



A GYRO TECHNOLOGIES INC. COMPANY

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

May 7, 2014

15- 42152

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

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 25 2014

Attn: Kanicia Castillo

RECEIVED

RE: **Sherman 4 Fee 10H**

Please find enclosed a copy of the survey from 0.00' to 2410.00' ran on the above referenced well.

Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §

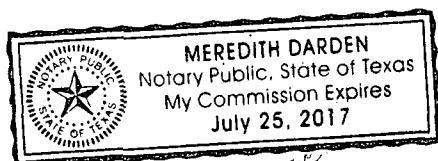
§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 7th day of May,
A.D., 2014, by Keith Havelka.



Meredith Darden
Notary Public, State of Texas



Company: Concho Resources

Well: Sherman 4 Fee 10H



Rig Name: Silveroak 3

State/County: New Mexico/Eddy

Latitude: 32.697, Longitude: -104.394

GRID North is 0.030 Degrees West of True North

VS-Azi: 0.000 Degrees



Depth Reference : RKB= 18'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: hagyro-de_01.ut

Minimum Curvature Method

Report Date/Time: 5/7/2014 / 14:15

VES Survey International

Midland, Texas

432-563-5444

Surveyor: Mark Simmons

Sherman 4 Fee 10H / API 30-015-42152

NM OIL CONSERVATION
ARTESIA DISTRICT
AUG 25 2014
RECEIVED

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	0.188	340.819	100.000	0.155	-0.054	0.155	0.164	340.819	0.188
200.000	0.135	340.954	199.999	0.421	-0.146	0.421	0.445	340.855	0.053
300.000	0.081	353.654	299.999	0.602	-0.192	0.602	0.632	342.293	0.059
400.000	0.227	41.717	399.999	0.820	-0.068	0.820	0.823	355.233	0.183
500.000	0.043	145.119	499.999	0.937	0.085	0.937	0.941	5.155	0.240
600.000	0.209	72.370	599.998	0.962	0.279	0.962	1.001	16.192	0.200
700.000	0.060	50.199	699.998	1.051	0.493	1.051	1.160	25.144	0.154
800.000	0.229	108.397	799.998	1.021	0.723	1.021	1.251	35.312	0.204
900.000	0.254	40.298	899.997	1.127	1.056	1.127	1.544	43.148	0.271
1000.000	0.243	157.682	999.997	1.100	1.280	1.100	1.688	49.323	0.424
1100.000	0.261	143.616	1099.996	0.721	1.495	0.721	1.660	64.275	0.064
1200.000	0.262	93.022	1199.995	0.525	1.859	0.525	1.932	74.233	0.224
1300.000	0.207	179.503	1299.994	0.332	2.089	0.332	2.115	80.970	0.324
1400.000	0.349	162.583	1399.993	-0.139	2.181	-0.139	2.186	93.651	0.162
1500.000	0.055	157.544	1499.992	-0.474	2.291	-0.474	2.339	101.686	0.294
1600.000	0.206	161.994	1599.992	-0.689	2.365	-0.689	2.463	106.251	0.151
1700.000	0.240	69.141	1699.991	-0.786	2.616	-0.786	2.732	106.716	0.324
1800.000	0.074	110.560	1799.991	-0.734	2.873	-0.734	2.965	104.327	0.191

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	0.092	278.639	1899.991	-0.744	2.854	-0.744	2.950	104.619	0.166
2000.000	0.232	292.452	1999.991	-0.655	2.587	-0.655	2.669	104.206	0.144
2100.000	0.182	345.439	2099.990	-0.424	2.360	-0.424	2.398	100.181	0.190
2200.000	0.165	301.123	2199.990	-0.196	2.197	-0.196	2.205	95.087	0.132
2300.000	0.172	305.172	2299.989	-0.034	1.950	-0.034	1.951	91.011	0.014
2400.000	0.049	334.170	2399.989	0.091	1.809	0.091	1.811	87.126	0.131
2410.000	0.016	317.914	2409.989	0.096	1.806	0.096	1.808	86.966	0.340



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

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 25 2014

RECEIVED

May 9, 2014

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

RE: Sherman 4 Fee #10H
150' FSL & 330' FWL
Sec. 33, T18S, R26E
Eddy County, New Mexico

Dear Sir,

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

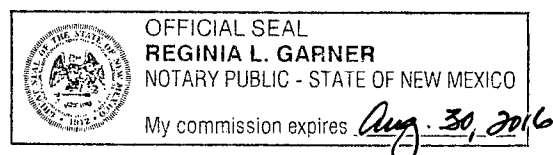
Very truly yours,

A handwritten signature in cursive script, appearing to read "Chris Graham".

