



A GYRO TECHNOLOGIES INC. COMPANY

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

April 17, 2014

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 04 2014

COG Operating LLC (Concho)
One Concho Center
600 W. Illinois Avenue
Midland, TX 79701

RECEIVED

30-015-41931

Attn: Kanicia Castillo

Re: **SRO State No 059H**

Please find enclosed a copy of the survey from 0' to 7,551' ran on the above referenced well.

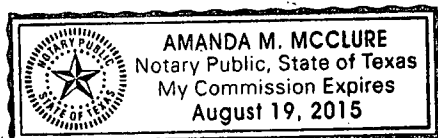
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 17 day of April, A.D., 2014, by Keith Havelka.



Amanda McClure
Notary Public, State of Texas



Company: COG Operating-Concho

Lease/Well: SRO State/No 059H

Rig Name: Silver Oak 7

State/County: New Mexico/Eddy

Latitude: 32.06, Longitude: -104.06

GRID North is 0.14 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RBK = 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: sro state com 59h_gyro survey.ut

Minimum Curvature Method

Report Date/Time: 4/17/2014 / 13:27

VES Survey International

Midland, Texas

432-563-5444

Surveyor: Gene Heiss

SRO State No 059H / API 30-015-41931

RECEIVED
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ARTESIA DISTRICT

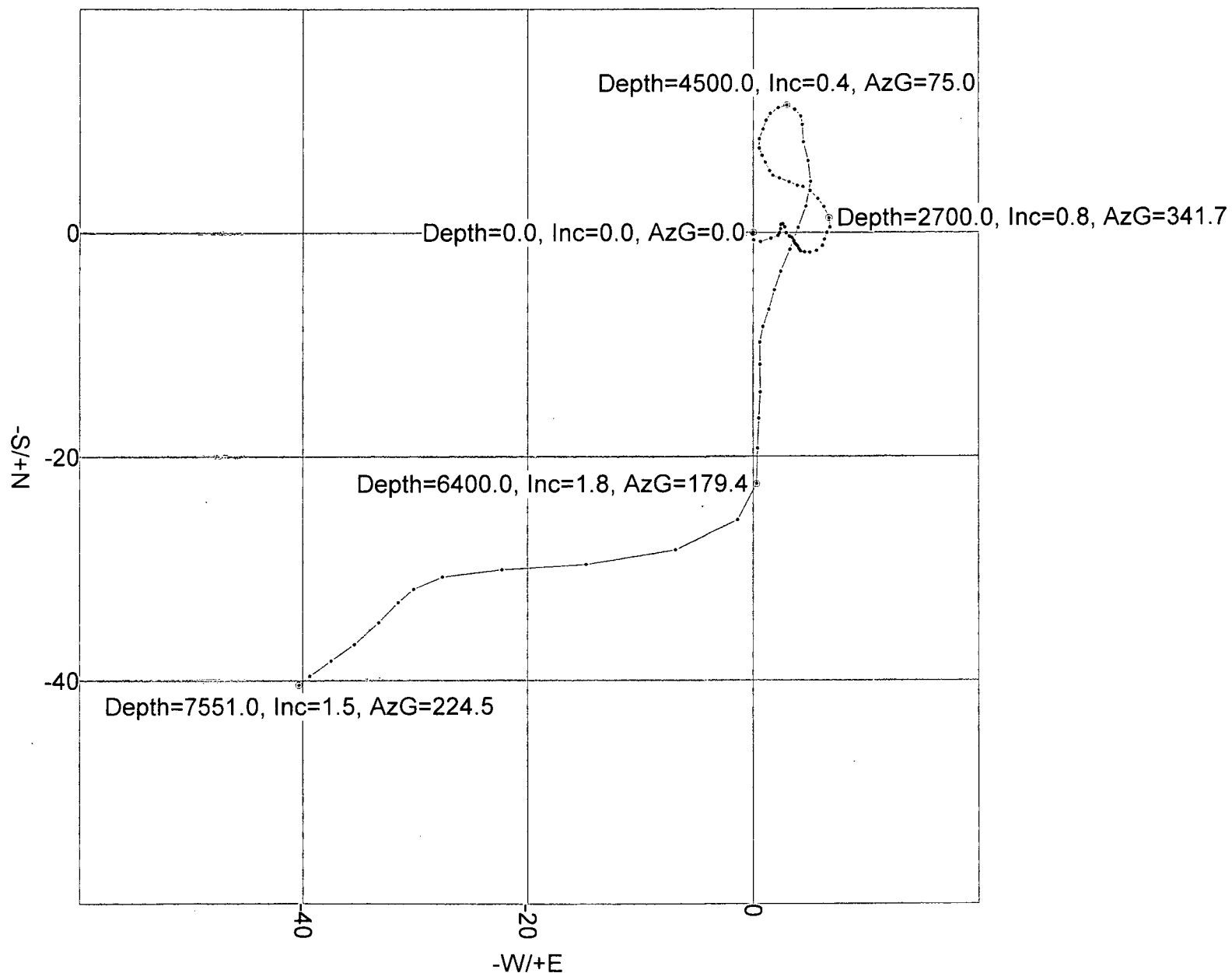
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.18	201.70	100.00	-0.15	-0.06	-0.15	0.16	201.70	0.18
200.00	0.46	157.29	200.00	-0.67	0.04	-0.67	0.67	176.78	0.35
300.00	0.57	63.04	300.00	-0.81	0.63	-0.81	1.03	142.08	0.76
400.00	0.56	81.83	399.99	-0.52	1.56	-0.52	1.65	108.43	0.18
500.00	0.26	36.33	499.99	-0.27	2.18	-0.27	2.20	97.03	0.42
600.00	0.07	20.55	599.99	-0.03	2.34	-0.03	2.34	90.73	0.19
700.00	0.35	11.39	699.99	0.32	2.42	0.32	2.44	82.39	0.28
800.00	0.11	348.16	799.99	0.72	2.46	0.72	2.56	73.76	0.25
900.00	0.22	98.72	899.99	0.78	2.62	0.78	2.74	73.37	0.28
1000.00	0.30	182.52	999.99	0.49	2.80	0.49	2.84	80.05	0.35
1100.00	0.32	152.22	1099.98	-0.02	2.92	-0.02	2.92	90.40	0.16
1200.00	0.19	109.85	1199.98	-0.33	3.21	-0.33	3.22	95.79	0.22
1300.00	0.11	135.27	1299.98	-0.45	3.43	-0.45	3.46	97.49	0.10
1400.00	0.26	155.40	1399.98	-0.72	3.59	-0.72	3.67	101.37	0.16
1500.00	0.04	157.44	1499.98	-0.95	3.70	-0.95	3.82	104.48	0.22
1600.00	0.10	127.71	1599.98	-1.04	3.78	-1.04	3.92	105.33	0.07
1700.00	0.15	141.27	1699.98	-1.19	3.92	-1.19	4.10	106.84	0.06
1800.00	0.21	163.02	1799.98	-1.47	4.06	-1.47	4.32	109.88	0.09

