	32° 20' 26.384 N	103° 43' 33.661 W
8,175.00	0.70	178.80	8,174.33	19.75	-6.13	488,179.4469	687,567.0651	32° 20' 26.373 N	103° 43' 33.660 W
8,268.00	0.80	171.40	8,267.32	18.54	-6.03	488,178.2369	687,567.1741	32° 20' 26.361 N	103° 43' 33.659 W
8,362.00	1.00	172.60	8,361.31	17.07	-5.82	488,176.7747	687,567.3779	32° 20' 26.347 N	103° 43' 33.657 W
8,455.00	0.90	177.00	8,454.30	15.54	-5.68	488,175.2405	687,567.5206	32° 20' 26.331 N	103° 43' 33.655 W
8,548.00	1.10	174.40	8,547.28	13.92	-5.55	488,173.6227	687,567.6460	32° 20' 26.315 N	103° 43' 33.654 W
8,641.00	1.00	185.90	8,640.27	12.23	-5.55	488,171.9270	687,567.6496	32° 20' 26.299 N	103° 43' 33.654 W
8,735.00	0.90	194.40	8,734.25	10.70	-5.82	488,170.3961	687,567.3817	32° 20' 26.284 N	103° 43' 33.657 W
8,829.00	0.60	232.70	8,828.25	9.68	-6.39	488,169.3828	687,566.8066	32° 20' 26.274 N	103° 43' 33.664 W
8,923.00	0.50	306.00	8,922.24	9.63	-7.12	488,169.3256	687,566.0833	32° 20' 26.273 N	103° 43' 33.672 W
9,016.00	0.60	291.70	9,015.24	10.04	-7.90	488,169.7442	687,565.3026	32° 20' 26.277 N	103° 43' 33.681 W
9,110.00	1.10	160.10	9,109.23	9.38	-8.05	488,169.0777	687,565.1524	32° 20' 26.271 N	103° 43' 33.683 W
9,203.00	1.20	189.30	9,202.22	7.58	-7.90	488,167.2773	687,565.2989	32° 20' 26.253 N	103° 43' 33.682 W
9,296.00	1.00	193.00	9,295.20	5.83	-8.24	488,165.5255	687,564.9589	32° 20' 26.235 N	103° 43' 33.686 W
9,389.00	0.80	188.70	9,388.19	4.39	-8.52	488,164.0930	687,564.6782	32° 20' 26.221 N	103° 43' 33.689 W
9,483.00	1.20	188.70	9,482.17	2.77	-8.77	488,162.4714	687,564.4300	32° 20' 26.205 N	103° 43' 33.692 W
9,576.00	1.10	94.30	9,575.16	1.74	-8.03	488,161.4417	687,565.1730	32° 20' 26.195 N	103° 43' 33.683 W
9,670.00	1.00	96.40	9,669.15	1.58	-6.31	488,161.2827	687,566.8878	32° 20' 26.193 N	103° 43' 33.663 W
9,763.00	1.10	95.00	9,762.13	1.41	-4.62	488,161.1144	687,568.5836	32° 20' 26.192 N	103° 43' 33.644 W
9,857.00	0.90	97.60	9,856.12	1.24	-2.99	488,160.9381	687,570.2142	32° 20' 26.190 N	103° 43' 33.625 W
9,912.00	0.40	146.10	9,911.11	1.02	-2.45	488,160.7216	687,570.7494	32° 20' 26.188 N	103° 43' 33.619 W
9,960.00	0.70	0.90	9,959.11	1.18	-2.35	488,160.8757	687,570.8475	32° 20' 26.189 N	103° 43' 33.617 W
10,006.00	7.70	356.20	10,004.96	4.54	-2.55	488,164.2358	687,570.6474	32° 20' 26.222 N	103° 43' 33.619 W
10,053.00	13.60	9.10	10,051.13	13.14	-1.89	488,172.8426	687,571.3134	32° 20' 26.308 N	103° 43' 33.611 W
10,100.00	19.60	9.30	10,096.16	26.39	0.26	488,186.0904	687,573.4632	32° 20' 26.438 N	103° 43' 33.585 W
10,147.00	25.70	4.20	10,139.51	44.35	2.29	488,204.0522	687,575.4857	32° 20' 26.616 N	103° 43' 33.560 W
10,193.00	31.40	2.50	10,179.90	66.29	3.54	488,225.9898	687,576.7399	32° 20' 26.833 N	103° 43' 33.544 W
10,240.00	37.60	0.90	10,218.62	92.89	4.30	488,252.5850	687,577.4999	32° 20' 27.096 N	103° 43' 33.534 W
10,288.00	42.80	1.10	10,255.27	123.85	4.84	488,283.5515	687,578.0434	32° 20' 27.403 N	103° 43' 33.525 W
10,335.00	47.40	0.50	10,288.44	157.13	5.30	488,316.8310	687,578.5011	32° 20' 27.732 N	103° 43' 33.518 W
10,382.00	49.30	0.20	10,319.67	192.25	5.51	488,351.9478	687,578.7143	32° 20' 28.079 N	103° 43' 33.513 W
10,429.00	54.00	358.00	10,348.83	229.09	4.91	488,388.7876	687,578.1126	32° 20' 28.444 N	103° 43' 33.518 W
10,476.00	57.50	356.70	10,375.28	267.89	3.11	488,427.5879	687,576.3075	32° 20' 28.828 N	103° 43' 33.536 W
10,523.00	58.10	356.90	10,400.32	307.60	0.89	488,467.2966	687,574.0877	32° 20' 29.221 N	103° 43' 33.559 W



