

COG Operating LLC

Lea County(NAD83)
Good Hands "15" State
#1H
OH

SUR:

A-15-145-32e, 1190/2 9430/E

30-025-39463

RECEIVED

JUL 07 2009

HOBBSOCD

Plan: Plan #1

Pathfinder X & Y Planning Report

02 July, 2009

PATHFINDER

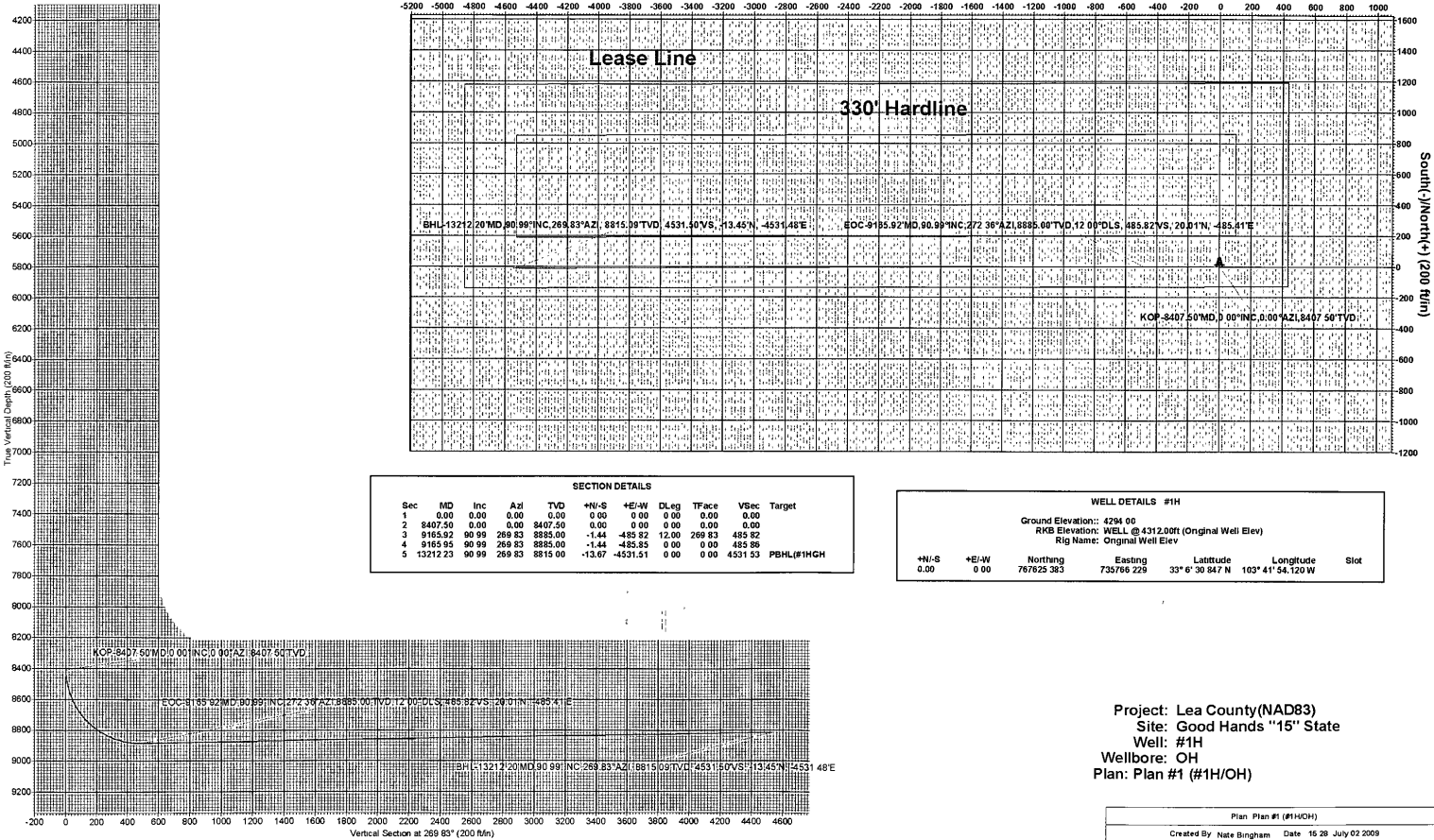
COG Operating, L.L.C.

