



June 26, 2014

3001542384

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

Attn: Kanicia Castillo

RE: **Noose Federal Com No. 009H**

Please find enclosed a copy of the survey from 0.00' to 2,230.00' ran on the above referenced well.

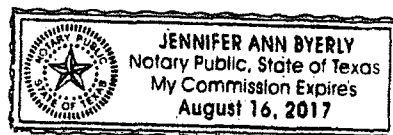
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 26 day of June, A.D., 2014, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas



VES Survey International
P.O. Box 261021 Corpus Christi, TX 78426
T (361) 767-0602 F (361) 767-0612
www.vessurvey.com



Company: COG Operating, LLC (Concho)
Lease/Well: Noose Federal Com/No. 009H

Rig Name: Silver Oak #3
State/County: New Mexico/Eddy
Latitude: 32.61, Longitude: -104.46
GRID North is 0.07 Degrees West of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB=17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 6/24/2014 / 15:24

VES Survey International

West, Texas

(432) 563-5444

Surveyor: Adam Gathright

Noose Federal Com No. 009H / API 30-015-42384

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	0.67	197.66	100.00	-0.56	-0.18	-0.56	0.58	197.66	0.67
200.00	0.35	213.90	199.99	-1.37	-0.52	-1.37	1.46	200.98	0.35
300.00	0.50	236.77	299.99	-1.85	-1.06	-1.85	2.13	209.64	0.22
400.00	0.37	166.72	399.99	-2.41	-1.34	-2.41	2.76	209.19	0.51
500.00	0.07	86.45	499.99	-2.72	-1.20	-2.72	2.97	203.92	0.36
600.00	0.31	41.32	599.99	-2.51	-0.96	-2.51	2.68	200.94	0.27
700.00	0.12	17.98	699.99	-2.20	-0.74	-2.20	2.32	198.72	0.21
800.00	0.36	345.49	799.99	-1.79	-0.79	-1.79	1.96	203.79	0.26
900.00	0.35	324.25	899.98	-1.24	-1.05	-1.24	1.62	220.22	0.13
1000.00	0.35	324.61	999.98	-0.74	-1.41	-0.74	1.59	242.28	0.00
1100.00	0.32	286.50	1099.98	-0.41	-1.85	-0.41	1.90	257.59	0.22
1200.00	0.17	289.64	1199.98	-0.28	-2.26	-0.28	2.28	262.96	0.16
1300.00	0.29	294.26	1299.98	-0.13	-2.63	-0.13	2.63	267.26	0.13
1400.00	0.28	260.64	1399.98	-0.06	-3.10	-0.06	3.10	268.88	0.17
1500.00	0.50	308.52	1499.98	0.17	-3.69	0.17	3.69	272.69	0.38
1600.00	0.76	307.51	1599.97	0.85	-4.56	0.85	4.64	280.56	0.25
1700.00	0.80	319.24	1699.96	1.78	-5.54	1.78	5.82	287.84	0.17
1800.00	0.98	322.76	1799.95	3.00	-6.52	3.00	7.17	294.70	0.19

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	1.40	321.32	1899.93	4.64	-7.80	4.64	9.08	300.72	0.42
2000.00	1.79	325.12	1999.89	6.87	-9.46	6.87	11.69	306.00	0.40
2100.00	2.56	322.18	2099.81	9.92	-11.72	9.92	15.35	310.24	0.78
2230.00	2.87	323.01	2229.67	14.81	-15.46	14.81	21.41	313.77	0.24



COG Operating LLC

Eddy County, NM (NAD27 NME)

Noose Federal Com

#9H

WB1/1410962

Survey: Phoenix MWD Survey

Standard Survey Report

22 June, 2014





Phoenix Technology Services
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Noose Federal Com
Well: #9H
Wellbore: WB1/1410962
Design: Surveys (Silver Oak 3)

Local Co-ordinate Reference: Well #9H
TVD Reference: KB @ 3483.00usft (Silver Oak 3)
MD Reference: KB @ 3483.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR DB

