

OPERATOR COG Operating LLC
WELL/LEASE Dodd Federal Unit #637
COUNTY Eddy Co., NM.

15-86
4/5

NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 06 2015

RECEIVED

STATE OF NEW MEXICO
DEVIATION REPORT

255	0.20
535	1.00
839	1.75
966	1.75
1042	1.40
1169	1.30
1296	1.50
1423	1.30
1549	1.10
1675	1.80
1802	1.30
1928	1.40
2054	1.40
2253	1.50
2316	1.50
2379	1.70
2442	1.60
2506	1.60
2569	1.20
3014	1.20
3078	1.40
3141	1.50
3204	1.50
3267	1.50
3330	1.60
3834	1.80
3897	1.90
3960	1.60
4024	1.50
4087	1.30
4150	1.30

SIGNED BY:

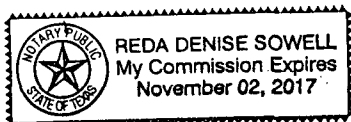
Ron Scandolari

RON SCANDOLARI, VP-CONTRACT DRILLING

STATE OF TEXAS
COUNTY OF MIDLAND

ON THIS 12 DAY OF January, ²⁰¹⁵~~2014~~, BEFORE ME, R SOWELL, A NOTARY
PUBLIC, PERSONALLY APPEARED RON SCANDOLARI, WHO ACKNOWLEDGED AND EXECUTED
THIS DOCUMENT. WITNESS MY HAND AND OFFICIAL SEAL.

(SEAL)



Reda Denise Sowell
NOTARY PUBLIC



January 13, 2015

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

NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 06 2015

RECEIVED

Attn: Kanicia Castillo

RE: Dodd Federal Unit 637

Please find enclosed a copy of the survey from 0.00' to 930.00' 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,

Keith Havelka
Operations

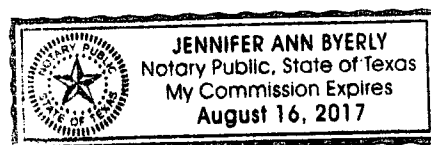
STATE OF TEXAS §

§

COUNTY OF NUECES §

This instrument was acknowledged before me on the 13 day of January
A.D., 2015, by Keith Havelka.

Jennifer Ann Byerly
Notary Public, State of Texas





Company: COG Operating
Lease/Well: Dodd Federal Unit/637

Rig Name: Basic 38
State/County: New Mexico/Eddy
Latitude: 32.83, Longitude: -103.04
GRID North is 0.70 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB: 13'