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	0.11	106.41	1899.98	-1.67	4.21	-1.67	4.53	111.69	0.18
2000.00	0.31	99.35	1999.98	-1.74	4.56	-1.74	4.88	110.91	0.20
2100.00	0.23	87.48	2099.98	-1.78	5.03	-1.78	5.34	109.46	0.09
2200.00	0.50	67.75	2199.98	-1.60	5.64	-1.60	5.87	105.86	0.30
2300.00	0.33	23.49	2299.97	-1.17	6.17	-1.17	6.27	100.73	0.35
2400.00	0.35	10.24	2399.97	-0.60	6.34	-0.60	6.36	95.43	0.08
2500.00	0.38	27.86	2499.97	-0.01	6.55	-0.01	6.55	90.06	0.12
2600.00	0.26	33.95	2599.97	0.47	6.83	0.47	6.84	86.02	0.13
2700.00	0.77	341.75	2699.96	1.30	6.74	1.30	6.87	79.09	0.65
2800.00	0.50	326.09	2799.96	2.30	6.29	2.30	6.69	69.87	0.32
2900.00	0.52	319.60	2899.95	3.01	5.75	3.01	6.49	62.33	0.06
3000.00	0.61	312.05	2999.95	3.71	5.06	3.71	6.28	53.73	0.12
3100.00	0.29	273.70	3099.95	4.08	4.42	4.08	6.02	47.25	0.42
3200.00	0.32	288.00	3199.95	4.19	3.90	4.19	5.72	43.01	0.08
3300.00	0.59	296.81	3299.94	4.50	3.18	4.50	5.51	35.22	0.28
3400.00	0.50	287.34	3399.94	4.87	2.30	4.87	5.38	25.33	0.13
3500.00	0.21	301.69	3499.94	5.10	1.73	5.10	5.38	18.73	0.30
3600.00	0.39	338.59	3599.93	5.51	1.44	5.51	5.70	14.67	0.26
3700.00	0.56	330.28	3699.93	6.26	1.07	6.26	6.35	9.74	0.18
3800.00	0.22	342.08	3799.93	6.87	0.77	6.87	6.91	6.40	0.35
3900.00	0.58	337.83	3899.93	7.52	0.52	7.52	7.54	3.96	0.36
4000.00	0.48	26.87	3999.92	8.36	0.52	8.36	8.38	3.55	0.45
4100.00	0.59	16.97	4099.92	9.22	0.86	9.22	9.26	5.30	0.14
4200.00	0.37	21.90	4199.91	10.01	1.12	10.01	10.07	6.41	0.22
4300.00	0.48	37.45	4299.91	10.64	1.50	10.64	10.74	8.03	0.16
4400.00	0.56	69.68	4399.91	11.14	2.21	11.14	11.36	11.24	0.30
4500.00	0.36	75.00	4499.90	11.39	2.97	11.39	11.78	14.62	0.21
4600.00	0.71	140.08	4599.90	11.00	3.67	11.00	11.59	18.45	0.65
4700.00	0.23	132.74	4699.90	10.39	4.21	10.39	11.21	22.08	0.49
4800.00	0.70	181.49	4799.89	9.64	4.34	9.64	10.58	24.25	0.58
4900.00	1.10	173.00	4899.88	8.08	4.45	8.08	9.22	28.82	0.42
5000.00	0.90	156.61	4999.87	6.41	4.87	6.41	8.05	37.25	0.35
5100.00	1.32	184.26	5099.85	4.54	5.10	4.54	6.83	48.31	0.67
5200.00	1.26	197.60	5199.82	2.34	4.68	2.34	5.23	63.44	0.31
5300.00	1.05	202.39	5299.80	0.44	4.00	0.44	4.02	83.66	0.24
5400.00	1.36	198.99	5399.78	-1.52	3.26	-1.52	3.60	114.96	0.32
5500.00	1.07	208.14	5499.76	-3.46	2.44	-3.46	4.24	144.88	0.34
5600.00	0.96	188.59	5599.74	-5.12	1.87	-5.12	5.45	159.95	0.36
5700.00	1.12	201.99	5699.73	-6.86	1.38	-6.86	6.99	168.63	0.29

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	0.75	194.03	5799.71	-8.39	0.85	-8.39	8.44	174.19	0.39
5900.00	0.90	188.20	5899.70	-9.81	0.58	-9.81	9.82	176.59	0.17
6000.00	1.38	174.51	5999.68	-11.78	0.59	-11.78	11.79	177.15	0.55
6100.00	1.46	184.24	6099.65	-14.25	0.61	-14.25	14.26	177.56	0.26
6200.00	1.22	181.60	6199.62	-16.58	0.48	-16.58	16.59	178.33	0.26
6300.00	1.86	183.12	6299.59	-19.26	0.37	-19.26	19.27	178.91	0.65
6400.00	1.77	179.44	6399.54	-22.43	0.29	-22.43	22.43	179.25	0.15
6500.00	2.74	224.85	6499.47	-25.67	-1.38	-25.67	25.71	183.08	1.96
6600.00	4.57	255.95	6599.27	-28.34	-6.93	-28.34	29.17	193.75	2.63
6700.00	4.65	265.42	6698.95	-29.63	-14.84	-29.63	33.13	206.60	0.76
6800.00	3.91	267.88	6798.67	-30.08	-22.28	-30.08	37.43	216.54	0.76
6900.00	2.25	254.28	6898.52	-30.74	-27.58	-30.74	41.30	221.91	1.80
7000.00	1.02	230.39	6998.48	-31.83	-30.16	-31.83	43.85	223.45	1.39
7100.00	1.08	227.87	7098.46	-33.03	-31.54	-33.03	45.67	223.68	0.08
7200.00	1.76	221.34	7198.43	-34.82	-33.26	-34.82	48.15	223.69	0.70
7300.00	1.58	235.48	7298.39	-36.76	-35.41	-36.76	51.04	223.93	0.45
7400.00	1.33	233.75	7398.35	-38.23	-37.49	-38.23	53.54	224.44	0.26
7500.00	1.34	235.72	7498.33	-39.57	-39.38	-39.57	55.83	224.87	0.05
7551.00	1.51	224.47	7549.31	-40.38	-40.35	-40.38	57.08	224.97	0.64



