

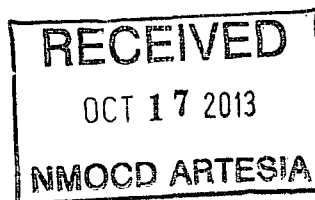
PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

A GYRO TECHNOLOGIES INC. COMPANY

August 22, 2013

COG OPER, LL
RECEIVED
AUG 27 2013
ARTESIA WEST

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



Attn: Kanicia Castillo

RE: Honey Graham State Com No. 004H

Please find enclosed a copy of the survey from 0.00' to 9250.00' ran on the above referenced well.

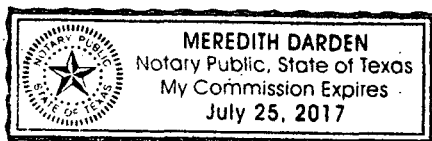
Sincerely,

Keith Havelka
Operations

30015 41379

STATE OF TEXAS §
§
COUNTY OF NUECES §

This instrument was acknowledged before me on the 22nd day of August, A.D., 2013, by Keith Havelka.

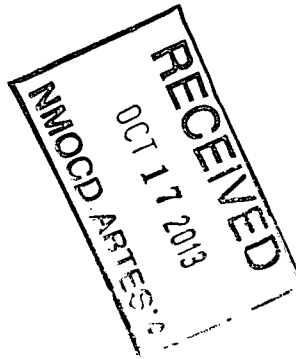


Meredith Darden
Notary Public, State of Texas

Company: COG Operating LLC (Concho)
Lease/Well: Honey Graham State Com/No. 004H



Rig Name: Patterson 79
State/County: New Mexico/Eddy
Latitude: 32.020, Longitude: -104.107
GRID North is 0.120 Degrees East of True North
VS-Azi: 0.000 Degrees



Depth Reference : RKB = 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ha gyro-de_01.ut
Minimum Curvature Method
Report Date/Time: 8/22/2013 / 10:34

Vaughn Energy Services
Midland, TX
432-563-5444
Surveyor: Charles Hines
Honey Graham State Com No. 004H / API 30-015-41379