PROJECT DETAILS: Lea County(NAD83)
Geodetic System US State Plane 1983
Datum: North American Datum 1983
Ellipsoid GRS 1980
Zone New Mexico Eastern Zone
System Datum Mean Sea Level
Local North Grid



Azimuths to Grid North
True North: -0.35°
Magnetic North: 7.59°

Magnetic Field
Strength: 49353.0nT
Dip Angle: 61.05°
Date: 07/02/2009
Model: IGRF200510



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8407.50	0.00	0.00	8407.50	0.00	0.00	0.00	0.00	0.00	
3	9165.92	90.99	269.83	8885.00	-1.44	-485.82	12.00	269.83	485.82	
4	9165.95	90.99	269.83	8885.00	-1.44	-485.85	0.00	0.00	485.86	
5	13212.23	90.99	269.83	8815.00	-13.67	-4531.51	0.00	0.00	4531.53	PBHL#1HGH

WELL DETAILS #1H						
Ground Elevation: 4294.00						
RKB Elevation: WELL @ 4312.00ft (Original Well Elev)						
Rig Name: Original Well Elev						
+N/-S	+E/-W	Northng	Easting	Latitude	Longitude	Slot
0.00	0.00	767625.383	735766.229	33° 6' 30.947 N	103° 41' 54.120 W	

Project: Lea County(NAD83)
Site: Good Hands "15" State
Well: #1H
Wellbore: OH
Plan: Plan #1 (#1H/OH)

Plan: Plan #1 (#1H/OH)			
Created By	Nate Bingham	Date	15 28 July 02 2009
Checked		Date	

Pathfinder Energy Services
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County(NAD83)	TVD Reference:	WELL @ 4312.00ft (Original Well Elev)
Site:	Good Hands "15" State	MD Reference:	WELL @ 4312.00ft (Original Well Elev)
Well:	#1H	North Reference:	Grd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Project	Lea County(NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Good Hands "15" State		
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Site Position:		Northing:	767,625 383 ft	Latitude:	33° 6' 30.847 N
From:	Map	Easting:	735,766 229 ft	Longitude:	103° 41' 54.120 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0 35 °

Well		#1H				
Well Position	+N-S	0.00 ft	Northing:	767,625 383 ft	Latitude:	33° 6' 30 847 N
	+E-W	0.00 ft	Easting:	735,766 229 ft	Longitude:	103° 41' 54 120 W
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	4,294 00 ft

Wellbore	OH				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	07/02/2009	7.93	61.05	49,353

Design	Plan #1				
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Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	269.83	

Survey Tool Program	Date 07/02/2009				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	13,212.23	Plan #1 (OH)			

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Well:	#1H	North Reference:	Grd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
0.00	0.00	0.00	0.00	-4,312.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
100.00	0.00	0.00	100.00	-4,212.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
200.00	0.00	0.00	200.00	-4,112.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
300.00	0.00	0.00	300.00	-4,012.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
400.00	0.00	0.00	400.00	-3,912.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
500.00	0.00	0.00	500.00	-3,812.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
600.00	0.00	0.00	600.00	-3,712.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
700.00	0.00	0.00	700.00	-3,612.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
800.00	0.00	0.00	800.00	-3,512.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
900.00	0.00	0.00	900.00	-3,412.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,000.00	0.00	0.00	1,000.00	-3,312.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,100.00	0.00	0.00	1,100.00	-3,212.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,200.00	0.00	0.00	1,200.00	-3,112.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,300.00	0.00	0.00	1,300.00	-3,012.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,400.00	0.00	0.00	1,400.00	-2,912.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,500.00	0.00	0.00	1,500.00	-2,812.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,600.00	0.00	0.00	1,600.00	-2,712.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,700.00	0.00	0.00	1,700.00	-2,612.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,800.00	0.00	0.00	1,800.00	-2,512.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
1,900.00	0.00	0.00	1,900.00	-2,412.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,000.00	0.00	0.00	2,000.00	-2,312.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,100.00	0.00	0.00	2,100.00	-2,212.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,200.00	0.00	0.00	2,200.00	-2,112.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,300.00	0.00	0.00	2,300.00	-2,012.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,400.00	0.00	0.00	2,400.00	-1,912.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,500.00	0.00	0.00	2,500.00	-1,812.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	
2,600.00	0.00	0.00	2,600.00	-1,712.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23	