VES Survey International
Midland, Texas
432-563-5444
Surveyor: Gene Heiss
SRO State No 059H / API 30-015-41931



VES Survey Date: 04/09/2014



COG Operating, LLC.

Eddy County, N.M.

Section 2-26S-28E SRO State #59H

SRO State #59H

Final

Design: Final

Standard Survey Report

05 May, 2014





Stryker Directional Survey Report



Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well SRO State #59H
Project:	Eddy County, N.M.	TVD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Site:	Section 2-26S-28E SRO State #59H	MD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Well:	SRO State #59H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Project	Eddy County, N.M.		
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	Section 2-26S-28E SRO State #59H		
Site Position:		Northing:	387,456.50 usft
From:	Map	Easting:	583,749.50 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 3' 53.802 N
		Longitude:	104° 3' 46.723 W
		Grid Convergence:	0.14 °

Well	SRO State #59H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 53.802 N
		Longitude:	104° 3' 46.723 W
		Ground Level:	2,964.7 usft

Wellbore	Original Hole		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/21/2014	7.46	59.89	48,194

Design	Original Hole		
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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	359.96	

Survey Program		Date 5/5/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	7,551.0	VES Gyro Survey #1 (Original Hole)	SRG-GYRO-MS	surface readout gyro multishot
7,633.0	8,379.0	MWD Survey #2 (Original Hole)	MWD	MWD - Standard
7,600.0	11,147.0	ST#1 Survey #3 (Original Hole)	MWD	MWD - Standard
10,944.0	12,662.0	ST#2 MWD Survey #4 (Original Hole)	MWD	MWD - Standard

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.18	201.70	100.0	-0.1	-0.1	-0.1	0.18	0.18	0.00	
200.0	0.46	157.29	200.0	-0.7	0.0	-0.7	0.35	0.28	-44.41	
300.0	0.57	63.04	300.0	-0.8	0.6	-0.8	0.76	0.11	-94.25	
400.0	0.56	81.83	400.0	-0.5	1.6	-0.5	0.18	-0.01	18.79	
500.0	0.26	36.33	500.0	-0.3	2.2	-0.3	0.42	-0.30	-45.50	
600.0	0.07	20.55	600.0	0.0	2.3	0.0	0.19	-0.19	-15.78	
700.0	0.35	11.39	700.0	0.3	2.4	0.3	0.28	0.28	-9.16	



Stryker Directional Survey Report



Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well SRO State #59H
Project:	Eddy County, N.M.	TVD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Site:	Section 2-26S-28E SRO State #59H	MD.Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Well:	SRO State #59H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

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)	
800.0	0.11	348.16	800.0	0.7	2.5	0.7	0.25	-0.24	-23.23	
900.0	0.22	98.72	900.0	0.8	2.6	0.8	0.28	0.11	110.56	
1,000.0	0.30	182.52	1,000.0	0.5	2.8	0.5	0.35	0.08	83.80	
1,100.0	0.32	152.22	1,100.0	0.0	2.9	0.0	0.16	-0.02	-30.30	
1,200.0	0.19	109.85	1,200.0	-0.3	3.2	-0.3	0.22	-0.13	-42.37	
1,300.0	0.11	135.27	1,300.0	-0.4	3.4	-0.4	0.10	-0.08	25.42	
1,400.0	0.26	155.40	1,400.0	-0.7	3.6	-0.7	0.16	0.15	20.13	
1,500.0	0.04	157.44	1,500.0	-0.9	3.7	-0.9	0.22	-0.22	2.04	
1,600.0	0.10	127.71	1,600.0	-1.0	3.8	-1.0	0.07	0.06	-29.73	
1,700.0	0.15	141.27	1,700.0	-1.2	3.9	-1.2	0.06	0.05	13.56	
1,800.0	0.21	163.02	1,800.0	-1.5	4.1	-1.5	0.09	0.06	21.75	
1,900.0	0.11	106.41	1,900.0	-1.7	4.2	-1.7	0.18	-0.10	-56.61	
2,000.0	0.31	99.35	2,000.0	-1.7	4.6	-1.7	0.20	0.20	-7.06	
2,100.0	0.23	87.48	2,100.0	-1.8	5.0	-1.8	0.10	-0.08	-11.87	
2,200.0	0.50	67.75	2,200.0	-1.6	5.7	-1.6	0.29	0.27	-19.73	
2,300.0	0.33	23.49	2,300.0	-1.2	6.2	-1.2	0.35	-0.17	-44.26	
2,400.0	0.35	10.24	2,400.0	-0.6	6.3	-0.6	0.08	0.02	-13.25	
2,500.0	0.38	27.86	2,500.0	0.0	6.5	0.0	0.12	0.03	17.62	
2,600.0	0.26	33.95	2,600.0	0.5	6.8	0.5	0.12	-0.12	6.09	
2,700.0	0.77	341.75	2,700.0	1.3	6.7	1.3	0.64	0.51	-52.20	
2,800.0	0.50	326.09	2,800.0	2.3	6.3	2.3	0.32	-0.27	-15.66	
2,900.0	0.52	319.60	2,900.0	3.0	5.8	3.0	0.06	0.02	-6.49	
3,000.0	0.61	312.05	2,999.9	3.7	5.1	3.7	0.12	0.09	-7.55	
3,100.0	0.29	273.70	3,099.9	4.1	4.4	4.1	0.42	-0.32	-38.35	
3,200.0	0.32	288.00	3,199.9	4.2	3.9	4.2	0.08	0.03	14.30	
3,300.0	0.59	296.81	3,299.9	4.5	3.2	4.5	0.28	0.27	8.81	
3,400.0	0.50	287.34	3,399.9	4.9	2.3	4.9	0.13	-0.09	-9.47	
3,500.0	0.21	301.69	3,499.9	5.1	1.7	5.1	0.30	-0.29	14.35	
3,600.0	0.39	338.59	3,599.9	5.5	1.4	5.5	0.26	0.18	36.90	
3,700.0	0.56	330.28	3,699.9	6.2	1.1	6.2	0.18	0.17	-8.31	
3,800.0	0.22	342.08	3,799.9	6.9	0.8	6.9	0.35	-0.34	11.80	
3,900.0	0.58	337.83	3,899.9	7.5	0.5	7.5	0.36	0.36	-4.25	
4,000.0	0.48	26.87	3,999.9	8.3	0.5	8.3	0.45	-0.10	49.04	
4,100.0	0.59	16.97	4,099.9	9.2	0.9	9.2	0.14	0.11	-9.90	
4,200.0	0.37	21.90	4,199.9	10.0	1.1	10.0	0.22	-0.22	4.93	
4,300.0	0.48	37.45	4,299.9	10.6	1.5	10.6	0.16	0.11	15.55	
4,400.0	0.56	69.68	4,399.9	11.1	2.2	11.1	0.30	0.08	32.23	
4,500.0	0.36	75.00	4,499.9	11.4	3.0	11.4	0.20	-0.20	5.32	
4,600.0	0.71	140.08	4,599.9	11.0	3.7	11.0	0.65	0.35	65.08	
4,700.0	0.23	132.74	4,699.9	10.4	4.2	10.4	0.48	-0.48	-7.34	
4,800.0	0.70	181.49	4,799.9	9.6	4.4	9.6	0.57	0.47	48.75	
4,900.0	1.10	173.00	4,899.9	8.1	4.5	8.1	0.42	0.40	-8.49	
5,000.0	0.90	156.61	4,999.9	6.4	4.9	6.4	0.35	-0.20	-16.39	



