



March 18, 2015

15.42887

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

NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 26 2015

RECEIVED

Attn: Kanicia Castillo

RE: **Sherman 4 Fee 8H**

Please find enclosed a copy of the survey from 0' to 2481' ran on the above referenced well.

Sincerely,

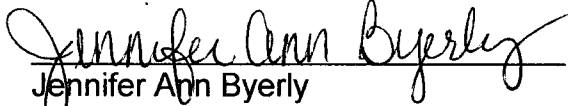

Keith Havelka
Operations

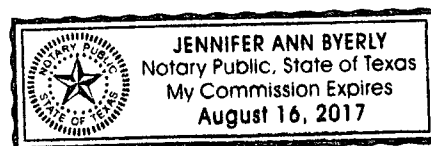
STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 18 day of March,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: Sherman 4 Fee/8H

Rig Name: Silver Oak 3
State/County: New Mexico/Eddy
Latitude: 32.68, Longitude: -104.38
GRID North is 0.02 Degrees West of True North
VS-Azi: 359.25 Degrees



ARM OIL CONSERVATION
ARTESIA DISTRICT
MAY 26 2015
RECEIVED

Depth Reference : RKB 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: sherman 4 fee #8h.ut
Minimum Curvature Method
Report Date/Time: 3/18/2015 / 13:29

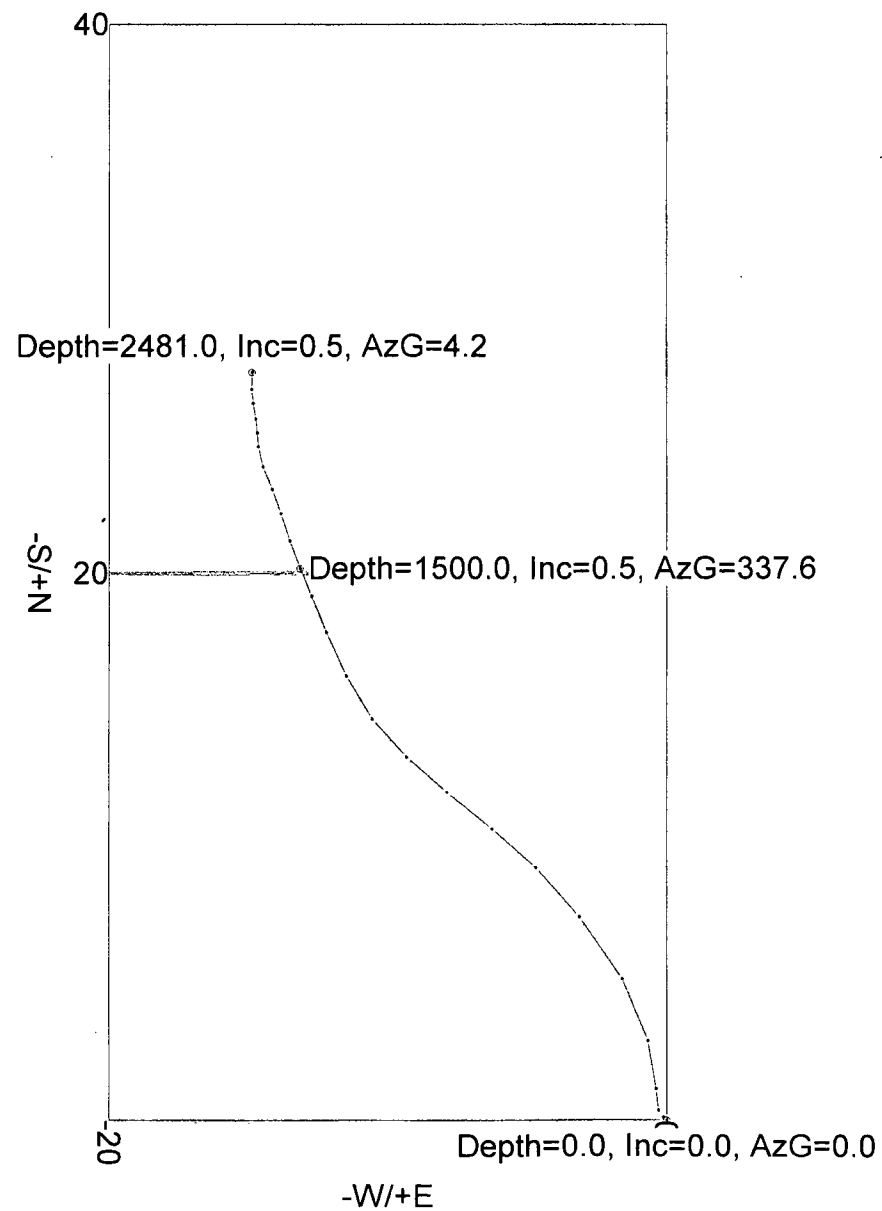
VES Survey International
Fort Worth, Texas
817-741-3610
Surveyor: Eric Warner
Sherman 4 Fee 8H / API 30-015-42887

