

15-39565



December 2, 2014

NM OIL CONSERVATION

ARTESIA DISTRICT

FEB 23 2015

RECEIVED

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

Attn: Kanicia Castillo

RE: Burch Keely Unit 543

Please find enclosed a copy of the survey from 0.00' to 1080.00' 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,

A handwritten signature in black ink, appearing to read "Keith Havelka".

Keith Havelka
Operations

STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 2 day of December, A.D., 2014, by Keith Havelka.

A handwritten signature in black ink, appearing to read "Jennifer Ann Byerly".
Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Burch Keely Unit/543

Rig Name: Basic 38
State/County: New Mexico /Eddy
Latitude: 32.83, Longitude: -104.03
GRID North is 0.16 Degrees East of True North
VS-Azi: 329.49 Degrees



Depth Reference : 13 FT

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: burch keely unit 543-de_01.ut

Minimum Curvature Method

Report Date/Time: 12/2/2014 / 13:56

VES Survey International

(432) 563-5444

West Texas

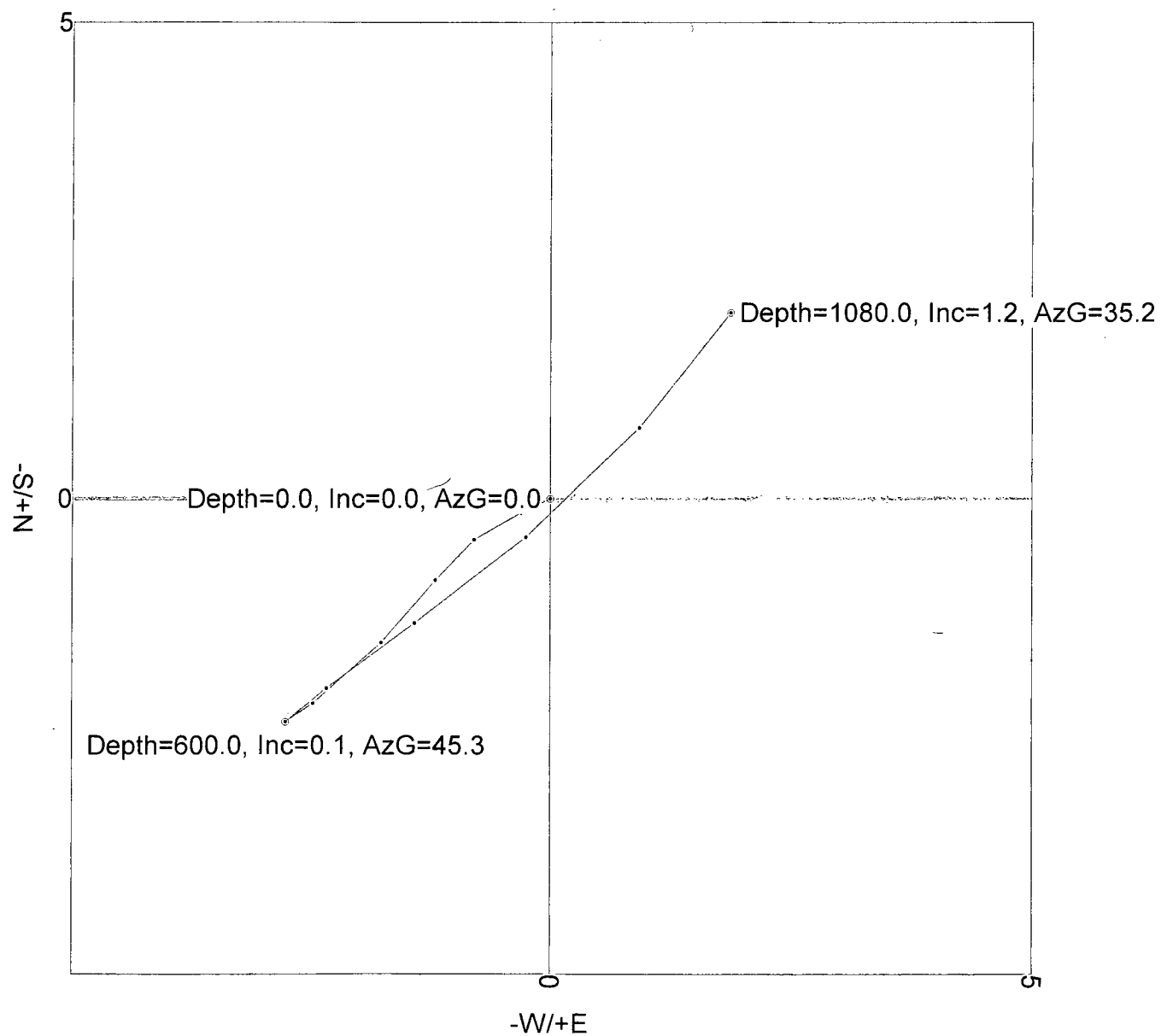
Surveyor: Javier Estrada

Burch Keely Unit 543 / API 30-015-39565

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	0.39	243.67	100.00	-0.15	-0.30	0.02	0.34	243.67	0.39
200.00	0.25	234.01	200.00	-0.43	-0.79	0.03	0.90	241.29	0.14
300.00	0.43	217.57	300.00	-0.86	-1.20	-0.13	1.47	234.35	0.20
400.00	0.56	223.18	399.99	-1.51	-1.76	-0.41	2.32	229.33	0.15
500.00	0.53	233.02	499.99	-2.15	-2.47	-0.60	3.27	228.93	0.10
600.00	0.13	45.34	599.99	-2.35	-2.75	-0.62	3.62	229.57	0.66
700.00	0.51	51.35	699.98	-1.99	-2.32	-0.53	3.06	229.47	0.38
800.00	0.80	54.41	799.98	-1.31	-1.41	-0.41	1.92	227.25	0.29
900.00	0.89	50.21	899.97	-0.41	-0.25	-0.22	0.48	211.89	0.11
1000.00	1.00	41.48	999.95	0.74	0.92	0.17	1.18	51.07	0.18
1080.00	1.20	35.23	1079.94	1.95	1.87	0.73	2.70	43.72	0.29



VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Burch Keely Unit 543 / API 30-015-39565



VES Survey Date: 11/23/2014

OPERATOR COG Operating
