

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX 39-DRILL

HOBBS OCD**FEB 09 2012**

Well Name and Num: Peashooter 4 Federal Com 1H
Location: Sec. 4, T19S, R32E
Operator: COG
Drilling Contractor: McVay Drilling Company

RECEIVED

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.25	414	0.44	7244	88.81	10748
1.11	768	1.14	7715	89.25	10840
2.49	1176	2.90	8192	85.56	11311
2.55	1307	4.92	8322	87.41	11877
1.55	1590	4.40	8372	89.60	11972
0.50	2000	3.96	8484	87.93	12447
0.51	2284	3.25	8499	91.10	12921
2.02	2630	2.46	8750	89.08	13108
1.58	3030	2.11	8845	88.37	13571
1.08	3397	1.76	8876	86.17	13791
0.90	3869	40.60	9164		
0.73	4341	53.38	9351		
0.72	4840	56.72	9382		
0.71	5316	80.72	9630		
0.69	5788	87.41	9691		
0.40	6261	94.26	9754		
0.82	6761	85.21	10376		

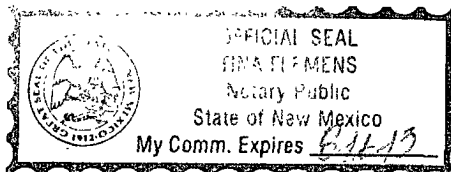
SUR: D-4-19s-32f, 380/N & 760/W
BHL: M-4-19s-32e, 4935/N & 441/W
API # 30-025-40313

RECEIVED**ARTESIA WEST**

By: *Harold Crum*

Subscribed and sworn to before me this *8th* day of *December*, 2011

John F. [Signature]
Notary Public, Lea County, New Mexico





COG Operating LLC

Lea County(NAD27)
Peashooter 4 Federal
#1H
OH

Design: OH

Pathfinder X & Y Report

05 December, 2011

HOBBS OCD

FEB 09 2012

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SUR: D-4-19s-32f, 380/N & 760/W
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PATHFINDER®
A Schlumberger Company



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Lea County(NAD27)
Site: Peashooter 4 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference: KB = 17' @ 3690.0usft
MD Reference: KB = 17' @ 3690.0usft
North Reference: Grd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Well #1H

KB = 17' @ 3690.0usft

KB = 17' @ 3690.0usft

Grd

Minimum Curvature

EDM 5000.1 Single User Db

Project:	Lea County(NAD27)	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Peashooter 4 Federal		
Site Position:			
From:	Map	617,211 300 usft	Latitude: 32° 41' 44.081 N
Position Uncertainty:	0.0 usft	671,174 100 usft	Longitude: 103° 46' 36.882 W
		13-3/16 "	Grid Convergence: 0.30 °

Well	#1H		
Well Position	+N/-S	617,211 300 usft	Latitude: 32° 41' 44.081 N
	+E/-W	671,174 100 usft	Longitude: 103° 46' 36.882 W
Position Uncertainty	0.0 usft	usft	Ground Level: 3,673.0 usft
	Wellhead Elevation:		

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF200510	5/31/2011	(°)
		7.71	Dip Angle
		60.61	(°)
			Field Strength
			(nT)
			48,916

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	Tie On Depth:
		ACTUAL	0.0
Vertical Section:		Depth From (TVD)	Direction
		(usft)	(°)
		0.0	184.49
		+N/-S	+E/-W
		(usft)	(usft)
		0.0	0.0



