

PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Down South Fed Com # 5 H
COUNTY: Eddy Co., New Mexico
Sec. 19, T28S, R20E

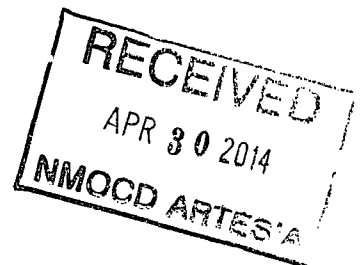
15-4400

**STATE OF NEW MEXICO
DEVIATION REPORT**

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
220	1	4,235	3/4
623	1 1/2	5,070	1
1,085	2 1/2	5,795	1 3/4
1,462	2	6,279	2
1,839	1 1/2	6,775	1 1/4
2,029	2 1/4	7,233	2 3/4
2,259	1 1/2		
2,766	1		
3,253	1/2		

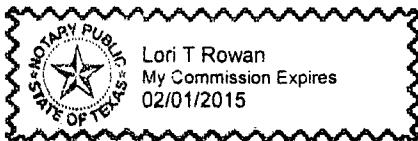
Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-
President



The foregoing instrument was acknowledged before me on this 27th day of February, 2014 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling,

My Commission Expires: 02/01/2015



Lori T. Rowan
Notary Public for Ector Co., Texas

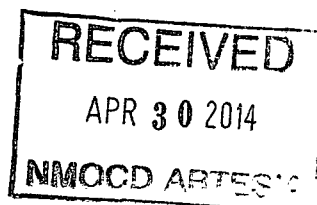


A GYRO TECHNOLOGIES INC. COMPANY

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

April 1, 2014

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



Attn: Kanicia Castillo

RE: Down South State Com No. 005

Please find enclosed a copy of the survey from 0.00' to 7150.00' ran on the above referenced well.

Sincerely,

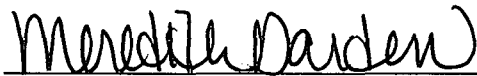

Keith Havelka
Operations

STATE OF TEXAS §

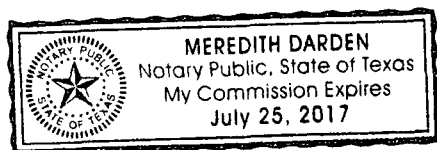
§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 1st day of April,
A.D., 2014, by Keith Havelka.



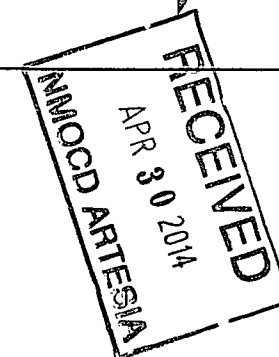
Meredith Darden
Notary Public, State of Texas





Company: COG Operating, LLC
Lease/Well: Down South State Com/No. 005H

Rig Name: Patriot 2
State/County: New Mexico/Eddy
Latitude: 32.02, Longitude: -104.12
GRID North is 0.11 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 17 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: ...h State Com 5H_gyro survey.ut