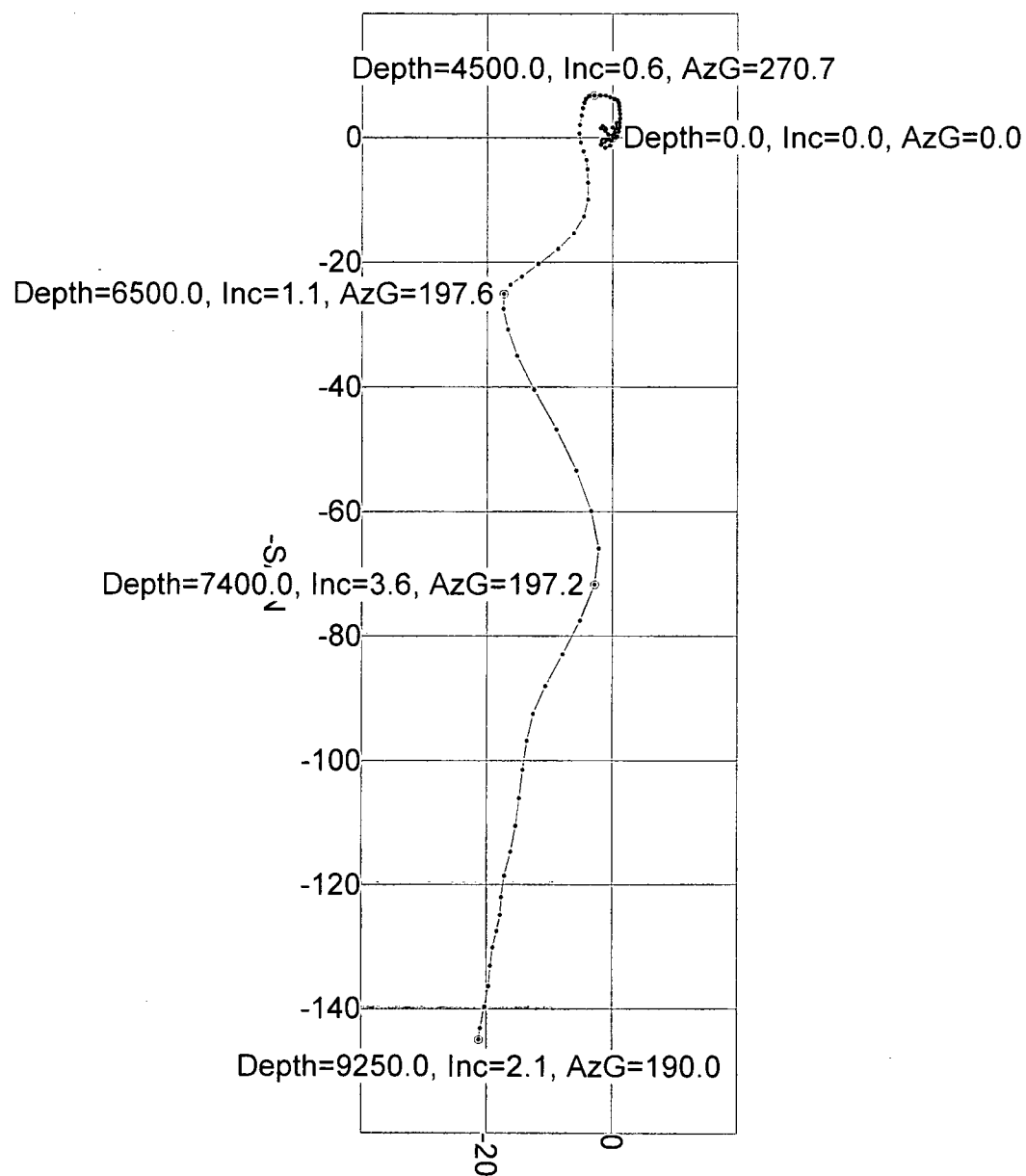
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.324	234.151	99.999	-0.165	-0.229	-0.165	0.283	234.151	0.324
200.000	0.421	272.040	199.997	-0.318	-0.825	-0.318	0.884	248.934	0.259
300.000	0.451	259.549	299.995	-0.376	-1.580	-0.376	1.624	256.604	0.100
400.000	0.195	114.422	399.994	-0.518	-1.812	-0.518	1.884	254.037	0.622
500.000	0.267	54.114	499.993	-0.452	-1.467	-0.452	1.535	252.878	0.241
600.000	0.091	85.076	599.993	-0.309	-1.199	-0.309	1.238	255.571	0.195
700.000	0.139	94.296	699.992	-0.311	-0.999	-0.311	1.047	252.722	0.051
800.000	0.286	275.530	799.992	-0.296	-1.127	-0.296	1.165	255.289	0.425
900.000	0.299	193.210	899.991	-0.526	-1.435	-0.526	1.528	249.869	0.385
1000.000	0.189	56.969	999.991	-0.690	-1.356	-0.690	1.522	243.028	0.455
1100.000	0.237	329.618	1099.990	-0.421	-1.322	-0.421	1.388	252.320	0.297
1200.000	0.434	238.040	1199.989	-0.443	-1.748	-0.443	1.803	255.770	0.500
1300.000	0.582	166.428	1299.986	-1.137	-1.950	-1.137	2.258	239.748	0.606
1400.000	0.623	91.314	1399.982	-1.643	-1.288	-1.643	2.088	218.079	0.735
1500.000	0.504	36.197	1499.978	-1.301	-0.485	-1.301	1.388	200.432	0.532
1600.000	0.598	344.039	1599.974	-0.445	-0.368	-0.445	0.577	219.646	0.492
1700.000	0.636	330.398	1699.968	0.540	-0.786	0.540	0.954	304.471	0.151
1800.000	0.553	342.689	1799.962	1.483	-1.204	1.483	1.910	320.931	0.152