Pathfinder
Pathfinder X & Y Report



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Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
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Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey Program		Date		12/5/2011						
From (usft)	To (usft)	Survey (Wellbore)		Tool Name	Description					
100.0	8,750.0	Gyro #1 (OH)		NS-GYRO-MS	North sensing gyrocompassing m/s					
8,813.0	13,840.0	MWD #1 (OH)		MWD	MWD - Standard					
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-3,690.0	0.0	0.0	0.0	0.00	617,211.30	671,174.10
100.0	0.31	64.61	100.0	-3,590.0	0.1	0.2	-0.1	0.31	617,211.42	671,174.34
200.0	0.10	44.32	200.0	-3,490.0	0.3	0.5	-0.3	0.22	617,211.59	671,174.65
300.0	0.24	330.85	300.0	-3,390.0	0.5	0.5	-0.6	0.23	617,211.84	671,174.61
400.0	0.19	291.69	400.0	-3,290.0	0.8	0.3	-0.8	0.15	617,212.08	671,174.35
500.0	0.46	291.45	500.0	-3,190.0	1.0	-0.3	-1.0	0.27	617,212.29	671,173.82
600.0	0.62	297.57	600.0	-3,090.0	1.4	-1.1	-1.3	0.17	617,212.69	671,172.97
700.0	0.59	308.68	700.0	-2,990.0	2.0	-2.0	-1.8	0.12	617,213.26	671,172.09
800.0	1.15	290.06	800.0	-2,890.0	2.6	-3.4	-2.4	0.62	617,213.93	671,170.75
900.0	1.60	285.82	899.9	-2,790.1	3.4	-5.6	-2.9	0.46	617,214.65	671,168.46
1,000.0	2.13	281.44	999.9	-2,690.1	4.1	-8.8	-3.4	0.55	617,215.40	671,165.30
1,100.0	2.73	275.77	1,099.8	-2,590.2	4.7	-13.0	-3.7	0.65	617,216.01	671,161.10
1,200.0	2.86	275.96	1,199.7	-2,490.3	5.2	-17.8	-3.8	0.13	617,216.51	671,156.25
1,300.0	2.48	275.03	1,299.6	-2,390.4	5.7	-22.5	-3.9	0.38	617,216.96	671,151.62
1,400.0	2.23	280.22	1,399.5	-2,290.5	6.2	-26.6	-4.1	0.33	617,217.49	671,147.55
1,500.0	1.89	280.50	1,499.4	-2,190.6	6.8	-30.1	-4.5	0.34	617,218.14	671,144.01
1,600.0	1.55	271.95	1,599.4	-2,090.6	7.2	-33.1	-4.6	0.43	617,218.48	671,141.04
1,700.0	1.40	272.94	1,699.3	-1,990.7	7.3	-35.6	-4.5	0.15	617,218.59	671,138.47
1,800.0	1.14	276.26	1,799.3	-1,890.7	7.5	-37.8	-4.5	0.27	617,218.76	671,136.26
1,900.0	0.99	279.29	1,899.3	-1,790.7	7.7	-39.7	-4.6	0.16	617,219.01	671,134.42
2,000.0	0.61	276.50	1,999.3	-1,690.7	7.9	-41.1	-4.7	0.38	617,219.21	671,133.03