Stryker Directional Survey Report



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Project:	Eddy County, N.M.	TVD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Site:	Section 2-26S-28E SRO State #59H	MD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Well:	SRO State #59H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

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)
5,100.0	1.32	184.26	5,099.8	4.5	5.1	4.5	0.67	0.42	27.65
5,200.0	1.26	197.60	5,199.8	2.3	4.7	2.3	0.31	-0.06	13.34
5,300.0	1.05	202.39	5,299.8	0.4	4.0	0.4	0.23	-0.21	4.79
5,400.0	1.36	198.99	5,399.8	-1.5	3.3	-1.5	0.32	0.31	-3.40
5,500.0	1.07	208.14	5,499.8	-3.5	2.5	-3.5	0.35	-0.29	9.15
5,600.0	0.96	188.59	5,599.7	-5.1	1.9	-5.1	0.36	-0.11	-19.55
5,700.0	1.12	201.99	5,699.7	-6.9	1.4	-6.9	0.29	0.16	13.40
5,800.0	0.75	194.03	5,799.7	-8.4	0.9	-8.4	0.39	-0.37	-7.96
5,900.0	0.90	188.20	5,899.7	-9.8	0.6	-9.8	0.17	0.15	-5.83
6,000.0	1.38	174.51	5,999.7	-11.8	0.6	-11.8	0.55	0.48	-13.69
6,100.0	1.46	184.24	6,099.7	-14.3	0.6	-14.3	0.25	0.08	9.73
6,200.0	1.22	181.60	6,199.6	-16.6	0.5	-16.6	0.25	-0.24	-2.64
6,300.0	1.86	183.12	6,299.6	-19.3	0.4	-19.3	0.64	0.64	1.52
6,400.0	1.77	179.44	6,399.5	-22.4	0.3	-22.4	0.15	-0.09	-3.68
6,500.0	2.74	224.85	6,499.5	-25.7	-1.4	-25.7	1.96	0.97	45.41
6,600.0	4.57	255.95	6,599.3	-28.3	-6.9	-28.3	2.64	1.83	31.10
6,700.0	4.65	265.42	6,698.9	-29.6	-14.8	-29.6	0.76	0.08	9.47
6,800.0	3.91	267.88	6,798.7	-30.1	-22.3	-30.1	0.76	-0.74	2.46
6,900.0	2.25	254.28	6,898.5	-30.7	-27.6	-30.7	1.80	-1.66	-13.60
7,000.0	1.02	230.39	6,998.5	-31.8	-30.1	-31.8	1.38	-1.23	-23.89
7,100.0	1.08	227.87	7,098.5	-33.0	-31.5	-33.0	0.08	0.06	-2.52
7,200.0	1.76	221.34	7,198.4	-34.8	-33.2	-34.8	0.70	0.68	-6.53
7,300.0	1.58	235.48	7,298.4	-36.8	-35.4	-36.7	0.45	-0.18	14.14
7,400.0	1.33	233.75	7,398.4	-38.2	-37.5	-38.2	0.25	-0.25	-1.73
7,500.0	1.34	235.72	7,498.3	-39.6	-39.4	-39.5	0.05	0.01	1.97
7,551.0	1.51	224.47	7,549.3	-40.4	-40.3	-40.4	0.64	0.33	-22.06
7551' MD VES Gyro Survey									
7,600.0	1.80	220.90	7,598.3	-41.4	-41.3	-41.4	0.63	0.59	-7.29
7,632.0	1.10	225.50	7,630.3	-42.0	-41.8	-42.0	2.22	-2.19	14.38
7,663.0	2.70	29.30	7,661.3	-41.6	-41.7	-41.6	12.16	5.16	528.39
7,695.0	8.30	31.40	7,693.1	-39.0	-40.1	-38.9	17.51	17.50	6.56
7,726.0	14.80	29.90	7,723.5	-33.6	-37.0	-33.6	20.99	20.97	-4.84
7,758.0	21.10	26.00	7,753.9	-24.9	-32.4	-24.9	20.03	19.69	-12.19
7,788.0	26.00	23.10	7,781.4	-14.0	-27.4	-14.0	16.78	16.33	-9.67
7,819.0	29.80	21.10	7,808.8	-0.5	-22.0	-0.5	12.62	12.26	-6.45
7,850.0	33.10	18.80	7,835.2	14.7	-16.5	14.7	11.33	10.65	-7.42
7,882.0	35.20	16.50	7,861.7	31.8	-11.1	31.8	7.70	6.56	-7.19
7,913.0	38.20	16.20	7,886.6	49.6	-5.8	49.6	9.69	9.68	-0.97
7,945.0	41.10	17.60	7,911.2	69.1	0.1	69.1	9.48	9.06	4.38
7,976.0	44.50	16.20	7,933.9	89.2	6.2	89.2	11.39	10.97	-4.52
8,009.0	48.80	13.70	7,956.6	112.4	12.4	112.4	14.15	13.03	-7.58
8,040.0	52.50	12.20	7,976.2	135.8	17.7	135.8	12.51	11.94	-4.84
8,072.0	54.10	10.00	7,995.4	161.0	22.7	160.9	7.44	5.00	-6.88
8,103.0	54.90	8.10	8,013.4	185.9	26.6	185.9	5.62	2.58	-6.13