Project: Eddy County, NM (NAD27 NME)

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site: Noose Federal Com

Site Position: Northing: 585,657.00 usft Latitude: 32° 36' 36.04153 N
From: Map Easting: 460,945.50 usft Longitude: 104° 27' 36.59241 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: -0.07 °

Well: #9H

Well Position: +N/-S 0.00 usft Northing: 585,658.70 usft Latitude: 32° 36' 36.06480 N
+E/-W 0.00 usft Easting: 461,495.90 usft Longitude: 104° 27' 30.15763 W
Position Uncertainty: 0.00 usft Wellhead Elevation: usft Ground Level: 3,465.00 usft

Wellbore: WB1/1410962

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	06/09/14	7.66	60.32	48,452

Design: Surveys (Silver Oak 3)

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	0.17

Survey Program: Date 06/22/14

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	2,230.00	VES Gyro Survey (WB1/1410962)	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro
2,281.00	7,426.00	Phoenix MWD Survey (WB1/1410962)	PHX+MWD+IGRF	PHX+MWD+IGRF v3: standard declination

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)
2,230.00	2.87	323.01	2,229.67	14.81	-15.46	14.76	0.00	0.00	0.00
2,281.00	3.40	324.50	2,280.59	17.06	-17.11	17.01	1.05	1.04	2.92
First Phoenix Survey									
2,312.00	3.30	322.50	2,311.54	18.52	-18.19	18.46	0.50	-0.32	-6.45
2,344.00	3.40	321.40	2,343.48	19.99	-19.34	19.93	0.37	0.31	-3.44
2,375.00	3.80	331.10	2,374.42	21.61	-20.41	21.55	2.35	1.29	31.29
2,406.00	6.20	343.50	2,405.30	24.11	-21.38	24.05	8.45	7.74	40.00
2,437.00	8.90	346.70	2,436.03	28.05	-22.41	27.99	8.81	8.71	10.32
2,468.00	11.90	346.90	2,466.52	33.50	-23.68	33.43	9.68	9.68	0.65
2,499.00	14.70	346.60	2,496.69	40.44	-25.32	40.36	9.03	9.03	-0.97



Phoenix Technology Services
Survey Report



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Project: Eddy County, NM (NAD27 NME)
Site: Noose Federal Corn
Well: #9H
Wellbore: WB1/1410962
Design: Surveys (Silver Oak 3)