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Lea County(NAD27)
Site: Peashooter 4 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: KB = 17' @ 3690.0usft
MD Reference: KB = 17' @ 3690.0usft
North Reference: Grd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
	2,100.0	0.53	297.45	2,099.3	-1,590.7	8.2	-42.0	-4.9	0.22	617,219.48	671,132.10
	2,200.0	0.26	332.17	2,199.3	-1,490.7	8.6	-42.5	-5.2	0.35	617,219.90	671,131.58
	2,300.0	0.23	60.86	2,299.3	-1,390.7	8.9	-42.5	-5.5	0.34	617,220.20	671,131.65
	2,400.0	0.65	46.93	2,399.3	-1,290.7	9.4	-41.9	-6.1	0.43	617,220.68	671,132.24
	2,500.0	1.14	54.26	2,499.3	-1,190.7	10.4	-40.6	-7.1	0.50	617,221.65	671,133.46
	2,600.0	1.83	64.81	2,599.2	-1,090.8	11.6	-38.4	-8.6	0.74	617,222.91	671,135.71
	2,700.0	1.79	60.53	2,699.2	-990.8	13.1	-35.6	-10.2	0.14	617,224.36	671,138.52
	2,800.0	1.74	53.59	2,799.1	-890.9	14.7	-33.0	-12.1	0.22	617,226.03	671,141.10
	2,900.0	1.54	45.24	2,899.1	-790.9	16.6	-30.8	-14.1	0.31	617,227.88	671,143.27
	3,000.0	1.32	36.52	2,999.1	-690.9	18.4	-29.2	-16.1	0.31	617,229.75	671,144.91
	3,100.0	1.48	35.01	3,099.0	-591.0	20.4	-27.8	-18.2	0.16	617,231.73	671,146.34
	3,200.0	1.32	23.26	3,199.0	-491.0	22.5	-26.6	-20.4	0.33	617,233.85	671,147.54
	3,300.0	0.56	343.91	3,299.0	-391.0	24.1	-26.2	-21.9	0.96	617,235.37	671,147.86
	3,400.0	0.59	309.92	3,399.0	-291.0	24.9	-26.8	-22.7	0.34	617,236.17	671,147.32
	3,500.0	0.45	313.32	3,499.0	-191.0	25.5	-27.5	-23.2	0.14	617,236.77	671,146.64
	3,600.0	0.61	304.60	3,599.0	-91.0	26.0	-28.2	-23.8	0.18	617,237.35	671,145.92
	3,700.0	0.66	304.14	3,699.0	9.0	26.7	-29.1	-24.3	0.05	617,237.97	671,145.01
	3,800.0	0.64	297.57	3,799.0	109.0	27.3	-30.1	-24.8	0.08	617,238.55	671,144.03
	3,900.0	0.48	279.02	3,899.0	209.0	27.6	-31.0	-25.1	0.24	617,238.88	671,143.13
	4,000.0	0.52	287.84	3,999.0	309.0	27.8	-31.8	-25.2	0.09	617,239.08	671,142.28
	4,100.0	0.40	306.84	4,099.0	409.0	28.1	-32.5	-25.5	0.19	617,239.43	671,141.57
	4,200.0	0.62	306.15	4,199.0	509.0	28.7	-33.2	-26.0	0.22	617,239.96	671,140.85
	4,300.0	0.56	310.67	4,298.9	608.9	29.3	-34.1	-26.5	0.08	617,240.60	671,140.04
	4,400.0	0.66	321.57	4,398.9	708.9	30.1	-34.8	-27.3	0.15	617,241.37	671,139.32
	4,500.0	0.81	319.43	4,498.9	808.9	31.1	-35.6	-28.2	0.15	617,242.35	671,138.50
	4,600.0	0.59	295.18	4,598.9	908.9	31.8	-36.5	-28.9	0.36	617,243.11	671,137.57
	4,700.0	0.62	300.35	4,698.9	1,008.9	32.3	-37.5	-29.3	0.06	617,243.60	671,136.64