Stryker Directional Survey Report



Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well SRO State #59H
Project:	Eddy County, N.M.	TVD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Site:	Section 2-26S-28E SRO State #59H	MD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Well:	SRO State #59H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

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)	
8,135.0	55.80	6.40	8,031.6	212.0	30.0	212.0	5.20	2.81	-5.31	
8,166.0	57.50	5.70	8,048.6	237.7	32.7	237.7	5.80	5.48	-2.26	
8,198.0	59.60	4.90	8,065.3	264.9	35.2	264.9	6.90	6.56	-2.50	
8,230.0	60.80	4.80	8,081.2	292.6	37.6	292.6	3.76	3.75	-0.31	
8,261.0	61.50	3.50	8,096.2	319.7	39.5	319.6	4.31	2.26	-4.19	
8,293.0	61.30	0.60	8,111.5	347.7	40.5	347.7	7.98	-0.63	-9.06	
8,324.0	61.30	356.60	8,126.4	374.9	39.9	374.9	11.32	0.00	-12.90	
8,356.0	63.30	354.20	8,141.3	403.2	37.6	403.1	9.12	6.25	-7.50	
8,388.0	66.60	353.60	8,154.8	432.0	34.5	431.9	10.45	10.31	-1.88	
8,419.0	70.40	353.80	8,166.2	460.6	31.3	460.6	12.27	12.26	0.65	
8,450.0	72.40	353.60	8,176.0	489.8	28.1	489.8	6.48	6.45	-0.65	
8,482.0	73.60	353.70	8,185.4	520.3	24.7	520.2	3.76	3.75	0.31	
8,514.0	74.50	354.50	8,194.2	550.9	21.6	550.8	3.70	2.81	2.50	
8,545.0	76.10	356.30	8,202.1	580.7	19.2	580.7	7.63	5.16	5.81	
8,577.0	77.30	357.30	8,209.4	611.8	17.4	611.8	4.83	3.75	3.13	
8,608.0	78.80	357.90	8,215.8	642.1	16.2	642.1	5.20	4.84	1.94	
8,640.0	80.70	358.40	8,221.5	673.6	15.1	673.6	6.13	5.94	1.56	
8,671.0	82.20	359.00	8,226.1	704.3	14.4	704.2	5.20	4.84	1.94	
8,702.0	83.50	359.00	8,230.0	735.0	13.9	735.0	4.19	4.19	0.00	
8,733.0	85.20	358.60	8,233.1	765.8	13.3	765.8	5.63	5.48	-1.29	
8,827.0	88.50	358.00	8,238.2	859.7	10.5	859.6	3.57	3.51	-0.64	
8,922.0	90.90	358.00	8,238.7	954.6	7.2	954.6	2.53	2.53	0.00	
9,015.0	88.90	359.60	8,238.9	1,047.6	5.2	1,047.6	2.75	-2.15	1.72	
9,110.0	88.40	0.30	8,241.1	1,142.5	5.1	1,142.5	0.91	-0.53	0.74	
9,204.0	89.40	359.50	8,242.9	1,236.5	5.0	1,236.5	1.36	1.06	-0.85	
9,298.0	90.90	359.30	8,242.7	1,330.5	4.0	1,330.5	1.61	1.60	-0.21	
9,391.0	89.00	359.40	8,242.8	1,423.5	2.9	1,423.5	2.05	-2.04	0.11	
9,486.0	88.90	359.00	8,244.5	1,518.5	1.6	1,518.5	0.43	-0.11	-0.42	
9,581.0	89.30	358.60	8,246.0	1,613.4	-0.4	1,613.4	0.60	0.42	-0.42	
9,675.0	89.50	358.60	8,247.0	1,707.4	-2.7	1,707.4	0.21	0.21	0.00	
9,769.0	90.80	358.20	8,246.7	1,801.4	-5.3	1,801.4	1.45	1.38	-0.43	
9,864.0	90.60	357.60	8,245.6	1,896.3	-8.8	1,896.3	0.67	-0.21	-0.63	
9,958.0	91.00	357.20	8,244.3	1,990.2	-13.1	1,990.2	0.60	0.43	-0.43	
10,052.0	88.90	358.00	8,244.3	2,084.1	-17.0	2,084.1	2.39	-2.23	0.85	
10,147.0	88.50	357.70	8,246.5	2,179.0	-20.6	2,179.0	0.53	-0.42	-0.32	
10,241.0	89.40	358.80	8,248.2	2,272.9	-23.4	2,273.0	1.51	0.96	1.17	
10,336.0	90.20	359.00	8,248.5	2,367.9	-25.2	2,367.9	0.87	0.84	0.21	
10,432.0	90.90	359.10	8,247.6	2,463.9	-26.8	2,463.9	0.74	0.73	0.10	
10,527.0	89.10	359.80	8,247.6	2,558.9	-27.7	2,558.9	2.03	-1.89	0.74	
10,623.0	88.60	0.30	8,249.6	2,654.9	-27.7	2,654.9	0.74	-0.52	0.52	
10,718.0	89.00	359.90	8,251.5	2,749.9	-27.5	2,749.9	0.60	0.42	-0.42	
10,813.0	89.20	359.60	8,253.0	2,844.8	-27.9	2,844.9	0.38	0.21	-0.32	
10,909.0	89.10	359.50	8,254.5	2,940.8	-28.7	2,940.8	0.15	-0.10	-0.10	