Local Co-ordinate Reference: Well #9H
TVD Reference: KB @ 3483.00usft (Silver Oak 3)
MD Reference: KB @ 3483.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 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)
2,531.00	17.40	348.40	2,527.44	49.08	-27.22	49.00	8.58	8.44	5.63
2,562.00	20.00	348.70	2,556.80	58.62	-29.20	58.73	8.39	8.39	0.97
2,593.00	23.20	348.90	2,585.62	70.01	-31.41	69.92	10.33	10.32	0.65
2,625.00	26.40	350.50	2,614.66	83.22	-33.80	83.12	10.22	10.00	5.00
2,656.00	29.50	351.90	2,642.04	97.57	-36.01	97.47	10.22	10.00	4.52
2,687.00	33.00	352.60	2,668.54	113.51	-38.18	113.39	11.35	11.29	2.26
2,718.00	36.60	353.00	2,693.99	131.06	-40.39	130.94	11.64	11.61	1.29
2,750.00	39.90	353.50	2,719.12	150.73	-42.71	150.60	10.36	10.31	1.56
2,781.00	42.50	354.40	2,742.44	171.03	-44.86	170.90	8.60	8.39	2.90
2,812.00	44.70	356.00	2,764.89	192.33	-46.64	192.19	7.94	7.10	5.16
2,843.00	46.10	358.80	2,786.66	214.38	-47.64	214.24	7.86	4.52	9.03
2,874.00	48.60	1.20	2,807.66	237.18	-47.63	237.03	9.87	8.06	7.74
2,905.00	51.00	2.50	2,827.67	260.84	-46.86	260.70	8.38	7.74	4.19
2,936.00	53.60	3.20	2,846.63	285.33	-45.64	285.20	8.58	8.39	2.26
2,968.00	56.50	3.50	2,864.96	311.51	-44.11	311.38	9.10	9.06	0.94
2,999.00	59.00	3.80	2,881.50	337.68	-42.44	337.55	8.11	8.06	0.97
3,029.00	62.20	3.90	2,896.22	363.75	-40.68	363.63	10.67	10.67	0.33
3,060.00	65.40	3.50	2,909.91	391.50	-38.89	391.39	10.39	10.32	-1.29
3,092.00	68.30	2.20	2,922.49	420.89	-37.43	420.77	9.80	9.06	-4.06
3,123.00	71.40	1.40	2,933.16	449.97	-36.52	449.86	10.29	10.00	-2.58
3,154.00	74.80	0.50	2,942.17	479.62	-36.03	479.51	11.31	10.97	-2.90
3,185.00	78.50	1.00	2,949.33	509.78	-35.63	509.67	12.04	11.94	1.61
3,216.00	82.50	1.80	2,954.45	540.34	-34.88	540.23	13.15	12.90	2.58
3,247.00	86.70	1.90	2,957.36	571.18	-33.89	571.07	13.55	13.55	0.32
3,297.00	90.40	1.50	2,958.63	621.13	-32.40	621.03	7.44	7.40	-0.80
3,328.00	90.90	1.60	2,958.28	652.12	-31.57	652.02	1.64	1.61	0.32
3,423.00	92.00	1.60	2,955.87	747.05	-28.91	746.96	1.16	1.16	0.00
3,516.00	92.90	1.60	2,951.90	839.93	-26.32	839.84	0.97	0.97	0.00
3,610.00	92.30	1.00	2,947.63	933.80	-24.19	933.73	0.90	-0.64	-0.64
3,703.00	90.60	359.60	2,945.28	1,026.77	-23.70	1,026.69	2.37	-1.83	-1.51
3,797.00	90.60	359.20	2,944.30	1,120.76	-24.69	1,120.68	0.43	0.00	-0.43
3,891.00	91.00	358.90	2,942.98	1,214.73	-26.25	1,214.65	0.53	0.43	-0.32
3,984.00	91.30	359.10	2,941.12	1,307.70	-27.87	1,307.61	0.39	0.32	0.22
4,077.00	91.20	0.40	2,939.09	1,400.68	-28.27	1,400.59	1.40	-0.11	1.40
4,170.00	90.10	1.50	2,938.03	1,493.65	-26.73	1,493.57	1.67	-1.18	1.18
4,263.00	89.40	2.80	2,938.44	1,586.59	-23.40	1,586.52	1.40	-0.75	1.16
4,357.00	90.20	2.50	2,938.77	1,680.50	-19.22	1,680.43	0.86	0.85	-0.11
4,451.00	89.50	1.40	2,939.01	1,774.44	-16.02	1,774.39	1.39	-0.74	-1.17
4,544.00	90.20	0.80	2,939.26	1,867.42	-14.24	1,867.37	0.99	0.75	-0.65
4,637.00	91.00	0.60	2,938.28	1,960.41	-13.10	1,960.36	0.89	0.86	-0.22
4,731.00	90.20	0.40	2,937.30	2,054.40	-12.28	2,054.35	0.88	-0.85	-0.21
4,824.00	90.90	0.20	2,936.40	2,147.39	-11.60	2,147.35	0.78	0.75	-0.22
4,918.00	91.30	359.50	2,934.60	2,241.38	-12.04	2,241.33	0.66	0.43	-0.74



Phoenix Technology Services
Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Site: Noose Federal Com
Well: #9H
Wellbore: WB1/1410962
Design: Surveys (Silver Oak 3)