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Lea County(NAD27)
Site: Peashooter 4 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: KB = 17' @ 3690 0usft
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North Reference: Grid
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Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
	4,800.0	0.54	318.29	4,798.9	1,108.9	32.9	-38.2	-29.8	0.20	617,244.23	671,135.86
	4,900.0	0.50	303.33	4,898.9	1,208.9	33.5	-38.9	-30.4	0.14	617,244.82	671,135.18
	5,000.0	0.48	318.56	4,998.9	1,308.9	34.1	-39.6	-30.9	0.13	617,245.37	671,134.54
	5,100.0	0.48	311.64	5,098.9	1,408.9	34.7	-40.2	-31.4	0.06	617,245.97	671,133.95
	5,200.0	0.67	316.08	5,198.9	1,508.9	35.4	-40.9	-32.1	0.20	617,246.67	671,133.23
	5,300.0	0.54	339.40	5,298.9	1,608.9	36.2	-41.4	-32.9	0.28	617,247.53	671,132.66
	5,400.0	0.64	350.87	5,398.9	1,708.9	37.2	-41.7	-33.8	0.15	617,248.52	671,132.40
	5,500.0	0.53	14.60	5,498.9	1,808.9	38.2	-41.7	-34.8	0.26	617,249.52	671,132.43
	5,600.0	0.50	337.50	5,598.9	1,908.9	39.1	-41.7	-35.7	0.33	617,250.37	671,132.38
	5,700.0	0.39	354.18	5,698.9	2,008.9	39.8	-41.9	-36.4	0.17	617,251.11	671,132.18
	5,800.0	0.36	352.83	5,798.9	2,108.9	40.5	-42.0	-37.0	0.03	617,251.76	671,132.11
	5,900.0	0.48	324.16	5,898.9	2,208.9	41.1	-42.3	-37.7	0.24	617,252.41	671,131.82
	6,000.0	0.48	327.63	5,998.9	2,308.9	41.8	-42.7	-38.3	0.03	617,253.11	671,131.35
	6,100.0	0.38	323.27	6,098.9	2,408.9	42.4	-43.2	-38.9	0.11	617,253.73	671,130.93
	6,200.0	0.29	340.92	6,198.9	2,508.9	42.9	-43.5	-39.4	0.14	617,254.23	671,130.65
	6,300.0	0.49	339.19	6,298.9	2,608.9	43.6	-43.7	-40.0	0.20	617,254.87	671,130.41
	6,400.0	0.46	346.93	6,398.9	2,708.9	44.4	-43.9	-40.8	0.07	617,255.66	671,130.17
	6,500.0	0.40	327.17	6,498.9	2,808.9	45.0	-44.2	-41.4	0.16	617,256.34	671,129.89
	6,600.0	0.38	342.54	6,598.9	2,908.9	45.7	-44.5	-42.0	0.11	617,256.95	671,129.60
	6,700.0	0.39	352.01	6,698.9	3,008.9	46.3	-44.6	-42.7	0.06	617,257.61	671,129.46
	6,800.0	0.47	350.88	6,798.8	3,108.8	47.0	-44.8	-43.4	0.08	617,258.35	671,129.34
	6,900.0	0.46	353.20	6,898.8	3,208.8	47.9	-44.9	-44.2	0.02	617,259.15	671,129.23
	7,000.0	0.70	357.78	6,998.8	3,308.8	48.9	-44.9	-45.2	0.24	617,260.16	671,129.16
	7,100.0	0.72	357.39	7,098.8	3,408.8	50.1	-45.0	-46.4	0.02	617,261.40	671,129.11
	7,200.0	0.29	4.54	7,198.8	3,508.8	51.0	-45.0	-47.3	0.43	617,262.28	671,129.10
	7,300.0	0.33	5.94	7,298.8	3,608.8	51.5	-45.0	-47.8	0.04	617,262.82	671,129.15
	7,400.0	0.52	10.29	7,398.8	3,708.8	52.3	-44.8	-48.6	0.19	617,263.55	671,129.26



