

JAN 12 2017

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COG Operating LLC

Eddy County, NM (NAD-27 2015)

Dodd Federal Unit #921H

API #: 30-015-42995

SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I

PP: 1762' FSL, 330' FEL, Sec 14, T17S, R29E, Unit I

BHL: 1666' FSL, 141' FWL, Sec 14, T17S, R29E, Unit L

Design: BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L

Standard Survey Report

30 October, 2016





TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3638.00usft (Silver Oak 3)
Site:	Dodd Federal Unit #921H	MD Reference:	KB @ 3638.00usft (Silver Oak 3)
Well:	SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I	North Reference:	Grid
Wellbore:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD-27 2015)		
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 #921H			
Site Position:		Northing:	666,414.50 usft	Latitude: 32° 49' 54.152 N
From:	Map	Easting:	591,024.60 usft	Longitude: 104° 2' 13.182 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: 0.16 °

Well	SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I			
Well Position	+N-S	0.00 usft	Northing:	666,414.50 usft
	+E-W	0.00 usft	Easting:	591,024.60 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 3,620.00 usft

Wellbore	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)
	IGRF2015	10/12/2016	7.29	60.55
				Field Strength (nT)
				48,317

Design	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L			
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	270.18

Survey Program	Date 10/30/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	961.00	VES Gyro #1 (BHL: 1670' FSL, 100' FWL)	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro
1,065.00	9,680.00	TDS MWD #2 (BHL: 1670' FSL, 100' FWL)	MWD	MWD - Standard

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.52	78.42	100.00	0.09	0.44	-0.44	0.52	0.52	0.00	
200.00	0.60	86.31	199.99	0.22	1.41	-1.41	0.11	0.08	7.89	
300.00	1.07	37.22	299.98	0.99	2.50	-2.50	0.81	0.47	-49.09	
400.00	0.59	69.46	399.97	1.92	3.55	-3.54	0.65	-0.48	32.24	
500.00	0.91	98.16	499.97	1.99	4.81	-4.81	0.48	0.32	28.70	
600.00	1.01	96.70	599.95	1.77	6.48	-6.47	0.10	0.10	-1.46	