Minimum Curvature Method

Report Date/Time: 4/1/2014 / 09:58

Vaughn Energy Services
Midland, TX
432-563-5444

Surveyor: Gene Heiss

Down South State Com No. 005H / API 30-015-41400

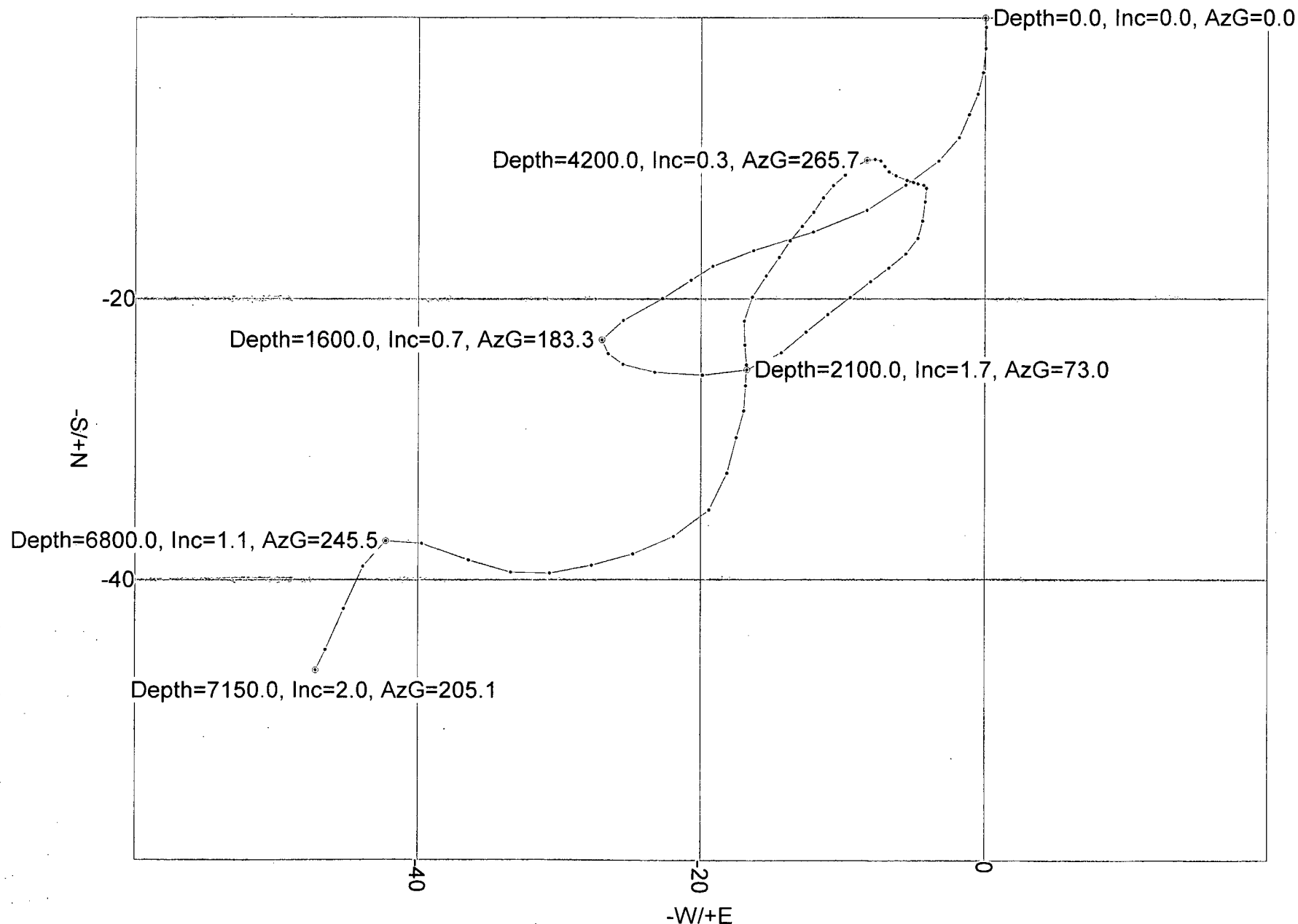
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.76	175.45	100.00	-0.66	0.05	-0.66	0.66	175.45	0.76
200.00	0.98	185.50	199.99	-2.17	0.02	-2.17	2.17	179.39	0.27
300.00	1.02	186.52	299.97	-3.91	-0.16	-3.91	3.91	182.34	0.04
400.00	0.80	201.42	399.96	-5.44	-0.52	-5.44	5.47	185.41	0.32
500.00	1.02	204.60	499.95	-6.90	-1.14	-6.90	7.00	189.39	0.23
600.00	1.01	201.01	599.93	-8.53	-1.83	-8.53	8.73	192.09	0.06
700.00	1.61	233.08	699.90	-10.20	-3.27	-10.20	10.71	197.76	0.93
800.00	1.70	234.43	799.86	-11.91	-5.60	-11.91	13.16	205.17	0.10
900.00	2.06	239.46	899.81	-13.68	-8.35	-13.68	16.03	211.39	0.40
1000.00	2.65	253.84	999.72	-15.24	-12.12	-15.24	19.47	218.49	0.83
1100.00	2.41	251.24	1099.63	-16.56	-16.33	-16.56	23.26	224.60	0.27
1200.00	1.10	242.14	1199.58	-17.69	-19.17	-17.69	26.08	227.31	1.34
1300.00	1.01	232.20	1299.56	-18.67	-20.72	-18.67	27.89	227.97	0.20
1400.00	1.75	239.99	1399.53	-19.98	-22.73	-19.98	30.26	228.69	0.76
1500.00	1.91	241.63	1499.48	-21.53	-25.52	-21.53	33.39	229.85	0.17
1600.00	0.68	183.29	1599.46	-22.92	-27.02	-22.92	35.43	229.70	1.66
1700.00	0.68	129.39	1699.45	-23.89	-26.60	-23.89	35.75	228.07	0.62
1800.00	0.81	123.88	1799.44	-24.66	-25.55	-24.66	35.51	226.02	0.15

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
1900.00	1.95	95.48	1899.41	-25.21	-23.27	-25.21	34.31	222.71	1.30
2000.00	1.93	91.74	1999.35	-25.43	-19.90	-25.43	32.29	218.04	0.13
2100.00	1.71	73.02	2099.31	-25.04	-16.79	-25.04	30.15	213.83	0.63
2200.00	1.45	52.06	2199.27	-23.83	-14.36	-23.83	27.82	211.08	0.63
2300.00	1.15	46.71	2299.24	-22.36	-12.63	-22.36	25.68	209.46	0.32
2400.00	1.11	54.50	2399.22	-21.11	-11.11	-21.11	23.86	207.76	0.16
2500.00	1.17	49.84	2499.20	-19.89	-9.54	-19.89	22.06	205.63	0.11
2600.00	0.94	54.32	2599.19	-18.75	-8.10	-18.75	20.43	203.35	0.24