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 9th day of May, 2014.

A handwritten signature in cursive script, appearing to read "Regina L. Garner".
Notary Public

SHERMAN 4 FEE #10

Date	Depth	Deviation	Direction
4/26/2014	201	0.50	0.00
4/26/2014	324	0.60	0.00
4/26/2014	567	0.70	0.00
4/26/2014	810	0.50	0.00
4/27/2014	1187	0.50	0.00
4/28/2014	1423	0.00	0.00
4/28/2014	1888	0.50	0.00
4/28/2014	2168	0.30	0.00
4/29/2014	2512	1.00	189.40
4/29/2014	2543	5.20	180.40
4/29/2014	2575	9.50	179.30
4/29/2014	2606	12.90	179.10
4/29/2014	2637	15.60	179.30
4/29/2014	2667	18.70	179.10
4/29/2014	2698	21.50	177.60
4/29/2014	2729	24.20	175.60
4/29/2014	2760	26.70	174.20
4/29/2014	2791	29.50	175.00
4/29/2014	2822	32.00	176.10
4/29/2014	2853	34.50	176.50
4/29/2014	2916	39.50	177.70
4/30/2014	2947	41.50	178.80
4/30/2014	2978	44.60	179.20
4/30/2014	3009	48.20	179.40
4/30/2014	3041	51.10	179.00
4/30/2014	3072	53.80	179.10
4/30/2014	3103	57.00	179.00
4/30/2014	3228	72.00	176.90
4/30/2014	3259	75.60	177.60
4/30/2014	3290	78.90	178.00
4/30/2014	3321	82.60	178.60
4/30/2014	3352	85.70	179.10
4/30/2014	3384	87.60	179.70
4/30/2014	3434	90.60	179.30
4/30/2014	3528	90.50	179.10
5/1/2014	3622	90.20	178.20
5/1/2014	3716	89.70	177.70
5/1/2014	3810	89.60	177.70
5/1/2014	3997	894.00	177.00
5/1/2014	4091	89.30	176.50
5/1/2014	4278	90.20	176.60
5/1/2014	4372	90.20	176.50
5/1/2014	4465	90.90	176.80

Date	Depth	Deviation	Direction
5/1/2014	4559	91.20	176.90
5/1/2014	4653	90.90	177.00
5/2/2014	4747	90.00	176.80
5/2/2014	4841	89.90	176.90
5/2/2014	4934	89.80	177.00
5/2/2014	5028	89.50	176.80
5/2/2014	5122	89.70	176.90
5/2/2014	5215	89.80	177.30
5/2/2014	5310	89.40	177.10
5/2/2014	5404	89.90	177.90
5/2/2014	5498	90.20	178.40
5/2/2014	5592	90.60	1748.70
5/2/2014	5686	90.60	178.90
5/3/2014	5780	89.40	178.10
5/3/2014	5874	89.10	177.50
5/3/2014	5967	89.70	177.70
5/3/2014	6062	90.30	177.90
5/3/2014	6156	90.60	178.20
5/3/2014	6250	90.00	177.10
5/3/2014	6344	90.00	177.10
5/3/2014	6438	89.90	176.40
5/3/2014	6531	89.90	176.50
5/3/2014	6624	90.00	176.20
5/3/2014	6718	89.80	176.80
5/4/2014	6811	90.20	177.10
5/4/2014	6905	90.40	177.70
5/4/2014	6998	91.20	178.30
5/4/2014	7092	91.00	178.30
5/4/2014	7186	91.00	178.10
5/4/2014	7279	89.90	178.00
5/4/2014	7372	89.70	178.20
5/4/2014	7466	89.40	177.60
5/4/2014	7559	89.30	177.60
5/4/2014	7652	89.40	177.10
5/5/2014	7744	89.10	176.80
5/5/2014	7829	89.10	177.00