DRILLOG HA GYRO SURVEY CALCULATIONS

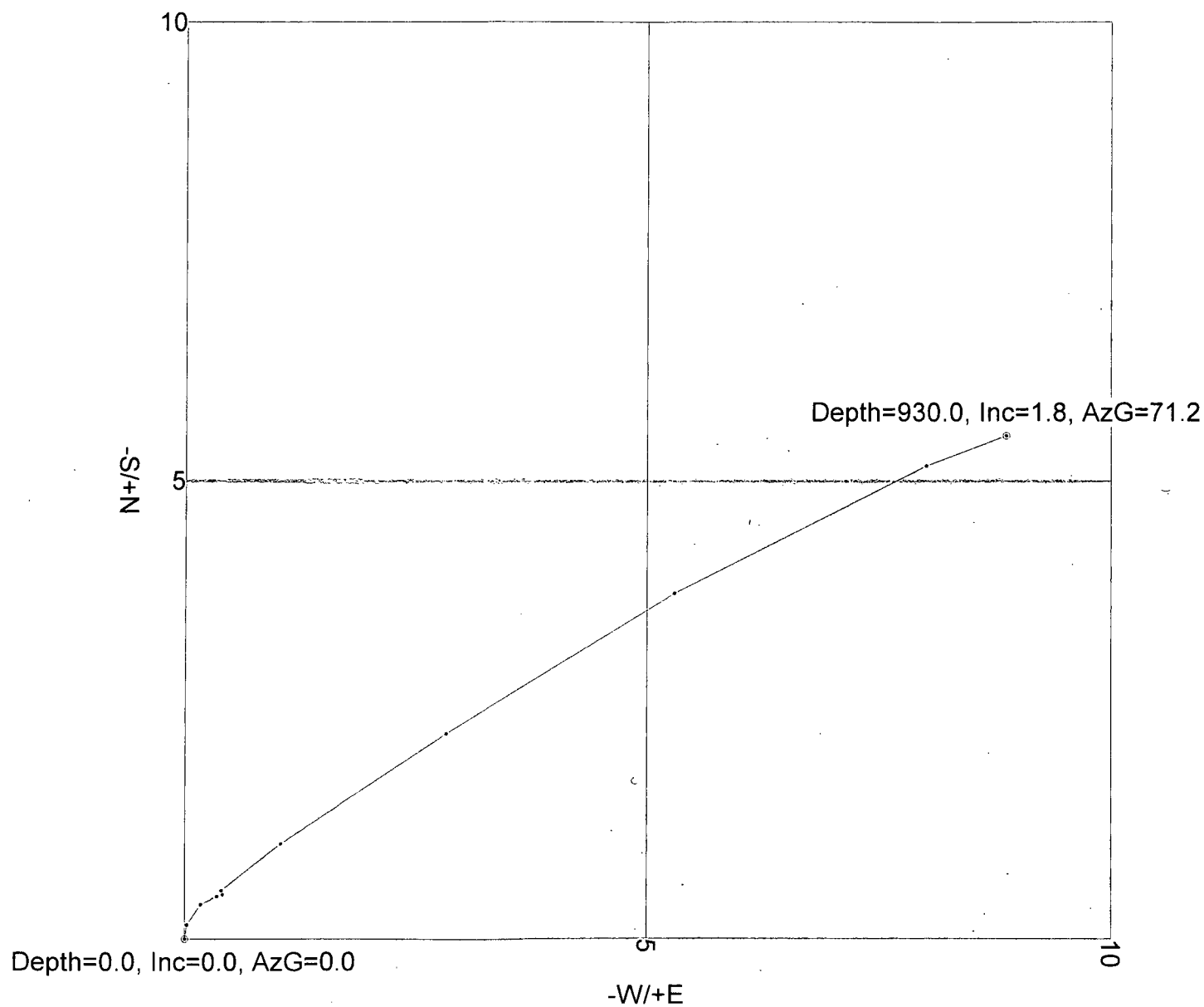
Filename: Dodd Federal Unit #637.ut
Minimum Curvature Method
Report Date/Time: 1/13/2015 / 14:26

VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Dodd Federal Unit 637 / API 30-015-41586

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	8.97	100.00	0.15	0.02	0.15	0.15	8.97	0.18
200.00	0.16	60.71	200.00	0.37	0.17	0.37	0.41	24.87	0.15
300.00	0.07	71.37	300.00	0.46	0.35	0.46	0.58	37.48	0.10
400.00	0.01	67.06	400.00	0.48	0.42	0.48	0.64	40.70	0.06
500.00	0.05	337.08	500.00	0.53	0.40	0.53	0.66	37.28	0.05
600.00	0.93	54.91	599.99	1.04	1.05	1.04	1.47	45.27	0.92
700.00	1.55	56.72	699.97	2.24	2.84	2.24	3.62	51.68	0.62
800.00	1.77	59.37	799.93	3.77	5.30	3.77	6.50	54.55	0.24
900.00	1.73	66.48	899.88	5.16	8.01	5.16	9.53	57.21	0.22
930.00	1.78	71.20	929.87	5.49	8.87	5.49	10.43	58.23	0.51



VES Survey International
Midland, TX
(432)-563-5444
Surveyor: Tim Dillon
Dodd Federal Unit 637 / API 30-015-41586



VES Survey Date: 12/27/2014



COG Operating LLC

Eddy County, NM (NAD27 NME)

Dodd Federal Unit

#637

WB1 / Job #1412572

Design: Surveys (Basic 38)

Standard Survey Report

02 January, 2015





Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #637
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	KB @ 3620.00usft (Basic 38)
Site:	Dodd Federal Unit	MD Reference:	KB @ 3620.00usft (Basic 38)
Well:	#637	North Reference:	Grid
Wellbore:	WB1 / Job #1412572	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	Dodd Federal Unit		
Site Position:		Northing:	669,009.70 usft
From:	Map	Easting:	585,704.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 50' 19.97600 N
		Longitude:	104° 3' 15.44871 W
		Grid Convergence:	0.15 °

Well	#637		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 49' 40.41675 N
		Longitude:	104° 2' 22.44296 W
		Ground Level:	3,608.00 usft

Wellbore	WB1 / Job #1412572		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	12/18/2014	7.42
			Dip Angle
			(°)
			60.58
			Field Strength
			(nT)
			48,575

Design	Surveys (Basic 38)		
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
			(°)
			0.01

