



HOBBS OCD

JUL 09 2015

RECEIVED

PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

February 23, 2015

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

RE: Sebastian Federal Com 1H
190' FNL & 660' FWL
Sec. 18, T24S, R34E
Lea County, New Mexico

Dear Sir,

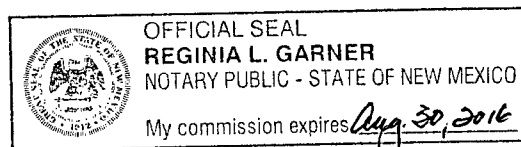
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Eddie C. LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 23rd day of February, 2015.

Notary Public

JUL 14 2015

Sebastian Fed Com 1H

Date	Depth	Deviation	Direction	TVD	Horiz Disp
2/1/2015	249	0.40	0.00	0.00	0.00
2/2/2015	485	0.20	0.00	0.00	0.00
2/2/2015	724	0.20	0.00	0.00	0.00
2/2/2015	975	0.40	0.00	0.00	0.00
2/2/2015	1345	0.60	0.00	0.00	0.00
2/4/2015	1458	0.90	0.00	0.00	0.00
2/4/2015	1743	0.90	321.20	0.00	0.00
2/4/2015	2027	0.70	0.00	0.00	0.00
2/4/2015	2312	0.70	318.40	0.00	0.00
2/5/2015	2596	0.70	299.10	0.00	0.00
2/5/2015	2881	0.70	298.70	0.00	0.00
2/5/2015	3166	1.10	356.70	0.00	0.00
2/5/2015	3450	0.70	0.00	0.00	0.00
2/5/2015	3734	0.70	0.00	0.00	0.00
2/5/2015	4019	0.40	0.00	0.00	0.00
2/5/2015	4304	0.90	0.00	0.00	0.00
2/6/2015	4588	2.50	0.00	0.00	0.00
2/6/2015	4873	3.00	0.00	0.00	0.00
2/6/2015	5167	1.60	0.00	0.00	0.00
2/8/2015	5450	1.40	0.00	0.00	0.00
2/8/2015	5776	0.90	0.00	0.00	0.00
2/8/2015	6092	0.20	0.00	0.00	0.00
2/8/2015	6409	0.80	0.00	0.00	0.00
2/8/2015	6725	0.50	0.00	0.00	0.00
2/9/2015	7042	0.80	0.00	0.00	0.00
2/9/2015	7359	1.50	0.00	0.00	0.00
2/9/2015	7580	2.20	0.00	0.00	0.00
2/9/2015	7896	0.50	0.00	0.00	0.00
2/9/2015	8213	0.40	0.00	0.00	0.00
2/10/2015	8530	0.30	0.00	0.00	0.00
2/10/2015	8815	1.20	0.00	0.00	0.00
2/10/2015	9133	1.50	0.00	0.00	0.00
2/11/2015	9353	1.30	0.00	0.00	0.00
2/11/2015	9606	1.50	0.00	0.00	0.00
2/12/2015	9888	2.40	0.00	0.00	0.00
2/14/2015	10307	0.90	51.80	0.00	0.00
2/14/2015	10339	1.30	146.20	0.00	0.00
2/14/2015	10371	3.60	169.20	0.00	0.00
2/14/2015	10402	6.80	177.90	0.00	0.00
2/14/2015	10465	14.40	184.80	10461.00	25.04
2/14/2015	10497	18.20	138.80	10492.00	16.09
2/14/2015	10529	21.80	182.70	0.00	0.00
2/14/2015	10561	25.50	181.10	0.00	0.00