EOF



COG Operating LLC

Eddy County, NM (NAD27 NME)

Sherman 4 Fee

#10H

WB1/Job #1410565

Survey: Phoenix MWD Survey

Standard Survey Report

05 May, 2014

NM OIL CONSERVATION

ARTESIA DISTRICT

AUG 25 2014

RECEIVED





Phoenix Technology Services
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #10H:
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Well:	#10H	North Reference:	Grid
Wellbore:	WB1/Job #1410565	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR DB

Project:	Eddy County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Sherman 4 Fee		
Site Position:		Northing:	612,151.80 usft
From:	Map	Easting:	485,212.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 40' 58.42381 N
		Longitude:	104° 22' 53.02452 W
		Grid Convergence:	-0.03 °

Well	#10H					
Well Position	+N/-S	0.00 usft	Northing:	617,385.00 usft	Latitude:	32° 41' 50.18981 N
	+E/-W	0.00 usft	Easting:	481,303.30 usft	Longitude:	104° 23' 38.79859 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,374.00 usft

Wellbore:	WB1/Job #1410565				
Magnetics:	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010_14	04/07/14	7.66	60.41	48,529

Design:	Surveys: (Silver Oak 3)				
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	177.46	

Survey Program:	Date 05/05/14			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.00	2,410.00	VES Gyro Surveys (WB1/Job #1410565)	NS-GYRO-MS	North sensing gyrocompassing m/s
2,481.00	7,890.00	Phoenix MWD Survey (WB1/Job #141056)	MWD	MWD - Standard

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)	
2,410.00	0.02	317.91	2,409.99	0.10	1.81	-0.02	0.00	0.00	0.00	
Tie-on to VES Gyro										
2,481.00	0.30	302.90	2,480.99	0.20	1.64	-0.13	0.40	0.40	-21.15	
First Phoenix MWD Survey										
2,512.00	1.00	189.40	2,511.99	-0.02	1.53	0.09	3.72	2.26	-366.13	
2,543.00	5.20	180.40	2,542.93	-1.69	1.48	1.76	13.60	13.55	-29.03	
2,574.00	9.50	179.30	2,573.67	-5.66	1.50	5.72	13.88	13.87	-3.55	
2,605.00	12.90	179.10	2,604.08	-11.68	1.59	11.73	10.97	10.97	-0.65	
2,636.00	15.60	179.30	2,634.12	-19.30	1.69	19.36	8.71	8.71	0.65	