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
1900.000	0.383	265.886	1899.960	1.920	-1.681	1.920	2.552	318.798	0.596
2000.000	0.421	177.524	1999.958	1.528	-1.998	1.528	2.516	307.415	0.561
2100.000	0.818	94.933	2099.954	1.100	-1.271	1.100	1.681	310.870	0.871
2200.000	0.852	37.356	2199.945	1.630	-0.108	1.630	1.633	356.203	0.805
2300.000	0.284	61.613	2299.939	2.339	0.561	2.339	2.405	13.495	0.605
2400.000	0.331	184.050	2399.939	2.169	0.759	2.169	2.298	19.289	0.539
2500.000	0.223	195.254	2499.938	1.693	0.687	1.693	1.827	22.099	0.120
2600.000	0.287	210.068	2599.937	1.288	0.511	1.288	1.386	21.624	0.091
2700.000	0.205	196.042	2699.936	0.899	0.336	0.899	0.960	20.470	0.101
2800.000	0.265	219.667	2799.935	0.549	0.138	0.549	0.566	14.157	0.113
2900.000	0.027	250.157	2899.934	0.363	-0.031	0.363	0.364	355.093	0.243
3000.000	0.457	132.144	2999.933	0.087	0.243	0.087	0.258	70.193	0.470
3100.000	0.488	16.554	3099.932	0.228	0.660	0.228	0.698	70.933	0.800
3200.000	0.455	16.990	3199.928	1.016	0.897	1.016	1.356	41.446	0.033
3300.000	0.412	2.721	3299.925	1.755	1.030	1.755	2.035	30.420	0.116
3400.000	0.354	1.715	3399.923	2.423	1.057	2.423	2.643	23.564	0.058
3500.000	0.423	10.219	3499.921	3.095	1.131	3.095	3.295	20.080	0.089
3600.000	0.422	351.359	3599.918	3.822	1.141	3.822	3.989	16.628	0.138
3700.000	0.354	353.538	3699.916	4.493	1.051	4.493	4.615	13.169	0.069
3800.000	0.305	351.380	3799.914	5.064	0.977	5.064	5.157	10.916	0.051
3900.000	0.289	355.043	3899.913	5.579	0.915	5.579	5.653	9.314	0.025
4000.000	0.278	311.304	3999.912	5.990	0.711	5.990	6.032	6.770	0.211
4100.000	0.358	288.852	4099.910	6.251	0.234	6.251	6.255	2.142	0.146
4200.000	0.514	292.951	4199.907	6.527	-0.475	6.527	6.544	355.841	0.160
4300.000	0.361	277.520	4299.904	6.743	-1.200	6.743	6.849	349.912	0.192
4400.000	0.570	270.620	4399.901	6.789	-2.009	6.789	7.080	343.515	0.217
4500.000	0.566	270.713	4499.896	6.801	-3.001	6.801	7.433	336.191	0.004
4600.000	0.449	249.692	4599.892	6.671	-3.863	6.671	7.708	329.927	0.218
4700.000	0.364	204.169	4699.890	6.245	-4.361	6.245	7.616	325.074	0.324
4800.000	0.415	196.234	4799.888	5.607	-4.592	5.607	7.247	320.682	0.074
4900.000	0.601	193.041	4899.884	4.748	-4.812	4.748	6.760	314.618	0.188
5000.000	0.795	186.910	4999.876	3.548	-5.013	3.548	6.142	305.290	0.207
5100.000	0.926	193.203	5099.865	2.073	-5.281	2.073	5.674	291.431	0.162
5200.000	0.756	170.688	5199.855	0.635	-5.359	0.635	5.397	276.757	0.368
5300.000	0.865	170.451	5299.845	-0.760	-5.127	-0.760	5.183	261.563	0.109
5400.000	0.873	155.482	5399.833	-2.198	-4.686	-2.198	5.176	244.869	0.227
5500.000	0.781	169.539	5499.823	-3.562	-4.246	-3.562	5.542	230.006	0.222
5600.000	0.965	175.731	5599.811	-5.073	-4.059	-5.073	6.497	218.669	0.206
5700.000	1.531	179.454	5699.787	-7.249	-3.984	-7.249	8.271	208.793	0.572