Stryker Directional Survey Report



Company:	COG Operating, LLC.	Local Co-ordinate Reference:	Well SRO State #59H
Project:	Eddy County, N.M.	TVD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Site:	Section 2-26S-28E SRO State #59H	MD Reference:	GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)
Well:	SRO State #59H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

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)
10,944.0	89.00	359.20	8,255.0	2,975.8	-29.1	2,975.8	0.90	-0.29	-0.86
10,975.6	86.30	359.20	8,256.3	3,007.4	-29.5	3,007.4	8.54	-8.54	0.00
11,007.0	85.00	357.60	8,258.7	3,038.7	-30.4	3,038.7	6.55	-4.14	-5.10
11,101.0	84.40	357.10	8,267.4	3,132.2	-34.7	3,132.2	0.83	-0.64	-0.53
11,195.0	88.30	358.00	8,273.4	3,225.9	-38.7	3,225.9	4.26	4.15	0.96
11,290.0	89.80	357.70	8,275.0	3,320.8	-42.3	3,320.8	1.61	1.58	-0.32
11,385.0	90.80	358.20	8,274.5	3,415.7	-45.7	3,415.8	1.18	1.05	0.53
11,480.0	90.20	358.20	8,273.6	3,510.7	-48.7	3,510.7	0.63	-0.63	0.00
11,574.0	90.50	359.50	8,273.1	3,604.7	-50.5	3,604.7	1.42	0.32	1.38
11,669.0	91.00	359.70	8,271.8	3,699.7	-51.2	3,699.7	0.57	0.53	0.21
11,763.0	89.50	359.60	8,271.4	3,793.6	-51.8	3,793.7	1.60	-1.60	-0.11
11,857.0	90.10	359.70	8,271.7	3,887.6	-52.4	3,887.7	0.65	0.64	0.11
11,952.0	90.90	359.50	8,270.9	3,982.6	-53.0	3,982.7	0.87	0.84	-0.21
12,047.0	91.80	359.30	8,268.7	4,077.6	-54.0	4,077.6	0.97	0.95	-0.21
12,141.0	90.90	359.80	8,266.4	4,171.6	-54.8	4,171.6	1.10	-0.96	0.53
12,236.0	89.30	0.90	8,266.3	4,266.6	-54.2	4,266.6	2.04	-1.68	1.16
12,331.0	90.40	1.00	8,266.5	4,361.6	-52.6	4,361.6	1.16	1.16	0.11
12,426.0	91.40	0.50	8,265.0	4,456.5	-51.4	4,456.6	1.18	1.05	-0.53
12,521.0	90.80	1.20	8,263.2	4,551.5	-49.9	4,551.5	0.97	-0.63	0.74
12,616.0	92.00	1.40	8,260.9	4,646.4	-47.8	4,646.5	1.28	1.26	0.21
12,662.0	92.00	1.40	8,259.3	4,692.4	-46.7	4,692.4	0.00	0.00	0.00

12662' MD Projected to Bit - PBHL SRO State #59H

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,551.0	7,549.3	-40.4	-40.3	7551' MD VES Gyro Survey
12,662.0	8,259.3	4,692.4	-46.7	12662' MD Projected to Bit



COMPANY: COG Operating, LLC.
 WELL: SRO:State #59H
 COUNTY: Eddy County, N.M.
 DATUM: NAD 1927 (NADCON CONUS)
 RIG: Silver Oak #7