Phoenix Technology Services
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County-NM (NAD27 NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Well:	#10H	North Reference:	Grid
Wellbore:	WB1/Job #1410565	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR 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)
2,667.00	18.70	179.10	2,663.74	-28.44	1.82	28.50	10.00	10.00	-0.65
2,698.00	21.50	177.60	2,692.85	-39.09	2.14	39.15	9.18	9.03	-4.84
2,729.00	24.20	175.60	2,721.41	-51.10	2.86	51.18	9.06	8.71	-6.45
2,760.00	26.70	174.20	2,749.40	-64.37	4.05	64.49	8.29	8.06	-4.52
2,791.00	29.50	175.00	2,776.75	-78.91	5.42	79.07	9.11	9.03	2.58
2,822.00	32.00	176.10	2,803.39	-94.71	6.65	94.91	8.27	8.06	3.55
2,853.00	34.50	176.50	2,829.31	-111.67	7.74	111.90	8.10	8.06	1.29
2,884.00	37.10	176.80	2,854.45	-129.77	8.80	130.03	8.41	8.39	0.97
2,916.00	39.50	177.70	2,879.56	-149.58	9.75	149.86	7.70	7.50	2.81
2,947.00	41.50	178.60	2,903.13	-169.70	10.39	169.99	6.72	6.45	2.90
2,978.00	44.60	179.20	2,925.78	-190.85	10.80	191.14	10.09	10.00	1.94
3,010.00	48.20	179.40	2,947.85	-214.02	11.08	214.30	11.26	11.25	0.63
3,041.00	51.10	179.00	2,967.92	-237.64	11.41	237.91	9.41	9.35	-1.29
3,072.00	53.80	179.10	2,986.81	-262.21	11.82	262.48	8.71	8.71	0.32
3,103.00	57.00	179.00	3,004.41	-287.72	12.24	287.98	10.33	10.32	-0.32
3,134.00	60.00	178.40	3,020.61	-314.14	12.84	314.41	9.82	9.68	-1.94
3,165.00	63.40	177.70	3,035.30	-341.42	13.77	341.69	11.15	10.97	-2.26
3,196.00	67.50	177.10	3,048.18	-369.58	15.05	369.89	13.34	13.23	-1.94
3,228.00	72.00	176.90	3,059.25	-399.55	16.63	399.90	14.07	14.06	-0.63
3,259.00	75.60	177.60	3,067.90	-429.28	18.05	429.66	11.81	11.61	2.26
3,290.00	78.90	178.00	3,074.74	-459.49	19.21	459.89	10.72	10.65	1.29
3,321.00	82.60	178.60	3,079.72	-490.07	20.12	490.48	12.09	11.94	1.94
3,352.00	85.70	179.10	3,082.88	-520.90	20.74	521.31	10.13	10.00	1.61
3,384.00	87.60	179.70	3,084.75	-552.84	21.07	553.23	6.23	5.94	1.88
3,434.00	90.60	179.30	3,085.53	-602.83	21.51	603.19	6.05	6.00	-0.80
3,528.00	90.50	179.10	3,084.63	-696.81	22.82	697.14	0.24	-0.11	-0.21
3,622.00	90.20	178.20	3,084.06	-790.79	25.04	791.12	1.01	-0.32	-0.96
3,716.00	89.70	177.70	3,084.14	-884.73	28.40	885.11	0.75	-0.53	-0.53
3,810.00	89.60	177.70	3,084.71	-978.65	32.17	979.11	0.11	-0.11	0.00
3,904.00	89.60	177.10	3,085.37	-1,072.55	36.43	1,073.11	0.64	0.00	-0.64
3,997.00	89.40	177.00	3,086.18	-1,165.42	41.22	1,166.10	0.24	-0.22	-0.11
4,091.00	89.30	176.50	3,087.25	-1,259.26	46.55	1,260.09	0.54	-0.11	-0.53
4,185.00	89.40	176.60	3,088.32	-1,353.09	52.20	1,354.07	0.15	0.11	0.11
4,279.00	90.20	176.60	3,088.64	-1,446.92	57.78	1,448.06	0.85	0.85	0.00
4,372.00	90.20	176.50	3,088.32	-1,539.75	63.38	1,541.05	0.11	0.00	-0.11
4,465.00	90.90	176.80	3,087.43	-1,632.59	68.81	1,634.03	0.82	0.75	0.32
4,559.00	91.20	176.90	3,085.70	-1,726.43	73.97	1,728.01	0.34	0.32	0.11
4,653.00	90.90	177.00	3,083.98	-1,820.28	78.98	1,821.99	0.34	-0.32	0.11
4,747.00	90.00	176.80	3,083.24	-1,914.14	84.06	1,915.98	0.98	-0.96	-0.21
4,841.00	89.90	176.90	3,083.32	-2,008.00	89.22	2,009.98	0.15	-0.11	0.11
4,934.00	89.80	177.00	3,083.57	-2,100.86	94.17	2,102.97	0.15	-0.11	0.11
5,028.00	89.50	176.80	3,084.14	-2,194.73	99.26	2,196.97	0.38	-0.32	-0.21
5,122.00	89.70	176.90	3,084.80	-2,288.58	104.42	2,290.96	0.24	0.21	0.11



Phoenix Technology Services
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #10H
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	KB @ 3392.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3392.00usft (Silver Oak 3)
Well:	#10H	North Reference:	Grid
Wellbore:	WB1/Job #1410565	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	GCR-DB