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Pathfinder X & Y Planning Report



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Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
2,700.00	0.00	0.00	2,700.00	-1,612.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
2,800.00	0.00	0.00	2,800.00	-1,512.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
2,900.00	0.00	0.00	2,900.00	-1,412.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,000.00	0.00	0.00	3,000.00	-1,312.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,100.00	0.00	0.00	3,100.00	-1,212.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,200.00	0.00	0.00	3,200.00	-1,112.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,300.00	0.00	0.00	3,300.00	-1,012.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,400.00	0.00	0.00	3,400.00	-912.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,500.00	0.00	0.00	3,500.00	-812.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,600.00	0.00	0.00	3,600.00	-712.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,700.00	0.00	0.00	3,700.00	-612.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,800.00	0.00	0.00	3,800.00	-512.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
3,900.00	0.00	0.00	3,900.00	-412.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,000.00	0.00	0.00	4,000.00	-312.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,100.00	0.00	0.00	4,100.00	-212.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,200.00	0.00	0.00	4,200.00	-112.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,300.00	0.00	0.00	4,300.00	-12.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,400.00	0.00	0.00	4,400.00	88.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,500.00	0.00	0.00	4,500.00	188.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,600.00	0.00	0.00	4,600.00	288.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,700.00	0.00	0.00	4,700.00	388.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,800.00	0.00	0.00	4,800.00	488.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
4,900.00	0.00	0.00	4,900.00	588.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,000.00	0.00	0.00	5,000.00	688.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,100.00	0.00	0.00	5,100.00	788.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,200.00	0.00	0.00	5,200.00	888.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,300.00	0.00	0.00	5,300.00	988.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23

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Project:	Lea County(NAD83)	TVD Reference:	WELL @ 4312 00ft (Original Well Elev)
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MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
5,400.00	0.00	0.00	5,400.00	1,088.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,500.00	0.00	0.00	5,500.00	1,188.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,600.00	0.00	0.00	5,600.00	1,288.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,700.00	0.00	0.00	5,700.00	1,388.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,800.00	0.00	0.00	5,800.00	1,488.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
5,900.00	0.00	0.00	5,900.00	1,588.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,000.00	0.00	0.00	6,000.00	1,688.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,100.00	0.00	0.00	6,100.00	1,788.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,200.00	0.00	0.00	6,200.00	1,888.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,300.00	0.00	0.00	6,300.00	1,988.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,400.00	0.00	0.00	6,400.00	2,088.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,500.00	0.00	0.00	6,500.00	2,188.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,600.00	0.00	0.00	6,600.00	2,288.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,700.00	0.00	0.00	6,700.00	2,388.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,800.00	0.00	0.00	6,800.00	2,488.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
6,900.00	0.00	0.00	6,900.00	2,588.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,000.00	0.00	0.00	7,000.00	2,688.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,100.00	0.00	0.00	7,100.00	2,788.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,200.00	0.00	0.00	7,200.00	2,888.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,300.00	0.00	0.00	7,300.00	2,988.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,400.00	0.00	0.00	7,400.00	3,088.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,500.00	0.00	0.00	7,500.00	3,188.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,600.00	0.00	0.00	7,600.00	3,288.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,700.00	0.00	0.00	7,700.00	3,388.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,800.00	0.00	0.00	7,800.00	3,488.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
7,900.00	0.00	0.00	7,900.00	3,588.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
8,000.00	0.00	0.00	8,000.00	3,688.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23

