

OCD-ARTESIA

Form 3160-4
(April 2004)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

FORM APPROVED
OMB NO. 1004-0137
Expires March 31, 2007

1a Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other b Type of Completion ☒ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr, Other _____		5 Lease Serial No SL:V0-6203 BHL:NMNM055377
2 Name of Operator COG OPERATING LLC		6 If Indian, Allottee or Tribe Name 7 Unit or CA Agreement Name and No
3 Address 550 WEST TEXAS AVEUNUE SUITE 100 MIDLAND, TEXAS 79701		8 Lease Name and Well No GRAVE DIGGER ST COM
4 Location of Well (Report location clearly and in accordance with Federal requirements)* At surface 330'FNL & 380'FWL LOT 4 At top prod interval reported below 330'FNL & 380'FWL LOT 4 At total depth SWSW 322'FSL & 384'FWL		9 AFI Well No 30-015-37665
14 Date Spudded 03/25/2010		10 Field and Pool, or Exploratory CEMETARY; YESO
15 Date T D Reached 04/02/2010		11 Sec, T, R, M, on Block and Survey or Area SEC 2, T20S-R25E
16 Date Completed ☐ D & A ☒ Ready to Prod		12 County or Parish EDDY 13 State NM
17 Elevations (DF, RKB, RT, GL)* 3482' GL		
18. Total Depth MD 6927 TVD 6927		19 Plug Back T D MD 6910 TVD 6910
20 Depth Bridge Plug Set MD TVD		
21. Type Electric & Other Mechanical Logs Run (Submit copy of each) NONE		22 Was well cored? ☐ No ☐ Yes (Submit analysis) Was DST run? ☐ No ☐ Yes (Submit report) Directional Survey? ☐ No ☒ Yes (Submit copy)

23 Casing and Liner Record (Report all strings set in well)

Hole Size	Size/Grade	Wt (#/ft)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No of Sks & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
12.25	8.625 J5	24		821		150		0	
7.875	5.5 J55	17		6923		750		0	

RECEIVED
 MAR 20 2012
 NMOCD ARTESIA

24 Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)
2.875	2160							

25 Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No Holes	Perf Status
A) YESO	2880	6880	2880 TO 6880		160	OPEN
B)						
C)						
D)						

**RECLAMATION
DUE 4-18-12**

27 Acid, Fracture, Treatment, Cement Squeeze, etc

Depth Interval	Amount and Type of Material
2880 TO 3480	ACIDIZE W/4,861 GALS 15%ACID. FRAC W/256,764# SAND, 516,224 GALS FLUID.
3730 TO 4330	ACIDIZE W/2,521 GALS 15%ACID. FRAC W/249,468# SAND, 511,005 GALS FLUID.
4580 TO 5180	ACIDIZE W/2,427 GALS 15%ACID. FRAC W/255,948# SAND, 519,074 GALS FLUID.
5430 TO 6030	ACIDIZE W/3,985 GALS 15%ACID. FRAC W/250,253# SAND, 532,321 GALS FLUID.

28. Production - Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
06/01/2010	06/12/2010	24	→	31	0	370			PUMPING
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	
			→	31	0	370			

ACCEPTED FOR RECORD
 PRODUCING

28a. Production - Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	
			→						

MAR 18 2012

*(See instructions and spaces for additional data on page 2)

Accepted for record

NMOCD

105
3/27/2012

BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

28b. Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

VENTED

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top Meas. Depth
SAN ANDRES GLORIETA YESO		835 2425 2525	DOLOMITE & LIMESTONE SANDSTONE DOLOMITE & ANHYDRITE	SAN ANDRES GLORIETA YESO	835 2425 2525

32. Additional remarks (include plugging procedure):

6266 TO 6880 ACIDIZE W/1,506 GALS 15%ACID. FRAC W/254,588# SAND, 512,961 GALS FLUID.

33. Indicate which items have been attached by placing a check in the appropriate boxes:

- ☐ Electrical/Mechanical Logs (1 full set req'd.)
 ☐ Geologic Report
 ☐ DST Report
 ☒ Directional Survey
☐ Sundry Notice for plugging and cement verification
 ☐ Core Analysis
 ☐ Other:

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

Name (please print) CHASITY JACKSON

Title REGULATORY ANALYST

Signature

CJackson

Date 03/09/2012

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

PathFinder Energy Services, Inc.