Date	Depth	Deviation	Direction	TVD	Horiz Disp
2/15/2015	10593	29.10	180.50	0.00	0.00
2/15/2015	10624	32.60	181.00	0.00	0.00
2/15/2015	10687	38.60	180.60	0.00	0.00
2/15/2015	10721	42.10	180.20	0.00	0.00
2/15/2015	10753	45.80	181.40	0.00	0.00
2/16/2015	10816	53.50	184.60	0.00	0.00
2/16/2015	10847	49.30	183.40	0.00	0.00
2/16/2015	10879	62.20	185.50	0.00	0.00
2/16/2015	10910	69.00	184.50	0.00	0.00
2/17/2015	11069	80.90	179.90	0.00	0.00
2/17/2015	11100	82.60	179.50	0.00	0.00
2/17/2015	11132	84.60	179.70	0.00	0.00
2/17/2015	11164	85.90	179.40	0.00	0.00
2/17/2015	11195	86.50	179.00	0.00	0.00
2/17/2015	11227	88.30	179.20	0.00	0.00
2/17/2015	11290	89.70	178.90	0.00	0.00
2/17/2015	11385	89.20	178.90	0.00	0.00
2/17/2015	11480	88.70	178.70	0.00	0.00
2/17/2015	11575	88.60	178.60	0.00	0.00
2/17/2015	11670	88.50	180.20	0.00	0.00
2/17/2015	11764	88.80	179.10	0.00	0.00
2/17/2015	11860	87.70	179.40	0.00	0.00
2/17/2015	11954	88.90	179.40	0.00	0.00
2/17/2015	12049	88.20	179.80	0.00	0.00
2/17/2015	12144	89.40	173.30	0.00	0.00
2/17/2015	12239	88.70	180.00	0.00	0.00
2/17/2015	12334	87.90	179.40	0.00	0.00
2/18/2015	12523	89.00	179.50	0.00	0.00
2/18/2015	12617	87.70	179.80	0.00	0.00
2/18/2015	12714	86.70	180.80	0.00	0.00
2/18/2015	12809	87.70	181.10	0.00	0.00
2/18/2015	12904	88.70	181.00	0.00	0.00
2/18/2015	12999	89.40	180.60	0.00	0.00
2/18/2015	13094	89.20	179.40	0.00	0.00
2/18/2015	13198	89.50	178.60	0.00	0.00
2/18/2015	13283	88.40	178.40	0.00	0.00
2/18/2015	13378	88.30	179.20	0.00	0.00
2/18/2015	13569	88.60	179.60	0.00	0.00
2/18/2015	13664	88.70	179.60	0.00	0.00
2/18/2015	13759	88.40	179.50	0.00	0.00
2/18/2015	13854	87.60	180.90	0.00	0.00
2/18/2015	13948	88.30	180.70	0.00	0.00
2/19/2015	14043	88.60	180.70	0.00	0.00
2/19/2015	14138	89.20	181.90	0.00	0.00
2/19/2015	14233	90.40	182.20	0.00	0.00

Date	Depth	Deviation	Direction	TVD	Horiz Disp
2/19/2015	14327	89.50	181.70	0.00	0.00
2/19/2015	14422	90.10	181.70	0.00	0.00
2/19/2015	14491	87.70	179.50	0.00	0.00
2/19/2015	14517	89.50	181.40	0.00	0.00
2/19/2015	14612	89.00	181.00	0.00	0.00
2/19/2015	14707	88.00	181.10	0.00	0.00
2/19/2015	14802	87.70	180.90	0.00	0.00
2/19/2015	14897	88.60	180.20	0.00	0.00
2/19/2015	15086	88.10	179.30	0.00	0.00
2/19/2015	15182	88.80	178.50	0.00	0.00
2/19/2015	15277	88.80	178.60	0.00	0.00



March 2, 2015

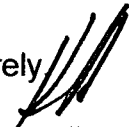
Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Sebastian Federal Com 1H**

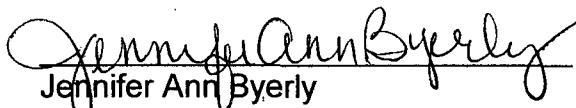
Please find enclosed a copy of the survey from 0' to 10,181' ran on the above referenced well.

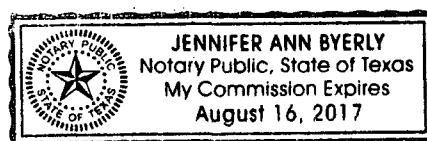
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 2 day of March
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Sebastian Federal Com/1H

Rig Name: Silveroak 12
State/County: New Mexico / Lea
Latitude: 32.22, Longitude: -103.51
GRID North is 0.44 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB= 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 3/2/2015 / 16:50

VES Survey International
West Texas
(432) 563-5444
Surveyor: Andy Askew
Sebastian Federal Com 1H / API 30-025-41687