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Site:	Dodd Federal Unit #921H	MD Reference:	KB @ 3638.00usft (Silver Oak 3)
Well:	SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I	North Reference:	Grid
Wellbore:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Database:	EDM 5000.1 Single User 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)
700.00	1.29	92.89	699.93	1.61	8.47	-8.47	0.29	0.28	-3.81
800.00	1.33	83.37	799.91	1.69	10.75	-10.75	0.22	0.04	-9.52
900.00	1.20	85.03	899.88	1.91	12.95	-12.94	0.14	-0.13	1.66
961.00	1.39	81.81	960.87	2.07	14.32	-14.31	0.33	0.31	-5.28
Tie-In to VES Gyro - Tie-In to VES Gyro									
1,065.00	0.70	70.60	1,064.85	2.46	16.16	-16.16	0.69	-0.66	-10.78
First TDS MWD Survey									
1,128.00	1.10	57.30	1,127.84	2.92	17.04	-17.03	0.71	0.63	-21.11
1,223.00	2.40	52.20	1,222.79	4.63	19.38	-19.36	1.38	1.37	-5.37
1,317.00	3.30	60.70	1,316.68	7.16	23.29	-23.27	1.06	0.96	9.04
1,412.00	3.30	58.70	1,411.52	9.92	28.01	-27.98	0.12	0.00	-2.11
1,507.00	2.90	56.90	1,506.38	12.65	32.36	-32.32	0.43	-0.42	-1.89
1,601.00	2.40	54.50	1,600.28	15.09	35.95	-35.91	0.54	-0.53	-2.55
1,695.00	4.00	58.60	1,694.13	17.94	40.36	-40.30	1.72	1.70	4.36
1,790.00	4.10	60.30	1,788.89	21.35	46.13	-46.07	0.16	0.11	1.79
1,884.00	3.50	59.00	1,882.69	24.50	51.51	-51.44	0.64	-0.64	-1.38
1,979.00	4.30	57.60	1,977.46	27.90	57.01	-56.92	0.85	0.84	-1.47
2,073.00	4.00	55.40	2,071.22	31.65	62.68	-62.58	0.36	-0.32	-2.34
2,168.00	3.20	51.60	2,166.03	35.18	67.48	-67.37	0.88	-0.84	-4.00
2,262.00	4.30	55.40	2,259.83	38.81	72.44	-72.32	1.20	1.17	4.04
2,357.00	4.40	55.60	2,354.55	42.89	78.38	-78.24	0.11	0.11	0.21
2,451.00	4.10	56.10	2,448.29	46.80	84.14	-84.00	0.32	-0.32	0.53
2,545.00	3.90	56.10	2,542.07	50.46	89.59	-89.43	0.21	-0.21	0.00
2,640.00	5.30	59.80	2,636.76	54.47	96.06	-95.89	1.51	1.47	3.89
2,734.00	5.50	61.10	2,730.34	58.83	103.76	-103.57	0.25	0.21	1.38
2,829.00	5.30	61.10	2,824.92	63.15	111.58	-111.38	0.21	-0.21	0.00
2,923.00	5.00	60.70	2,918.54	67.25	119.96	-119.74	0.32	-0.32	-0.43
3,018.00	4.70	60.70	3,013.20	71.18	125.96	-125.74	0.32	-0.32	0.00
3,112.00	4.60	61.10	3,106.89	74.89	132.62	-132.38	0.11	-0.11	0.43
3,206.00	4.30	64.00	3,200.61	78.25	139.09	-138.84	0.40	-0.32	3.09
3,301.00	4.30	64.90	3,295.34	81.33	145.51	-145.26	0.07	0.00	0.95
3,395.00	3.70	51.70	3,389.11	84.70	151.08	-150.82	1.17	-0.64	-14.04
3,490.00	3.60	49.80	3,483.92	88.53	155.77	-155.49	0.17	-0.11	-2.00
3,584.00	3.90	58.20	3,577.72	92.12	160.74	-160.45	0.67	0.32	8.94
3,679.00	3.90	59.20	3,672.50	95.47	166.26	-165.96	0.07	0.00	1.05
3,773.00	3.90	58.50	3,766.28	98.78	171.73	-171.42	0.05	0.00	-0.74
3,868.00	2.20	55.20	3,861.14	101.51	175.98	-175.66	1.80	-1.79	-3.47
3,962.00	0.90	358.80	3,955.11	103.28	177.45	-177.12	1.98	-1.38	-60.00
4,057.00	0.20	336.10	4,050.11	104.17	177.37	-177.04	0.76	-0.74	-23.89
4,151.00	0.00	318.40	4,144.11	104.32	177.30	-176.97	0.21	-0.21	0.00
4,183.00	0.50	224.70	4,176.10	104.22	177.20	-176.87	1.56	1.56	0.00