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
5800.000	1.555	181.639	5799.751	-9.941	-4.010	-9.941	10.720	201.967	0.063
5900.000	1.707	202.822	5899.711	-12.671	-4.627	-12.671	13.489	200.059	0.618
6000.000	1.896	218.069	5999.662	-15.346	-6.225	-15.346	16.561	202.078	0.513
6100.000	2.211	231.489	6099.598	-17.850	-8.755	-17.850	19.882	206.125	0.573
6200.000	2.362	232.678	6199.519	-20.301	-11.903	-20.301	23.533	210.384	0.158
6300.000	1.458	233.237	6299.462	-22.312	-14.561	-22.312	26.643	213.129	0.905
6400.000	1.032	233.669	6399.438	-23.607	-16.306	-23.607	28.691	214.633	0.426
6500.000	1.122	197.576	6499.422	-25.074	-17.327	-25.074	30.478	214.645	0.673
6600.000	1.688	172.861	6599.392	-27.468	-17.439	-27.468	32.537	212.411	0.817
6700.000	2.187	163.757	6699.335	-30.761	-16.723	-30.761	35.013	208.530	0.585
6800.000	2.949	158.914	6799.234	-34.993	-15.264	-34.993	38.177	203.566	0.792
6900.000	4.077	150.264	6899.045	-40.479	-12.575	-40.479	42.388	197.258	1.243
7000.000	4.309	151.205	6998.777	-46.858	-9.002	-46.858	47.715	190.875	0.242
7100.000	4.088	157.096	7098.510	-53.433	-5.806	-53.433	53.748	186.201	0.484
7200.000	3.842	162.870	7198.271	-59.918	-3.432	-59.918	60.016	183.278	0.469
7300.000	3.256	175.316	7298.080	-65.950	-2.214	-65.950	65.987	181.922	0.964
7400.000	3.560	197.217	7397.907	-71.746	-2.901	-71.746	71.805	182.315	1.328
7500.000	3.573	205.578	7497.714	-77.523	-5.165	-77.523	77.695	183.812	0.520
7600.000	3.448	209.040	7597.527	-82.963	-7.970	-82.963	83.345	185.487	0.246
7700.000	3.157	207.707	7697.360	-88.029	-10.710	-88.029	88.678	186.937	0.301
7800.000	2.440	197.884	7797.241	-92.492	-12.643	-92.492	93.352	187.784	0.860
7900.000	2.666	189.009	7897.142	-96.814	-13.661	-96.814	97.773	188.032	0.455
8000.000	2.750	186.425	7997.031	-101.495	-14.294	-101.495	102.496	188.016	0.148
8100.000	2.539	187.429	8096.924	-106.075	-14.849	-106.075	107.110	187.969	0.216
8200.000	2.593	187.219	8196.824	-110.516	-15.419	-110.516	111.586	187.943	0.055
8300.000	2.317	193.953	8296.732	-114.722	-16.191	-114.722	115.859	188.033	0.399
8400.000	2.257	194.880	8396.652	-118.587	-17.184	-118.587	119.825	188.245	0.071
8500.000	1.811	178.299	8496.590	-122.070	-17.643	-122.070	123.338	188.224	0.734
8600.000	1.498	189.642	8596.548	-124.937	-17.815	-124.937	126.201	188.115	0.452
8700.000	1.503	194.707	8696.514	-127.494	-18.367	-127.494	128.810	188.198	0.133
8800.000	1.592	192.398	8796.478	-130.119	-18.998	-130.119	131.499	188.307	0.109
8900.000	1.865	183.741	8896.432	-133.100	-19.402	-133.100	134.507	188.294	0.377
9000.000	1.934	185.709	8996.377	-136.403	-19.676	-136.403	137.815	188.208	0.095
9100.000	1.955	196.810	9096.320	-139.716	-20.338	-139.716	141.188	188.282	0.377
9200.000	2.097	185.543	9196.258	-143.170	-21.008	-143.170	144.703	188.348	0.422
9250.000	2.118	190.012	9246.224	-144.991	-21.257	-144.991	146.541	188.341	0.331