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	7,500.0	0.93	358.91	7,498.8	3,808.8	53.5	-44.8	-49.8	0.43	617,264.81	671,129.33
	7,600.0	1.04	8.72	7,598.8	3,908.8	55.2	-44.7	-51.6	0.20	617,266.52	671,129.45
	7,700.0	1.09	12.47	7,698.8	4,008.8	57.0	-44.3	-53.4	0.09	617,268.34	671,129.79
	7,800.0	1.01	20.52	7,798.8	4,108.8	58.8	-43.8	-55.2	0.17	617,270.10	671,130.31
	7,900.0	2.95	19.42	7,898.7	4,208.7	62.1	-42.6	-58.5	1.94	617,273.35	671,131.47
	8,000.0	3.05	23.27	7,998.6	4,308.6	66.9	-40.7	-63.5	0.22	617,278.22	671,133.38
	8,100.0	3.74	29.14	8,098.4	4,408.4	72.2	-38.1	-69.0	0.77	617,283.51	671,136.02
	8,200.0	4.54	42.54	8,198.1	4,508.1	78.0	-33.8	-75.1	1.25	617,289.28	671,140.28
	8,300.0	4.70	45.15	8,297.8	4,607.8	83.8	-28.2	-81.3	0.26	617,295.08	671,145.86
	8,400.0	4.03	50.82	8,397.5	4,707.5	88.9	-22.6	-86.9	0.80	617,300.19	671,151.49
	8,500.0	3.46	53.36	8,497.3	4,807.3	92.9	-17.5	-91.3	0.59	617,304.21	671,156.63
	8,600.0	1.77	33.52	8,597.2	4,907.2	96.0	-14.2	-94.6	1.89	617,307.30	671,159.91
	8,700.0	2.06	23.26	8,697.1	5,007.1	98.9	-12.6	-97.6	0.45	617,310.24	671,161.47
	8,750.0	2.34	21.10	8,747.1	5,057.1	100.7	-11.9	-99.5	0.58	617,312.02	671,162.19
	8,813.0	2.46	23.18	8,810.0	5,120.0	103.2	-10.9	-102.0	0.24	617,314.46	671,163.19
	8,845.0	2.11	41.20	8,842.0	5,152.0	104.2	-10.3	-103.1	2.48	617,315.54	671,163.85
	8,876.0	1.76	144.47	8,873.0	5,183.0	104.3	-9.6	-103.2	9.81	617,315.58	671,164.50
	8,908.0	5.54	184.37	8,904.9	5,214.9	102.3	-9.4	-101.3	13.56	617,313.64	671,164.67
	8,940.0	10.20	196.76	8,936.6	5,246.6	98.1	-10.4	-97.0	15.42	617,309.38	671,163.73
	8,972.0	15.39	199.75	8,967.8	5,277.8	91.4	-12.6	-90.1	16.34	617,302.67	671,161.48
	9,004.0	20.84	199.84	8,998.2	5,308.2	82.0	-16.0	-80.5	17.03	617,293.31	671,158.11
	9,036.0	25.15	197.73	9,027.7	5,337.7	70.2	-20.0	-68.4	13.71	617,281.47	671,154.11
	9,068.0	29.11	193.60	9,056.2	5,366.2	56.1	-23.9	-54.1	13.70	617,267.42	671,150.20
	9,100.0	34.21	191.40	9,083.4	5,393.4	39.7	-27.5	-37.5	16.34	617,251.03	671,146.59
	9,132.0	37.64	187.89	9,109.3	5,419.3	21.2	-30.6	-18.8	12.50	617,232.53	671,143.47
	9,164.0	40.63	184.72	9,134.1	5,444.1	1.2	-32.8	1.4	11.24	617,212.46	671,141.27
	9,195.0	41.68	184.37	9,157.5	5,467.5	-19.2	-34.4	21.8	3.47	617,192.12	671,139.66