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
91.00	0.27	99.80	91.00	-0.04	0.21	-0.04	0.21	99.80	0.30
191.00	0.04	207.69	191.00	-0.11	0.43	-0.11	0.44	104.02	0.28
291.00	0.21	131.75	291.00	-0.26	0.54	-0.26	0.60	115.20	0.20
391.00	0.11	38.04	391.00	-0.30	0.74	-0.30	0.80	112.32	0.24
491.00	0.08	205.13	491.00	-0.29	0.76	-0.29	0.82	110.89	0.19
591.00	0.13	154.78	591.00	-0.45	0.78	-0.45	0.90	120.21	0.10
691.00	0.16	65.41	691.00	-0.50	0.95	-0.50	1.08	117.57	0.20
791.00	0.20	321.44	791.00	-0.30	0.97	-0.30	1.02	107.37	0.28
891.00	0.08	159.73	891.00	-0.23	0.89	-0.23	0.92	104.84	0.28
991.00	0.16	344.22	991.00	-0.17	0.87	-0.17	0.89	100.94	0.24
1091.00	0.18	160.22	1091.00	-0.18	0.89	-0.18	0.91	101.72	0.34
1191.00	0.26	301.02	1191.00	-0.22	0.75	-0.22	0.78	106.13	0.42
1291.00	0.83	282.12	1290.99	0.06	-0.16	0.06	0.17	289.18	0.58
1391.00	0.85	291.70	1390.98	0.48	-1.56	0.48	1.63	287.21	0.14
1491.00	0.75	311.10	1490.97	1.19	-2.74	1.19	2.99	293.41	0.29
1591.00	0.95	301.61	1590.96	2.05	-3.93	2.05	4.44	297.50	0.24
1691.00	1.05	310.14	1690.95	3.07	-5.34	3.07	6.16	299.92	0.18
1791.00	1.14	308.05	1790.93	4.28	-6.83	4.28	8.06	302.08	0.10
1891.00	1.32	316.37	1890.90	5.73	-8.41	5.73	10.17	304.27	0.25