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8,100.00	0.00	0.00	8,100.00	3,788.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
8,200.00	0.00	0.00	8,200.00	3,888.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
8,300.00	0.00	0.00	8,300.00	3,988.00	0.00	0.00	0.00	0.00	767,625.38	735,766.23
8,407.50	0.00	0.00	8,407.50	4,095.50	0.00	0.00	0.00	0.00	767,625.38	735,766.23
KOP-8407.50°MD,0.00°INC,0.00°AZI,8407.50°TVD										
8,425.00	2.10	269.83	8,425.00	4,113.00	0.00	-0.32	0.32	12.00	767,625.38	735,765.91
8,450.00	5.10	269.83	8,449.94	4,137.94	-0.01	-1.89	1.89	12.00	767,625.38	735,764.34
8,475.00	8.10	269.83	8,474.78	4,162.78	-0.01	-4.76	4.76	12.00	767,625.37	735,761.47
8,500.00	11.10	269.83	8,499.42	4,187.42	-0.03	-8.93	8.93	12.00	767,625.36	735,757.30
8,525.00	14.10	269.83	8,523.82	4,211.82	-0.04	-14.38	14.38	12.00	767,625.34	735,751.85
8,550.00	17.10	269.83	8,547.89	4,235.89	-0.06	-21.10	21.10	12.00	767,625.32	735,745.13
8,575.00	20.10	269.83	8,571.59	4,259.59	-0.09	-29.07	29.07	12.00	767,625.30	735,737.16
8,600.00	23.09	269.83	8,594.83	4,282.83	-0.11	-38.27	38.27	12.00	767,625.27	735,727.96
8,625.00	26.09	269.83	8,617.56	4,305.56	-0.14	-48.68	48.68	12.00	767,625.24	735,717.55
8,650.00	29.09	269.83	8,639.71	4,327.71	-0.18	-60.26	60.26	12.00	767,625.20	735,705.97
8,675.00	32.09	269.83	8,661.23	4,349.23	-0.22	-72.98	72.98	12.00	767,625.17	735,693.25
8,700.00	35.09	269.83	8,682.05	4,370.05	-0.26	-86.81	86.81	12.00	767,625.13	735,679.42
8,725.00	38.09	269.83	8,702.12	4,390.12	-0.30	-101.71	101.71	12.00	767,625.08	735,664.52
8,750.00	41.09	269.83	8,721.39	4,409.39	-0.35	-117.64	117.64	12.00	767,625.03	735,648.59
8,775.00	44.09	269.83	8,739.79	4,427.79	-0.40	-134.56	134.56	12.00	767,624.98	735,631.67
8,800.00	47.09	269.83	8,757.28	4,445.28	-0.45	-152.41	152.41	12.00	767,624.93	735,613.82
8,825.00	50.09	269.83	8,773.82	4,461.82	-0.51	-171.16	171.16	12.00	767,624.88	735,595.07
8,850.00	53.09	269.83	8,789.35	4,477.35	-0.57	-190.75	190.75	12.00	767,624.82	735,575.48
8,875.00	56.09	269.83	8,803.83	4,491.83	-0.63	-211.12	211.12	12.00	767,624.76	735,555.11
8,900.00	59.09	269.83	8,817.23	4,505.23	-0.69	-232.22	232.22	12.00	767,624.69	735,534.01
8,925.00	62.09	269.83	8,829.51	4,517.51	-0.75	-254.00	254.00	12.00	767,624.63	735,512.23
8,950.00	65.09	269.83	8,840.63	4,528.63	-0.82	-276.39	276.39	12.00	767,624.56	735,489.84