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Lea County(NAD27)
Site: Peashooter 4 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: KB = 17' @ 3690 Ousft
MD Reference: KB = 17' @ 3690 Ousft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
	9,226.0	43.09	184.72	9,180.4	5,490.4	-40.0	-36.1	42.7	4.61	617,171.29	671,138.00
	9,257.0	44.76	185.51	9,202.7	5,512.7	-61.4	-38.0	64.2	5.67	617,149.87	671,136.08
	9,288.0	46.60	186.22	9,224.3	5,534.3	-83.5	-40.3	86.4	6.16	617,127.81	671,133.81
	9,320.0	48.89	186.13	9,245.9	5,555.9	-107.0	-42.8	110.1	7.16	617,104.26	671,131.26
	9,351.0	53.38	186.22	9,265.3	5,575.3	-131.0	-45.4	134.2	14.49	617,080.27	671,128.67
	9,382.0	56.72	187.36	9,283.1	5,593.1	-156.3	-48.4	159.6	11.19	617,055.05	671,125.66
	9,414.0	59.79	188.59	9,299.9	5,609.9	-183.2	-52.2	186.7	10.14	617,028.10	671,121.88
	9,442.0	63.22	190.03	9,313.3	5,623.3	-207.5	-56.2	211.2	13.06	617,003.82	671,117.89
	9,473.0	66.39	192.23	9,326.5	5,636.5	-235.0	-61.6	239.1	12.07	616,976.31	671,112.47
	9,505.0	69.12	195.03	9,338.6	5,648.6	-263.8	-68.6	268.3	11.76	616,947.53	671,105.49
	9,535.0	71.75	197.69	9,348.6	5,658.6	-290.9	-76.6	296.0	12.11	616,920.41	671,097.52
	9,567.0	74.92	199.32	9,357.8	5,667.8	-320.0	-86.3	325.7	11.04	616,891.35	671,087.79
	9,599.0	77.73	200.59	9,365.4	5,675.4	-349.2	-96.9	355.7	9.59	616,862.13	671,077.18
	9,630.0	80.72	202.33	9,371.2	5,681.2	-377.5	-108.1	384.8	11.11	616,833.79	671,066.04
	9,659.0	84.06	204.37	9,375.0	5,685.0	-403.9	-119.5	412.0	13.46	616,807.41	671,054.64
	9,691.0	87.41	205.74	9,377.4	5,687.4	-432.8	-133.0	441.9	11.31	616,778.50	671,041.13
	9,722.0	90.84	206.42	9,377.8	5,687.8	-460.6	-146.6	470.7	11.28	616,750.67	671,027.51
	9,754.0	94.26	205.36	9,376.4	5,686.4	-489.4	-160.5	500.5	11.19	616,721.91	671,013.55
	9,786.0	95.50	203.73	9,373.7	5,683.7	-518.4	-173.8	530.4	6.39	616,692.91	671,000.31
	9,816.0	95.94	201.24	9,370.7	5,680.7	-546.0	-185.2	558.8	8.39	616,665.33	670,988.89
	9,847.0	96.29	198.92	9,367.4	5,677.4	-574.9	-195.8	588.5	7.53	616,636.38	670,978.31
	9,878.0	96.20	195.87	9,364.0	5,674.0	-604.3	-205.0	618.5	9.78	616,606.98	670,969.10
	9,910.0	94.79	192.90	9,361.0	5,671.0	-635.2	-212.9	649.9	10.24	616,576.13	670,961.19
	9,941.0	93.65	190.47	9,358.7	5,668.7	-665.4	-219.2	680.6	8.64	616,545.86	670,954.92
	9,971.0	92.95	187.74	9,357.0	5,667.0	-695.0	-223.9	710.4	9.38	616,516.29	670,950.19
	10,002.0	91.98	184.73	9,355.6	5,665.6	-725.8	-227.3	741.4	10.19	616,485.50	670,946.82
	10,034.0	91.01	182.45	9,354.8	5,664.8	-757.7	-229.3	773.3	7.74	616,453.58	670,944.82