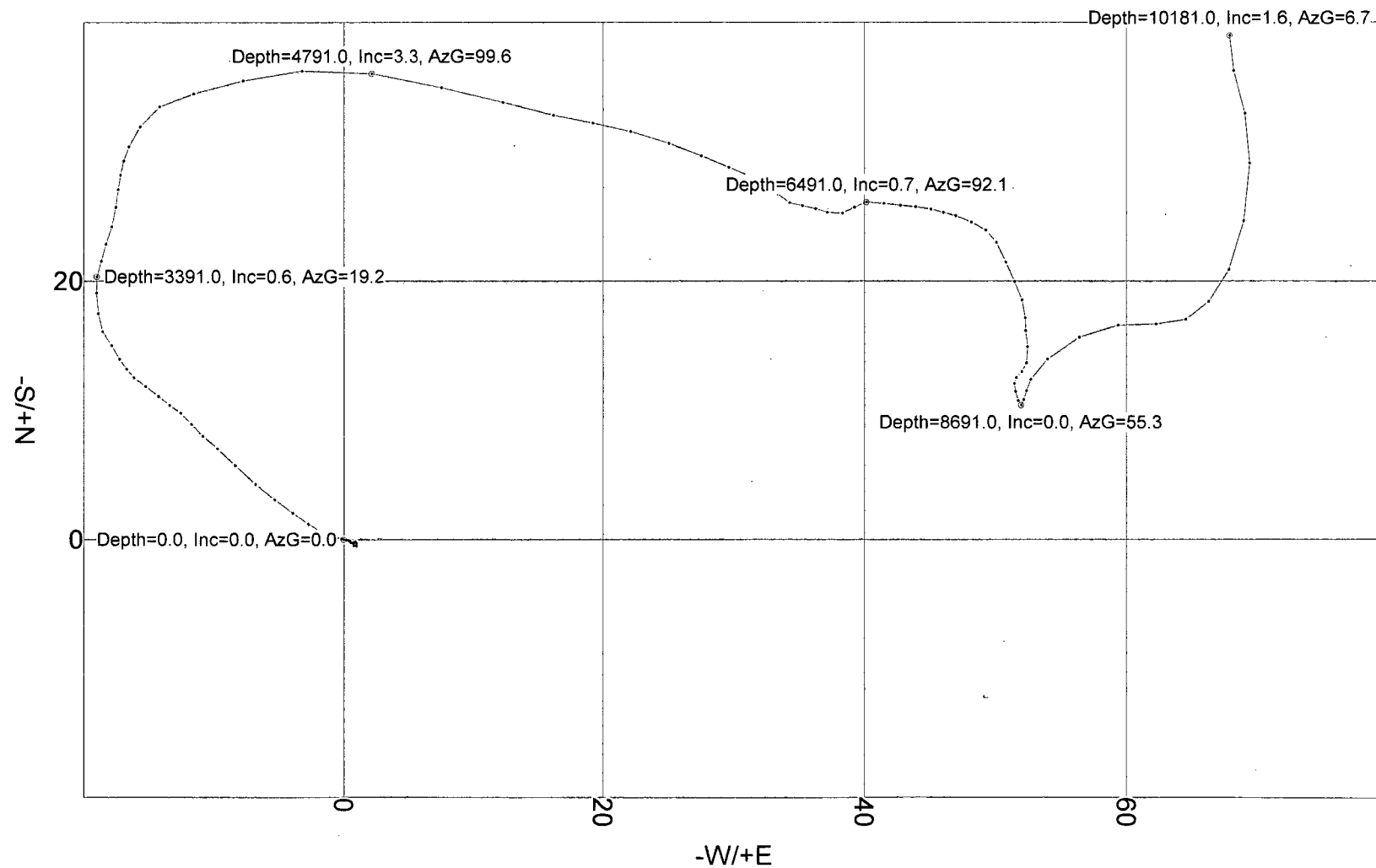
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1991.00	0.84	309.69	1990.89	7.03	-9.76	7.03	12.03	305.74	0.50
2091.00	0.85	311.91	2090.88	7.99	-10.88	7.99	13.50	306.30	0.04
2191.00	0.63	322.12	2190.87	8.92	-11.77	8.92	14.77	307.16	0.25
2291.00	0.72	311.95	2290.86	9.78	-12.58	9.78	15.94	307.87	0.15
2391.00	0.50	296.14	2390.85	10.40	-13.45	10.40	17.00	307.72	0.27
2491.00	0.74	318.30	2490.85	11.07	-14.27	11.07	18.06	307.81	0.33
2591.00	0.74	296.52	2590.84	11.84	-15.28	11.84	19.33	307.79	0.28
2691.00	0.59	320.23	2690.83	12.53	-16.18	12.53	20.46	307.74	0.31
2791.00	0.40	318.79	2790.83	13.18	-16.74	13.18	21.30	308.22	0.19
2891.00	0.68	328.46	2890.83	13.95	-17.28	13.95	22.20	308.91	0.30
2991.00	0.72	330.86	2990.82	15.01	-17.89	15.01	23.35	309.98	0.05
3091.00	0.73	325.63	3090.81	16.08	-18.56	16.08	24.56	310.91	0.07
3191.00	0.99	1.81	3190.80	17.47	-18.90	17.47	25.74	312.76	0.59
3291.00	0.87	348.53	3290.79	19.08	-19.02	19.08	26.94	315.09	0.24
3391.00	0.63	19.21	3390.78	20.34	-18.99	20.34	27.83	316.97	0.46
3491.00	0.81	11.90	3490.77	21.55	-18.67	21.55	28.51	319.10	0.20
3591.00	0.75	19.63	3590.76	22.85	-18.30	22.85	29.28	321.31	0.12
3691.00	0.90	15.58	3690.75	24.22	-17.87	24.22	30.10	323.58	0.16
3791.00	0.86	8.58	3790.74	25.72	-17.55	25.72	31.13	325.69	0.11
3891.00	0.72	5.61	3890.73	27.08	-17.38	27.08	32.18	327.32	0.15
3991.00	0.58	14.32	3990.72	28.20	-17.19	28.20	33.03	328.64	0.17
4091.00	0.68	10.79	4090.72	29.28	-16.95	29.28	33.83	329.93	0.10
4191.00	0.68	28.79	4190.71	30.38	-16.56	30.38	34.60	331.41	0.21
4291.00	1.35	29.79	4290.69	31.92	-15.68	31.92	35.57	333.84	0.67
4391.00	1.19	60.74	4390.67	33.45	-14.19	33.45	36.34	337.01	0.70
4491.00	2.04	73.77	4490.63	34.46	-11.58	34.46	36.35	341.43	0.92
4591.00	2.44	76.43	4590.55	35.46	-7.80	35.46	36.30	347.60	0.42
4691.00	2.90	83.81	4690.45	36.23	-3.22	36.23	36.37	354.93	0.57
4791.00	3.34	99.59	4790.30	36.02	2.17	36.02	36.08	3.45	0.96
4891.00	3.00	103.27	4890.15	34.93	7.59	34.93	35.75	12.25	0.40
4991.00	2.59	103.65	4990.03	33.80	12.33	33.80	35.98	20.04	0.41
5091.00	1.99	105.70	5089.95	32.80	16.19	32.80	36.57	26.27	0.61
5191.00	1.57	95.19	5189.90	32.20	19.23	32.20	37.51	30.84	0.52
5291.00	1.81	109.82	5289.86	31.54	22.08	31.54	38.50	34.99	0.49
5391.00	1.67	104.54	5389.81	30.64	24.98	30.64	39.53	39.19	0.21
5491.00	1.40	119.44	5489.77	29.67	27.46	29.67	40.43	42.78	0.48
5591.00	1.24	105.69	5589.75	28.78	29.56	28.78	41.26	45.77	0.35
5691.00	1.38	120.44	5689.72	27.88	31.64	27.88	42.17	48.62	0.36
5791.00	0.91	132.02	5789.70	26.74	33.27	26.74	42.68	51.21	0.52
5891.00	0.44	114.52	5889.69	26.05	34.21	26.05	43.00	52.72	0.51
5991.00	0.73	96.07	5989.69	25.82	35.20	25.82	43.65	53.74	0.34