Vaughn Energy Services
Midland, TX
432-563-5444
Surveyor: Charles Hines
Honey Graham State Com No. 004H / API 30-015-41379



-W/+E
VES Survey Date: 08/13/2013



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 29, T26S, R28E

Honey Graham State Com #4H

Wellbore #1

Design: Wellbore #1

DDC Survey Report

28 August, 2013





Survey Certification Sheet

COG Operating, LLC
Company

WT-13643
Job Number

8/28/13
Date

Sec29, T26S, R28E
Lease

Honey Graham State Com # 4
Well Name

Eddy, NM
County & State

API: 30-015-41379

Surveyed from a depth of: 7200 feet to 14393 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: George Sample

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larryw@directionaldrillers.c
om, c=US
Date: 2013.09.03 16:18:43 -05'00'

Larry Wright
MWD General Manager



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3019.3usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	WELL @ 3019.3usft (Patterson #79)
Well:	Honey Graham State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, NM (NAD 27)		
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 29, T26S, R28E		
Site Position:		Northing:	371,191.10 usft
From:	Map	Easting:	568,843.40 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 1' 13.166 N
		Longitude:	104° 6' 40.339 W
		Grid Convergence:	0.12 °

Well:	Honey Graham State Com #4H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 1' 11.015 N
		Longitude:	104° 6' 24.928 W
		Ground Level:	3,001.8 usft

Wellbore:	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	7/12/2013	7.56
			Dip Angle
			(°)
			Field Strength
			(nT)
			59.85
			48,230

Design:	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			179.90

Survey Program	Date: 8/26/2013		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	7,200.0	Gyro (Wellbore #1)	Good_gyro
7,288.0	14,393.0	MWD (Wellbore #1)	Good Gyro

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
TIE IN @ 7200' MD / 7198.3' TVD									
7,200.0	3.84	162.87	7,198.3	-59.9	-3.4	59.9	0.47	-0.25	5.77
7,288.0	6.30	174.10	7,285.9	-67.5	-2.1	67.5	3.00	2.79	12.76
7,320.0	9.70	175.10	7,317.6	-72.0	-1.7	72.0	10.63	10.63	3.13
7,351.0	13.20	176.00	7,348.0	-78.1	-1.2	78.1	11.30	11.29	2.90
7,383.0	16.30	180.90	7,378.9	-86.2	-1.0	86.2	10.43	9.69	15.31
7,414.0	20.10	182.20	7,408.4	-95.9	-1.3	95.9	12.33	12.26	4.19
7,446.0	23.80	182.90	7,438.0	-107.9	-1.8	107.9	11.59	11.56	2.19
7,477.0	27.30	181.80	7,466.0	-121.2	-2.4	121.2	11.39	11.29	-3.55