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Wellbore:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Database:	EDM 5000.1 Single User 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)	
4,214.00	2.10	260.20	4,207.10	104.03	176.55	-176.22	5.54	5.16	114.52	
4,246.00	5.10	265.80	4,239.03	103.83	174.55	-174.22	9.43	9.38	17.50	
4,277.00	8.30	268.60	4,269.81	103.67	170.94	-170.61	10.37	10.32	9.03	
4,309.00	11.60	271.70	4,301.33	103.71	165.41	-165.09	10.44	10.31	9.69	
4,340.00	15.10	273.30	4,331.49	104.04	158.26	-157.94	11.35	11.29	5.16	
4,372.00	18.50	273.40	4,362.12	104.58	149.03	-148.70	10.63	10.63	0.31	
4,403.00	22.10	272.20	4,391.19	105.09	138.29	-137.96	11.69	11.61	-3.87	
4,435.00	25.40	270.40	4,420.47	105.37	125.41	-125.08	10.56	10.31	-5.63	
4,466.00	28.80	269.30	4,448.06	105.33	111.29	-110.96	11.09	10.97	-3.55	
4,498.00	32.20	269.60	4,475.63	105.17	95.05	-94.72	10.64	10.63	0.94	
4,529.00	35.50	270.50	4,501.38	105.19	77.79	-77.46	10.77	10.65	2.90	
4,561.00	39.20	271.50	4,526.81	105.54	58.38	-58.05	11.72	11.56	3.13	
4,592.00	42.60	272.60	4,550.24	106.27	38.10	-37.77	11.21	10.97	3.55	
4,624.00	45.30	273.40	4,573.27	107.44	15.93	-15.59	8.61	8.44	2.50	
4,655.00	45.90	273.90	4,594.96	108.85	-6.18	6.52	2.25	1.94	1.61	
4,686.00	45.60	273.10	4,616.59	110.21	-28.34	28.69	2.09	-0.97	-2.58	
4,718.00	45.40	271.10	4,639.03	111.04	-51.15	51.50	4.50	-0.63	-6.25	
4,749.00	45.40	270.70	4,660.79	111.39	-73.22	73.57	0.92	0.00	-1.29	
4,781.00	45.10	270.70	4,683.32	111.67	-95.94	96.29	0.94	-0.94	0.00	
4,812.00	45.40	270.60	4,705.14	111.92	-117.96	118.31	0.99	0.97	-0.32	
4,829.07	46.79	270.27	4,716.98	112.01	-130.25	130.61	8.24	8.12	-1.91	
As-Drilled PP										
4,844.00	48.00	270.00	4,727.09	112.04	-141.24	141.59	8.24	8.13	-1.83	
4,875.00	51.30	269.10	4,747.16	111.85	-164.86	165.21	10.87	10.65	-2.90	
4,907.00	54.70	268.70	4,766.41	111.35	-190.41	190.76	10.67	10.63	-1.25	
4,938.00	58.30	268.00	4,783.52	110.61	-216.25	216.59	11.76	11.61	-2.26	
4,969.00	62.10	267.60	4,798.92	109.57	-243.12	243.47	12.31	12.26	-1.29	
5,001.00	65.60	267.20	4,813.02	108.27	-271.81	272.15	10.99	10.94	-1.25	
5,033.00	68.90	267.70	4,825.40	106.96	-301.29	301.62	10.41	10.31	1.56	
5,059.00	71.50	268.70	4,834.20	106.19	-325.74	326.07	10.63	10.00	3.85	
5,091.00	74.40	269.90	4,843.59	105.82	-356.33	356.66	9.75	9.06	3.75	
5,122.00	78.10	271.20	4,850.95	106.11	-386.43	386.76	12.61	11.94	4.19	
5,154.00	83.20	271.00	4,856.15	106.72	-417.99	418.32	15.95	15.94	-0.63	
5,185.00	89.00	270.60	4,858.26	107.15	-448.90	449.23	18.75	18.71	-1.29	
5,284.00	91.70	270.60	4,857.65	108.18	-547.88	548.22	2.73	2.73	0.00	
5,378.00	91.10	268.10	4,855.36	107.12	-641.84	642.18	2.73	-0.64	-2.66	
5,473.00	90.60	268.40	4,853.95	104.22	-736.79	737.11	0.61	-0.53	0.32	
5,568.00	90.50	268.60	4,853.04	101.73	-831.75	832.07	0.24	-0.11	0.21	
5,662.00	90.50	267.20	4,852.22	98.29	-925.68	925.98	1.49	0.00	-1.49	
5,756.00	90.10	267.90	4,851.72	94.27	-1,019.59	1,019.88	0.86	-0.43	0.74	
5,850.00	89.30	268.30	4,852.22	91.15	-1,113.54	1,113.82	0.95	-0.85	0.43	