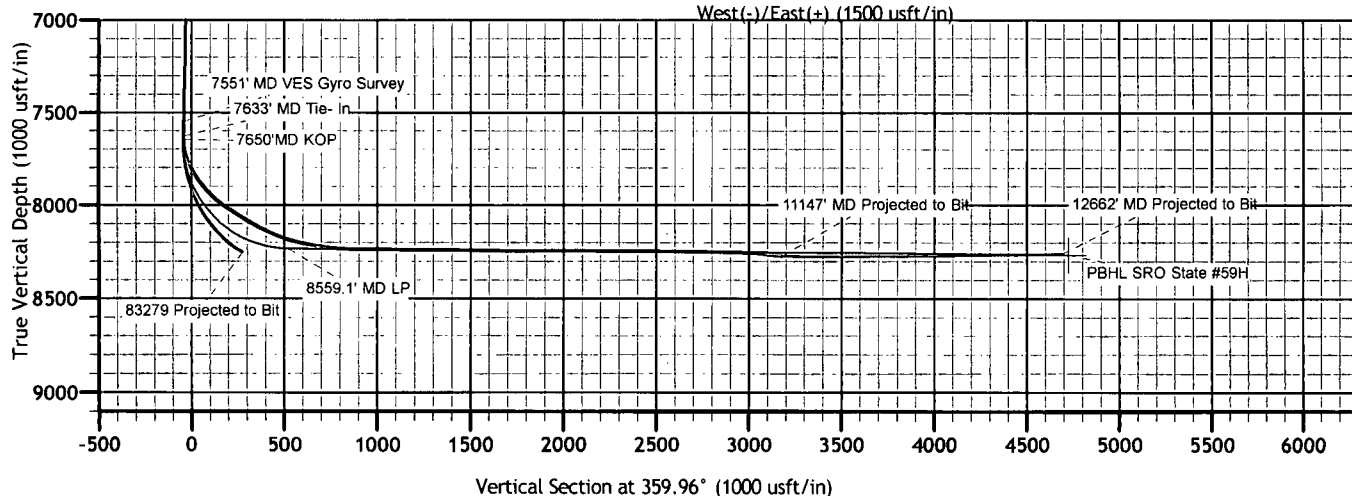
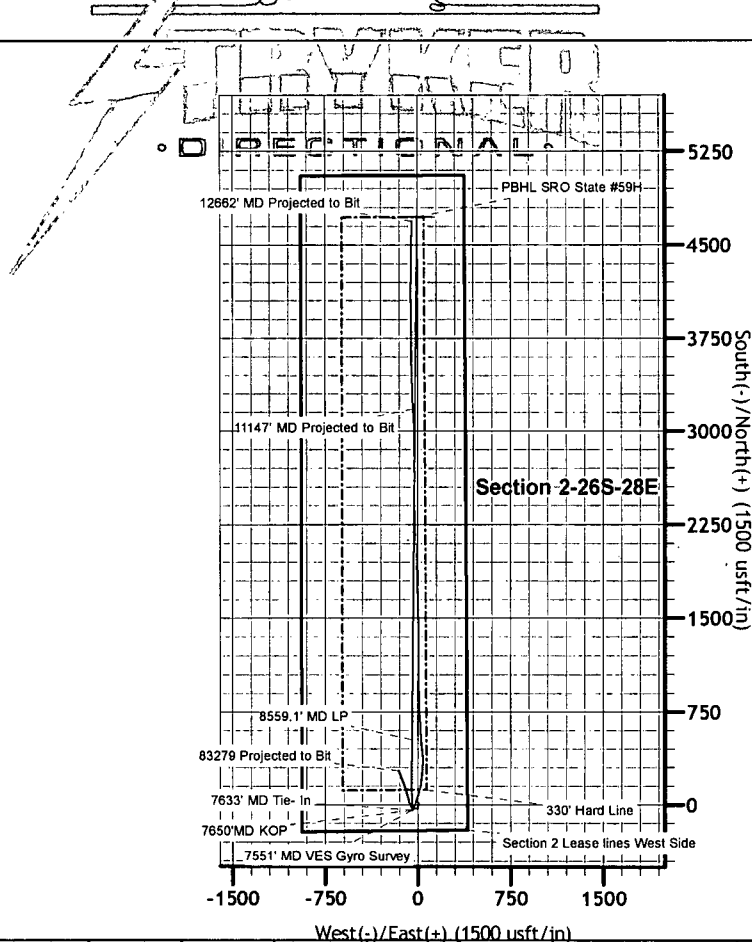
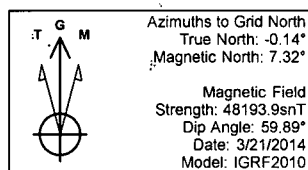


OFFICE: 936.582.7296

GRID CORRECTION: To convert a Magnetic Direction to a Grid Direction, Add 7.32°

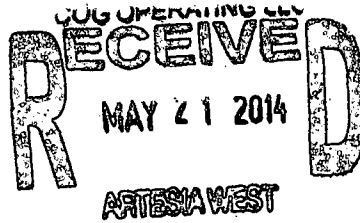
GEODETTIC ZONE: New Mexico East 3001						
GL 2964.7 + 18 @ 2982.7usft (Silver Oak #7)						
GROUND ELEVATION: 2964.7						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	387456.50	583749.50	32° 3' 53.802 N	104° 3' 46.723 W	

PLAN SECTIONS											
Sec	MD	Inc	Azi	-TVD	+N/-S	+E/-W	Dleg	TFace	VSeet	Target	
1	7633.0	2.00	220.20	7631.3	-42.3	-42.0	0.00	0.00	-42.2		
2	7650.0	2.00	220.20	7648.3	-42.7	-42.4	0.00	0.00	-42.7		
3	8559.1	89.59	0.63	8235.0	524.6	-49.1	10.02	140.42	524.7		
4	12758.3	89.59	0.63	8265.0	4723.5	0.00	0.00	4723.5	PBHL SRO State #59H		





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



NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 04 2014

RECEIVED

May 7, 2014

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

RE: SRO State Com #59H
210' FSL & 330' FWL
Sec. 2, T26S, R28E
Eddy County, New Mexico

Dear Sir,

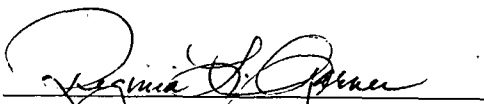
The attached is the Deviation Survey for the above captioned well.

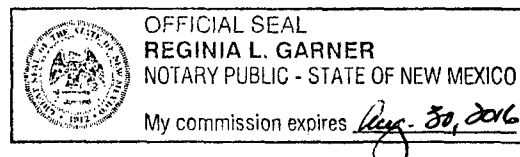
Very truly yours,


Eddie LaRue
Operations Manager

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 7th day of May, 2014.


Notary Public



SRO State Com #59H

Date	Depth	Deviation	Direction	TVD	Horiz Disp
3/31/2014	291	0.30	0.00	0.00	0.00
4/1/2014	501	0.30	0.00	0.00	0.00
4/1/2014	629	0.30	0.00	0.00	0.00
4/1/2014	774	0.30	0.00	0.00	0.00
4/1/2014	1018	0.10	0.00	0.00	0.00
4/2/2014	1298	0.30	0.00	0.00	0.00
4/3/2014	1582	0.30	0.00	0.00	0.00
4/3/2014	1888	0.70	0.00	0.00	0.00
4/3/2014	2042	0.70	0.00	0.00	0.00
4/3/2014	2295	0.70	0.00	0.00	0.00
4/3/2014	2510	0.50	0.00	0.00	0.00
4/5/2014	2864	0.30	0.00	0.00	0.00
4/5/2014	3118	0.10	0.00	0.00	0.00
4/5/2014	3400	0.30	0.00	0.00	0.00
4/5/2014	3810	1.30	0.00	0.00	0.00
4/5/2014	4110	1.70	0.00	0.00	0.00
4/5/2014	4410	0.30	0.00	0.00	0.00
4/6/2014	4694	0.40	0.00	0.00	0.00
4/6/2014	4978	0.80	0.00	0.00	0.00
4/6/2014	5262	1.30	0.00	0.00	0.00
4/6/2014	5498	0.90	0.00	0.00	0.00
4/6/2014	5542	0.70	0.00	0.00	0.00
4/6/2014	5829	0.70	0.00	0.00	0.00
4/6/2014	6112	1.00	0.00	0.00	0.00
4/7/2014	6395	1.60	0.00	0.00	0.00
4/7/2014	6667	3.90	0.00	0.00	0.00
4/7/2014	6761	3.70	0.00	0.00	0.00
4/8/2014	6844	2.80	268.00	6839.00	13.40
4/8/2014	6876	1.90	254.50	6871.70	13.50
4/8/2014	6907	1.20	246.60	6906.90	0.52
4/8/2014	6970	1.20	226.50	0.00	0.00
4/8/2014	7128	1.60	229.70	0.00	0.00
4/8/2014	7254	1.50	232.30	0.00	0.00
4/9/2014	7317	1.40	236.80	0.00	0.00
4/9/2014	7502	1.30	237.20	0.00	0.00
4/9/2014	7603	1.80	224.10	0.00	0.00
4/9/2014	7633	2.00	220.20	7631.30	42.20
4/9/2014	7696	4.10	298.60	7694.20	42.60
4/9/2014	7823	12.50	338.10	7820.08	28.90
4/9/2014	7886	18.70	340.20	7880.75	13.08
4/10/2014	7980	24.20	339.70	7940.40	8.52
4/10/2014	7981	27.00	341.20	7968.36	9.27
4/10/2014	8013	29.10	342.60	7996.60	35.50