Pathfinder Energy Services
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County(NAD83)	TVD Reference:	WELL @ 4312.00ft (Original Well Elev)
Site:	Good Hands "15" State	MD Reference:	WELL @ 4312.00ft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
8,975.00	68.08	269.83	8,850.56	4,538.56	-0.89	-299.32	299.33	12.00	767,624.49	735,466.90
9,000.00	71.08	269.83	8,859.28	4,547.28	-0.96	-322.75	322.75	12.00	767,624.43	735,443.48
9,025.00	74.08	269.83	8,866.76	4,554.76	-1.03	-346.60	346.60	12.00	767,624.35	735,419.63
9,050.00	77.08	269.83	8,872.99	4,560.99	-1.10	-370.81	370.81	12.00	767,624.28	735,395.42
9,075.00	80.08	269.83	8,877.93	4,565.93	-1.17	-395.31	395.32	12.00	767,624.21	735,370.91
9,100.00	83.08	269.83	8,881.59	4,569.59	-1.25	-420.04	420.04	12.00	767,624.14	735,346.19
9,125.00	86.08	269.83	8,883.95	4,571.95	-1.32	-444.93	444.93	12.00	767,624.06	735,321.30
9,150.00	89.08	269.83	8,885.01	4,573.01	-1.39	-469.90	469.90	12.00	767,623.99	735,296.33
9,165.92	90.99	269.83	8,885.00	4,573.00	-1.44	-485.82	485.82	12.00	767,623.94	735,280.41
EOC-9165.92°MD,90.99°INC,272.36°AZI,8885.00°TVD,12.00°DLS, 485.82°VS, 20.01°N, -485.41°E										
9,165.95	90.99	269.83	8,885.00	4,573.00	-1.44	-485.85	485.86	0.00	767,623.94	735,280.37
9,200.00	90.99	269.83	8,884.41	4,572.41	-1.54	-519.90	519.90	0.00	767,623.84	735,246.33
9,300.00	90.99	269.83	8,882.68	4,570.68	-1.84	-619.88	619.88	0.00	767,623.54	735,146.35
9,400.00	90.99	269.83	8,880.96	4,568.96	-2.14	-719.87	719.87	0.00	767,623.25	735,046.36
9,500.00	90.99	269.83	8,879.23	4,567.23	-2.43	-819.85	819.85	0.00	767,622.95	734,946.38
9,600.00	90.99	269.83	8,877.50	4,565.50	-2.73	-919.83	919.84	0.00	767,622.65	734,846.39
9,700.00	90.99	269.83	8,875.77	4,563.77	-3.03	-1,019.82	1,019.82	0.00	767,622.36	734,746.41
9,800.00	90.99	269.83	8,874.04	4,562.04	-3.32	-1,119.80	1,119.81	0.00	767,622.06	734,646.42
9,900.00	90.99	269.83	8,872.32	4,560.32	-3.62	-1,219.79	1,219.79	0.00	767,621.76	734,546.44
10,000.00	90.99	269.83	8,870.59	4,558.59	-3.92	-1,319.77	1,319.78	0.00	767,621.47	734,446.46
10,100.00	90.99	269.83	8,868.86	4,556.86	-4.21	-1,419.76	1,419.76	0.00	767,621.17	734,346.47
10,200.00	90.99	269.83	8,867.13	4,555.13	-4.51	-1,519.74	1,519.75	0.00	767,620.87	734,246.49
10,300.00	90.99	269.83	8,865.41	4,553.41	-4.81	-1,619.73	1,619.73	0.00	767,620.58	734,146.50
10,400.00	90.99	269.83	8,863.68	4,551.68	-5.10	-1,719.71	1,719.72	0.00	767,620.28	734,046.52
10,500.00	90.99	269.83	8,861.95	4,549.95	-5.40	-1,819.70	1,819.70	0.00	767,619.98	733,946.53
10,600.00	90.99	269.83	8,860.22	4,548.22	-5.70	-1,919.68	1,919.69	0.00	767,619.69	733,846.55
10,700.00	90.99	269.83	8,858.49	4,546.49	-5.99	-2,019.67	2,019.67	0.00	767,619.39	733,746.56