2700.00	0.91	52.70	2699.17	-17.80	-6.80	-17.80	19.05	200.91	0.04
2800.00	0.87	47.50	2799.16	-16.80	-5.61	-16.80	17.71	198.46	0.09
2900.00	0.76	26.80	2899.15	-15.70	-4.75	-15.70	16.40	196.84	0.31
3000.00	0.73	3.64	2999.14	-14.47	-4.41	-14.47	15.13	196.95	0.30
3100.00	0.86	10.63	3099.13	-13.10	-4.23	-13.10	13.76	197.91	0.16
3200.00	0.27	347.80	3199.13	-12.13	-4.14	-12.13	12.82	198.86	0.62
3300.00	0.16	267.44	3299.13	-11.90	-4.33	-11.90	12.67	200.00	0.29
3400.00	0.33	288.98	3399.13	-11.82	-4.74	-11.82	12.73	201.88	0.19
3500.00	0.05	283.58	3499.13	-11.71	-5.06	-11.71	12.76	203.36	0.28
3600.00	0.51	287.88	3599.12	-11.56	-5.52	-11.56	12.82	205.53	0.46
3700.00	0.46	297.58	3699.12	-11.24	-6.30	-11.24	12.89	209.28	0.10
3800.00	0.19	306.78	3799.12	-10.96	-6.79	-10.96	12.89	211.80	0.27
3900.00	0.37	329.69	3899.12	-10.58	-7.09	-10.58	12.73	213.82	0.21
4000.00	0.21	312.77	3999.12	-10.18	-7.39	-10.18	12.57	215.97	0.18
4100.00	0.31	263.38	4099.12	-10.08	-7.79	-10.08	12.74	217.69	0.24
4200.00	0.35	265.74	4199.11	-10.14	-8.36	-10.14	13.14	219.52	0.04
4300.00	0.61	229.13	4299.11	-10.51	-9.07	-10.51	13.88	220.80	0.39
4400.00	0.62	231.15	4399.10	-11.20	-9.89	-11.20	14.94	221.47	0.02
4500.00	0.66	226.22	4499.10	-11.93	-10.73	-11.93	16.05	221.96	0.07
4600.00	0.65	211.50	4599.09	-12.82	-11.44	-12.82	17.18	221.76	0.17
4700.00	0.74	213.84	4699.08	-13.84	-12.10	-13.84	18.38	221.17	0.09
4800.00	0.75	224.71	4799.08	-14.84	-12.92	-14.84	19.67	221.05	0.14
4900.00	0.78	213.71	4899.07	-15.87	-13.76	-15.87	21.00	220.92	0.15
5000.00	0.81	211.94	4999.06	-17.03	-14.51	-17.03	22.38	220.42	0.04
5100.00	1.05	217.30	5099.04	-18.36	-15.44	-18.36	23.99	220.05	0.26
5200.00	1.00	207.92	5199.03	-19.86	-16.40	-19.86	25.76	219.55	0.17
5300.00	1.09	189.66	5299.01	-21.57	-16.97	-21.57	27.45	218.19	0.34
5400.00	0.91	166.15	5399.00	-23.28	-16.94	-23.28	28.79	216.04	0.44
5500.00	0.73	185.86	5498.99	-24.68	-16.81	-24.68	29.87	214.26	0.33
5600.00	0.99	180.14	5598.98	-26.18	-16.88	-26.18	31.15	212.81	0.27
5700.00	1.07	187.58	5698.96	-27.97	-17.01	-27.97	32.74	211.30	0.16