Survey Program	Date 1/2/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	930.00	VES Gyro Survey (WB1 / Job #1412572)	PHX+MWD+IGRF
1,092.00	4,600.00	Phoenix MWD Survey (WB1 / Job #14125)	PHX+MWD+IGRF
			Description
			PHX+MWD+IGRF v3: standard declination
			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	0.18	8.97	100.00	0.16	0.02	0.16	0.18	0.18	0.00
200.00	0.16	60.71	200.00	0.38	0.17	0.38	0.15	-0.02	51.74
300.00	0.07	71.37	300.00	0.47	0.35	0.47	0.09	-0.09	10.66
400.00	0.01	67.06	400.00	0.49	0.42	0.49	0.06	-0.06	-4.31
500.00	0.05	337.08	500.00	0.53	0.41	0.53	0.05	0.04	-89.98
600.00	0.93	54.91	599.99	1.04	1.05	1.04	0.92	0.88	77.83
700.00	1.55	56.72	699.97	2.25	2.85	2.25	0.62	0.62	1.81
800.00	1.77	59.37	799.93	3.78	5.31	3.78	0.23	0.22	2.65
900.00	1.73	66.48	899.88	5.17	8.02	5.17	0.22	-0.04	7.11



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #637
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB @ 3620.00usft (Basic 38)
Site:	Dodd Federal Unit	MD Reference:	KB @ 3620.00usft (Basic 38)
Well:	#637	North Reference:	Grid
Wellbore:	WB1 / Job #1412572	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)
930.00	1.78	71.20	929.87	5.50	8.88	5.50	0.51	0.17	15.73
Tie-on to VES Gyro Survey									
1,052.00	1.51	47.12	1,051.82	7.20	11.85	7.20	0.60	-0.22	-19.74
First Phoenix MWD Survey									
1,116.00	1.50	32.40	1,115.80	8.48	12.92	8.49	0.60	-0.02	-22.99
1,179.00	1.30	352.70	1,178.78	9.89	13.27	9.89	1.54	-0.32	-63.02
1,243.00	1.40	344.20	1,242.76	11.36	12.96	11.36	0.35	0.16	-13.28
1,306.00	1.50	342.00	1,305.74	12.89	12.50	12.89	0.18	0.16	-3.49
1,369.00	1.50	336.10	1,368.72	14.42	11.91	14.43	0.25	0.00	-9.37
1,433.00	1.30	7.80	1,432.70	15.91	11.67	15.91	1.23	-0.31	49.53
1,496.00	1.20	12.60	1,495.69	17.26	11.91	17.26	0.23	-0.16	7.62
1,559.00	1.10	9.40	1,558.67	18.50	12.15	18.50	0.19	-0.16	-5.08
1,623.00	1.70	354.60	1,622.66	20.05	12.16	20.05	1.09	0.94	-23.13
1,686.00	1.80	351.00	1,685.63	21.96	11.92	21.96	0.24	0.16	-5.71
1,749.00	1.00	336.30	1,748.61	23.44	11.55	23.44	1.38	-1.27	-23.33
1,813.00	1.30	0.10	1,812.59	24.68	11.32	24.68	0.87	0.47	37.19
1,876.00	1.70	10.20	1,875.57	26.31	11.49	26.31	0.76	0.63	16.03
1,939.00	1.40	8.30	1,938.55	27.99	11.77	28.00	0.48	-0.48	-3.02
2,003.00	1.30	11.50	2,002.53	29.48	12.02	29.48	0.20	-0.16	5.00
2,066.00	1.40	351.40	2,065.51	30.94	12.05	30.94	0.76	0.16	-31.90
2,129.00	1.50	344.60	2,128.49	32.50	11.72	32.50	0.32	0.16	-10.79
2,192.00	1.50	338.60	2,191.47	34.06	11.20	34.06	0.25	0.00	-9.52
2,225.00	1.50	341.80	2,224.46	34.87	10.90	34.87	0.25	0.00	9.70
2,319.00	1.50	342.70	2,318.43	37.22	10.15	37.22	0.03	0.00	0.96
2,382.00	1.70	340.10	2,381.41	38.88	9.59	38.88	0.34	0.32	-4.13
2,445.00	1.60	1.90	2,444.38	40.64	9.30	40.64	1.00	-0.16	34.60
2,508.00	1.60	5.00	2,507.36	42.39	9.41	42.39	0.14	0.00	4.92
2,572.00	1.20	352.70	2,571.34	43.95	9.40	43.95	0.78	-0.63	-19.22
2,635.00	1.10	339.00	2,634.32	45.17	9.10	45.17	0.46	-0.16	-21.75
2,698.00	1.10	341.50	2,697.31	46.31	8.69	46.31	0.08	0.00	3.97
2,761.00	1.20	339.60	2,760.30	47.50	8.27	47.50	0.17	0.16	-3.02
2,825.00	1.40	342.60	2,824.28	48.87	7.80	48.87	0.33	0.31	4.69
2,888.00	1.10	338.40	2,887.27	50.17	7.35	50.17	0.50	-0.48	-6.67
2,951.00	1.30	336.80	2,950.25	51.39	6.84	51.39	0.32	0.32	-2.54
3,014.00	1.20	332.90	3,013.24	52.63	6.26	52.63	0.21	-0.16	-6.19
3,078.00	1.40	334.60	3,077.22	53.93	5.62	53.93	0.32	0.31	2.66
3,141.00	1.50	337.70	3,140.20	55.39	4.98	55.39	0.20	0.16	4.92
3,204.00	1.50	333.60	3,203.18	56.89	4.30	56.89	0.17	0.00	-6.51
3,267.00	1.50	341.60	3,266.16	58.42	3.67	58.42	0.33	0.00	12.70
3,330.00	1.60	347.50	3,329.14	60.06	3.22	60.06	0.30	0.16	9.37
3,394.00	1.70	345.80	3,393.11	61.85	2.80	61.85	0.17	0.16	-2.66
3,457.00	1.60	350.20	3,456.08	63.62	2.42	63.62	0.26	-0.16	6.98
3,520.00	1.60	350.60	3,519.06	65.36	2.12	65.36	0.02	0.00	0.63