TDS
Survey Report



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5,944.00	90.20	267.20	4,852.63	87.46	-1,207.46	1,207.73	1.51	0.96	-1.17
6,039.00	90.50	267.50	4,852.05	83.07	-1,302.36	1,302.61	0.45	0.32	0.32
6,133.00	90.10	267.90	4,851.55	79.30	-1,396.28	1,396.52	0.60	-0.43	0.43
6,228.00	89.70	268.10	4,851.72	75.98	-1,491.22	1,491.46	0.47	-0.42	0.21
6,322.00	91.10	268.60	4,851.06	73.27	-1,585.18	1,585.40	1.58	1.49	0.53
6,417.00	91.00	269.00	4,849.32	71.28	-1,680.14	1,680.36	0.43	-0.11	0.42
6,511.00	90.40	268.90	4,848.17	69.56	-1,774.12	1,774.33	0.65	-0.64	-0.11
6,606.00	89.80	269.00	4,848.01	67.82	-1,869.10	1,869.31	0.64	-0.63	0.11
6,700.00	90.70	268.80	4,847.60	66.02	-1,963.08	1,963.28	0.98	0.96	-0.21
6,795.00	90.70	269.00	4,846.44	64.19	-2,058.06	2,058.25	0.21	0.00	0.21
6,889.00	89.90	269.00	4,845.94	62.55	-2,152.04	2,152.23	0.85	-0.85	0.00
6,983.00	91.30	269.50	4,844.96	61.32	-2,246.03	2,246.21	1.58	1.49	0.53
7,078.00	91.30	269.80	4,842.80	60.74	-2,341.00	2,341.18	0.32	0.00	0.32
7,172.00	91.10	270.30	4,840.84	60.82	-2,434.98	2,435.16	0.57	-0.21	0.53
7,267.00	91.00	270.50	4,839.10	61.49	-2,529.96	2,530.14	0.24	-0.11	0.21
7,361.00	90.50	270.90	4,837.87	62.64	-2,623.95	2,624.13	0.68	-0.53	0.43
7,456.00	90.00	271.20	4,837.45	64.38	-2,718.93	2,719.12	0.61	-0.53	0.32
7,550.00	90.40	269.00	4,837.12	64.54	-2,812.92	2,813.11	2.38	0.43	-2.34
7,645.00	91.00	267.70	4,835.96	61.81	-2,907.87	2,908.05	1.51	0.63	-1.37
7,739.00	91.20	268.30	4,834.16	58.53	-3,001.80	3,001.97	0.67	0.21	0.64
7,833.00	91.00	268.30	4,832.35	55.74	-3,095.74	3,095.90	0.21	-0.21	0.00
7,928.00	90.50	268.70	4,831.11	53.25	-3,190.70	3,190.85	0.67	-0.53	0.42
8,022.00	90.20	268.40	4,830.53	50.87	-3,284.67	3,284.81	0.45	-0.32	-0.32
8,116.00	90.10	268.80	4,830.29	48.58	-3,378.64	3,378.77	0.44	-0.11	0.43
8,211.00	89.90	269.00	4,830.29	46.75	-3,473.62	3,473.75	0.30	-0.21	0.21
8,305.00	89.70	268.80	4,830.62	44.95	-3,567.60	3,567.73	0.30	-0.21	-0.21
8,400.00	89.70	269.20	4,831.11	43.29	-3,662.59	3,662.70	0.42	0.00	0.42
8,494.00	89.60	269.00	4,831.69	41.81	-3,756.57	3,756.69	0.24	-0.11	-0.21
8,589.00	89.50	269.60	4,832.43	40.65	-3,851.56	3,851.67	0.64	-0.11	0.63
8,683.00	90.20	268.60	4,832.68	39.18	-3,945.55	3,945.65	1.30	0.74	-1.06
8,778.00	90.50	269.40	4,832.10	37.52	-4,040.53	4,040.63	0.90	0.32	0.84
8,872.00	89.60	269.20	4,832.02	36.37	-4,134.52	4,134.62	0.98	-0.96	-0.21
8,967.00	90.20	267.80	4,832.18	33.88	-4,229.49	4,229.57	1.60	0.63	-1.47
9,061.00	90.60	267.50	4,831.53	30.03	-4,323.41	4,323.48	0.53	0.43	-0.32
9,156.00	90.50	267.70	4,830.62	26.05	-4,418.32	4,418.38	0.24	-0.11	0.21
9,250.00	89.90	267.80	4,830.29	22.36	-4,512.24	4,512.29	0.65	-0.64	0.11
9,344.00	91.30	268.40	4,829.30	19.24	-4,606.19	4,606.22	1.62	1.49	0.64
9,439.00	91.80	268.60	4,826.73	16.76	-4,701.12	4,701.15	0.57	0.53	0.21
9,533.00	91.50	268.80	4,824.03	14.63	-4,795.05	4,795.08	0.38	-0.32	0.21
9,596.00	91.60	268.90	4,822.32	13.36	-4,858.02	4,858.04	0.22	0.16	0.16