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)
5,216.00	89.80	177.30	3,085.21	-2,382.46	109.18	2,384.96	0.44	0.11	0.43
5,310.00	89.40	177.10	3,085.86	-2,476.34	113.77	2,478.95	0.48	-0.43	-0.21
5,404.00	89.80	177.90	3,086.52	-2,570.25	117.87	2,572.95	0.95	0.43	0.85
5,498.00	90.20	178.40	3,086.52	-2,664.20	120.90	2,666.94	0.68	0.43	0.53
5,592.00	90.60	178.70	3,085.86	-2,758.17	123.28	2,760.92	0.53	0.43	0.32
5,686.00	90.60	178.90	3,084.88	-2,852.14	125.25	2,854.89	0.21	0.00	0.21
5,780.00	89.40	178.10	3,084.88	-2,946.11	127.71	2,948.87	1.53	-1.28	-0.85
5,874.00	89.10	177.50	3,086.11	-3,040.03	131.32	3,042.86	0.71	-0.32	-0.64
5,968.00	89.70	177.70	3,087.10	-3,133.94	135.25	3,136.86	0.67	0.64	0.21
6,062.00	90.30	177.90	3,087.10	-3,227.87	138.86	3,230.86	0.67	0.64	0.21
6,157.00	90.60	178.20	3,086.35	-3,322.82	142.10	3,325.85	0.45	0.32	0.32
6,250.00	90.00	177.10	3,085.86	-3,415.73	145.91	3,418.84	1.35	-0.65	-1.18
6,344.00	90.00	177.10	3,085.86	-3,509.61	150.66	3,512.84	0.00	0.00	0.00
6,438.00	89.90	176.40	3,085.94	-3,603.46	155.99	3,606.83	0.75	-0.11	-0.74
6,531.00	89.90	176.50	3,086.11	-3,696.28	161.75	3,699.82	0.11	0.00	0.11
6,624.00	90.00	176.20	3,086.19	-3,789.09	167.67	3,792.80	0.34	0.11	-0.32
6,718.00	89.80	176.80	3,086.35	-3,882.92	173.41	3,886.79	0.67	-0.21	0.64
6,811.00	90.20	177.10	3,086.35	-3,975.79	178.36	3,979.79	0.54	0.43	0.32
6,905.00	90.40	177.70	3,085.86	-4,069.69	182.62	4,073.78	0.67	0.21	0.64
6,998.00	91.20	178.30	3,084.56	-4,162.62	185.87	4,166.77	1.08	0.86	0.65
7,092.00	91.00	178.30	3,082.76	-4,256.56	188.66	4,260.74	0.21	-0.21	0.00
7,186.00	91.00	178.10	3,081.12	-4,350.50	191.61	4,354.72	0.21	0.00	-0.21
7,279.00	89.90	178.00	3,080.39	-4,443.44	194.77	4,447.71	1.19	-1.18	-0.11
7,372.00	89.70	178.20	3,080.71	-4,536.39	197.86	4,540.70	0.30	-0.22	0.22
7,466.00	89.40	177.60	3,081.45	-4,630.33	201.30	4,634.70	0.71	-0.32	-0.64
7,559.00	89.30	177.60	3,082.50	-4,723.24	205.20	4,727.69	0.11	-0.11	0.00
7,652.00	89.40	177.10	3,083.56	-4,816.13	209.49	4,820.68	0.55	0.11	-0.54
7,744.00	89.10	176.80	3,084.76	-4,907.99	214.39	4,912.67	0.46	-0.33	-0.33
7,829.00	88.90	176.50	3,086.25	-4,992.84	219.36	4,997.65	0.42	-0.24	-0.35
Last Phoenix MWD Survey									
7,890.00	88.90	176.50	3,087.42	-5,053.71	223.08	5,058.63	0.00	0.00	0.00
Projection to TD:									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
2,410.00	2,409.99	0.10	1.81	Tie-on to VES Gyro
2,481.00	2,480.99	0.20	1.64	First Phoenix MWD Survey
7,829.00	3,086.25	-4,992.84	219.36	Last Phoenix MWD Survey
7,890.00	3,087.42	-5,053.71	223.08	Projection to TD

Checked By: _____ Approved By: _____ Date: _____