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
5800.00	1.20	202.40	5798.94	-29.87	-17.53	-29.87	34.63	210.41	0.32
5900.00	1.81	189.13	5898.91	-32.39	-18.18	-32.39	37.15	209.30	0.70
6000.00	1.67	222.92	5998.86	-35.02	-19.42	-35.02	40.04	209.01	1.02
6100.00	1.97	241.75	6098.81	-36.90	-21.93	-36.90	42.92	210.72	0.66
6200.00	1.66	252.20	6198.76	-38.16	-24.82	-38.16	45.52	213.04	0.45
6300.00	1.80	256.85	6298.72	-38.96	-27.73	-38.96	47.82	215.44	0.20
6400.00	1.64	261.98	6398.67	-39.51	-30.68	-39.51	50.02	217.82	0.22
6500.00	1.59	281.21	6498.63	-39.44	-33.45	-39.44	51.72	220.30	0.54
6600.00	1.96	290.36	6598.58	-38.58	-36.42	-38.58	53.05	223.35	0.46
6700.00	2.06	289.37	6698.52	-37.39	-39.72	-37.39	54.55	226.73	0.11
6800.00	1.15	245.55	6798.49	-37.21	-42.33	-37.21	56.35	228.68	1.47
6900.00	1.81	206.65	6898.45	-39.03	-43.95	-39.03	58.78	228.39	1.17
7000.00	1.99	201.77	6998.40	-42.06	-45.30	-42.06	61.81	227.13	0.24
7100.00	1.70	206.59	7098.35	-45.00	-46.61	-45.00	64.78	226.01	0.33
7150.00	2.02	205.06	7148.32	-46.46	-47.31	-46.46	66.31	225.52	0.65



Vaughn Energy Services
Midland, TX
432-563-5444
Surveyor: Gene Heiss
Down South State Com No. 005H / API 30-015-41400



VES Survey Date: 02/21/2014



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Down South State Com Well 5H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Site:	Down South State Com	MD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Well:	Down South State Com Well 5H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Project	Eddy County, New Mexico		
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	Down South State Com		
Site Position:		Northing:	371,857.20 usft
From:	Map	Easting:	566,673.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 1' 19.80176357 N
		Longitude:	104° 7' 5.53171417 W
		Grid Convergence:	0.11 °

Well	Down South State Com Well 5H		
Well Position	+N-S	0.00 usft	Northing: 371,857.20 usft
	+E-W	0.00 usft	Easting: 566,673.20 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 1' 19.80176357 N
		Longitude:	104° 7' 5.53171417 W
		Ground Level:	3,008.50 usft

Wellbore:	Original Hole				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2/7/2014	7.50	59.84	48,173

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00		269.90

Survey Program	Date	3/18/2014			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.00	7,150.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s	
7,233.00	12,240.00	MWD tip=7150 (Original Hole)	MWD	MWD - Standard	

Survey										
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Map	Map	Latitude	Longitude	
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting			
(usft)			(usft)			(usft)	(usft)			
0.00	0.00	0.00	0.00	0.00	0.00	371,857.20	566,673.20	32° 1' 19.80176357 N	104° 7' 5.53171417 W	
100.00	0.76	175.45	100.00	-0.66	0.05	371,856.54	566,673.26	32° 1' 19.79521962 N	104° 7' 5.53111832 W	
Gyro										
200.00	0.98	185.50	199.99	-2.17	0.02	371,855.02	566,673.23	32° 1' 19.78025301 N	104° 7' 5.53149425 W	
300.00	1.02	186.52	299.97	-3.91	-0.16	371,853.29	566,673.04	32° 1' 19.76308055 N	104° 7' 5.53366046 W	
400.00	0.80	201.42	399.96	-5.44	-0.52	371,851.76	566,672.69	32° 1' 19.74790407 N	104° 7' 5.53783139 W	
500.00	1.02	204.60	499.95	-6.90	-1.14	371,850.30	566,672.06	32° 1' 19.73347547 N	104° 7' 5.54513049 W	
600.00	1.01	201.01	599.93	-8.53	-1.83	371,848.66	566,671.37	32° 1' 19.71733733 N	104° 7' 5.55314259 W	
700.00	1.61	233.08	699.90	-10.20	-3.27	371,847.00	566,669.94	32° 1' 19.70087142 N	104° 7' 5.56989777 W	
800.00	1.70	234.43	799.86	-11.91	-5.60	371,845.29	566,667.61	32° 1' 19.68402669 N	104° 7' 5.59699791 W	
900.00	2.06	239.46	899.81	-13.68	-8.35	371,843.51	566,664.85	32° 1' 19.66650330 N	104° 7' 5.62903492 W	