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	0.20	310.99	100.00	0.12	-0.13	0.12	0.18	310.99	0.20
200.00	0.16	342.30	200.00	0.37	-0.31	0.37	0.48	319.86	0.11
300.00	0.75	356.25	300.00	1.16	-0.39	1.16	1.22	341.17	0.60
400.00	1.31	347.28	399.98	2.93	-0.69	2.93	3.01	346.75	0.58
500.00	1.53	330.53	499.95	5.20	-1.60	5.22	5.44	342.93	0.47
600.00	1.60	321.82	599.91	7.46	-3.12	7.50	8.09	337.32	0.25
700.00	1.13	315.22	699.88	9.26	-4.68	9.32	10.38	333.20	0.49
800.00	1.29	308.49	799.86	10.67	-6.26	10.75	12.37	329.59	0.21
900.00	1.12	310.63	899.84	12.01	-7.89	12.11	14.37	326.71	0.18
1000.00	1.11	312.27	999.82	13.29	-9.34	13.41	16.25	324.90	0.03
1100.00	1.03	324.77	1099.80	14.67	-10.57	14.81	18.09	324.23	0.24
1200.00	1.08	334.14	1199.79	16.26	-11.50	16.41	19.92	324.72	0.18
1300.00	0.90	337.69	1299.77	17.84	-12.22	18.00	21.62	325.60	0.19
1400.00	0.72	338.33	1399.76	19.16	-12.75	19.32	23.01	326.36	0.18
1500.00	0.54	337.57	1499.75	20.18	-13.16	20.35	24.09	326.89	0.18
1600.00	0.69	341.47	1599.75	21.19	-13.53	21.36	25.14	327.43	0.16
1700.00	0.50	343.44	1699.74	22.18	-13.85	22.36	26.15	328.02	0.19
1800.00	0.57	337.52	1799.74	23.05	-14.16	23.24	27.06	328.44	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	0.45	339.26	1899.73	23.88	-14.49	24.06	27.93	328.75	0.12
2000.00	0.43	354.99	1999.73	24.62	-14.66	24.81	28.65	329.22	0.12
2100.00	0.14	359.72	2099.73	25.12	-14.70	25.31	29.10	329.67	0.29
2200.00	0.44	351.93	2199.73	25.62	-14.75	25.81	29.57	330.07	0.30
2300.00	0.21	346.73	2299.73	26.19	-14.85	26.38	30.10	330.45	0.23
2400.00	0.38	358.10	2399.73	26.70	-14.90	26.89	30.57	330.83	0.18
2481.00	0.51	4.18	2480.72	27.33	-14.88	27.52	31.12	331.43	0.17



VES Survey International
Fort Worth, Texas
817-741-3610
Surveyor: Eric Warner
Sherman 4 Fee 8H / API 30-015-42887



VES Survey Date: 3/14/2015



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

March 23, 2015

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

RE: Sherman 4 Fee #8H
330' FSL & 270' FEL
Sec. 4, T19S, R26E
Eddy County, New Mexico

Dear Sir,

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

Very truly yours,

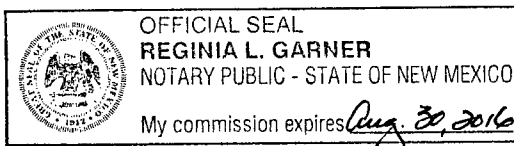
A handwritten signature in black ink, appearing to read "Chris Graham", written in a cursive style.