Last MWD TDS Survey



TDS
Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3638.00usft (Silver Oak 3)
Site:	Dodd Federal Unit #921H	MD Reference:	KB @ 3638.00usft (Silver Oak 3)
Well:	SHL: 1650' FSL, 200' FEL, Sec 14, T17S, R29E, Unit I	North Reference:	Grid
Wellbore:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Survey Calculation Method:	Minimum Curvature
Design:	BHL: 1670' FSL, 100' FWL, Sec 14, T17S, R29E, Unit L	Database:	EDM 5000.1 Single User.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)
9,680.00	91.60	268.90	4,819.98	11.75	-4,941.97	4,941.98	0.00	0.00	0.00
Projection to Bit/TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
961.00	960.87	2.07	14.32	Tie-In to VES Gyro
961.00	960.87	2.07	14.32	Tie-In to VES Gyro
1,065.00	1,064.85	2.46	16.16	First TDS MWD Survey
4,829.07	4,716.98	112.01	-130.25	As-Drilled PP
9,596.00	4,822.32	13.36	-4,858.02	Last MWD TDS Survey
9,680.00	4,819.98	11.75	-4,941.97	Projection to Bit/TD

Checked By: _____	Approved By: _____	Date: _____
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1/2/17

State of New Mexico
County of Eddy

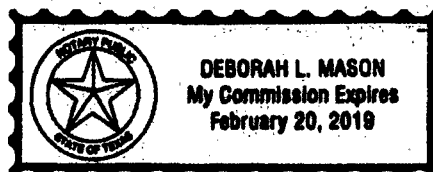
I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 10/20/2016 through 10/29/2016 conduct or supervise the taking of a MWD survey from a depth of 1065 feet to a depth of 9680 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating LLC for the Dodd Federal Unit #921H Well API 30-015-42995 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

A handwritten signature of Donald D. Mason in black ink, written over a horizontal line.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D. Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.

A handwritten signature of Deborah L. Mason in black ink, written over a horizontal line.

Notary Public's Signature



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

October 31, 2016

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

RE: Dodd Fed Unit 921H
1650' FSL & 200' FE
Sec. 14, T17S, R29E
Eddy County, New Mexico

Dear Sir,

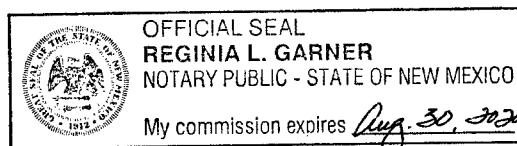
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 31st day of October, 2016.