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Down South State Com Well 5H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Site:	Down South State Com	MD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Well:	Down South State Com Well 5H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,000.00	2.65	253.84	999.72	-15.24	-12.12	371,841.96	566,661.08	32° 1' 19.65117133 N	104° 7' 5.67284432 W
1,100.00	2.41	251.24	1,099.63	-16.56	-16.33	371,840.64	566,656.87	32° 1' 19.63819488 N	104° 7' 5.72179142 W
1,200.00	1.10	242.14	1,199.58	-17.69	-19.17	371,839.51	566,654.03	32° 1' 19.62711922 N	104° 7' 5.75480107 W
1,300.00	1.01	232.20	1,299.56	-18.67	-20.72	371,838.52	566,652.49	32° 1' 19.61736441 N	104° 7' 5.77277054 W
1,400.00	1.75	239.99	1,399.53	-19.98	-22.73	371,837.22	566,650.47	32° 1' 19.60450000 N	104° 7' 5.79624897 W
1,500.00	1.91	241.63	1,499.48	-21.53	-25.52	371,835.67	566,647.68	32° 1' 19.58916026 N	104° 7' 5.82867628 W
1,600.00	0.68	183.29	1,599.46	-22.92	-27.02	371,834.28	566,646.18	32° 1' 19.57548924 N	104° 7' 5.84613770 W
1,700.00	0.68	129.39	1,699.45	-23.89	-26.60	371,833.31	566,646.60	32° 1' 19.56589106 N	104° 7' 5.84122858 W
1,800.00	0.81	123.88	1,799.44	-24.66	-25.55	371,832.54	566,647.65	32° 1' 19.55824416 N	104° 7' 5.82910295 W
1,900.00	1.95	95.48	1,899.41	-25.21	-23.27	371,831.98	566,649.93	32° 1' 19.55269146 N	104° 7' 5.80262587 W
2,000.00	1.93	91.74	1,999.35	-25.43	-19.90	371,831.77	566,653.31	32° 1' 19.55051095 N	104° 7' 5.76340724 W
2,100.00	1.71	73.02	2,099.31	-25.04	-16.79	371,832.16	566,656.42	32° 1' 19.55425596 N	104° 7' 5.72727120 W
2,200.00	1.45	52.06	2,199.27	-23.83	-14.36	371,833.37	566,658.84	32° 1' 19.56621926 N	104° 7' 5.69907660 W
2,300.00	1.15	46.71	2,299.24	-22.36	-12.63	371,834.84	566,660.57	32° 1' 19.58069368 N	104° 7' 5.67896744 W
2,400.00	1.11	54.50	2,399.22	-21.11	-11.11	371,836.09	566,662.09	32° 1' 19.59304007 N	104° 7' 5.66129424 W
2,500.00	1.17	49.84	2,499.20	-19.89	-9.54	371,837.31	566,663.66	32° 1' 19.60509197 N	104° 7' 5.64304307 W
2,600.00	0.94	54.32	2,599.19	-18.75	-8.10	371,838.44	566,665.10	32° 1' 19.61631458 N	104° 7' 5.62621393 W
2,700.00	0.91	52.70	2,699.17	-17.80	-6.80	371,839.40	566,666.40	32° 1' 19.62578619 N	104° 7' 5.61111474 W
2,800.00	0.87	47.50	2,799.16	-16.80	-5.61	371,840.40	566,667.59	32° 1' 19.63560107 N	104° 7' 5.59725254 W
2,900.00	0.76	26.80	2,899.15	-15.70	-4.75	371,841.50	566,668.45	32° 1' 19.64651866 N	104° 7' 5.58725181 W
3,000.00	0.73	3.64	2,999.14	-14.47	-4.41	371,842.73	566,668.79	32° 1' 19.65866220 N	104° 7' 5.58328021 W
3,100.00	0.86	10.63	3,099.13	-13.10	-4.23	371,844.10	566,668.97	32° 1' 19.67225000 N	104° 7' 5.58117064 W
3,200.00	0.27	347.80	3,199.13	-12.13	-4.14	371,845.07	566,669.06	32° 1' 19.68182712 N	104° 7' 5.58011859 W
3,300.00	0.16	267.44	3,299.13	-11.90	-4.33	371,845.30	566,668.87	32° 1' 19.68404831 N	104° 7' 5.58231204 W
3,400.00	0.33	288.98	3,399.13	-11.82	-4.74	371,845.38	566,668.46	32° 1' 19.68492163 N	104° 7' 5.58709350 W
3,500.00	0.05	283.58	3,499.13	-11.71	-5.06	371,845.49	566,668.14	32° 1' 19.68595616 N	104° 7' 5.59074700 W
3,600.00	0.51	287.88	3,599.12	-11.56	-5.52	371,845.63	566,667.68	32° 1' 19.68741904 N	104° 7' 5.59615627 W
3,700.00	0.46	297.58	3,699.12	-11.24	-6.30	371,845.96	566,666.90	32° 1' 19.69062601 N	104° 7' 5.60520175 W
3,800.00	0.19	306.78	3,799.12	-10.96	-6.79	371,846.24	566,666.41	32° 1' 19.69345745 N	104° 7' 5.61087074 W
3,900.00	0.37	329.69	3,899.12	-10.58	-7.09	371,846.62	566,666.11	32° 1' 19.69720444 N	104° 7' 5.61429741 W
4,000.00	0.21	312.77	3,999.12	-10.18	-7.39	371,847.02	566,665.82	32° 1' 19.70120054 N	104° 7' 5.61774356 W
4,100.00	0.31	263.38	4,099.12	-10.08	-7.79	371,847.12	566,665.41	32° 1' 19.70213141 N	104° 7' 5.62242548 W
4,200.00	0.35	265.74	4,199.11	-10.14	-8.36	371,847.06	566,664.84	32° 1' 19.70160952 N	104° 7' 5.62908616 W
4,300.00	0.61	229.13	4,299.11	-10.51	-9.07	371,846.69	566,664.13	32° 1' 19.69795172 N	104° 7' 5.63730857 W
4,400.00	0.62	231.15	4,399.10	-11.20	-9.89	371,846.00	566,663.31	32° 1' 19.69116200 N	104° 7' 5.64689465 W
4,500.00	0.66	226.22	4,499.10	-11.93	-10.73	371,845.27	566,662.47	32° 1' 19.68387598 N	104° 7' 5.65663638 W
4,600.00	0.65	211.50	4,599.09	-12.82	-11.44	371,844.38	566,661.76	32° 1' 19.67515992 N	104° 7' 5.66492963 W
4,700.00	0.74	213.84	4,699.08	-13.84	-12.10	371,843.36	566,661.10	32° 1' 19.66507833 N	104° 7' 5.67257291 W
4,800.00	0.75	224.71	4,799.08	-14.84	-12.92	371,842.36	566,660.28	32° 1' 19.65518316 N	104° 7' 5.68212154 W
4,900.00	0.78	213.71	4,899.07	-15.87	-13.76	371,841.33	566,659.45	32° 1' 19.64499293 N	104° 7' 5.69188173 W
5,000.00	0.81	211.94	4,999.06	-17.03	-14.51	371,840.16	566,658.69	32° 1' 19.63346796 N	104° 7' 5.70064024 W
5,100.00	1.05	217.30	5,099.04	-18.36	-15.44	371,838.84	566,657.76	32° 1' 19.62033686 N	104° 7' 5.71146406 W
5,200.00	1.00	207.92	5,199.03	-19.86	-16.40	371,837.34	566,656.80	32° 1' 19.60551188 N	104° 7' 5.72269441 W
5,300.00	1.09	189.66	5,299.01	-21.57	-16.97	371,835.63	566,656.23	32° 1' 19.58861255 N	104° 7' 5.72933401 W
5,400.00	0.91	166.15	5,399.00	-23.28	-16.94	371,833.92	566,656.26	32° 1' 19.57170184 N	104° 7' 5.72901939 W
5,500.00	0.73	185.86	5,498.99	-24.68	-16.81	371,832.51	566,656.39	32° 1' 19.55779751 N	104° 7' 5.72759929 W
5,600.00	0.99	180.14	5,598.98	-26.18	-16.88	371,831.02	566,656.32	32° 1' 19.54297769 N	104° 7' 5.72841392 W
5,700.00	1.07	187.58	5,698.96	-27.97	-17.01	371,829.23	566,656.20	32° 1' 19.52527082 N	104° 7' 5.72991047 W
5,800.00	1.20	202.40	5,798.94	-29.87	-17.53	371,827.33	566,655.67	32° 1' 19.50654030 N	104° 7' 5.73601994 W
5,900.00	1.81	189.13	5,898.91	-32.39	-18.18	371,824.81	566,655.02	32° 1' 19.48154039 N	104° 7' 5.74362428 W
6,000.00	1.67	222.92	5,998.86	-35.02	-19.42	371,822.18	566,653.78	32° 1' 19.45557240 N	104° 7' 5.75812231 W
6,100.00	1.97	241.75	6,098.81	-36.90	-21.93	371,820.30	566,651.27	32° 1' 19.43700975 N	104° 7' 5.78727955 W
6,200.00	1.66	252.20	6,198.76	-38.16	-24.82	371,819.04	566,648.38	32° 1' 19.42463331 N	104° 7' 5.82091524 W
6,300.00	1.80	256.85	6,298.72	-38.96	-27.73	371,818.24	566,645.47	32° 1' 19.41677254 N	104° 7' 5.85471762 W
6,400.00	1.64	261.98	6,398.67	-39.51	-30.68	371,817.68	566,642.53	32° 1' 19.41131866 N	104° 7' 5.88895457 W