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

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

A handwritten signature in black ink, appearing to read "Regina L. Garner", written in a cursive style.

Notary Public

SHERMAN 4 FEE #8H

Date	Depth	Deviation	Direction	TVD
3/11/2015	200	0.60	0.00	0.00
3/11/2015	504	1.60	0.00	0.00
3/12/2015	565	1.40	0.00	0.00
3/12/2015	626	1.30	0.00	0.00
3/12/2015	719	1.70	0.00	0.00
3/12/2015	781	1.40	0.00	0.00
3/12/2015	844	1.50	0.00	0.00
3/12/2015	908	1.00	0.00	0.00
3/12/2015	971	0.90	0.00	0.00
3/12/2015	1161	1.20	0.00	0.00
3/14/2015	1380	0.80	0.00	0.00
3/14/2015	1820	0.80	0.00	0.00
3/14/2015	2331	0.50	0.00	0.00
3/15/2015	2515	0.30	22.50	0.00
3/15/2015	2547	1.40	1.50	0.00
3/15/2015	2579	4.60	349.40	0.00
3/15/2015	2611	8.00	345.50	0.00
3/15/2015	2675	10.60	341.40	0.00
3/15/2015	2706	15.70	337.30	0.00
3/15/2015	2799	21.60	343.10	0.00
3/16/2015	2831	24.50	345.80	0.00
3/16/2015	2863	27.60	346.90	0.00
3/16/2015	2894	30.20	346.40	0.00
3/16/2015	2926	33.00	345.40	0.00
3/16/2015	2957	36.40	344.60	0.00
3/16/2015	2989	39.80	344.10	0.00
3/16/2015	3114	51.50	343.00	0.00
3/16/2015	3146	54.90	342.90	0.00
3/16/2015	3178	58.80	342.00	0.00
3/16/2015	3210	62.70	341.90	0.00
3/16/2015	3241	66.20	342.00	0.00
3/16/2015	3273	69.80	342.30	0.00
3/16/2015	3368	79.00	243.60	0.00
3/16/2015	3399	82.50	343.90	0.00
3/16/2015	3431	85.60	343.80	0.00
3/17/2015	3483	89.30	342.90	3155.00
3/17/2015	3514	91.40	343.90	3155.00
3/17/2015	3546	91.60	345.70	0.00
3/17/2015	3578	91.10	347.20	3154.00
3/17/2015	3610	90.60	347.50	3153.00
3/17/2015	3641	90.50	348.30	3153.00
3/17/2015	3768	89.40	353.70	0.00
3/17/2015	3799	89.70	353.80	0.00

Date	Depth	Deviation	Direction	TVD
3/17/2015	3863	90.60	356.60	0.00
3/17/2015	3894	90.80	357.50	0.00
3/17/2015	3990	90.80	0.60	0.00
3/17/2015	4085	91.10	1.00	0.00
3/17/2015	4180	89.50	1.40	0.00
3/17/2015	4275	89.70	1.30	0.00
3/17/2015	4370	89.80	1.20	0.00
3/17/2015	4465	90.00	1.00	0.00
3/18/2015	4559	90.10	0.80	3151.00
3/18/2015	4654	90.10	0.40	3151.00
3/18/2015	4749	90.20	0.20	3151.00
3/18/2015	4844	90.20	360.00	3150.00
3/18/2015	4939	90.60	359.70	3150.00
3/18/2015	5128	90.10	0.20	0.00
3/18/2015	5223	90.20	1.30	0.00
3/18/2015	5413	91.30	1.00	0.00
3/18/2015	5508	90.00	1.10	0.00
3/18/2015	5603	90.60	2.40	0.00
3/18/2015	5697	89.40	2.40	0.00
3/19/2015	5791	89.40	2.40	3145.00
3/19/2015	5887	91.30	1.40	3145.00
3/19/2015	5981	90.60	1.40	3143.00
3/19/2015	6075	90.90	1.50	3142.00
3/19/2015	6265	89.30	0.40	0.00
3/19/2015	6359	89.50	0.40	0.00
3/19/2015	6454	90.00	0.70	0.00
3/19/2015	6548	90.20	0.80	0.00
3/19/2015	6643	90.60	1.00	0.00
3/19/2015	6738	90.90	0.90	0.00
3/19/2015	6894	91.00	0.80	0.00
3/19/2015	6929	91.50	0.40	0.00
3/19/2015	7022	91.40	1.70	0.00
3/20/2015	7110	89.90	1.70	3134.00
3/20/2015	7205	90.20	1.90	3133.00
3/20/2015	7300	90.40	1.80	0.00
3/20/2015	7395	90.60	1.70	3132.00
3/20/2015	7489	89.50	1.00	3132.00
3/20/2015	7584	89.80	0.60	3133.00
3/20/2015	7678	90.10	0.30	3133.00
3/20/2015	7772	90.60	360.00	3132.00
3/20/2015	7867	91.10	359.40	0.00
3/20/2015	7880	90.90	359.50	0.00