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
6091.00	0.48	113.84	6089.68	25.58	36.22	25.58	44.34	54.76	0.31
6191.00	0.61	100.76	6189.68	25.31	37.12	25.31	44.93	55.71	0.19
6291.00	0.73	86.67	6289.67	25.25	38.29	25.25	45.86	56.59	0.20
6391.00	0.59	36.49	6389.67	25.70	39.23	25.70	46.90	56.77	0.57
6491.00	0.71	92.10	6489.66	26.10	40.16	26.10	47.89	56.98	0.62
6591.00	0.81	95.81	6589.65	26.00	41.48	26.00	48.95	57.92	0.11
6691.00	0.64	98.21	6689.64	25.85	42.73	25.85	49.94	58.82	0.17
6791.00	0.70	93.80	6789.64	25.73	43.89	25.73	50.87	59.62	0.09
6891.00	0.67	103.75	6889.63	25.55	45.07	25.55	51.81	60.45	0.12
6991.00	0.46	105.31	6989.62	25.31	46.02	25.31	52.52	61.19	0.22
7091.00	0.67	106.03	7089.62	25.04	46.96	25.04	53.22	61.93	0.21
7191.00	0.81	116.77	7189.61	24.56	48.15	24.56	54.06	62.97	0.20
7291.00	0.63	124.32	7289.60	23.93	49.24	23.93	54.75	64.08	0.20
7391.00	0.85	150.86	7389.60	22.98	50.06	22.98	55.08	65.35	0.40
7491.00	1.07	157.40	7489.58	21.46	50.78	21.46	55.13	67.09	0.25
7591.00	0.81	155.36	7589.57	19.95	51.43	19.95	55.17	68.80	0.26
7691.00	0.96	161.51	7689.56	18.52	51.99	18.52	55.19	70.39	0.17
7791.00	0.66	182.04	7789.55	17.15	52.24	17.15	54.98	71.82	0.41
7891.00	0.50	172.24	7889.54	16.14	52.27	16.14	54.71	72.84	0.19
7991.00	0.92	173.02	7989.53	14.92	52.43	14.92	54.51	74.12	0.42
8091.00	0.58	201.83	8089.52	13.65	52.34	13.65	54.09	75.38	0.49
8191.00	0.32	218.74	8189.52	12.96	51.97	12.96	53.57	76.00	0.29
8291.00	0.36	227.74	8289.52	12.53	51.56	12.53	53.06	76.34	0.07
8391.00	0.31	160.51	8389.52	12.06	51.42	12.06	52.81	76.79	0.37
8491.00	0.41	180.68	8489.52	11.45	51.50	11.45	52.76	77.46	0.16
8591.00	0.49	150.29	8589.51	10.73	51.71	10.73	52.81	78.28	0.25
8691.00	0.05	55.28	8689.51	10.38	51.95	10.38	52.98	78.70	0.49
8791.00	0.51	19.06	8789.51	10.83	52.13	10.83	53.24	78.27	0.47
8891.00	0.29	13.80	8889.51	11.49	52.34	11.49	53.58	77.62	0.22
8991.00	0.79	23.29	8989.50	12.37	52.67	12.37	54.10	76.78	0.51
9091.00	1.56	46.99	9089.48	13.93	53.94	13.93	55.71	75.52	0.89
9191.00	1.88	61.53	9189.44	15.64	56.38	15.64	58.51	74.49	0.54
9291.00	1.77	84.56	9289.39	16.57	59.36	16.57	61.63	74.40	0.74
9391.00	1.58	92.39	9389.35	16.66	62.28	16.66	64.47	75.02	0.30
9491.00	1.12	65.50	9489.32	17.01	64.55	17.01	66.75	75.23	0.77
9591.00	1.51	40.62	9589.29	18.42	66.29	18.42	68.80	74.48	0.68
9691.00	1.87	24.90	9689.25	20.89	67.83	20.89	70.98	72.88	0.58
9791.00	2.66	11.37	9789.17	24.65	68.98	24.65	73.25	70.34	0.95
9891.00	2.51	359.71	9889.07	29.12	69.43	29.12	75.28	67.25	0.55
9991.00	1.94	348.00	9988.99	32.96	69.06	32.96	76.53	64.48	0.72
10091.00	1.95	342.67	10088.94	36.25	68.20	36.25	77.24	62.01	0.18

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
10181.00	1.63	6.74	10178.89	38.98	67.90	38.98	78.29	60.14	0.90



VES Survey International
West Texas
(432) 563-5444
Surveyor: Andy Askew
Sebastian Federal Com 1H / API 30-025-41687