Pathfinder Energy Services
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County(NAD83)	TVD Reference:	WELL @ 4312.00ft (Original Well Elev)
Site:	Good Hands "15" State	MD Reference:	WELL @ 4312.00ft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
10,800.00	90.99	269.83	8,856.77	4,544.77	-6.29	-2,119.65	2,119.66	0.00	767,619.09	733,646.58	
10,900.00	90.99	269.83	8,855.04	4,543.04	-6.59	-2,219.64	2,219.64	0.00	767,618.80	733,546.59	
11,000.00	90.99	269.83	8,853.31	4,541.31	-6.88	-2,319.62	2,319.63	0.00	767,618.50	733,446.61	
11,100.00	90.99	269.83	8,851.58	4,539.58	-7.18	-2,419.60	2,419.61	0.00	767,618.20	733,346.62	
11,200.00	90.99	269.83	8,849.86	4,537.86	-7.48	-2,519.59	2,519.60	0.00	767,617.91	733,246.64	
11,300.00	90.99	269.83	8,848.13	4,536.13	-7.77	-2,619.57	2,619.59	0.00	767,617.61	733,146.66	
11,400.00	90.99	269.83	8,846.40	4,534.40	-8.07	-2,719.56	2,719.57	0.00	767,617.31	733,046.67	
11,500.00	90.99	269.83	8,844.67	4,532.67	-8.37	-2,819.54	2,819.56	0.00	767,617.02	732,946.69	
11,600.00	90.99	269.83	8,842.94	4,530.94	-8.66	-2,919.53	2,919.54	0.00	767,616.72	732,846.70	
11,700.00	90.99	269.83	8,841.22	4,529.22	-8.96	-3,019.51	3,019.53	0.00	767,616.42	732,746.72	
11,800.00	90.99	269.83	8,839.49	4,527.49	-9.26	-3,119.50	3,119.51	0.00	767,616.13	732,646.73	
11,900.00	90.99	269.83	8,837.76	4,525.76	-9.55	-3,219.48	3,219.50	0.00	767,615.83	732,546.75	
12,000.00	90.99	269.83	8,836.03	4,524.03	-9.85	-3,319.47	3,319.48	0.00	767,615.53	732,446.76	
12,100.00	90.99	269.83	8,834.31	4,522.31	-10.15	-3,419.45	3,419.47	0.00	767,615.24	732,346.78	
12,200.00	90.99	269.83	8,832.58	4,520.58	-10.44	-3,519.44	3,519.45	0.00	767,614.94	732,246.79	
12,300.00	90.99	269.83	8,830.85	4,518.85	-10.74	-3,619.42	3,619.44	0.00	767,614.64	732,146.81	
12,400.00	90.99	269.83	8,829.12	4,517.12	-11.04	-3,719.40	3,719.42	0.00	767,614.35	732,046.82	
12,500.00	90.99	269.83	8,827.39	4,515.39	-11.33	-3,819.39	3,819.41	0.00	767,614.05	731,946.84	
12,600.00	90.99	269.83	8,825.67	4,513.67	-11.63	-3,919.37	3,919.39	0.00	767,613.75	731,846.86	
12,700.00	90.99	269.83	8,823.94	4,511.94	-11.93	-4,019.36	4,019.38	0.00	767,613.46	731,746.87	
12,800.00	90.99	269.83	8,822.21	4,510.21	-12.22	-4,119.34	4,119.36	0.00	767,613.16	731,646.89	
12,900.00	90.99	269.83	8,820.48	4,508.48	-12.52	-4,219.33	4,219.35	0.00	767,612.86	731,546.90	
13,000.00	90.99	269.83	8,818.76	4,506.76	-12.82	-4,319.31	4,319.33	0.00	767,612.57	731,446.92	
13,100.00	90.99	269.83	8,817.03	4,505.03	-13.11	-4,419.30	4,419.32	0.00	767,612.27	731,346.93	
13,200.00	90.99	269.83	8,815.30	4,503.30	-13.41	-4,519.28	4,519.30	0.00	767,611.97	731,246.95	
13,212.20	90.99	269.83	8,815.09	4,503.09	-13.45	-4,531.48	4,531.50	0.00	767,611.94	731,234.75	

BHL-13212.20°MD,90.99°INC,269.83°AZI, 8815.09°TVD, 4531.50°VS, -13.45°N, -4531.48°E

Pathfinder Energy Services
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Lea County(NAD83)	TVD Reference:	WELL @ 4312.00ft (Original Well Elev)
Site:	Good Hands "15" State	MD Reference:	WELL @ 4312.00ft (Original Well Elev)
Well:	#1H	North Reference:	Gnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	Midland Database

Planned Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
13,212.23	90.99	269.83	8,815.00	4,503.00	-13.67	-4,531.51	4,531.53	0.00	767,611.71	731,234.72	
PBHL(#1HGH)											

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL(#1HGH)	0.00	0.00	8,815.00	-13.67	-4,531.51	767,611.712	731,234.717	33° 6' 30.980 N	103° 42' 47.395 W
- plan hits target									
- Point									

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
8,407.50	8,407.50	0.00	0.00	KOP-8407.50'MD,0.00°INC,0.00°AZI,8407.50'TVD	
9,165.92	8,885.00	-1.44	-485.82	EOC-9165.92'MD,90.99°INC,272.36°AZI,8885.00'TVD,12.00'DLS, 485	
13,212.20	8,815.09	-13.45	-4,531.48	BHL-13212.20'MD,90.99°INC,269.83°AZI, 8815.09'TVD, 4531.50'VS, -	

Checked By: _____ Approved By: _____ Date: _____