EOF



COG Operating LLC

Eddy County, NM (NAD27 NME)

Sherman 4 Fee

#8H

WB1 / Job #1513148

NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 26 2015

RECEIVED

Design: Surveys (Silver Oak 3)

Standard Survey Report

21 March, 2015



PHOENIX
TECHNOLOGY SERVICES



Phoenix
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3356.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3356.00usft (Silver Oak 3)
Well:	#8H	North Reference:	Grid
Wellbore:	WB1 / Job #1513148	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	Compass 5000 GCR

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:	#8H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 40' 55.51528 N
		Longitude:	104° 22' 42.90551 W
		Ground Level:	3,338.00 usft

Wellbore:	WB1 / Job #1513148		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	3/10/2015	7.60
			Dip Angle
			60.38
			Field Strength
			48,357

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
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			358.01

Survey Program	Date 3/21/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	2,481.00	VES Gyro Survey (WB1 / Job #1513148)	NS-GYRO-MS
2,515.00	7,941.00	Phoenix MWD Survey (WB1 / Job #15131	PHX+MWD+IGRF
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+IGRF v3: standard declination

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)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	100.00	0.20	310.99	100.00	0.11	-0.13	0.12	0.20	0.20	0.00
	200.00	0.16	342.30	200.00	0.36	-0.31	0.37	0.10	-0.04	31.31
	300.00	0.75	356.25	300.00	1.15	-0.39	1.16	0.60	0.59	13.95
	400.00	1.31	347.28	399.98	2.92	-0.69	2.94	0.58	0.56	-8.97
	500.00	1.53	330.53	499.95	5.19	-1.59	5.25	0.47	0.22	-16.75
	600.00	1.60	321.82	599.91	7.45	-3.11	7.56	0.25	0.07	-8.71
	700.00	1.13	315.22	699.88	9.25	-4.67	9.41	0.49	-0.47	-6.60
	800.00	1.29	308.49	799.86	10.65	-6.25	10.86	0.21	0.16	-6.73
	900.00	1.12	310.63	899.84	11.99	-7.87	12.25	0.18	-0.17	2.14



Phoenix
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3356.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3356.00usft (Silver Oak 3)
Well:	#8H	North Reference:	Gnd
Wellbore:	WB1 / Job #1513148	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	Compass 5000 GCR