Survey Report - Geographic



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Down South State Com Well 5H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Site:	Down South State Com	MD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Well:	Down South State Com Well 5H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,500.00	1.59	281.21	6,498.63	-39.44	-33.45	371,817.76	566,639.75	32° 1' 19.41206676 N	104° 7' 5.92122036 W
6,600.00	1.96	290.36	6,598.59	-38.58	-36.42	371,818.62	566,636.78	32° 1' 19.42068260 N	104° 7' 5.95563144 W
6,700.00	2.06	289.37	6,698.52	-37.39	-39.72	371,819.81	566,633.49	32° 1' 19.43253521 N	104° 7' 5.99392236 W
6,800.00	1.15	245.55	6,798.49	-37.21	-42.33	371,819.99	566,630.88	32° 1' 19.43437560 N	104° 7' 6.02422633 W
6,900.00	1.81	206.65	6,898.45	-39.03	-43.95	371,818.16	566,629.25	32° 1' 19.41632744 N	104° 7' 6.04310848 W
7,000.00	1.99	201.77	6,998.40	-42.06	-45.30	371,815.14	566,627.90	32° 1' 19.38642750 N	104° 7' 6.05888649 W
7,100.00	1.70	206.59	7,098.35	-45.00	-46.61	371,812.20	566,626.59	32° 1' 19.35736846 N	104° 7' 6.07414652 W
7,150.00	2.02	205.06	7,148.32	-46.46	-47.31	371,810.74	566,625.89	32° 1' 19.34291868 N	104° 7' 6.08237200 W
7,233.00	2.60	214.80	7,231.25	-49.33	-49.01	371,807.87	566,624.20	32° 1' 19.31453874 N	104° 7' 6.10211577 W
MWD surveys									
7,264.00	7.90	239.40	7,262.12	-50.99	-51.24	371,806.21	566,621.96	32° 1' 19.29812298 N	104° 7' 6.12813650 W
7,296.00	13.70	251.70	7,293.54	-53.30	-56.74	371,803.89	566,616.46	32° 1' 19.27535464 N	104° 7' 6.19203047 W
7,328.00	18.70	260.20	7,324.26	-55.37	-65.40	371,801.83	566,607.80	32° 1' 19.25509265 N	104° 7' 6.29266422 W
7,359.00	20.60	263.00	7,353.46	-56.88	-75.71	371,800.32	566,597.49	32° 1' 19.24034526 N	104° 7' 6.41247027 W
7,391.00	20.40	264.40	7,383.43	-58.11	-86.85	371,799.09	566,586.35	32° 1' 19.22838860 N	104° 7' 6.54187681 W
7,423.00	22.00	268.20	7,413.27	-58.84	-98.39	371,798.36	566,574.81	32° 1' 19.22136559 N	104° 7' 6.67597005 W
7,454.00	25.90	272.80	7,441.59	-58.69	-110.96	371,798.50	566,562.24	32° 1' 19.22308178 N	104° 7' 6.82199857 W
7,486.00	29.90	275.60	7,469.87	-57.57	-125.89	371,799.63	566,547.31	32° 1' 19.23446162 N	104° 7' 6.99533769 W
7,513.00	33.73	277.46	7,492.81	-55.94	-140.02	371,801.26	566,533.18	32° 1' 19.25087283 N	104° 7' 7.15950146 W
330 Hard line intercept @ 7513 MD 468 FSL 330 FEL									
7,517.00	34.30	277.70	7,496.13	-55.65	-142.24	371,801.55	566,530.96	32° 1' 19.25383730 N	104° 7' 7.18525953 W
7,549.00	38.40	277.40	7,521.89	-53.16	-161.04	371,804.04	566,512.16	32° 1' 19.27884113 N	104° 7' 7.40356450 W
7,581.00	41.50	275.60	7,546.42	-50.84	-181.45	371,806.35	566,491.75	32° 1' 19.30215525 N	104° 7' 7.64061954 W
7,613.00	43.50	275.30	7,570.01	-48.79	-202.97	371,808.41	566,470.23	32° 1' 19.32288709 N	104° 7' 7.89054556 W
7,644.00	45.70	273.90	7,592.09	-47.05	-224.67	371,810.15	566,448.53	32° 1' 19.34053643 N	104° 7' 8.14250588 W
7,676.00	49.60	271.80	7,613.64	-45.89	-248.28	371,811.31	566,424.92	32° 1' 19.35250090 N	104° 7' 8.41677144 W
7,708.00	53.00	271.40	7,633.65	-45.19	-273.24	371,812.00	566,399.96	32° 1' 19.35987025 N	104° 7' 8.70668978 W
7,740.00	54.90	272.50	7,652.48	-44.31	-299.10	371,812.89	566,374.10	32° 1' 19.36911912 N	104° 7' 9.00699806 W
7,771.00	56.70	273.20	7,669.90	-43.03	-324.70	371,814.16	566,348.50	32° 1' 19.38225371 N	104° 7' 9.30440740 W
7,803.00	61.40	272.10	7,686.35	-41.77	-352.11	371,815.43	566,321.09	32° 1' 19.39528046 N	104° 7' 9.62272508 W
7,835.00	65.60	271.80	7,700.63	-40.80	-380.73	371,816.40	566,292.48	32° 1' 19.40546944 N	104° 7' 9.95508784 W
7,867.00	69.00	271.80	7,712.98	-39.87	-410.23	371,817.33	566,262.98	32° 1' 19.41522294 N	104° 7' 10.29775969 W
7,898.00	70.90	271.10	7,723.60	-39.14	-439.34	371,818.06	566,233.86	32° 1' 19.42307465 N	104° 7' 10.63588292 W
7,930.00	74.30	270.70	7,733.17	-38.66	-469.87	371,818.54	566,203.34	32° 1' 19.42840829 N	104° 7' 10.99047205 W
7,961.00	76.50	271.80	7,740.99	-38.00	-499.85	371,819.20	566,173.35	32° 1' 19.43548523 N	104° 7' 11.33880860 W
7,993.00	80.10	271.80	7,747.47	-37.02	-531.17	371,820.18	566,142.03	32° 1' 19.44583672 N	104° 7' 11.70252932 W
8,024.00	82.70	270.70	7,752.11	-36.35	-561.81	371,820.85	566,111.39	32° 1' 19.45304231 N	104° 7' 12.05843452 W
8,056.00	85.20	269.60	7,755.48	-36.27	-593.63	371,820.93	566,079.57	32° 1' 19.45448123 N	104° 7' 12.42803172 W
8,088.00	88.50	268.60	7,757.24	-36.77	-625.57	371,820.43	566,047.63	32° 1' 19.45013437 N	104° 7' 12.79908548 W
8,119.00	89.90	268.20	7,757.67	-37.64	-656.56	371,819.56	566,016.65	32° 1' 19.44217364 N	104° 7' 13.15901009 W
8,183.00	91.50	267.50	7,756.89	-40.04	-720.50	371,817.16	565,952.70	32° 1' 19.41966207 N	104° 7' 13.90186902 W
8,278.00	93.30	267.90	7,752.91	-43.85	-815.34	371,813.35	565,857.86	32° 1' 19.38381060 N	104° 7' 15.00355363 W
8,373.00	91.00	267.90	7,749.35	-47.32	-910.20	371,809.87	565,763.00	32° 1' 19.35123042 N	104° 7' 16.10554288 W
8,468.00	91.80	267.20	7,747.03	-51.38	-1,005.09	371,805.81	565,668.12	32° 1' 19.31289627 N	104° 7' 17.20778300 W
8,562.00	90.10	267.50	7,745.47	-55.73	-1,098.97	371,801.47	565,574.23	32° 1' 19.27171362 N	104° 7' 18.29840835 W
8,658.00	90.60	267.20	7,744.88	-60.17	-1,194.86	371,797.03	565,478.34	32° 1' 19.22964511 N	104° 7' 19.41240787 W
8,752.00	91.10	266.50	7,743.49	-65.33	-1,288.71	371,791.87	565,384.49	32° 1' 19.18034699 N	104° 7' 20.50263017 W
8,848.00	91.80	265.80	7,741.06	-71.78	-1,384.46	371,785.42	565,288.74	32° 1' 19.11842536 N	104° 7' 21.61500606 W
8,943.00	90.10	266.80	7,739.48	-77.90	-1,479.25	371,779.29	565,193.96	32° 1' 19.05959417 N	104° 7' 22.71613952 W
9,038.00	89.00	267.90	7,740.23	-82.30	-1,574.14	371,774.90	565,099.06	32° 1' 19.01795407 N	104° 7' 23.81849112 W
9,133.00	89.20	270.30	7,741.72	-83.79	-1,669.11	371,773.41	565,004.09	32° 1' 19.00501553 N	104° 7' 24.92167152 W
9,228.00	91.00	272.80	7,741.56	-81.22	-1,764.06	371,775.98	564,909.14	32° 1' 19.03226584 N	104° 7' 26.02457563 W
9,323.00	91.70	272.10	7,739.32	-77.16	-1,858.95	371,780.04	564,814.25	32° 1' 19.07426419 N	104° 7' 27.12665625 W
9,418.00	92.20	271.80	7,736.09	-73.93	-1,953.84	371,783.27	564,719.36	32° 1' 19.10805394 N	104° 7' 28.22880177 W
9,513.00	92.90	271.80	7,731.86	-70.95	-2,048.70	371,786.25	564,624.51	32° 1' 19.13936925 N	104° 7' 29.33059206 W