Date	Depth	Deviation	Direction	TVD	Horiz Disp
4/10/2014	8044	31.20	342.80	8023.40	50.30
4/10/2014	8107	35.50	343.60	8076.10	83.33
4/10/2014	8139	38.30	343.30	8101.70	101.80
4/11/2014	8171	40.70	341.90	8126.40	121.20
4/11/2014	8234	47.30	339.00	8171.80	162.30
4/12/2014	8265	50.70	338.60	8192.17	184.10
4/12/2014	8296	53.70	339.00	8211.17	206.94
4/12/2014	8327	57.20	338.80	8228.75	230.76
4/15/2014	7632	1.10	225.50	7630.30	42.00
4/15/2014	7695	8.30	31.40	7693.10	38.90
4/15/2014	7726	14.80	29.90	7723.50	33.60
4/15/2014	7758	21.10	26.00	7753.90	24.90
4/16/2014	7882	35.20	16.50	7861.71	31.79
4/16/2014	7913	38.20	16.20	7886.56	49.56
4/16/2014	7976	44.50	16.20	7933.90	89.20
4/16/2014	8008	48.40	14.20	7956.00	111.60
4/17/2014	8009	48.80	13.70	7656.64	112.34
4/17/2014	8040	52.50	12.20	7976.30	135.69
4/17/2014	8072	54.10	10.00	7995.42	160.86
4/17/2014	8103	54.90	8.10	8013.40	185.80
4/17/2014	8166	57.50	5.70	8048.60	237.70
4/18/2014	8198	59.60	4.90	8065.30	264.90
4/19/2014	8230	60.90	4.80	8081.20	295.00
4/19/2014	8261	61.50	3.50	8096.10	319.70
4/19/2014	8365	63.30	354.20	8141.20	403.15
4/19/2014	8450	72.40	353.60	8176.00	489.85
4/20/2014	8514	74.50	354.50	8194.20	550.90
4/20/2014	8545	76.10	356.30	8202.00	581.10
4/20/2014	8577	77.30	357.30	8209.40	611.90
4/20/2014	8608	78.80	357.90	8215.80	642.40
4/20/2014	8671	82.20	359.00	8226.10	704.30
4/20/2014	8733	85.20	358.60	8229.95	735.02
4/21/2014	8827	88.50	358.00	8238.67	859.67
4/21/2014	8922	90.90	358.00	8238.67	954.61
4/21/2014	9015	88.90	359.60	8238.83	1047.58
4/21/2014	9110	88.40	0.30	8241.07	1142.56
4/21/2014	9204	89.40	359.50	8249.90	1236.50
4/21/2014	9391	89.00	359.40	8242.70	1423.50
4/22/2014	9486	88.90	359.00	8244.50	1518.50
4/22/2014	9581	89.30	358.60	8245.90	1613.50
4/22/2014	9769	90.80	358.20	8245.80	1801.40
4/22/2014	9864	90.60	357.60	8245.70	1896.30
4/22/2014	9958	91.00	357.20	8244.38	1990.23
4/23/2014	10104	88.90	358.00	8244.51	2131.10
4/23/2014	10147	88.50	357.70	8246.30	2178.97

Date	Depth	Deviation	Direction	TVD	Horiz Disp
4/23/2014	10241	89.40	358.80	8248.21	2273.00
4/23/2014	10336	90.20	359.00	8248.00	2368.00
4/23/2014	10432	90.90	359.10	8247.00	2463.00
4/23/2014	10527	89.10	359.80	8247.00	2558.00
4/23/2014	10623	88.60	0.30	8249.70	2654.90
4/23/2014	10813	89.20	359.60	8254.05	2844.83
4/23/2014	10909	89.10	359.50	8554.40	2940.80
4/24/2014	11099	91.10	359.00	8253.40	3130.80
4/24/2014	11194	90.10	0.10	8252.47	3225.84
5/1/2014	10944	89.10	359.20	8255.00	2975.80
5/1/2014	11007	85.00	357.60	8258.70	3038.60
5/1/2014	11101	84.40	357.10	8267.40	3132.10
5/1/2014	11195	88.30	358.00	8273.30	3225.00
5/1/2014	11290	89.80	357.70	8274.90	3320.00
5/1/2014	11385	90.80	358.20	8274.40	3415.80
5/1/2014	11480	90.20	358.70	8273.57	3510.74
5/2/2014	11669	91.00	359.70	8271.80	3699.60
5/2/2014	11763	89.50	359.60	8271.34	3793.71
5/2/2014	11952	90.90	359.50	8270.00	3982.00
5/2/2014	12047	91.80	359.30	8268.00	4077.00
5/3/2014	12141	90.90	359.80	8266.39	4171.64
5/3/2014	12336	84.30	39.00	8266.22	4266.24
5/3/2014	12426	91.40	0.50	8265.00	4456.00
5/3/2014	12530	90.80	1.20	8263.20	4551.60