VES Survey Date: 2/12/2015



COG Operating LLC

Lea County, NM

Sebastian Federal Com

#1H

OH

Survey: MWD #1

Survey Report - Geographic

20 February, 2015



Wellplanning Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3617.4usft (Original Well Elev)
Site:	Sebastian Federal Com	MD Reference:	WELL @ 3617.4usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sebastian Federal Com				
Site Position:		Northing:	446,247.40 usft	Latitude:	32° 13' 27.036 N
From:	Map	Easting:	754,263.30 usft	Longitude:	103° 30' 40.034 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.44 °

Well	#1H					
Well Position	+N/-S	0.0 usft	Northing:	446,238.10 usft	Latitude:	32° 13' 27.033 N
	+E/-W	0.0 usft	Easting:	753,093.60 usft	Longitude:	103° 30' 53.651 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,599.4 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/13/2015	7.11	60.10	48,254

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	179.56	

Survey Program	Date	2/20/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,190.0	GYRO (OH)	NS-GYRO-SS	NS Gyro single shots
10,307.0	15,417.0	MWD #1 (OH)	MWD	MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,190.0	1.63	6.74	10,187.9	39.0	68.0	446,277.06	753,161.56	32° 13' 27.413 N	103° 30' 52.856 W
10,307.0	0.90	51.80	10,304.9	41.2	68.9	446,279.28	753,162.48	32° 13' 27.435 N	103° 30' 52.845 W
10,339.0	1.30	146.20	10,336.9	41.0	69.3	446,279.13	753,162.88	32° 13' 27.434 N	103° 30' 52.841 W
10,371.0	3.60	169.20	10,368.8	39.7	69.7	446,277.84	753,163.27	32° 13' 27.421 N	103° 30' 52.836 W
10,402.0	6.80	177.90	10,399.7	37.0	69.9	446,275.05	753,163.52	32° 13' 27.393 N	103° 30' 52.833 W
10,434.0	10.50	183.00	10,431.3	32.1	69.8	446,270.25	753,163.44	32° 13' 27.346 N	103° 30' 52.835 W
10,465.0	14.40	184.80	10,461.6	25.5	69.4	446,263.58	753,162.97	32° 13' 27.280 N	103° 30' 52.841 W
10,497.0	18.20	183.80	10,492.3	16.5	68.7	446,254.63	753,162.30	32° 13' 27.191 N	103° 30' 52.849 W
10,529.0	21.80	182.70	10,522.4	5.6	68.1	446,243.70	753,161.69	32° 13' 27.083 N	103° 30' 52.858 W
10,561.0	25.50	181.10	10,551.7	-7.2	67.7	446,230.88	753,161.28	32° 13' 26.956 N	103° 30' 52.863 W
10,593.0	29.10	180.50	10,580.1	-21.9	67.5	446,216.20	753,161.08	32° 13' 26.811 N	103° 30' 52.867 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM	TVD Reference:	WELL @ 3617.4usft (Original Well Elev)
Site:	Sebastian Federal Com	MD Reference:	WELL @ 3617.4usft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,624.0	32.60	181.00	10,606.7	-37.8	67.3	446,200.31	753,160.87	32° 13' 26.654 N	103° 30' 52.871 W
10,656.0	35.50	181.00	10,633.2	-55.7	67.0	446,182.40	753,160.55	32° 13' 26.477 N	103° 30' 52.876 W
10,687.0	38.60	180.60	10,658.0	-74.4	66.7	446,163.72	753,160.29	32° 13' 26.292 N	103° 30' 52.881 W
10,721.0	42.10	180.20	10,683.9	-96.4	66.5	446,141.71	753,160.14	32° 13' 26.074 N	103° 30' 52.885 W
10,753.0	45.80	181.40	10,706.9	-118.6	66.2	446,119.51	753,159.83	32° 13' 25.854 N	103° 30' 52.890 W
10,784.0	49.30	183.40	10,727.8	-141.4	65.3	446,096.66	753,158.86	32° 13' 25.628 N	103° 30' 52.904 W
10,816.0	53.50	184.60	10,747.8	-166.4	63.5	446,071.72	753,157.11	32° 13' 25.382 N	103° 30' 52.926 W
10,847.0	57.80	185.60	10,765.3	-191.9	61.2	446,046.24	753,154.82	32° 13' 25.130 N	103° 30' 52.955 W
10,879.0	62.20	185.50	10,781.3	-219.4	58.5	446,018.66	753,152.15	32° 13' 24.857 N	103° 30' 52.989 W
10,910.0	67.00	184.50	10,794.6	-247.3	56.1	445,990.77	753,149.71	32° 13' 24.581 N	103° 30' 53.019 W
10,942.0	71.80	183.30	10,805.8	-277.2	54.1	445,960.90	753,147.68	32° 13' 24.286 N	103° 30' 53.046 W
10,974.0	75.30	182.70	10,814.9	-307.8	52.5	445,930.25	753,146.07	32° 13' 23.983 N	103° 30' 53.067 W
11,006.0	77.50	181.20	10,822.4	-338.9	51.4	445,899.17	753,145.02	32° 13' 23.675 N	103° 30' 53.082 W
11,037.0	79.30	180.00	10,828.6	-369.3	51.1	445,868.81	753,144.70	32° 13' 23.375 N	103° 30' 53.089 W
11,069.0	80.90	179.90	10,834.1	-400.8	51.1	445,837.29	753,144.73	32° 13' 23.063 N	103° 30' 53.091 W
11,100.0	82.60	179.50	10,838.6	-431.5	51.3	445,806.61	753,144.89	32° 13' 22.759 N	103° 30' 53.092 W