Survey Report

MARBOB ENERGY CORPORATION
GRAVE DIGGER FEDERAL #1H
EDDY COUNTY, NEW MEXICO
Rig:
PathFinder Office Supervisor:
PathFinder Field Engineers:

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.36.31.2669 N LON: 104.27.44.3122 W
GRID Reference: NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 460284.6000 Y: 585175.3000
North Aligned To: GRID NORTH
Total Magnetic Correction: 8.17° EAST TO GRID
Vertical Section Plane: 180.21
Survey Vert. Reference: 0.00' Kelly Bushing To MSL

Survey Calculations by RX5 V6.02B using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Subsea Depth (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)	TEMP (F)
THE FOLLOWING ARE SCIENTIFIC DRILLING GYRO SURVEYS.											
0.00	0.00	0.00	-0.01	-0.01	0.01	0.01 S	0.00 W	0.01@	183.98	0.00	0.00
100.00	0.71	167.46	99.99	99.99	0.62	0.62 S	0.13 E	0.63@	167.75	0.71	0.00
200.00	0.67	186.63	199.98	199.98	1.80	1.80 S	0.20 E	1.81@	173.64	0.23	0.00
300.00	0.85	167.47	299.98	299.98	3.11	3.11 S	0.29 E	3.12@	174.59	0.31	0.00
400.00	1.12	143.83	399.96	399.96	4.62	4.62 S	1.03 E	4.73@	167.41	0.48	0.00
500.00	1.44	155.21	499.94	499.94	6.54	6.55 S	2.14 E	6.89@	161.94	0.41	0.00
600.00	1.79	150.36	599.90	599.90	9.03	9.05 S	3.43 E	9.68@	159.21	0.38	0.00
700.00	1.73	152.15	699.85	699.85	11.72	11.74 S	4.91 E	12.73@	157.29	0.08	0.00
800.00	1.91	151.58	799.80	799.80	14.52	14.54 S	6.41 E	15.89@	156.21	0.18	0.00
900.00	1.69	151.13	899.75	899.75	17.27	17.30 S	7.92 E	19.02@	155.41	0.22	0.00
1000.00	1.79	152.40	999.70	999.70	19.94	19.97 S	9.35 E	22.05@	154.91	0.11	0.00
1100.00	1.63	151.31	1099.66	1099.66	22.56	22.60 S	10.76 E	25.03@	154.55	0.16	0.00
1200.00	1.39	162.00	1199.62	1199.62	24.96	25.00 S	11.82 E	27.66@	154.71	0.37	0.00
1300.00	1.48	169.37	1299.59	1299.59	27.38	27.43 S	12.43 E	30.11@	155.62	0.20	0.00
1400.00	1.56	167.73	1399.56	1399.56	29.98	30.03 S	12.96 E	32.70@	156.66	0.09	0.00
1500.00	1.44	171.27	1499.52	1499.52	32.55	32.60 S	13.44 E	35.26@	157.60	0.15	0.00
1600.00	1.61	178.66	1599.49	1599.49	35.20	35.25 S	13.66 E	37.80@	158.82	0.26	0.00
1700.00	1.94	173.37	1699.44	1699.44	38.28	38.33 S	13.89 E	40.77@	160.08	0.37	0.00
1800.00	1.77	181.14	1799.39	1799.39	41.50	41.56 S	14.05 E	43.87@	161.32	0.30	0.00
1900.00	1.80	178.83	1899.34	1899.34	44.62	44.67 S	14.05 E	46.83@	162.54	0.08	0.00
2000.00	2.12	182.15	1999.28	1999.28	48.04	48.09 S	14.02 E	50.09@	163.75	0.34	0.00
**	TIE IN TO SCIENTIFIC DRILLING GYRO SURVEY @ 2035'MD.										
2035.00	1.82	175.05	2034.26	2034.26	49.24	49.29 S	14.04 E	51.25@	164.10	1.10	0.00
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.											
2163.00	7.12	183.36	2161.83	2161.83	59.19	59.24 S	13.75 E	60.82@	166.93	4.16	75.72
2194.00	10.99	185.30	2192.43	2192.43	64.05	64.10 S	13.36 E	65.48@	168.22	12.52	79.34

PathFinder Energy Services, Inc.