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)
1,000.00	1.11	312.27	999.82	13.28	-9.33	13.59	0.03	-0.01	1.64
1,100.00	1.03	324.77	1,099.80	14.66	-10.56	15.02	0.25	-0.08	12.50
1,200.00	1.08	334.14	1,199.79	16.24	-11.49	16.63	0.18	0.05	9.37
1,300.00	0.90	337.69	1,299.77	17.82	-12.20	18.23	0.19	-0.18	3.55
1,400.00	0.72	338.33	1,399.76	19.13	-12.73	19.56	0.18	-0.18	0.64
1,500.00	0.54	337.57	1,499.75	20.15	-13.14	20.59	0.18	-0.18	-0.76
1,600.00	0.69	341.47	1,599.75	21.15	-13.52	21.61	0.16	0.15	3.90
1,700.00	0.50	343.44	1,699.74	22.14	-13.83	22.61	0.19	-0.19	1.97
1,800.00	0.57	337.52	1,799.74	23.02	-14.15	23.50	0.09	0.07	-5.92
1,900.00	0.45	339.26	1,899.74	23.85	-14.47	24.34	0.12	-0.12	1.74
2,000.00	0.43	354.99	1,999.73	24.59	-14.65	25.08	0.12	-0.02	15.73
2,100.00	0.14	359.72	2,099.73	25.09	-14.68	25.58	0.29	-0.29	4.73
2,200.00	0.44	351.93	2,199.73	25.59	-14.73	26.08	0.30	0.30	-7.79
2,300.00	0.21	346.73	2,299.73	26.15	-14.83	26.65	0.23	-0.23	-5.20
2,400.00	0.38	358.10	2,399.73	26.66	-14.88	27.16	0.18	0.17	11.37
2,481.00	0.51	4.18	2,480.72	27.28	-14.87	27.78	0.17	0.16	7.51
Tie-on to VES Gyro Survey									
2,515.00	0.30	22.50	2,514.72	27.52	-14.82	28.02	0.72	-0.62	53.88
First Phoenix MWD Survey									
2,547.00	1.40	1.50	2,546.72	27.99	-14.78	28.48	3.52	3.44	-65.63
2,579.00	4.60	349.40	2,578.67	29.64	-15.00	30.14	10.14	10.00	-37.81
2,611.00	8.00	345.50	2,610.47	33.06	-15.80	33.59	10.70	10.63	-12.19
2,643.00	10.60	341.40	2,642.05	38.00	-17.30	38.58	8.38	8.13	-12.81
2,675.00	12.70	337.00	2,673.39	44.03	-19.61	44.69	7.12	6.56	-13.75
2,706.00	15.70	337.30	2,703.44	51.04	-22.56	51.79	9.68	9.68	0.97
2,737.00	18.10	339.10	2,733.10	59.41	-25.90	60.27	7.92	7.74	5.81
2,768.00	19.90	340.70	2,762.41	68.89	-29.36	69.86	6.04	5.81	5.16
2,799.00	21.60	343.10	2,791.40	79.33	-32.76	80.42	6.13	5.48	7.74
2,831.00	24.50	345.80	2,820.84	91.40	-36.10	92.60	9.64	9.06	8.44
2,863.00	27.60	346.90	2,849.59	105.05	-39.41	106.36	9.80	9.69	3.44
2,894.00	30.20	346.40	2,876.72	119.63	-42.87	121.04	8.42	8.39	-1.61
2,926.00	33.00	345.40	2,903.98	135.89	-46.96	137.44	8.90	8.75	-3.13
2,957.00	36.40	344.60	2,929.46	152.93	-51.53	154.63	11.07	10.97	-2.58
2,989.00	39.80	344.10	2,954.64	171.94	-56.86	173.81	10.67	10.63	-1.56
3,020.00	42.40	344.00	2,978.00	191.53	-62.46	193.58	8.39	8.39	-0.32
3,051.00	45.20	344.10	3,000.37	212.16	-68.36	214.41	9.04	9.03	0.32
3,083.00	48.50	343.90	3,022.25	234.60	-74.79	237.05	10.32	10.31	-0.63
3,114.00	51.50	343.00	3,042.17	257.36	-81.56	260.03	9.93	9.68	-2.90
3,146.00	54.90	342.20	3,061.34	281.80	-89.23	284.73	10.81	10.63	-2.50
3,178.00	58.80	342.00	3,078.84	307.29	-97.46	310.49	12.20	12.19	-0.63
3,210.00	62.70	341.90	3,094.47	333.83	-106.11	337.32	12.19	12.19	-0.31
3,241.00	66.20	342.00	3,107.84	360.42	-114.77	364.19	11.29	11.29	0.32
3,273.00	69.80	342.30	3,119.82	388.66	-123.87	392.72	11.28	11.25	0.94



Phoenix
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM(NAD27 NME)	TVD Reference:	KB @ 3356.00usft (Silver Oak 3)
Site:	Sherman 4:Fee	MD Reference:	KB @ 3356.00usft (Silver Oak 3)
Well:	#8H	North Reference:	Grid
Wellbore:	WB1 //Job #1513148	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	Compass 5000 GCR