Notary Public

Dodd Fed Unit 921H

Date	Depth	Deviation	Direction
10/18/2016	170	0.60	
10/19/2016	389	0.50	
10/19/2016	596	1.10	
10/19/2016	747	1.50	
10/19/2016	967	1.30	
10/20/2016	1065	0.70	70.60
10/20/2016	1128	1.10	57.30
10/20/2016	1223	2.40	52.20
10/20/2016	1307	3.30	60.70
10/21/2016	1412	3.30	58.70
10/21/2016	1507	2.90	56.90
10/21/2016	1601	2.40	54.50
10/21/2016	1695	4.00	58.60
10/21/2016	1790	4.60	60.30
10/21/2016	1884	3.50	59.00
10/21/2016	1979	4.30	57.60
10/21/2016	2013	4.00	55.40
10/21/2016	2168	3.20	51.60
10/21/2016	2262	4.30	55.40
10/21/2016	2357	4.40	55.60
10/21/2016	2451	4.10	56.10
10/21/2016	2641	5.30	59.80
10/21/2016	2734	5.50	61.10
10/21/2016	2829	5.30	61.10
10/21/2016	2923	5.00	60.70
10/21/2016	3018	4.70	60.70
10/22/2016	3206	4.30	64.00
10/22/2016	3301	4.30	64.90
10/22/2016	3395	3.70	51.70
10/22/2016	3490	3.60	49.80
10/22/2016	3584	3.90	58.20
10/22/2016	3679	3.90	59.20
10/22/2016	5773	3.90	58.50
10/22/2016	3868	2.20	55.20
10/22/2016	3962	0.90	358.80
10/22/2016	4057	0.20	336.10
10/22/2016	4183	0.50	224.70
10/22/2016	4214	2.10	260.20
10/22/2016	4246	5.10	265.80
10/22/2016	4277	8.30	268.60
10/22/2016	4309	11.60	271.70
10/22/2016	4340	15.10	273.30

Date	Depth	Deviation	Direction
10/22/2016	4372	18.50	273.40
10/22/2016	4403	27.10	272.20
10/23/2016	4435	25.40	270.40
10/23/2016	4498	32.20	269.90
10/23/2016	4561	39.20	271.50
10/23/2016	4592	42.60	272.60
10/23/2016	4624	45.30	273.40
10/23/2016	4655	45.90	273.90
10/23/2016	4718	45.40	271.10
10/23/2016	4749	45.40	270.70
10/23/2016	4781	45.10	270.70
10/23/2016	4844	48.00	270.00
10/23/2016	4873	51.30	269.10
10/23/2016	4907	54.70	268.70
10/23/2016	4938	58.30	268.00
10/23/2016	4969	62.10	267.60
10/23/2016	5001	65.60	267.20
10/23/2016	5033	68.90	267.70
10/24/2016	5091	74.40	269.90
10/24/2016	5122	78.10	2762.00
10/24/2016	5154	83.20	271.00
10/24/2016	5185	89.00	270.60
10/24/2016	5284	91.70	270.60
10/25/2016	5378	91.10	268.10
10/25/2016	5473	90.60	268.40
10/25/2016	5568	90.50	268.60
10/25/2016	5662	90.50	267.20
10/25/2016	5850	89.30	268.30
10/25/2016	5944	90.20	267.20
10/25/2016	6039	90.50	267.50
10/25/2016	6133	90.10	267.90
10/25/2016	6228	89.70	268.10
10/25/2016	6322	91.10	268.60
10/25/2016	6417	91.00	269.00
10/25/2016	6511	90.40	268.90
10/26/2016	6606	89.80	269.00
10/26/2016	6700	90.70	268.80
10/26/2016	6795	90.70	269.00
10/26/2016	6889	89.90	269.00
10/26/2016	6983	91.30	269.50
10/26/2016	7078	91.30	269.80
10/26/2016	7172	91.10	270.30
10/26/2016	7267	91.00	270.50
10/26/2016	7361	90.50	270.90
10/27/2016	7456	90.00	271.20

Date	Depth	Deviation	Direction
10/27/2016	7550	90.40	269.00
10/27/2016	7739	91.20	268.30
10/27/2016	7833	91.00	268.30
10/27/2016	7928	90.50	268.70
10/27/2016	8022	90.20	268.40
10/27/2016	8116	90.10	268.80
10/28/2016	8211	89.90	269.00
10/28/2016	8305	89.70	268.80
10/28/2016	8400	89.70	269.20
10/28/2016	8494	89.60	269.00
10/28/2016	8589	89.80	269.60
10/28/2016	8683	40.20	268.60
10/28/2016	8778	90.50	269.40
10/28/2016	8872	89.60	269.20
10/28/2016	8967	90.20	267.80
10/29/2016	9061	90.60	267.50
10/29/2016	9156	90.50	267.70
10/29/2016	9250	89.90	267.80
10/29/2016	9344	91.30	268.40
10/29/2016	9439	91.80	268.60
10/29/2016	9533	91.50	268.80
10/29/2016	9596	91.60	268.90



October 24, 2016

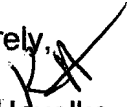
Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Dodd Federal Unit No. 921H**

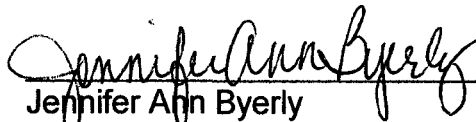
Please find enclosed a copy of the survey from 0' to 961' ran on the above referenced well.