Integrity Directional Services, LLC

Survey Report - Geographic



Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 36, T 22 S., R 31 E
Well: Bultaco State 3H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Bultaco State 3H
TVD Reference: KB=26' @ 3504.70ft (Scandril Freedom)
MD Reference: KB=26' @ 3504.70ft (Scandril Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,543.24	60.68	357.17	10,410.63	324.99	-0.01	488,484.6917	687,573.1868	32° 20' 29.393 N	103° 43' 33.569 W
South 330' Crossing Point									
10,570.00	64.10	357.50	10,423.02	348.68	-1.12	488,508.3755	687,572.0848	32° 20' 29.628 N	103° 43' 33.580 W
10,617.00	70.70	356.80	10,441.08	391.99	-3.28	488,551.6880	687,569.9223	32° 20' 30.057 N	103° 43' 33.602 W
10,663.00	78.80	356.30	10,453.17	436.25	-5.95	488,595.9505	687,567.2501	32° 20' 30.495 N	103° 43' 33.631 W
10,695.00	80.90	356.60	10,458.80	467.69	-7.90	488,627.3874	687,565.3000	32° 20' 30.806 N	103° 43' 33.651 W
10,724.00	85.00	357.00	10,462.36	496.42	-9.51	488,656.1170	687,563.6943	32° 20' 31.090 N	103° 43' 33.668 W
10,755.00	87.90	357.30	10,464.28	527.32	-11.04	488,687.0159	687,562.1561	32° 20' 31.396 N	103° 43' 33.684 W
10,787.00	90.00	357.70	10,464.87	559.28	-12.44	488,718.9781	687,560.7607	32° 20' 31.712 N	103° 43' 33.698 W
10,850.00	92.00	358.30	10,463.77	622.23	-14.64	488,781.9265	687,558.5624	32° 20' 32.336 N	103° 43' 33.720 W
10,943.00	89.20	357.40	10,462.80	715.15	-18.13	488,874.8455	687,555.0738	32° 20' 33.255 N	103° 43' 33.754 W
11,036.00	89.80	357.20	10,463.61	808.04	-22.51	488,967.7381	687,550.6931	32° 20' 34.175 N	103° 43' 33.799 W
11,130.00	90.40	357.00	10,463.44	901.92	-27.26	489,061.6169	687,545.9374	32° 20' 35.104 N	103° 43' 33.848 W
11,223.00	91.30	357.40	10,462.06	994.80	-31.81	489,154.4943	687,541.3949	32° 20' 36.023 N	103° 43' 33.895 W
11,316.00	92.20	358.00	10,459.22	1,087.68	-35.54	489,247.3745	687,537.6643	32° 20' 36.943 N	103° 43' 33.932 W
11,410.00	90.00	358.30	10,457.42	1,181.60	-38.57	489,341.3021	687,534.6306	32° 20' 37.872 N	103° 43' 33.961 W
11,503.00	88.00	357.90	10,459.04	1,274.53	-41.65	489,434.2317	687,531.5479	32° 20' 38.792 N	103° 43' 33.991 W
11,597.00	89.10	359.20	10,461.42	1,368.47	-44.03	489,528.1679	687,529.1704	32° 20' 39.722 N	103° 43' 34.013 W
11,690.00	88.60	0.00	10,463.29	1,461.45	-44.68	489,621.1457	687,528.5212	32° 20' 40.642 N	103° 43' 34.014 W
11,784.00	89.10	356.40	10,465.17	1,555.37	-47.63	489,715.0644	687,525.5694	32° 20' 41.571 N	103° 43' 34.042 W
11,877.00	89.90	357.00	10,465.99	1,648.21	-52.98	489,807.9053	687,520.2163	32° 20' 42.490 N	103° 43' 34.099 W
11,971.00	90.90	357.60	10,465.33	1,742.10	-57.41	489,901.7968	687,515.7884	32° 20' 43.420 N	103° 43' 34.144 W
12,065.00	92.10	358.50	10,462.87	1,836.01	-60.61	489,995.7073	687,512.5908	32° 20' 44.349 N	103° 43' 34.175 W
12,159.00	90.40	357.00	10,460.82	1,929.91	-64.30	490,089.6062	687,508.9012	32° 20' 45.279 N	103° 43' 34.212 W
12,252.00	91.10	357.70	10,459.60	2,022.80	-68.60	490,182.4974	687,504.6017	32° 20' 46.198 N	103° 43' 34.256 W
12,346.00	89.20	356.20	10,459.36	2,116.66	-73.60	490,276.3568	687,499.6006	32° 20' 47.127 N	103° 43' 34.308 W