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3019.3usft (Patterson #79)
Site:	Sec 29 T26S R28E	MD Reference:	WELL @ 3019.3usft (Patterson #79)
Well:	Honey Graham State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey:									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,509.0	30.30	180.40	7,494.0	-136.6	-2.6	136.6	9.61	9.38	-4.38
7,541.0	33.20	180.20	7,521.3	-153.5	-2.7	153.5	9.07	9.06	-0.63
7,572.0	35.90	179.40	7,546.8	-171.0	-2.7	171.0	8.83	8.71	-2.58
7,604.0	39.40	179.00	7,572.1	-190.6	-2.4	190.6	10.96	10.94	-1.25
7,635.0	42.50	179.20	7,595.5	-210.9	-2.1	210.9	10.01	10.00	0.65
7,667.0	44.70	179.90	7,618.7	-233.0	-1.9	233.0	7.04	6.88	2.19
7,698.0	46.30	182.20	7,640.4	-255.1	-2.3	255.1	7.39	5.16	7.42
7,730.0	50.60	182.90	7,661.7	-279.0	-3.4	279.0	13.54	13.44	2.19
7,761.0	54.60	182.20	7,680.5	-303.6	-4.5	303.6	13.03	12.90	-2.26
7,793.0	57.10	182.20	7,698.4	-330.0	-5.5	330.0	7.81	7.81	0.00
7,824.0	60.10	181.60	7,714.6	-356.5	-6.4	356.5	9.82	9.68	-1.94
7,855.0	62.00	181.10	7,729.6	-383.6	-7.0	383.6	6.29	6.13	-1.61
7,887.0	63.90	180.20	7,744.1	-412.1	-7.3	412.1	6.44	5.94	-2.81
7,918.0	66.90	180.10	7,757.0	-440.3	-7.4	440.3	9.68	9.68	-0.32
7,971.0	73.80	180.80	7,774.9	-490.2	-7.8	490.2	13.08	13.02	1.32
8,002.0	74.50	180.10	7,783.3	-520.0	-8.0	520.0	3.13	2.26	-2.26
8,045.0	76.90	180.60	7,793.9	-561.7	-8.3	561.6	5.69	5.58	1.16
8,065.0	77.30	180.40	7,798.4	-581.1	-8.5	581.1	2.22	2.00	-1.00
8,097.0	77.00	180.20	7,805.5	-612.3	-8.6	612.3	1.12	-0.94	-0.63
8,129.0	78.60	180.60	7,812.3	-643.6	-8.8	643.6	5.15	5.00	1.25
8,160.0	81.60	180.90	7,817.6	-674.2	-9.2	674.1	9.72	9.68	0.97
8,192.0	85.40	180.10	7,821.2	-705.9	-9.5	705.9	12.13	11.88	-2.50
8,224.0	86.40	180.10	7,823.5	-737.9	-9.6	737.8	3.13	3.13	0.00
8,256.0	88.50	180.80	7,825.0	-769.8	-9.8	769.8	6.92	6.56	2.19
8,288.0	90.20	180.60	7,825.3	-801.8	-10.2	801.8	5.35	5.31	-0.63
8,319.0	90.70	180.90	7,825.1	-832.8	-10.6	832.8	1.88	1.61	0.97
8,351.0	90.80	180.40	7,824.7	-864.8	-11.0	864.8	1.59	0.31	-1.56
8,383.0	90.80	180.90	7,824.2	-896.8	-11.3	896.8	1.56	0.00	1.56
8,446.0	90.90	180.90	7,823.3	-959.8	-12.3	959.8	0.16	0.16	0.00
8,510.0	89.40	180.40	7,823.1	-1,023.8	-13.1	1,023.8	2.47	-2.34	-0.78
8,573.0	89.30	179.50	7,823.8	-1,086.8	-13.0	1,086.8	1.44	-0.16	-1.43
8,637.0	89.30	179.50	7,824.6	-1,150.8	-12.4	1,150.7	0.00	0.00	0.00
8,700.0	89.30	179.70	7,825.4	-1,213.8	-12.0	1,213.7	0.32	0.00	0.32
8,763.0	89.40	178.80	7,826.1	-1,276.8	-11.2	1,276.7	1.44	0.16	-1.43
8,858.0	89.70	178.50	7,826.8	-1,371.7	-8.9	1,371.7	0.45	0.32	-0.32
8,953.0	90.00	178.10	7,827.1	-1,466.7	-6.1	1,466.7	0.53	0.32	-0.42
9,048.0	91.10	178.10	7,826.2	-1,561.6	-3.0	1,561.6	1.16	1.16	0.00
9,142.0	90.30	180.10	7,825.0	-1,655.6	-1.5	1,655.6	2.29	-0.85	2.13
9,236.0	90.00	179.50	7,824.8	-1,749.6	-1.2	1,749.6	0.71	-0.32	-0.64
9,331.0	90.40	179.00	7,824.4	-1,844.6	0.1	1,844.6	0.67	0.42	-0.53
9,427.0	90.70	178.60	7,823.5	-1,940.6	2.1	1,940.6	0.52	0.31	-0.42
9,522.0	90.30	181.60	7,822.7	-2,035.5	1.9	2,035.5	3.19	-0.42	3.16
9,617.0	90.00	180.60	7,822.4	-2,130.5	0.1	2,130.5	1.10	-0.32	-1.05
9,711.0	88.10	180.40	7,824.0	-2,224.5	-0.7	2,224.5	2.03	-2.02	-0.21