Survey Report

MARBOB ENERGY CORPORATION
GRAVE DIGGER FEDERAL #1H
EDDY COUNTY, NEW MEXICO
RIG:

Page 02/02

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Subsea Depth (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)	TEMP (F)
2225.00	15.04	182.64	2222.63	2222.63	71.02	71.07 S	12.91 E	72.23@	169.71	13.20	79.34
2256.00	18.20	180.90	2252.33	2252.33	79.88	79.93 S	12.64 E	80.92@	171.01	10.32	82.95
2287.00	20.93	180.29	2281.54	2281.54	90.26	90.31 S	12.54 E	91.17@	172.09	8.83	82.95
2319.00	23.48	181.55	2311.16	2311.16	102.35	102.40 S	12.34 E	103.14@	173.13	8.11	86.57
2350.00	25.59	181.03	2339.36	2339.36	115.22	115.27 S	12.05 E	115.89@	174.03	6.84	86.57
2381.00	28.75	179.67	2366.94	2366.94	129.37	129.42 S	11.97 E	129.97@	174.71	10.39	86.57
2412.00	32.45	178.67	2393.62	2393.62	145.15	145.19 S	12.21 E	145.71@	175.19	12.05	86.57
2443.00	36.23	178.35	2419.21	2419.21	162.62	162.67 S	12.67 E	163.16@	175.55	12.21	90.18
2474.00	38.78	179.45	2443.80	2443.80	181.49	181.54 S	13.02 E	182.01@	175.90	8.50	90.18
2506.00	41.33	179.19	2468.29	2468.29	202.08	202.13 S	13.27 E	202.56@	176.24	7.99	90.18
2537.00	43.97	180.42	2491.09	2491.09	223.08	223.13 S	13.34 E	223.53@	176.58	8.93	90.18
2568.00	46.52	181.04	2512.92	2512.92	245.09	245.14 S	13.05 E	245.49@	176.95	8.35	90.18
2598.00	49.68	181.10	2532.95	2532.95	267.41	267.46 S	12.64 E	267.76@	177.30	10.53	90.18
2629.00	53.90	180.45	2552.12	2552.12	291.77	291.81 S	12.31 E	292.07@	177.58	13.71	90.18
2660.00	57.42	179.87	2569.60	2569.60	317.36	317.40 S	12.24 E	317.64@	177.79	11.46	90.18
2691.00	61.82	178.98	2585.28	2585.28	344.09	344.14 S	12.51 E	344.37@	177.92	14.41	90.18
2722.00	66.83	178.71	2598.71	2598.71	372.01	372.06 S	13.08 E	372.29@	177.99	16.18	86.57
2754.00	71.23	178.23	2610.16	2610.16	401.87	401.93 S	13.88 E	402.17@	178.02	13.82	90.18
2784.00	75.80	178.21	2618.67	2618.67	430.62	430.67 S	14.77 E	430.93@	178.04	15.23	90.18

** The survey data at tie-in point was furnished by a recognized survey company and entered as submitted. Survey stations above the tie-in point represent recalculated data by PathFinder Energy Services, Inc. and may reflect minor changes due to rounding differences between survey programs. Only survey stations taken by qualified PathFinder personnel are subject to certification.