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)
3,304.00	73.30	342.30	3,129.63	416.67	-132.80	421.03	11.29	11.29	0.00
3,336.00	76.00	342.80	3,138.10	446.10	-142.06	450.77	8.57	8.44	1.56
3,368.00	79.00	343.60	3,145.03	476.01	-151.08	480.97	9.69	9.38	2.50
3,399.00	82.50	343.90	3,150.01	505.38	-159.64	510.62	11.33	11.29	0.97
3,431.00	85.60	343.80	3,153.33	535.95	-168.50	541.47	9.69	9.69	-0.31
3,462.00	87.70	343.50	3,155.14	565.64	-177.21	571.45	6.84	6.77	-0.97
3,483.00	89.30	342.90	3,155.69	585.74	-183.27	591.75	8.14	7.62	-2.86
3,514.00	91.40	343.90	3,155.50	615.44	-192.13	621.74	7.50	6.77	3.23
3,578.00	91.10	347.20	3,154.10	677.39	-208.09	684.21	5.18	-0.47	5.16
3,610.00	90.60	347.50	3,153.63	708.61	-215.10	715.66	1.82	-1.56	0.94
3,641.00	90.50	348.30	3,153.33	738.92	-221.60	746.17	2.60	-0.32	2.58
3,673.00	89.80	350.00	3,153.25	770.35	-227.62	777.79	5.75	-2.19	5.31
3,736.00	89.40	353.10	3,153.69	832.66	-236.88	840.38	4.96	-0.63	4.92
3,768.00	89.40	353.80	3,154.02	864.45	-240.53	872.28	2.19	0.00	2.19
3,799.00	89.70	353.80	3,154.26	895.26	-243.88	903.19	0.97	0.97	0.00
3,863.00	90.60	356.60	3,154.10	959.03	-249.23	967.11	4.60	1.41	4.38
3,894.00	90.80	357.50	3,153.72	989.99	-250.83	998.10	2.97	0.65	2.90
3,990.00	90.80	0.60	3,152.38	1,085.95	-252.42	1,094.06	3.23	0.00	3.23
4,085.00	91.10	1.00	3,150.80	1,180.93	-251.09	1,188.94	0.53	0.32	0.42
4,180.00	89.50	1.40	3,150.30	1,275.91	-249.10	1,283.79	1.74	-1.68	0.42
4,275.00	89.70	1.30	3,150.97	1,370.88	-246.86	1,378.62	0.24	0.21	-0.11
4,370.00	89.80	1.20	3,151.38	1,465.85	-244.79	1,473.47	0.15	0.11	-0.11
4,465.00	90.00	1.00	3,151.55	1,560.84	-242.97	1,568.33	0.30	0.21	-0.21
4,559.00	90.10	0.80	3,151.47	1,654.82	-241.49	1,662.21	0.24	0.11	-0.21
4,654.00	90.10	0.40	3,151.30	1,749.82	-240.50	1,757.11	0.42	0.00	-0.42
4,749.00	90.20	0.20	3,151.05	1,844.82	-240.00	1,852.04	0.24	0.11	-0.21
4,844.00	90.20	360.00	3,150.72	1,939.82	-239.83	1,946.97	0.21	0.00	-0.21
4,939.00	90.60	359.70	3,150.06	2,034.81	-240.08	2,041.92	0.53	0.42	-0.32
5,034.00	90.30	0.70	3,149.31	2,129.81	-239.75	2,136.85	1.10	-0.32	1.05
5,128.00	90.10	0.20	3,148.98	2,223.80	-239.01	2,230.76	0.57	-0.21	-0.53
5,223.00	90.20	1.30	3,148.73	2,318.79	-237.77	2,325.65	1.16	0.11	1.16
5,318.00	90.70	1.20	3,147.99	2,413.77	-235.70	2,420.50	0.54	0.53	-0.11
5,413.00	91.30	1.00	3,146.33	2,508.74	-233.87	2,515.34	0.67	0.63	-0.21
5,508.00	90.00	1.10	3,145.25	2,603.71	-232.13	2,610.20	1.37	-1.37	0.11
5,603.00	90.60	2.40	3,144.75	2,698.66	-229.23	2,705.00	1.51	0.63	1.37
5,697.00	89.40	2.40	3,144.75	2,792.58	-225.30	2,798.72	1.28	-1.28	0.00
5,791.00	89.40	2.40	3,145.74	2,886.49	-221.36	2,892.44	0.00	0.00	0.00
5,887.00	91.30	1.10	3,145.15	2,982.44	-218.43	2,988.23	2.40	1.98	-1.35
5,981.00	90.60	1.40	3,143.59	3,076.40	-216.38	3,082.06	0.81	-0.74	0.32
6,075.00	90.90	1.50	3,142.36	3,170.37	-214.00	3,175.88	0.34	0.32	0.11
6,170.00	90.30	1.30	3,141.37	3,265.33	-211.68	3,270.71	0.67	-0.63	-0.21
6,265.00	89.30	0.40	3,141.70	3,360.32	-210.27	3,365.59	1.42	-1.05	-0.95
6,359.00	89.50	0.40	3,142.68	3,454.31	-209.61	3,459.51	0.21	0.21	0.00
6,454.00	90.00	0.70	3,143.10	3,549.30	-208.70	3,554.41	0.61	0.53	0.32