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Honey Graham State Com #4H
Project:	Eddy County NM (NAD 27)	TVD Reference:	WELL @ 3019.3usft (Patterson #79)
Site:	Sec 29 T26S R28E	MD Reference:	WELL @ 3019.3usft (Patterson #79)
Well:	Honey Graham State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,805.0	87.80	180.40	7,827.4	-2,318.4	-1.4	2,318.4	0.32	-0.32	0.00	
9,901.0	87.90	180.20	7,831.0	-2,414.4	-1.9	2,414.4	0.23	0.10	-0.21	
9,996.0	88.80	180.60	7,833.7	-2,509.3	-2.5	2,509.3	1.04	0.95	0.42	
10,091.0	90.40	179.90	7,834.4	-2,604.3	-3.0	2,604.3	1.84	1.68	-0.74	
10,186.0	92.90	179.40	7,831.6	-2,699.3	-2.4	2,699.3	2.68	2.63	-0.53	
10,281.0	92.90	179.50	7,826.8	-2,794.2	-1.5	2,794.1	0.11	0.00	0.11	
10,376.0	92.90	179.20	7,822.0	-2,889.0	-0.4	2,889.0	0.32	0.00	-0.32	
10,471.0	90.20	179.40	7,819.4	-2,984.0	0.8	2,984.0	2.85	-2.84	0.21	
10,566.0	88.10	179.90	7,820.9	-3,079.0	1.3	3,079.0	2.27	-2.21	0.53	
10,660.0	87.80	179.90	7,824.2	-3,172.9	1.5	3,172.9	0.32	-0.32	0.00	
10,755.0	88.00	179.70	7,827.7	-3,267.8	1.8	3,267.8	0.30	0.21	-0.21	
10,850.0	88.50	178.80	7,830.6	-3,362.8	3.1	3,362.8	1.08	0.53	-0.95	
10,945.0	88.30	179.20	7,833.3	-3,457.7	4.7	3,457.7	0.47	-0.21	0.42	
11,040.0	89.80	179.20	7,834.8	-3,552.7	6.1	3,552.7	1.58	1.58	0.00	
11,135.0	90.00	179.40	7,835.0	-3,647.7	7.2	3,647.7	0.30	0.21	0.21	
11,228.0	89.70	178.50	7,835.2	-3,740.7	8.9	3,740.7	1.02	-0.32	-0.97	
11,323.0	89.30	177.90	7,836.1	-3,835.6	11.9	3,835.6	0.76	-0.42	-0.63	
11,418.0	89.50	178.10	7,837.1	-3,930.6	15.2	3,930.6	0.30	0.21	0.21	
11,513.0	89.80	178.50	7,837.6	-4,025.5	18.1	4,025.5	0.53	0.32	0.42	
11,608.0	89.80	178.50	7,838.0	-4,120.5	20.5	4,120.5	0.00	0.00	0.00	
11,703.0	90.60	179.40	7,837.6	-4,215.5	22.3	4,215.5	1.27	0.84	0.95	
11,798.0	90.60	179.00	7,836.6	-4,310.5	23.6	4,310.5	0.42	0.00	-0.42	
11,893.0	91.00	178.60	7,835.3	-4,405.4	25.6	4,405.5	0.60	0.42	-0.42	
11,988.0	89.70	180.40	7,834.7	-4,500.4	26.4	4,500.4	2.34	-1.37	1.89	
12,082.0	89.60	179.70	7,835.3	-4,594.4	26.3	4,594.4	0.75	-0.11	-0.74	
12,177.0	89.50	180.90	7,836.1	-4,689.4	25.8	4,689.4	1.27	-0.11	1.26	
12,272.0	89.80	180.90	7,836.6	-4,784.4	24.4	4,784.4	0.32	0.32	0.00	
12,367.0	90.10	180.90	7,836.7	-4,879.4	22.9	4,879.4	0.32	0.32	0.00	
12,463.0	90.00	180.10	7,836.6	-4,975.4	22.0	4,975.4	0.84	-0.10	-0.83	
12,558.0	89.60	179.20	7,837.0	-5,070.4	22.6	5,070.4	1.04	-0.42	-0.95	
12,652.0	89.30	178.30	7,837.9	-5,164.3	24.7	5,164.4	1.01	-0.32	-0.96	
12,747.0	90.30	178.60	7,838.2	-5,259.3	27.2	5,259.3	1.10	1.05	0.32	
12,841.0	90.40	179.50	7,837.6	-5,353.3	28.8	5,353.3	0.96	0.11	0.96	
12,936.0	90.70	178.60	7,836.7	-5,448.3	30.4	5,448.3	1.00	0.32	-0.95	
13,031.0	89.30	179.90	7,836.7	-5,543.3	31.6	5,543.3	2.01	-1.47	1.37	
13,126.0	89.30	180.10	7,837.9	-5,638.2	31.6	5,638.3	0.21	0.00	0.21	
13,219.0	89.50	180.40	7,838.9	-5,731.2	31.2	5,731.3	0.39	0.22	0.32	
13,314.0	89.50	179.40	7,839.7	-5,826.2	31.4	5,826.3	1.05	0.00	-1.05	
13,409.0	89.90	179.00	7,840.2	-5,921.2	32.7	5,921.3	0.60	0.42	-0.42	
13,504.0	89.50	179.70	7,840.7	-6,016.2	33.8	6,016.3	0.85	-0.42	0.74	
13,600.0	89.70	179.90	7,841.3	-6,112.2	34.1	6,112.3	0.29	0.21	0.21	
13,694.0	89.50	180.10	7,842.0	-6,206.2	34.1	6,206.3	0.30	-0.21	0.21	
13,789.0	89.10	180.10	7,843.2	-6,301.2	33.9	6,301.3	0.42	-0.42	0.00	