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Down South State Com Well 5H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Site:	Down South State Com	MD Reference:	RKB=3008.5+17 @ 3025.50usft (Patriot 2)
Well:	Down South State Com Well 5H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	EDM 5000.1 Ddatabase

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,608.00	92.90	272.80	7,727.05	-67.14	-2,143.50	371,790.06	564,529.71	32° 1' 19.17886076 N	104° 7' 30.43169254 W
9,703.00	92.20	273.50	7,722.83	-61.92	-2,238.26	371,795.27	564,434.94	32° 1' 19.23227939 N	104° 7' 31.53230475 W
9,798.00	90.40	273.90	7,720.67	-55.80	-2,333.03	371,801.40	564,340.17	32° 1' 19.29473770 N	104° 7' 32.63303794 W
9,893.00	91.00	273.90	7,719.51	-49.33	-2,427.80	371,807.86	564,245.40	32° 1' 19.36047998 N	104° 7' 33.73375273 W
9,988.00	91.70	273.20	7,717.27	-43.45	-2,522.59	371,813.74	564,150.61	32° 1' 19.42047785 N	104° 7' 34.83468655 W
10,084.00	91.10	272.50	7,714.93	-38.68	-2,618.45	371,818.52	564,054.76	32° 1' 19.46951745 N	104° 7' 35.94797447 W
10,179.00	91.80	272.50	7,712.52	-34.54	-2,713.32	371,822.66	563,959.88	32° 1' 19.51230887 N	104° 7' 37.04997441 W
10,274.00	92.20	272.10	7,709.21	-30.73	-2,808.19	371,826.47	563,865.01	32° 1' 19.55180905 N	104° 7' 38.15182702 W
10,369.00	93.10	272.10	7,704.81	-27.25	-2,903.02	371,829.95	563,770.18	32° 1' 19.58801210 N	104° 7' 39.25332069 W
10,464.00	91.00	271.80	7,701.42	-24.02	-2,997.90	371,833.18	563,675.30	32° 1' 19.62176677 N	104° 7' 40.35534404 W
10,559.00	91.50	270.70	7,699.34	-21.95	-3,092.86	371,835.25	563,580.35	32° 1' 19.64405776 N	104° 7' 41.45825533 W
10,654.00	92.40	270.30	7,696.11	-21.12	-3,187.80	371,836.08	563,485.41	32° 1' 19.65404086 N	104° 7' 42.56104516 W
10,749.00	90.80	270.70	7,693.46	-20.29	-3,282.75	371,836.91	563,390.45	32° 1' 19.66402337 N	104° 7' 43.66401935 W
10,844.00	91.50	270.00	7,691.55	-19.71	-3,377.73	371,837.49	563,295.47	32° 1' 19.67154398 N	104° 7' 44.76725283 W
10,939.00	92.00	270.30	7,688.65	-19.46	-3,472.68	371,837.73	563,200.52	32° 1' 19.67577872 N	104° 7' 45.87022701 W
11,034.00	90.80	270.00	7,686.33	-19.22	-3,567.65	371,837.98	563,105.55	32° 1' 19.68001114 N	104° 7' 46.97336984 W
11,129.00	91.30	270.30	7,684.59	-18.97	-3,662.64	371,838.23	563,010.56	32° 1' 19.68424194 N	104° 7' 48.07667350 W
11,225.00	91.70	270.00	7,682.08	-18.72	-3,758.60	371,838.48	562,914.60	32° 1' 19.68851426 N	104° 7' 49.19139730 W
11,320.00	92.20	270.00	7,678.84	-18.72	-3,853.55	371,838.48	562,819.65	32° 1' 19.69027822 N	104° 7' 50.29425776 W
11,415.00	90.80	270.00	7,676.36	-18.72	-3,948.51	371,838.48	562,724.69	32° 1' 19.69203989 N	104° 7' 51.39735520 W
11,510.00	91.10	269.60	7,674.78	-19.05	-4,043.50	371,838.15	562,629.70	32° 1' 19.69051805 N	104° 7' 52.50070354 W
11,605.00	91.50	269.60	7,672.63	-19.71	-4,138.47	371,837.49	562,534.73	32° 1' 19.68571260 N	104° 7' 53.60390782 W
11,700.00	92.20	268.90	7,669.56	-20.95	-4,233.41	371,836.25	562,439.79	32° 1' 19.67516695 N	104° 7' 54.70675443 W
11,795.00	92.40	268.90	7,665.75	-22.78	-4,328.32	371,834.42	562,344.88	32° 1' 19.65888235 N	104° 7' 55.80920414 W
11,890.00	92.90	268.90	7,661.35	-24.60	-4,423.20	371,832.60	562,250.00	32° 1' 19.64259944 N	104° 7' 56.91135977 W
11,985.00	93.60	268.60	7,655.97	-26.67	-4,518.02	371,830.53	562,155.18	32° 1' 19.62386658 N	104° 7' 58.01286229 W
12,080.00	92.40	268.60	7,651.00	-28.98	-4,612.86	371,828.21	562,060.34	32° 1' 19.60266854 N	104° 7' 59.11455373 W
12,179.00	93.60	268.20	7,645.82	-31.74	-4,711.69	371,825.45	561,961.51	32° 1' 19.57716277 N	104° 8' 0.26253223 W
12,240.00	93.60	268.20	7,641.99	-33.66	-4,772.54	371,823.54	561,900.66	32° 1' 19.55935134 N	104° 8' 0.96939112 W
Survey projected to 12240.00 MD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	-0.66	0.05	Gyro
7,233.00	7,231.25	-49.33	-49.01	MWD surveys
7,513.00	7,492.81	-55.94	-140.02	330 Hard line intercept @ 7513 MD 468 FSL 330 FEL
12,240.00	7,641.99	-33.66	-4,772.54	Survey projected to 12240.00 MD