12,439.00	89.90	356.70	10,460.09	2,209.48	-79.36	490,369.1744	687,493.8423	32° 20' 48.046 N	103° 43' 34.369 W
12,532.00	90.80	357.70	10,459.52	2,302.36	-83.90	490,462.0593	687,489.2994	32° 20' 48.965 N	103° 43' 34.416 W
12,626.00	89.20	355.90	10,459.52	2,396.21	-89.15	490,555.9057	687,484.0526	32° 20' 49.894 N	103° 43' 34.471 W
12,720.00	89.30	356.90	10,460.75	2,490.02	-95.05	490,649.7108	687,478.1509	32° 20' 50.823 N	103° 43' 34.533 W
12,814.00	90.10	358.40	10,461.24	2,583.93	-98.90	490,743.6268	687,474.2968	32° 20' 51.753 N	103° 43' 34.572 W
12,908.00	91.10	358.90	10,460.26	2,677.90	-101.12	490,837.5939	687,472.0823	32° 20' 52.682 N	103° 43' 34.592 W
13,001.00	91.50	357.40	10,458.15	2,770.82	-104.12	490,930.5184	687,469.0810	32° 20' 53.602 N	103° 43' 34.621 W
13,095.00	92.20	358.10	10,455.11	2,864.70	-107.81	491,024.3957	687,465.3924	32° 20' 54.531 N	103° 43' 34.657 W
13,188.00	90.30	358.40	10,453.08	2,957.63	-110.65	491,117.3256	687,462.5532	32° 20' 55.451 N	103° 43' 34.684 W
13,281.00	90.70	359.10	10,452.27	3,050.61	-112.68	491,210.2990	687,460.5245	32° 20' 56.371 N	103° 43' 34.702 W
13,375.00	89.80	358.20	10,451.86	3,144.58	-114.89	491,304.2699	687,458.3099	32° 20' 57.301 N	103° 43' 34.721 W
13,469.00	88.70	355.90	10,453.09	3,238.44	-119.73	491,398.1294	687,453.4733	32° 20' 58.230 N	103° 43' 34.772 W
13,562.00	89.30	356.70	10,454.71	3,331.23	-125.73	491,490.9200	687,447.4729	32° 20' 59.149 N	103° 43' 34.835 W
13,656.00	90.00	354.80	10,455.29	3,424.96	-132.69	491,584.6547	687,440.5071	32° 21' 0.077 N	103° 43' 34.910 W
13,749.00	91.20	355.50	10,454.31	3,517.62	-140.56	491,677.3142	687,432.6448	32° 21' 0.994 N	103° 43' 34.996 W
13,843.00	92.00	356.10	10,451.69	3,611.33	-147.44	491,771.0238	687,425.7631	32° 21' 1.922 N	103° 43' 35.070 W
13,936.00	89.90	355.50	10,450.15	3,704.06	-154.25	491,863.7555	687,418.9532	32° 21' 2.840 N	103° 43' 35.143 W
14,031.00	90.20	356.60	10,450.07	3,798.84	-160.79	491,958.5280	687,412.4091	32° 21' 3.778 N	103° 43' 35.213 W
14,124.00	90.80	357.30	10,449.25	3,891.70	-165.74	492,051.3916	687,407.4611	32° 21' 4.697 N	103° 43' 35.265 W
14,218.00	89.80	356.90	10,448.76	3,985.58	-170.49	492,145.2684	687,402.7055	32° 21' 5.627 N	103° 43' 35.314 W
14,311.00	90.20	357.50	10,448.76	4,078.46	-175.04	492,238.1565	687,398.1625	32° 21' 6.546 N	103° 43' 35.361 W
14,405.00	90.80	358.60	10,447.94	4,172.40	-178.24	492,332.0965	687,394.9641	32° 21' 7.476 N	103° 43' 35.392 W
14,499.00	91.50	358.90	10,446.05	4,266.36	-180.29	492,426.0543	687,392.9139	32° 21' 8.406 N	103° 43' 35.410 W
14,592.00	89.90	358.60	10,444.92	4,359.33	-182.32	492,519.0219	687,390.8853	32° 21' 9.326 N	103° 43' 35.427 W
14,686.00	88.10	358.00	10,446.56	4,453.27	-185.10	492,612.9617	687,388.0973	32° 21' 10.256 N	103° 43' 35.453 W
14,779.00	88.20	358.50	10,449.56	4,546.18	-187.94	492,705.8694	687,385.2587	32° 21' 11.175 N	103° 43' 35.480 W
14,872.00	89.70	357.10	10,451.27	4,639.09	-191.51	492,798.7801	687,381.6892	32° 21' 12.095 N	103° 43' 35.516 W
14,967.00	90.00	357.50	10,451.51	4,733.98	-195.99	492,893.6737	687,377.2141	32° 21' 13.034 N	103° 43' 35.562 W
15,061.00	90.70	357.40	10,450.94	4,827.89	-200.17	492,987.5781	687,373.0321	32° 21' 13.963 N	103° 43' 35.604 W