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well: Honey Graham State Com #4H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3019.3usft (Patterson #79)
Site:	Sec 29, T26S, R28E	MD Reference:	WELL @ 3019.3usft (Patterson #79)
Well:	Honey Graham State Com #4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,884.0	88.30	179.40	7,845.3	-6,396.2	34.3	6,396.2	1.12	-0.84	-0.74	
13,979.0	89.10	179.40	7,847.5	-6,491.1	35.3	6,491.2	0.84	0.84	0.00	
14,075.0	89.20	179.20	7,848.9	-6,587.1	36.5	6,587.2	0.23	0.10	-0.21	
14,170.0	89.20	179.70	7,850.2	-6,682.1	37.4	6,682.2	0.53	0.00	0.53	
14,265.0	89.00	179.20	7,851.7	-6,777.1	38.3	6,777.2	0.57	-0.21	-0.53	
TD @ 14393' MD / 7854' TVD										
14,393.0	89.00	179.20	7,854.0	-6,905.1	40.1	6,905.1	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
7,200.0	7,198.3	-59.9	-3.4	TIE IN @ 7200' MD / 7198.3' TVD	
14,393.0	7,854.0	-6,905.1	40.1	TD @ 14393' MD / 7854' TVD	

Checked By: _____	Approved By: _____	Date: _____
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