11,132.0	84.60	179.70	10,842.2	-463.3	51.5	445,774.81	753,145.11	32° 13' 22.445 N	103° 30' 53.092 W
11,164.0	85.90	179.40	10,844.8	-495.2	51.8	445,742.92	753,145.36	32° 13' 22.129 N	103° 30' 53.092 W
11,195.0	86.50	179.00	10,846.9	-526.1	52.2	445,711.99	753,145.79	32° 13' 21.823 N	103° 30' 53.090 W
11,227.0	88.30	179.20	10,848.3	-558.1	52.7	445,680.03	753,146.30	32° 13' 21.507 N	103° 30' 53.087 W
11,290.0	89.70	178.90	10,849.4	-621.0	53.7	445,617.05	753,147.34	32° 13' 20.883 N	103° 30' 53.080 W
11,385.0	89.20	178.90	10,850.3	-716.0	55.6	445,522.07	753,149.16	32° 13' 19.943 N	103° 30' 53.067 W
11,480.0	88.70	178.70	10,852.1	-811.0	57.6	445,427.11	753,151.15	32° 13' 19.003 N	103° 30' 53.053 W
11,575.0	88.60	178.60	10,854.3	-905.9	59.8	445,332.16	753,153.39	32° 13' 18.064 N	103° 30' 53.035 W
11,670.0	88.50	180.20	10,856.7	-1,000.9	60.8	445,237.20	753,154.39	32° 13' 17.124 N	103° 30' 53.032 W
11,764.0	88.80	179.10	10,858.9	-1,094.9	61.4	445,143.23	753,154.96	32° 13' 16.194 N	103° 30' 53.033 W
11,860.0	87.70	179.40	10,861.9	-1,190.8	62.6	445,047.29	753,156.22	32° 13' 15.245 N	103° 30' 53.027 W
11,954.0	88.90	179.40	10,864.6	-1,284.8	63.6	444,953.34	753,157.20	32° 13' 14.315 N	103° 30' 53.024 W
12,049.0	88.20	179.80	10,867.1	-1,379.7	64.3	444,858.37	753,157.86	32° 13' 13.375 N	103° 30' 53.025 W
12,144.0	89.40	179.30	10,869.0	-1,474.7	65.0	444,763.39	753,158.61	32° 13' 12.435 N	103° 30' 53.025 W
12,239.0	88.70	180.00	10,870.6	-1,569.7	65.6	444,668.41	753,159.19	32° 13' 11.495 N	103° 30' 53.026 W
12,334.0	87.90	179.40	10,873.4	-1,664.6	66.1	444,573.45	753,159.69	32° 13' 10.556 N	103° 30' 53.029 W
12,429.0	90.50	179.80	10,874.8	-1,759.6	66.8	444,478.47	753,160.35	32° 13' 9.616 N	103° 30' 53.030 W
12,523.0	89.00	179.50	10,875.2	-1,853.6	67.3	444,384.48	753,160.92	32° 13' 8.685 N	103° 30' 53.031 W
12,619.0	87.70	179.80	10,877.9	-1,949.6	67.9	444,288.52	753,161.51	32° 13' 7.736 N	103° 30' 53.033 W
12,714.0	86.70	180.80	10,882.6	-2,044.5	67.4	444,193.64	753,161.01	32° 13' 6.797 N	103° 30' 53.047 W
12,809.0	87.70	181.10	10,887.2	-2,139.3	65.8	444,098.77	753,159.44	32° 13' 5.858 N	103° 30' 53.074 W
12,904.0	88.70	181.00	10,890.2	-2,234.3	64.1	444,003.83	753,157.70	32° 13' 4.919 N	103° 30' 53.103 W
12,999.0	89.40	180.60	10,891.8	-2,329.2	62.8	443,908.86	753,156.37	32° 13' 3.979 N	103° 30' 53.126 W
13,094.0	89.20	179.40	10,892.9	-2,424.2	62.8	443,813.86	753,156.37	32° 13' 3.039 N	103° 30' 53.135 W
13,189.0	89.50	178.60	10,894.0	-2,519.2	64.4	443,718.89	753,158.03	32° 13' 2.099 N	103° 30' 53.124 W
13,283.0	88.40	178.40	10,895.7	-2,613.2	66.9	443,624.94	753,160.49	32° 13' 1.170 N	103° 30' 53.104 W
13,378.0	88.30	179.20	10,898.5	-2,708.1	68.9	443,530.00	753,162.48	32° 13' 0.230 N	103° 30' 53.089 W
13,474.0	88.00	180.40	10,901.6	-2,804.1	69.2	443,434.05	753,162.82	32° 12' 59.280 N	103° 30' 53.094 W
13,569.0	88.60	179.60	10,904.4	-2,899.0	69.2	443,339.09	753,162.82	32° 12' 58.341 N	103° 30' 53.102 W
13,664.0	88.70	179.60	10,906.6	-2,994.0	69.9	443,244.12	753,163.48	32° 12' 57.401 N	103° 30' 53.103 W
13,759.0	88.40	179.50	10,909.0	-3,088.9	70.6	443,149.15	753,164.22	32° 12' 56.461 N	103° 30' 53.102 W
13,854.0	87.60	180.90	10,912.3	-3,183.9	70.3	443,054.22	753,163.89	32° 12' 55.522 N	103° 30' 53.115 W
13,948.0	88.30	180.70	10,915.7	-3,277.8	69.0	442,960.29	753,162.58	32° 12' 54.592 N	103° 30' 53.138 W
14,043.0	88.60	180.70	10,918.3	-3,372.8	67.8	442,865.33	753,161.42	32° 12' 53.653 N	103° 30' 53.160 W
14,138.0	89.20	181.90	10,920.1	-3,467.7	65.7	442,770.37	753,159.27	32° 12' 52.713 N	103° 30' 53.194 W
14,233.0	90.40	182.20	10,920.4	-3,562.7	62.3	442,675.44	753,155.87	32° 12' 51.774 N	103° 30' 53.242 W
14,327.0	89.50	181.70	10,920.5	-3,656.6	59.1	442,581.49	753,152.67	32° 12' 50.845 N	103° 30' 53.287 W
14,422.0	90.10	181.70	10,920.8	-3,751.6	56.3	442,486.53	753,149.85	32° 12' 49.905 N	103° 30' 53.328 W
14,517.0	89.50	181.40	10,921.2	-3,846.5	53.7	442,391.57	753,147.28	32° 12' 48.966 N	103° 30' 53.367 W