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Lea County(NAD27)
Site: Peashooter 4 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: KB = 17' @ 3690.0usft
MD Reference: KB = 17' @ 3690.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
	10,065.0	91.01	181.61	9,354.2	5,664.2	-788.7	-230.4	804.3	2.71	616,422.60	670,943.72
	10,096.0	90.04	179.91	9,354.0	5,664.0	-819.7	-230.8	835.2	6.31	616,391.61	670,943.31
	10,127.0	90.04	179.16	9,353.9	5,663.9	-850.7	-230.5	866.1	2.42	616,360.61	670,943.56
	10,158.0	88.64	178.11	9,354.3	5,664.3	-881.7	-229.8	897.0	5.64	616,329.62	670,944.30
	10,190.0	87.93	177.35	9,355.3	5,665.3	-913.6	-228.5	928.7	3.25	616,297.66	670,945.57
	10,283.0	86.26	176.34	9,360.0	5,670.0	-1,006.4	-223.4	1,020.8	2.10	616,204.93	670,950.68
	10,376.0	85.21	175.17	9,366.9	5,676.9	-1,098.9	-216.6	1,112.4	1.89	616,112.44	670,957.54
	10,470.0	84.77	174.54	9,375.1	5,685.1	-1,192.1	-208.2	1,204.8	0.82	616,019.18	670,965.94
	10,563.0	85.12	175.48	9,383.3	5,693.3	-1,284.4	-200.1	1,296.1	1.07	615,926.89	670,974.00
	10,656.0	87.14	175.97	9,389.6	5,699.6	-1,376.9	-193.2	1,387.8	2.23	615,834.37	670,980.91
	10,748.0	88.81	177.26	9,392.8	5,702.8	-1,468.7	-187.8	1,478.9	2.29	615,742.59	670,986.34
	10,840.0	89.25	178.39	9,394.4	5,704.4	-1,560.6	-184.3	1,570.3	1.32	615,650.67	670,989.83
	10,933.0	88.20	179.51	9,396.4	5,706.4	-1,653.6	-182.6	1,662.8	1.65	615,557.71	670,991.54
	11,027.0	86.79	178.83	9,400.6	5,710.6	-1,747.5	-181.2	1,756.3	1.67	615,463.82	670,992.90
	11,122.0	86.70	181.96	9,405.9	5,715.9	-1,842.3	-181.9	1,850.9	3.29	615,368.98	670,992.24
	11,216.0	86.00	181.20	9,411.9	5,721.9	-1,936.1	-184.4	1,944.6	1.10	615,275.21	670,989.66
	11,312.0	85.56	183.77	9,419.0	5,729.0	-2,031.7	-188.6	2,040.3	2.71	615,179.57	670,985.51
	11,404.0	85.82	184.20	9,425.9	5,735.9	-2,123.2	-195.0	2,132.0	0.55	615,088.05	670,979.13
	11,498.0	89.60	184.05	9,429.7	5,739.7	-2,216.9	-201.7	2,225.9	4.02	614,994.39	670,972.38
	11,592.0	89.08	182.71	9,430.7	5,740.7	-2,310.7	-207.3	2,319.9	1.53	614,900.56	670,966.83
	11,687.0	88.46	183.14	9,432.8	5,742.8	-2,405.6	-212.1	2,414.8	0.79	614,805.71	670,961.99
	11,782.0	88.72	183.04	9,435.1	5,745.1	-2,500.4	-217.2	2,509.8	0.29	614,710.87	670,956.87
	11,877.0	87.41	182.96	9,438.3	5,748.3	-2,595.2	-222.2	2,604.7	1.38	614,616.06	670,951.88
	11,972.0	89.60	183.28	9,440.8	5,750.8	-2,690.1	-227.4	2,699.6	2.33	614,521.24	670,946.70
	12,067.0	89.69	182.62	9,441.4	5,751.4	-2,784.9	-232.3	2,794.6	0.70	614,426.37	670,941.81
	12,161.0	90.04	181.68	9,441.6	5,751.6	-2,878.9	-235.8	2,888.5	1.07	614,332.44	670,938.28
	12,256.0	91.10	181.27	9,440.7	5,750.7	-2,973.8	-238.3	2,983.4	1.20	614,237.47	670,935.84