Phoenix
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #8H
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	KB @ 3356.00usft (Silver Oak 3)
Site:	Sherman 4 Fee	MD Reference:	KB @ 3356.00usft (Silver Oak 3)
Well:	#8H	North Reference:	Grid
Wellbore:	WB1 / Job #1513148	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Silver Oak 3)	Database:	Compass 5000 GCR

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)
6,548.00	90.20	0.80	3,142.94	3,643.30	-207.47	3,648.30	0.24	0.21	0.11
6,643.00	90.60	1.00	3,142.27	3,738.28	-205.98	3,743.18	0.47	0.42	0.21
6,738.00	90.90	0.90	3,141.03	3,833.26	-204.40	3,838.05	0.33	0.32	-0.11
6,833.00	91.00	0.80	3,139.45	3,928.24	-202.99	3,932.92	0.15	0.11	-0.11
6,929.00	91.50	0.40	3,137.36	4,024.21	-201.99	4,028.80	0.67	0.52	-0.42
7,022.00	91.40	1.70	3,135.01	4,117.16	-200.29	4,121.63	1.40	-0.11	1.40
7,110.00	89.90	1.70	3,134.01	4,205.11	-197.67	4,209.44	1.70	-1.70	0.00
7,205.00	90.20	1.90	3,133.92	4,300.07	-194.69	4,304.23	0.38	0.32	0.21
7,300.00	90.40	1.80	3,133.43	4,395.02	-191.62	4,399.02	0.24	0.21	-0.11
7,395.00	90.60	1.70	3,132.60	4,489.97	-188.72	4,493.81	0.24	0.21	-0.11
7,489.00	89.50	1.00	3,132.52	4,583.94	-186.51	4,587.65	1.39	-1.17	-0.74
7,584.00	89.80	0.60	3,133.10	4,678.93	-185.18	4,682.54	0.53	0.32	-0.42
7,678.00	90.10	0.30	3,133.18	4,772.93	-184.44	4,776.45	0.45	0.32	-0.32
7,772.00	90.60	360.00	3,132.60	4,866.92	-184.20	4,870.38	0.62	0.53	-0.32
7,867.00	91.10	359.40	3,131.19	4,961.91	-184.70	4,965.33	0.82	0.53	-0.63
7,880.00	90.90	359.50	3,130.97	4,974.91	-184.82	4,978.33	1.72	-1.54	0.77
Last Phoenix MWD Survey									
7,941.00	90.90	359.50	3,130.01	5,035.90	-185.35	5,039.30	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
2,481.00	2,480.72	27.28	-14.87	Tie-on to VES Gyro Survey
2,515.00	2,514.72	27.52	-14.82	First Phoenix MWD Survey
7,880.00	3,130.97	4,974.91	-184.82	Last Phoenix MWD Survey
7,941.00	3,130.01	5,035.90	-185.35	Projection to TD

Checked By: _____ Approved By: _____ Date: _____