Wellplanning
Survey Report - Geographic

Company: COG Operating LLC
Project: Lea County, NM
Site: Sebastian Federal Com
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 3617.4usft (Original Well Elev)
MD Reference: WELL @ 3617.4usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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
14,612.0	89.00	181.00	10,922.4	-3,941.5	51.7	442,296.60	753,145.29	32° 12' 48.026 N	103° 30' 53.398 W
14,707.0	88.00	181.10	10,924.9	-4,036.5	50.0	442,201.65	753,143.55	32° 12' 47.087 N	103° 30' 53.427 W
14,802.0	87.70	180.90	10,928.5	-4,131.4	48.3	442,106.73	753,141.90	32° 12' 46.148 N	103° 30' 53.455 W
14,897.0	88.60	180.20	10,931.5	-4,226.3	47.4	442,011.79	753,140.98	32° 12' 45.208 N	103° 30' 53.474 W
14,991.0	87.70	179.50	10,934.6	-4,320.3	47.6	441,917.84	753,141.23	32° 12' 44.279 N	103° 30' 53.479 W
15,086.0	88.10	179.30	10,938.1	-4,415.2	48.6	441,822.91	753,142.22	32° 12' 43.339 N	103° 30' 53.476 W
15,182.0	88.80	178.50	10,940.7	-4,511.1	50.5	441,726.96	753,144.07	32° 12' 42.390 N	103° 30' 53.463 W
15,277.0	88.80	178.60	10,942.6	-4,606.1	52.9	441,632.01	753,146.47	32° 12' 41.450 N	103° 30' 53.444 W
15,372.0	89.70	178.30	10,943.9	-4,701.0	55.4	441,537.06	753,149.04	32° 12' 40.510 N	103° 30' 53.422 W
15,417.0	89.70	178.30	10,944.1	-4,746.0	56.8	441,492.08	753,150.37	32° 12' 40.065 N	103° 30' 53.411 W
PBHL(SFC#1)									

Checked By: _____ Approved By: _____ Date: _____