COG Operating LLC

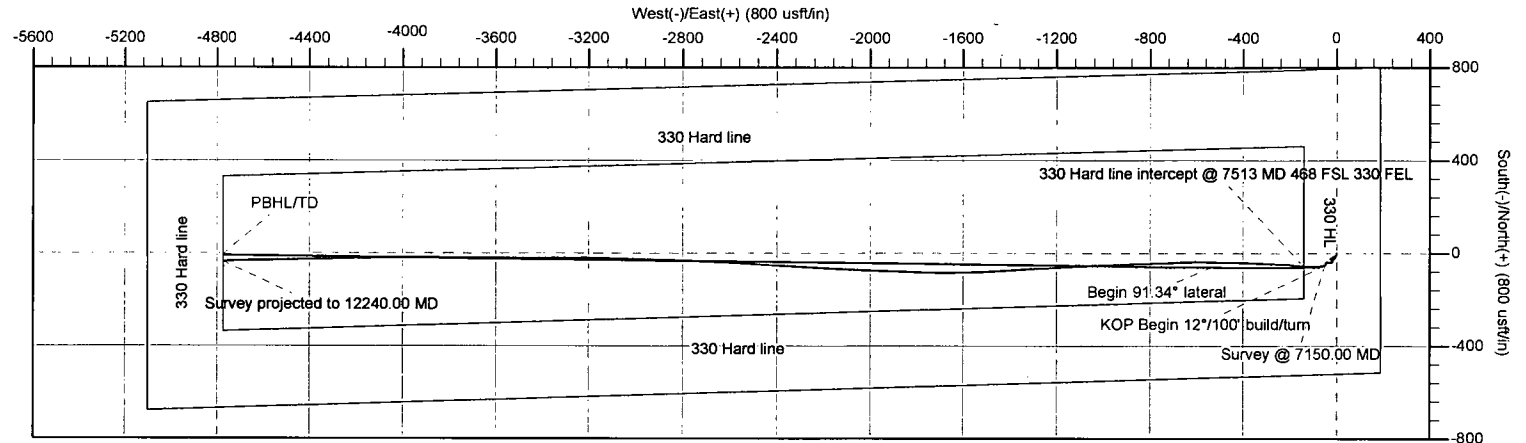
Well: Down South State Com Well 5H

Site: Down South State Com

Project: Eddy County, New Mexico

Design: rev1

Rig: Patriot 2



Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	7150.00	2.02	205.06	7148.32	-46.46	-47.31	0.00	0.00	47.39	Survey @ 7150.00 MD
2	7290.77	2.02	205.06	7289.00	-50.95	-49.42	0.00	0.00	49.50	KOP Begin 12°/100' build/turn
3	8044.99	91.34	270.71	7759.14	-60.38	-538.15	12.00	65.62	538.25	Begin 91.34° lateral
4	12281.83	91.34	270.71	7660.00	-8.00	-4773.50	0.00	0.00	4773.51	PBHL/TD

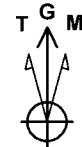
Surface Location: RKB=3008.5+17 @ 3025.50usft (Patriot 2)
US State Plane 1927 (Exact solution)

Northings Eastings Latitude Longitude
371857.20 566673.20 32° 1' 19.80176357 N 104° 7' 5.53171416 W
Total Correction (M +> G) To convert a Magnetic Direction to a Grid Direction, Add 7.38°

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
100.00	100.00	0.76	175.45	-0.66	0.05	-0.05	0.66	Gyro
7231.25	7233.00	2.60	214.80	-49.33	-49.01	49.09	141.66	MWD surveys
7492.81	7513.00	33.73	277.46	-55.94	-140.02	140.12	234.52	330 Hard line intercept @ 7513 MD 468 FSL 330 FEL
7641.99	12240.00	93.60	268.20	-33.66	-4772.54	4772.59	4870.43	Survey projected to 12240.00 MD

N-ZONE



Azimuths to Grid North
True North: -0.11°
Magnetic North: 7.38°
Magnetic Field
Strength: 48173.1snT
Dip Angle: 59.84°
Date: 2/7/2014
Model: IGRF2010