WELL/LEASE Burch Keely Unit #543
COUNTY Eddy, Co., NM

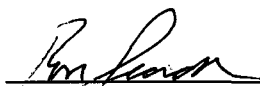
STATE OF NEW MEXICO
DEVIATION REPORT

419	1.06
809	1.16
1272	1.40
1462	4.10
1652	3.40
1842	3.00
2031	2.60
2221	2.20
2411	2.00
2601	2.20
2790	2.90
2980	3.00
3170	2.30
3360	3.00
3550	3.10
3740	2.90
3866	2.80
3993	2.70
4119	2.50
4246	2.50
4372	2.10
4499	3.00
4734	2.90

NM OIL CONSERVATION
ARTESIA DISTRICT

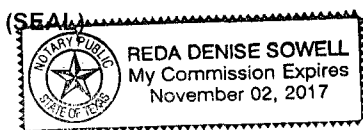
FEB 23 2015

RECEIVED

SIGNED BY: 
RON SCANDOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS
COUNTY OF MIDLAND

ON THIS 8 DAY OF December, 2014, BEFORE ME, R SOWELL, A NOTARY
PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED
THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.



Reda Denise Sowell
NOTARY PUBLIC



NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 23 2015

RECEIVED

COG Operating LLC

Eddy County, NM (NAD27 NME)

Burch Keely Unit

#543

WB1 / Job #1412353

Design: Surveys (Basic 38)

Standard Survey Report

27 November, 2014



PHOENIX
TECHNOLOGY SERVICES



Phoenix
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #543
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3616.00usft (Basic 38)
Site:	Burch Keely Unit	MD Reference:	KB @ 3616.00usft (Basic 38)
Well:	#543	North Reference:	Grid
Wellbore:	WB1 / Job #1412353	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Basic 38)	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		Burch Keely Unit			
Site Position:		Northing:	666,591.10 usft	Latitude:	32° 49' 55.74916 N
From:	Map	Easting:	596,305.50 usft	Longitude:	104° 1' 11.28420 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.17 °

Well	#543					
Well Position	+N-S	0.00 usft	Northing:	664,643.00 usft	Latitude:	32° 49' 36.57889 N
	+E-W	0.00 usft	Easting:	592,598.90 usft	Longitude:	104° 1' 54.79073 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,604.00 usft

Wellbore						WB1./Job #1412353					
Magnetics		Model Name		Sample Date		Declination (°)		Dip Angle (°)		Field Strength (nT)	
		IGRF2010_14		11/24/2014		7.42		60.58		48,582	