Marbob

Eddy County

Grave Digger Federal

#1H

OH

Survey: MWD #1

Pathfinder X & Y Survey Report

05 May, 2010

PATHFINDER



Pathfinder

Pathfinder X & Y Survey Report



Company:	Marbob	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	WELL @ 3504.00ft (Original Well Elev)
Site:	Grave Digger Federal	MD Reference:	WELL @ 3504.00ft (Original Well Elev)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland Database

Project		Eddy County	
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		Grave Digger Federal									
Site Position:		Northing:		585,175.300 ft		Latitude:		32° 36' 31.267 N			
From:		Map		Easting:		460,284.600 ft		Longitude:		104° 27' 44.312 W	
Position Uncertainty:		0.00 ft		Slot Radius:		"		Grid Convergence:		-0.07 °	

Well	#1H					
Well Position	+N/-S	0.00 ft	Northing:	585,175.300 ft	Latitude:	32° 36' 31.267 N
	+E/-W	0.00 ft	Easting:	460,284.600 ft	Longitude:	104° 27' 44.312 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,482.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	03/24/2010	8.17	60.41	48,867

Design					OH
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	180.01	



Pathfinder

Pathfinder X & Y Survey Report



Company: Marbob
 Project: Eddy County
 Site: Grave Digger Federal
 Well: #1H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well #1H
 TVD Reference: WELL @ 3504.00ft (Original Well Elev)
 MD Reference: WELL @ 3504.00ft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Midland Database

Survey Program Date 05/05/2010

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	2,035.00	GYRO-Scientific (OH)	CT_GYRO_MS	Continuous Gyro Multishot
2,163.00	6,927.00	MWD #1 (OH)	MWD	MWD - Standard

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
2,035.00	1.82	175.05	2,034.27	-1,469.73	-49.28	14.04	49.28	0.00	585,126.02	460,298.64
2,163.00	7.12	183.36	2,161.83	-1,342.17	-59.23	13.75	59.23	4.16	585,116.07	460,298.35
2,194.00	10.99	185.30	2,192.44	-1,311.56	-64.09	13.37	64.09	12.52	585,111.21	460,297.97
2,225.00	15.04	182.64	2,222.64	-1,281.36	-71.06	12.91	71.05	13.20	585,104.24	460,297.51
2,256.00	18.20	180.90	2,252.34	-1,251.66	-79.92	12.65	79.91	10.32	585,095.38	460,297.25
2,287.00	20.93	180.29	2,281.55	-1,222.45	-90.30	12.54	90.29	8.83	585,085.00	460,297.14
2,319.00	23.48	181.55	2,311.17	-1,192.83	-102.39	12.34	102.38	8.11	585,072.91	460,296.94
2,350.00	25.59	181.03	2,339.37	-1,164.63	-115.25	12.05	115.25	6.84	585,060.05	460,296.65
2,381.00	28.75	179.67	2,366.95	-1,137.05	-129.41	11.98	129.40	10.39	585,045.89	460,296.58
2,412.00	32.45	178.67	2,393.62	-1,110.38	-145.18	12.21	145.18	12.05	585,030.12	460,296.81
2,443.00	36.23	178.35	2,419.22	-1,084.78	-162.66	12.67	162.66	12.21	585,012.64	460,297.27
2,474.00	38.78	179.45	2,443.81	-1,060.19	-181.53	13.03	181.53	8.50	584,993.77	460,297.63
2,506.00	41.33	179.19	2,468.30	-1,035.70	-202.12	13.27	202.12	7.99	584,973.18	460,297.87
2,537.00	43.97	180.42	2,491.10	-1,012.90	-223.12	13.34	223.12	8.93	584,952.18	460,297.94
2,568.00	46.52	181.04	2,512.92	-991.08	-245.13	13.05	245.13	8.35	584,930.17	460,297.65
2,598.00	49.68	181.10	2,532.96	-971.04	-267.45	12.64	267.45	10.53	584,907.85	460,297.24
2,629.00	53.90	180.45	2,552.13	-951.87	-291.80	12.31	291.80	13.71	584,883.50	460,296.91
2,660.00	57.42	179.87	2,569.61	-934.39	-317.39	12.24	317.39	11.46	584,857.91	460,296.84
2,691.00	61.81	178.98	2,585.29	-918.71	-344.13	12.52	344.13	14.38	584,831.17	460,297.12
2,722.00	66.83	178.71	2,598.72	-905.28	-372.05	13.08	372.05	16.21	584,803.25	460,297.68
2,754.00	71.23	178.23	2,610.17	-893.83	-401.91	13.88	401.91	13.82	584,773.39	460,298.48