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #637
Project:	Eddy County - NM (NAD27 - NME)	TVD Reference:	KB @ 3620.00usft (Basic 38)
Site:	Dodd Federal Unit	MD Reference:	KB @ 3620.00usft (Basic 38)
Well:	#637	North Reference:	Grid
Wellbore:	WB17 / Job #1412572	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)
3,583.00	1.80	348.80	3,582.03	67.19	1.79	67.19	0.33	0.32	-2.86
3,647.00	1.70	341.40	3,646.00	69.08	1.29	69.08	0.39	-0.16	-11.56
3,710.00	1.70	342.10	3,708.97	70.85	0.70	70.85	0.03	0.00	1.11
3,773.00	1.80	345.90	3,771.94	72.70	0.18	72.70	0.24	0.16	6.03
3,836.00	1.80	342.00	3,834.91	74.60	-0.37	74.60	0.19	0.00	-6.19
3,900.00	1.90	344.00	3,898.88	76.58	-0.97	76.58	0.19	0.16	3.13
3,963.00	1.60	352.00	3,961.85	78.46	-1.38	78.45	0.61	-0.48	12.70
4,026.00	1.50	356.90	4,024.83	80.15	-1.55	80.15	0.26	-0.16	7.78
4,090.00	1.30	349.20	4,088.81	81.70	-1.73	81.70	0.43	-0.31	-12.03
4,153.00	1.30	354.90	4,151.79	83.11	-1.93	83.11	0.21	0.00	9.05
4,217.00	1.20	352.20	4,215.78	84.50	-2.09	84.50	0.18	-0.16	-4.22
4,280.00	1.10	355.60	4,278.76	85.76	-2.22	85.76	0.19	-0.16	5.40
4,343.00	1.20	355.80	4,341.75	87.02	-2.32	87.02	0.16	0.16	0.32
4,406.00	1.20	3.00	4,404.74	88.33	-2.33	88.33	0.24	0.00	11.43
4,470.00	1.40	3.80	4,468.72	89.78	-2.24	89.78	0.31	0.31	1.25
4,533.00	1.90	356.10	4,531.69	91.59	-2.26	91.59	0.87	0.79	-12.22
4,551.00	1.80	357.70	4,549.69	92.17	-2.29	92.17	0.63	-0.56	8.89
Last Phoenix MWD Survey									
4,600.00	1.70	357.70	4,598.66	93.67	-2.35	93.67	0.20	-0.20	0.00
Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
930.00	929.87	5.50	8.88	Tie-on to VES Gyro Survey
1,052.00	1,051.82	7.20	11.85	First Phoenix MWD Survey
4,551.00	4,549.69	92.17	-2.29	Last Phoenix MWD Survey
4,600.00	4,598.66	93.67	-2.35	Projection to TD

Checked By: _____ Approved By: _____ Date: _____