Local Co-ordinate Reference: Well #9H
TVD Reference: KB @ 3483.00usft (Silver Oak 3)
MD Reference: KB @ 3483.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 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)
5,012.00	91.20	359.00	2,932.55	2,335.34	-13.27	2,335.29	0.54	-0.11	-0.53
5,106.00	90.80	359.80	2,930.91	2,429.32	-14.26	2,429.27	0.95	-0.43	0.85
5,199.00	90.10	1.00	2,930.18	2,522.32	-13.61	2,522.27	1.49	-0.75	1.29
5,293.00	90.90	1.10	2,929.36	2,616.30	-11.88	2,616.25	0.86	0.85	0.11
5,387.00	90.40	1.00	2,928.29	2,710.27	-10.16	2,710.23	0.54	-0.53	-0.11
5,481.00	90.90	1.30	2,927.23	2,804.25	-8.28	2,804.21	0.62	0.53	0.32
5,574.00	89.90	1.30	2,926.58	2,897.22	-6.17	2,897.19	1.08	-1.08	0.00
5,668.00	90.60	1.40	2,926.17	2,991.19	-3.95	2,991.17	0.75	0.74	0.11
5,762.00	89.80	0.20	2,925.84	3,085.18	-2.64	3,085.16	1.53	-0.85	-1.28
5,856.00	90.80	359.90	2,925.35	3,179.18	-2.56	3,179.16	1.11	1.06	-0.32
5,949.00	90.10	0.00	2,924.62	3,272.18	-2.64	3,272.15	0.76	-0.75	0.11
6,042.00	90.90	359.90	2,923.80	3,365.17	-2.72	3,365.15	0.87	0.86	-0.11
6,136.00	91.30	0.50	2,922.00	3,459.15	-2.39	3,459.13	0.77	0.43	0.64
6,230.00	90.60	1.90	2,920.44	3,553.12	-0.42	3,553.10	1.66	-0.74	1.49
6,323.00	90.70	2.30	2,919.39	3,646.05	2.99	3,646.04	0.44	0.11	0.43
6,417.00	89.50	1.80	2,919.22	3,739.99	6.35	3,739.99	1.38	-1.28	-0.53
6,510.00	89.50	0.90	2,920.03	3,832.96	8.54	3,832.96	0.97	0.00	-0.97
6,604.00	89.80	0.20	2,920.61	3,926.95	9.44	3,926.96	0.81	0.32	-0.74
6,697.00	90.60	359.90	2,920.28	4,019.95	9.52	4,019.96	0.92	0.86	-0.32
6,791.00	90.80	359.70	2,919.13	4,113.94	9.19	4,113.95	0.30	0.21	-0.21
6,885.00	89.80	0.00	2,918.64	4,207.94	8.95	4,207.94	1.11	-1.06	0.32
6,979.00	90.00	359.90	2,918.81	4,301.94	8.67	4,301.94	0.24	0.21	-0.11
7,072.00	89.80	358.90	2,918.97	4,394.93	7.89	4,394.93	1.10	-0.22	-1.08
7,166.00	90.80	359.50	2,918.48	4,488.92	6.58	4,488.92	1.24	1.06	0.64
7,260.00	91.30	359.90	2,916.75	4,582.90	6.09	4,582.90	0.68	0.53	0.43
7,353.00	91.30	1.10	2,914.64	4,675.87	6.90	4,675.87	1.29	0.00	1.29
7,364.00	91.30	1.30	2,914.39	4,686.87	7.13	4,686.87	1.82	0.00	1.82
Final Phoenix Survey									
7,426.00	91.30	1.30	2,912.99	4,748.83	8.54	4,748.84	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)	
2,281.00	2,280.59	17.06	-17.11	First Phoenix Survey
7,364.00	2,916.52	4,686.81	7.48	Final Phoenix Survey
7,426.00	2,915.12	4,748.87	8.89	Projection to TD

Checked By: _____ Approved By: _____ Date: _____