Pathfinder

Pathfinder X & Y Survey Report



Company: Marbob
Project: Eddy County
Site: Grave Digger Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 3504.00ft (Original Well Elev)
MD Reference: WELL @ 3504.00ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
2,784.00	75.80	178.21	2,618.68	-885.32	-430.66	14.77	430.66	15.23	584,744.64	460,299.37
2,816.00	78.88	177.46	2,625.69	-878.31	-461.85	15.95	461.85	9.89	584,713.45	460,300.55
2,847.00	82.04	177.91	2,630.83	-873.17	-492.40	17.19	492.39	10.29	584,682.90	460,301.79
2,878.00	85.82	180.21	2,634.10	-869.90	-523.21	17.69	523.21	14.25	584,652.09	460,302.29
2,909.00	90.57	179.63	2,635.08	-868.92	-554.19	17.73	554.18	15.44	584,621.11	460,302.33
2,941.00	92.95	179.01	2,634.10	-869.90	-586.17	18.11	586.16	7.69	584,589.13	460,302.71
3,003.00	92.15	178.48	2,631.34	-872.66	-648.09	19.47	648.09	1.55	584,527.21	460,304.07
3,065.00	90.31	178.57	2,630.01	-873.99	-710.05	21.07	710.05	2.97	584,465.25	460,305.67
3,128.00	89.96	177.87	2,629.86	-874.14	-773.02	23.02	773.02	1.24	584,402.28	460,307.62
3,190.00	90.31	178.57	2,629.71	-874.29	-834.99	24.95	834.99	1.26	584,340.31	460,309.55
3,252.00	90.84	180.15	2,629.09	-874.91	-896.98	25.64	896.98	2.69	584,278.32	460,310.24
3,314.00	90.92	180.33	2,628.14	-875.86	-958.97	25.38	958.97	0.32	584,216.33	460,309.98
3,377.00	91.01	180.15	2,627.08	-876.92	-1,021.96	25.12	1,021.96	0.32	584,153.34	460,309.72
3,440.00	90.75	181.39	2,626.11	-877.89	-1,084.95	24.27	1,084.95	2.01	584,090.35	460,308.87
3,503.00	90.84	181.65	2,625.24	-878.76	-1,147.92	22.60	1,147.92	0.44	584,027.38	460,307.20
3,564.00	90.40	181.95	2,624.58	-879.42	-1,208.89	20.68	1,208.88	0.87	583,966.41	460,305.28
3,625.00	89.69	182.15	2,624.53	-879.47	-1,269.85	18.50	1,269.84	1.21	583,905.45	460,303.10
3,687.00	89.96	182.13	2,624.72	-879.28	-1,331.80	16.19	1,331.80	0.44	583,843.50	460,300.79
3,750.00	90.22	180.94	2,624.62	-879.38	-1,394.78	14.50	1,394.78	1.93	583,780.52	460,299.10
3,812.00	90.31	180.82	2,624.33	-879.67	-1,456.77	13.55	1,456.77	0.24	583,718.53	460,298.15
3,875.00	90.48	180.70	2,623.90	-880.10	-1,519.77	12.71	1,519.76	0.33	583,655.53	460,297.31
3,937.00	89.52	181.31	2,623.90	-880.10	-1,581.75	11.62	1,581.75	1.83	583,593.55	460,296.22
3,999.00	89.34	181.76	2,624.51	-879.49	-1,643.73	9.96	1,643.73	0.78	583,531.57	460,294.56
4,061.00	89.60	181.97	2,625.09	-878.91	-1,705.69	7.95	1,705.69	0.54	583,469.61	460,292.55
4,123.00	89.87	181.81	2,625.37	-878.63	-1,767.66	5.90	1,767.66	0.51	583,407.64	460,290.50
4,185.00	89.78	180.42	2,625.56	-878.44	-1,829.65	4.69	1,829.65	2.25	583,345.65	460,289.29
4,247.00	89.78	180.21	2,625.80	-878.20	-1,891.64	4.35	1,891.64	0.34	583,283.66	460,288.95