Sincerely,

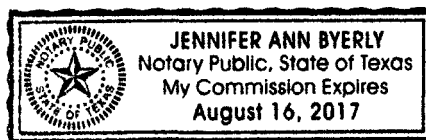

Keith Havelka
Operations

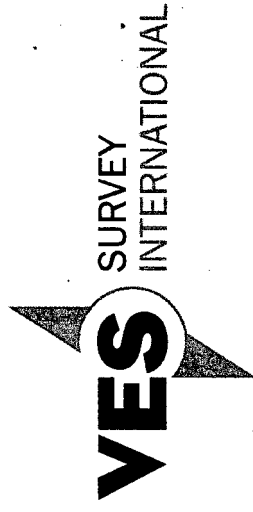
STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 24th day of October, A.D., 2016, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas

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





Company: COG OPERATING
Lease/Well: DODD FEDERAL UNIT No.921H

Rig Name: SILVEROAK 3
State/County: NEW MEXICO/EDDY
VS-Azi: 0.00 Degrees

Latitude: 32.83171, Longitude: -104.03700
Grid North = True North -0.16 degs (NAD 27)
Grid Correction Applied = -0.16 degs

Depth Reference : RKB=18 FEET

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: e-line gyro-de_01.ut
Minimum Curvature Method
Report Date/Time: 10/24/2016 / 13:38

VES Survey International
Midland, Texas
432-563-5444
Surveyor: Michael Cook
Dodd Federal Unit No. 921H / API 30-015-42995