Design: Surveys (Basic 38)				
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	329.49

Survey Program		Date	11/27/2014		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.00	1,080.00	VES Gyro Survey (WB1 / Job #1412353)	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
1,208.00	4,784.00	Phoenix MWD Survey (WB1 / Job #14123)	PHX+MWD+IGRF	PHX+MWD+IGRF v3:standard declination	

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(usft)	(°)	(°)	(usft)	(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	0.39	243.67	100.00	-0.15	-0.31	0.02	0.39	0.39	0.00
200.00	0.25	234.01	200.00	-0.43	-0.79	0.03	0.15	-0.14	-9.66
300.00	0.43	217.57	300.00	-0.86	-1.19	-0.13	0.20	0.18	-16.44
400.00	0.56	223.18	399.99	-1.51	-1.76	-0.41	0.14	0.13	5.61
500.00	0.53	233.02	499.99	-2.14	-2.46	-0.60	0.10	-0.03	9.84
600.00	0.13	45.34	599.99	-2.34	-2.75	-0.62	0.66	-0.40	172.32
700.00	0.51	51.35	699.98	-1.98	-2.32	-0.53	0.38	0.38	6.01
800.00	0.80	54.41	799.98	-1.30	-1.40	-0.41	0.29	0.29	3.06
900.00	0.89	50.21	899.97	-0.40	-0.24	-0.22	0.11	0.09	-4.20



Phoenix
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well: #543
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3616.00usft (Basic 38)
Site:	Burch Keely Unit	MD Reference:	KB @ 3616.00usft (Basic 38)
Well:	#543	North Reference:	Grid
Wellbore:	WB17 Job #1412353	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Basic 38)	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	1.00	41.48	999.95	0.75	0.94	0.17	0.18	0.11	-8.73
1,080.00	1.20	35.23	1,079.94	1.96	1.88	0.73	0.29	0.25	-7.81
Tie-on to VES Gyro Survey									
1,208.00	0.70	44.50	1,207.92	3.61	3.20	1.49	0.41	-0.39	7.24
First Phoenix MWD Survey									
1,272.00	1.40	9.10	1,271.91	4.66	3.60	2.19	1.44	1.09	-55.31
1,335.00	2.80	334.50	1,334.87	6.81	3.06	4.32	2.90	2.22	-54.92
1,398.00	3.50	327.70	1,397.77	9.83	1.37	7.77	1.26	1.11	-10.79
1,462.00	4.10	323.80	1,461.63	13.33	-1.03	12.00	1.02	0.94	-6.09
1,525.00	4.00	313.60	1,524.48	16.66	-3.95	16.36	1.15	-0.16	-16.19
1,589.00	4.30	318.50	1,588.31	19.99	-7.15	20.86	0.73	0.47	7.66
1,652.00	3.40	329.40	1,651.17	23.37	-9.67	25.04	1.84	-1.43	17.30
1,715.00	2.60	323.80	1,714.08	26.13	-11.47	28.33	1.35	-1.27	-8.89
1,778.00	2.60	318.80	1,777.01	28.36	-13.25	31.16	0.36	0.00	-7.94
1,842.00	3.00	323.40	1,840.94	30.80	-15.21	34.25	0.72	0.63	7.19
1,905.00	3.20	329.00	1,903.85	33.63	-17.09	37.65	0.58	0.32	8.89
1,968.00	2.90	338.30	1,966.76	36.62	-18.59	40.98	0.92	-0.48	14.76
2,032.00	2.60	340.20	2,030.68	39.49	-19.68	44.01	0.49	-0.47	2.97
2,095.00	2.30	335.20	2,093.63	41.98	-20.69	46.67	0.58	-0.48	-7.94
2,156.00	2.40	333.60	2,154.57	44.23	-21.77	49.16	0.20	0.16	-2.62
2,219.00	2.20	337.70	2,217.52	46.53	-22.82	51.68	0.41	-0.32	6.51
2,285.00	2.10	330.70	2,283.48	48.76	-23.89	54.14	0.43	-0.15	-10.61
2,348.00	2.10	336.70	2,346.44	50.83	-24.91	56.44	0.35	0.00	9.52
2,411.00	2.00	329.00	2,409.40	52.83	-25.94	58.68	0.46	-0.16	-12.22
2,474.00	2.00	328.70	2,472.36	54.71	-27.07	60.88	0.02	0.00	-0.48
2,537.00	2.00	330.20	2,535.32	56.60	-28.19	63.08	0.08	0.00	2.38
2,601.00	2.20	335.10	2,599.28	58.69	-29.26	65.42	0.42	0.31	7.66
2,664.00	2.10	336.40	2,662.23	60.84	-30.23	67.77	0.18	-0.16	2.06
2,727.00	2.60	331.60	2,725.18	63.16	-31.38	70.34	0.85	0.79	-7.62
2,790.00	2.90	337.50	2,788.11	65.89	-32.67	73.35	0.65	0.48	9.37
2,854.00	2.80	334.10	2,852.03	68.79	-33.97	76.51	0.31	-0.16	-5.31
2,917.00	3.10	334.50	2,914.94	71.71	-35.37	79.74	0.48	0.48	0.63
2,980.00	3.00	336.70	2,977.85	74.76	-36.76	83.07	0.24	-0.16	3.49
3,044.00	3.30	327.60	3,041.76	77.86	-38.41	86.58	0.91	0.47	-14.22
3,107.00	2.60	317.50	3,104.67	80.44	-40.35	89.79	1.38	-1.11	-16.03
3,170.00	2.30	317.10	3,167.62	82.42	-42.17	92.42	0.48	-0.48	-0.63
3,233.00	2.30	318.50	3,230.57	84.29	-43.87	94.89	0.09	0.00	2.22
3,297.00	2.30	316.00	3,294.51	86.18	-45.61	97.40	0.16	0.00	-3.91
3,360.00	3.00	327.50	3,357.45	88.48	-47.38	100.28	1.39	1.11	18.25
3,424.00	3.30	331.10	3,421.35	91.50	-49.17	103.79	0.56	0.47	5.63
3,487.00	3.20	325.30	3,484.25	94.54	-51.04	107.36	0.55	-0.16	-9.21
3,550.00	3.10	314.40	3,547.15	97.17	-53.26	110.76	0.96	-0.16	-17.30
3,614.00	3.00	322.40	3,611.06	99.71	-55.52	114.09	0.68	-0.16	12.50