Pathfinder

Pathfinder X & Y Survey Report



Company:	Marbob	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	WELL @ 3504.00ft (Original Well Elev)
Site:	Grave Digger Federal	MD Reference:	WELL @ 3504.00ft (Original Well Elev)
Well:	#1H	North Reference:	Gnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland Database

Survey										
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
4,309.00	90.04	179.62	2,625.90	-878.10	-1,953.64	4.45	1,953.64	1.04	583,221.66	460,289.05
4,372.00	89.96	179.81	2,625.90	-878.10	-2,016.64	4.76	2,016.64	0.33	583,158.66	460,289.36
4,434.00	90.22	179.74	2,625.80	-878.20	-2,078.64	5.00	2,078.64	0.43	583,096.66	460,289.60
4,496.00	90.04	179.80	2,625.66	-878.34	-2,140.64	5.25	2,140.64	0.31	583,034.66	460,289.85
4,558.00	90.13	179.83	2,625.57	-878.43	-2,202.64	5.45	2,202.64	0.15	582,972.66	460,290.05
4,621.00	90.04	179.94	2,625.48	-878.52	-2,265.64	5.58	2,265.64	0.23	582,909.66	460,290.18
4,683.00	90.13	179.77	2,625.38	-878.62	-2,327.64	5.73	2,327.64	0.31	582,847.66	460,290.33
4,745.00	90.04	180.02	2,625.29	-878.71	-2,389.64	5.85	2,389.64	0.43	582,785.66	460,290.45
4,807.00	90.31	180.02	2,625.10	-878.90	-2,451.64	5.83	2,451.64	0.44	582,723.66	460,290.43
4,871.00	90.22	180.13	2,624.81	-879.19	-2,515.64	5.74	2,515.64	0.22	582,659.66	460,290.34
4,933.00	89.96	180.46	2,624.71	-879.29	-2,577.64	5.42	2,577.64	0.68	582,597.66	460,290.02
4,996.00	90.22	181.07	2,624.61	-879.39	-2,640.63	4.58	2,640.63	1.05	582,534.67	460,289.18
5,060.00	90.31	181.11	2,624.31	-879.69	-2,704.62	3.37	2,704.62	0.15	582,470.68	460,287.97
5,122.00	90.22	181.25	2,624.03	-879.97	-2,766.61	2.09	2,766.61	0.27	582,408.69	460,286.69
5,184.00	88.55	181.11	2,624.69	-879.31	-2,828.59	0.81	2,828.59	2.70	582,346.71	460,285.41
5,247.00	88.20	179.84	2,626.48	-877.52	-2,891.56	0.29	2,891.56	2.09	582,283.74	460,284.89
5,310.00	88.72	179.35	2,628.17	-875.83	-2,954.53	0.73	2,954.53	1.13	582,220.77	460,285.33
5,373.00	90.22	179.59	2,628.76	-875.24	-3,017.53	1.32	3,017.53	2.41	582,157.77	460,285.92
5,435.00	90.40	179.65	2,628.42	-875.58	-3,079.52	1.73	3,079.52	0.31	582,095.78	460,286.33
5,498.00	90.31	179.39	2,628.03	-875.97	-3,142.52	2.26	3,142.52	0.44	582,032.78	460,286.86
5,561.00	89.96	179.24	2,627.88	-876.12	-3,205.52	3.01	3,205.52	0.60	581,969.78	460,287.61
5,623.00	90.40	179.51	2,627.69	-876.31	-3,267.51	3.69	3,267.51	0.83	581,907.79	460,288.29
5,685.00	90.57	179.36	2,627.16	-876.84	-3,329.51	4.30	3,329.51	0.37	581,845.79	460,288.90
5,748.00	90.75	179.43	2,626.44	-877.56	-3,392.50	4.96	3,392.50	0.31	581,782.80	460,289.56
5,811.00	89.25	179.50	2,626.44	-877.56	-3,455.49	5.55	3,455.49	2.38	581,719.81	460,290.15
5,874.00	89.43	179.48	2,627.16	-876.84	-3,518.49	6.11	3,518.49	0.29	581,656.81	460,290.71
5,937.00	89.96	179.32	2,627.50	-876.50	-3,581.48	6.77	3,581.48	0.88	581,593.82	460,291.37