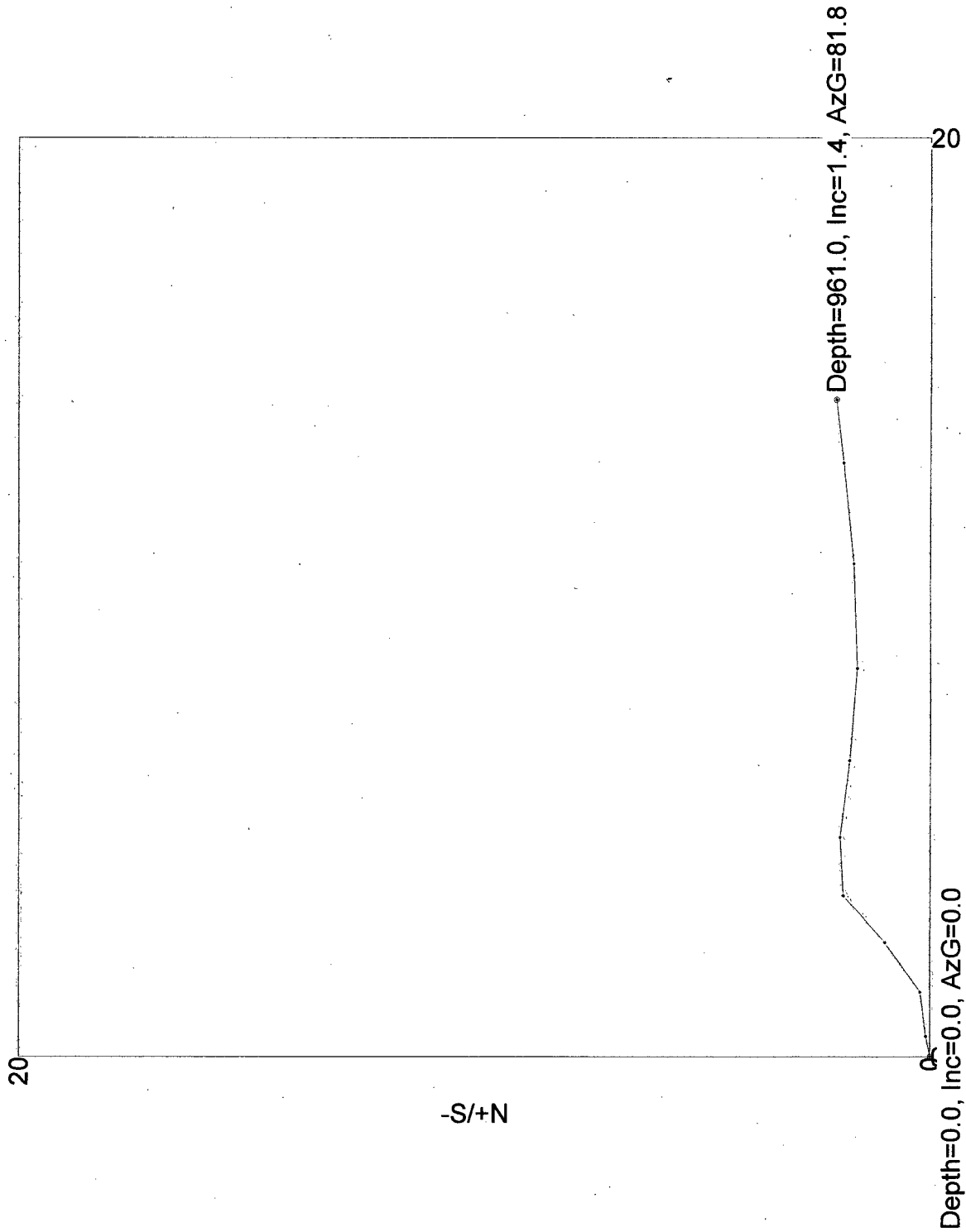
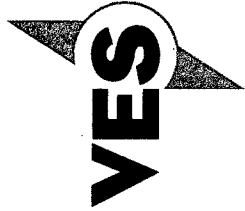
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.52	78.42	100.00	0.09	0.45	0.09	0.46	78.42	0.52
200.00	0.60	86.31	199.99	0.22	1.42	0.22	1.44	81.31	0.11
300.00	1.07	37.22	299.98	0.99	2.51	0.99	2.70	68.42	0.81
400.00	0.59	69.46	399.97	1.91	3.55	1.91	4.04	61.70	0.65
500.00	0.91	98.16	499.97	1.98	4.82	1.98	5.21	67.66	0.48
600.00	1.01	96.70	599.95	1.77	6.49	1.77	6.72	74.77	0.11
700.00	1.29	92.89	699.93	1.61	8.49	1.61	8.64	79.29	0.29
800.00	1.33	83.37	799.91	1.68	10.76	1.68	10.89	81.11	0.22
900.00	1.20	85.03	899.88	1.91	12.95	1.91	13.09	81.63	0.13
961.00	1.39	81.81	960.87	2.07	14.32	2.07	14.47	81.79	0.34



VES Survey International
Midland, Texas
432-563-5444

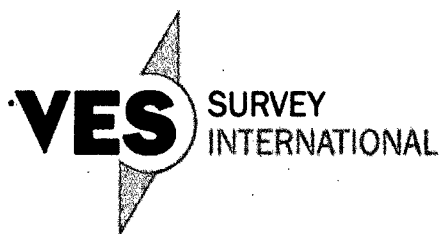
Surveyor: Michael Cook

Dodd Federal Unit No. 921H / API 30-015-42995



-W/+E

V.E.S. Survey Date: 10/19/2016



I Michael Cook certify that I am employed by VES Survey International. That I did on the day(s) of 10/19/16 through 10/19/16 conduct or supervise the taking of a Rate Gyro survey from a depth of 0.00 feet to a depth of 961.00 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Vaughn Energy Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of COG Operating for the Dodd Federal Unit Well # 921H API # 30-015-429952 in Eddy County / Parish New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by VES Survey International.

A handwritten signature in cursive script, appearing to read "M. Cook", is written over a horizontal line.

Michael Cook
Service Technician
VES Survey International