Phoenix
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #543
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3616.00usft (Basic 38)
Site:	Burch Keely Unit	MD Reference:	KB @ 3616.00usft (Basic 38)
Well:	#543	North Reference:	Grid
Wellbore:	WB1 // Job #1412353	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Basic 38)	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)
3,677.00	3.00	327.30	3,673.98	102.40	-57.42	117.38	0.41	0.00	7.78
3,740.00	2.90	326.60	3,736.89	105.12	-59.19	120.61	0.17	-0.16	-1.11
3,803.00	2.50	321.50	3,799.82	107.53	-60.92	123.57	0.74	-0.63	-8.10
3,866.00	2.80	326.30	3,862.76	109.88	-62.63	126.46	0.59	0.48	7.62
3,993.00	2.70	327.00	3,989.61	114.97	-65.98	132.55	0.08	-0.08	0.55
4,119.00	2.50	321.10	4,115.48	119.60	-69.32	138.23	0.26	-0.16	-4.68
4,246.00	2.50	322.30	4,242.36	123.95	-72.75	143.72	0.04	0.00	0.94
4,372.00	2.10	322.50	4,368.26	127.95	-75.84	148.74	0.32	-0.32	0.16
4,499.00	3.00	323.80	4,495.13	132.48	-79.22	154.36	0.71	0.71	1.02
4,562.00	3.10	324.10	4,558.04	135.19	-81.19	157.69	0.16	0.16	0.48
4,625.00	2.90	324.80	4,620.96	137.87	-83.11	160.98	0.32	-0.32	1.11
4,689.00	2.70	318.80	4,684.88	140.33	-85.03	164.07	0.55	-0.31	-9.38
4,734.00	2.90	322.50	4,729.83	142.03	-86.42	166.24	0.60	0.44	8.22
Last Phoenix MWD Survey									
4,784.00	2.90	322.50	4,779.76	144.04	-87.96	168.75	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,080.00	1,079.94	1.96	1.88	Tie-on to VES Gyro Survey
1,208.00	1,207.92	3.61	3.20	First Phoenix MWD Survey
4,734.00	4,729.83	142.03	-86.42	Last Phoenix MWD Survey
4,784.00	4,779.76	144.04	-87.96	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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