Pathfinder

Pathfinder X & Y Survey Report



Company: Marbob
Project: Eddy County
Site: Grave Digger Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #1H
WELL @ 3504.00ft (Original Well Elev)
WELL @ 3504.00ft (Original Well Elev)
Grd
Minimum Curvature
Midland Database

Survey

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
5,999.00	89.87	179.44	2,627.59	-876.41	-3,643.48	7.44	3,643.48	0.24	581,531.82	460,292.04
6,062.00	90.22	179.41	2,627.54	-876.46	-3,706.48	8.07	3,706.47	0.56	581,468.82	460,292.67
6,126.00	90.22	179.21	2,627.29	-876.71	-3,770.47	8.84	3,770.47	0.31	581,404.83	460,293.44
6,188.00	90.31	179.51	2,627.01	-876.99	-3,832.47	9.54	3,832.46	0.51	581,342.83	460,294.14
6,251.00	90.57	179.35	2,626.52	-877.48	-3,895.46	10.16	3,895.46	0.48	581,279.84	460,294.76
6,313.00	89.69	179.36	2,626.38	-877.62	-3,957.46	10.86	3,957.45	1.42	581,217.84	460,295.46
6,376.00	89.60	179.68	2,626.77	-877.23	-4,020.45	11.39	4,020.45	0.53	581,154.85	460,295.99
6,439.00	89.52	180.75	2,627.26	-876.74	-4,083.45	11.15	4,083.45	1.70	581,091.85	460,295.75
6,502.00	89.69	180.64	2,627.69	-876.31	-4,146.44	10.39	4,146.44	0.32	581,028.86	460,294.99
6,564.00	89.87	180.70	2,627.93	-876.07	-4,208.44	9.66	4,208.44	0.31	580,966.86	460,294.26
6,626.00	90.22	180.77	2,627.88	-876.12	-4,270.43	8.87	4,270.43	0.58	580,904.87	460,293.47
6,689.00	90.40	180.69	2,627.54	-876.46	-4,333.43	8.07	4,333.43	0.31	580,841.87	460,292.67
6,752.00	90.40	180.78	2,627.10	-876.90	-4,396.42	7.26	4,396.42	0.14	580,778.88	460,291.86
6,815.00	90.22	181.35	2,626.76	-877.24	-4,459.41	6.09	4,459.41	0.95	580,715.89	460,290.69
6,877.00	90.13	180.97	2,626.57	-877.43	-4,521.40	4.83	4,521.39	0.63	580,653.90	460,289.43
6,927.00	90.13	180.97	2,626.46	-877.54	-4,571.39	3.99	4,571.39	0.00	580,603.91	460,288.59

BHL-6927.00°MD,90.13°INC,180.97°AZI, 2626.46°TVD, 4571.39°VS, -4571.39°N, 3.99°E

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									
Grave Digger BHL	0.00	0.00	2,630.00	-4,571.90	-16.40	580,603.400	460,268.200	32° 35' 46.024 N	104° 27' 44.439 W
- survey misses target center by 20.70ft at 6927.00ft MD (2626.46 TVD, -4571.39 N, 3.99 E)									
- Point									



Pathfinder
Pathfinder X & Y Survey Report



Company: Marbob
Project: Eddy County
Site: Grave Digger Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 3504.00ft (Original Well Elev)
MD Reference: WELL @ 3504.00ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,927.00	2,626.46	-4,571.39	3.99	BHL-6927.00'MD,90.13°INC,180.97°AZI, 2626.46'TVD, 4571.39'VS, -4'

Checked By: _____ Approved By: _____ Date: _____