Integrity Directional Services, LLC
Survey Report - Geographic



Company: COG Operating L L C
Project: Eddy County, NM (NAD 27 NME)
Site: Sec. 36, T 22 S., R 31 E
Well: Bultaco State 3H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Bultaco State 3H
TVD Reference: KB=26' @ 3504.70ft (Scandill Freedom)
MD Reference: KB=26' @ 3504.70ft (Scandill Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,154.00	91.40	357.80	10,449.24	4,920.79	-204.06	493,080.4800	687,369.1383	32° 21' 14.883 N	103° 43' 35.644 W
15,166.67	91.48	357.79	10,448.92	4,933.45	-204.55	493,093.1366	687,368.6506	32° 21' 15.008 N	103° 43' 35.648 W
North 330' Crossing Point									
15,247.00	92.00	357.70	10,446.48	5,013.68	-207.71	493,173.3668	687,365.4888	32° 21' 15.802 N	103° 43' 35.680 W
15,342.00	92.80	358.00	10,442.50	5,108.53	-211.27	493,268.2155	687,361.9279	32° 21' 16.741 N	103° 43' 35.715 W
Final IDS MWD Survey									
15,447.00	92.80	358.00	10,437.37	5,213.34	-214.93	493,373.0261	687,358.2678	32° 21' 17.779 N	103° 43' 35.751 W
Projection to TD									

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
113.00	113.00	-0.06	0.79	First IDS MWD Survey
10,543.24	10,410.63	324.99	-0.01	South 330' Crossing Point
15,166.67	10,448.92	4,933.45	-204.55	North 330' Crossing Point
15,342.00	10,442.50	5,108.53	-211.27	Final IDS MWD Survey
15,447.00	10,437.37	5,213.34	-214.93	Projection to TD

Checked By: _____ Approved By: _____ Date: _____