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Lea County(NAD27)
Site: Peashooter 4 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: KB = 17' @ 3690.0usft
MD Reference: KB = 17' @ 3690.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi(azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)
12,351.0	88.64	182.47	9,440.9	5,750.9	-3,068.8	-241.4	3,078.2	2.88	614,142.53	670,932.74
12,447.0	87.93	183.44	9,443.8	5,753.8	-3,164.6	-246.3	3,174.2	1.25	614,046.71	670,927.79
12,542.0	90.57	182.71	9,445.0	5,755.0	-3,259.4	-251.4	3,269.1	2.88	613,951.86	670,922.70
12,634.0	90.04	182.32	9,444.5	5,754.5	-3,351.3	-255.4	3,361.1	0.72	613,859.95	670,918.66
12,730.0	90.40	182.00	9,444.2	5,754.2	-3,447.3	-259.1	3,457.0	0.50	613,764.02	670,915.04
12,825.0	90.04	181.03	9,443.8	5,753.8	-3,542.2	-261.6	3,551.9	1.09	613,669.06	670,912.53
12,921.0	91.10	180.12	9,442.8	5,752.8	-3,638.2	-262.5	3,647.6	1.46	613,573.07	670,911.57
13,013.0	90.22	181.09	9,441.8	5,751.8	-3,730.2	-263.5	3,739.4	1.42	613,481.08	670,910.59
13,108.0	89.08	184.70	9,442.4	5,752.4	-3,825.1	-268.3	3,834.3	3.98	613,386.22	670,905.80
13,201.0	89.52	186.09	9,443.5	5,753.5	-3,917.7	-277.0	3,927.3	1.57	613,293.64	670,897.05
13,293.0	90.75	186.20	9,443.3	5,753.3	-4,009.1	-286.9	4,019.3	1.34	613,202.17	670,887.21
13,386.0	89.25	184.91	9,443.3	5,753.3	-4,101.7	-295.9	4,112.3	2.13	613,109.61	670,878.20
13,478.0	89.78	184.06	9,444.0	5,754.0	-4,193.4	-303.1	4,204.3	1.09	613,017.90	670,871.01
13,571.0	88.37	183.20	9,445.6	5,755.6	-4,286.2	-309.0	4,297.2	1.78	612,925.10	670,865.12
13,663.0	86.79	182.23	9,449.4	5,759.4	-4,378.0	-313.3	4,389.1	2.01	612,833.29	670,860.77
13,791.0	86.17	181.80	9,457.3	5,767.3	-4,505.7	-317.8	4,516.7	0.59	612,705.61	670,856.28
13,840.0	86.17	181.80	9,460.6	5,770.6	-4,554.6	-319.4	4,565.6	0.00	612,656.75	670,854.74

Design Annotations				Local Coordinates		
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment		
8,908.0	8,904.9	102.3	-9.4	KOP - 8908.0 'MD, 8904.9 'TVD, 102.3 'N, -9.4 'E		
9,722.0	9,377.8	-460.6	-146.6	IP - 9722.0 'MD, 9377.8 'TVD, -460.6 'N, -146.6 'E		
13,840.0	9,460.6	-4,554.6	-319.4	BHL - 13840.0 'MD, 9460.6 'TVD, -4554.6 'N, -319.4 'E		

Checked By: _____

Approved By: _____

Date: _____

Project: Lea County(NAD27)
 Site: Peashooter 4 Federal
 Well: #1H
 Wellbore: OH
 Plan: Post Gyro Plan #2 (#1H/OH)



PROJECT DETAILS: Lea County(NAD27)
 Geodetic System: US State Plane 1927 (Exact Solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level
 Local North: Grid

WELL DETAILS: #1H

Ground Elevation: 3673.0
 RXB Elevation KB = 17 @ 3890.0usft
 Rig Name

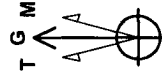
+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	817211.300	671174.100	32° 41' 44.881 N	103° 46' 36.882 W	

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSet	Target
8750.0	2.34	21.10	8750.9	105.7	-10.0	0.00	0.00	-10.0	
8835.0	2.34	21.10	8835.9	105.7	-10.0	0.00	0.00	-10.0	
9646.6	88.53	184.33	9375.0	-366.5	-39.9	12.00	163.23	368.5	
13873.0	88.53	184.33	9410.0	-4580.6	-359.3	0.00	0.00	4594.7	BHL (Peashooter)

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N-S	+E-W	Northing	Easting	Shape
BHL (Peashooter)	9410.0	-4580.6	-359.3	672830.700	670814.800	Point



Azimuths to Grid North
 True North: -0.30°
 Magnetic North: 7.41°
 Magnetic Field
 Strength: 48915.9nT
 Dip Angle: 60.61°
 Date: 5/31/2011
 Model: IGRF200510

