

## District I

1625 N French Dr, Hobbs, NM 88240

## District II

1301 W Grand Avenue, Artesia, NM 88210

## District III

1000 Rio Brazos Road, Aztec, NM 87410

## District IV

1220 S St Francis Dr, Santa Fe, NM 87501

State of New Mexico  
Energy Minerals and Natural Resources

Form C-101

May 27, 2004

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AUG 05 2010

HOBBSOCD

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Submit to appropriate District Office

☐ AMENDED REPORT

## APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

|                                                                                             |  |                           |
|---------------------------------------------------------------------------------------------|--|---------------------------|
| Operator Name and Address<br>Mack Energy Corporation<br>P.O. Box 960 Artesia, NM 88211-0960 |  | OGRID Number<br>013837    |
| Property Code<br>38274                                                                      |  | API Number<br>30-25-27241 |
| Property Name<br>Bull Bat State                                                             |  | Well No<br>1              |
| Proposed Pool 1<br>Wildcat Abo <97019>                                                      |  | Proposed Pool 2           |

| 7 Surface Location |         |          |       |         |               |                  |               |                |                                         |
|--------------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|-----------------------------------------|
| UL or lot no       | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County                                  |
| M                  | 2       | 15S      | 32E   |         | 660           | South            | 660           | West           | Lea <input checked="" type="checkbox"/> |

## 8 Proposed Bottom Hole Location If Different From Surface

| UL or lot no | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|--------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| P            | 2       | 15S      | 32E   |         | 660           | South            | 330           | East           | Lea    |

## Additional Well Information

|                                                                                             |                            |                                                                                                                                                                                |                         |                                              |
|---------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------|
| 11 Work Type Code<br>ReEntry                                                                | 12 Well Type Code<br>O     | 13 Cable/Rotary<br>Rotary                                                                                                                                                      | 14 Lease Type Code<br>S | 15 Ground Level Elevation<br>4279            |
| 16 Multiple<br>No                                                                           | 17 Proposed Depth<br>13048 | 18 Formation<br>Abo                                                                                                                                                            | 19 Contractor           | 20 Spud Date<br>8/10/2010                    |
| Depth to Groundwater<br>65'                                                                 |                            | Distance from nearest fresh water well<br>1000'                                                                                                                                |                         | Distance from nearest surface water<br>1000' |
| Pit Liner: Synthetic <input type="checkbox"/> _____mils thick Clay <input type="checkbox"/> |                            | Pit Volume: _____ bbls                                                                                                                                                         |                         |                                              |
| Closed-Loop System <input checked="" type="checkbox"/>                                      |                            | Drilling Method -<br>Fresh Water <input checked="" type="checkbox"/> Brine <input type="checkbox"/> Diesel/Oil-based <input type="checkbox"/> Gas/Air <input type="checkbox"/> |                         |                                              |

## 21 Proposed Casing and Cement Program

| Hole Size | Casing Size | Casing weight/foot | Setting Depth | Sacks of Cement | Estimated TOC           |
|-----------|-------------|--------------------|---------------|-----------------|-------------------------|
| 17 1/2    | 13 3/8      | 54.5               | 420           | 450sx           | Surface-In place        |
| 12 1/4    | 8 5/8       | 28                 | 4120          | 1400sx          | Surface-In place        |
| 7 7/8     | 5 1/2       | 17                 | 6180-12434    | 1230sx          | 6800'-In place          |
| 7 7/8     | 7"          | 26                 | 8900          | 450sx           | Surface                 |
| 6 1/8     | 4 1/2       | 11.6               | 13048         | 0               | Set w/Isolation Packers |

22 Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone

Describe the blowout prevention program, if any Use additional sheets if necessary.

Mack Energy proposes to re-enter drill out plugs to 4300' side track well 200' east and drill to 8500' and start building curve. TD 7 7/8 hole @ 8900', run 7" 26# P-110 Flush Joint HDL casing and cement to surface Drill 6 1/8" hole horizontally to 13048'. Run 4 1/2 casing from 8350-TD, set using Liner Hanger and Peak Completion Packer System.

**Permit Expires 2 Years From Approval**  
**Date Unless Drilling Underway**  
**Re-Entry**

|                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                          |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------|--|
| I hereby certify that the information given above is true and complete to the best of my knowledge and belief I further certify that the drilling pit will be constructed according to NMOCD guidelines <input checked="" type="checkbox"/> a general permit <input type="checkbox"/> , or an (attached) alternative OCD-approved plan. <input type="checkbox"/> |                      | OIL CONSERVATION DIVISION                                |  |
| Signature <i>Jerry W. Sherrell</i>                                                                                                                                                                                                                                                                                                                               |                      | Approved by: <i>[Signature]</i>                          |  |
| Printed name: Jerry W. Sherrell                                                                                                                                                                                                                                                                                                                                  |                      | Title: PETROLEUM ENGINEER                                |  |
| Title: Production Clerk                                                                                                                                                                                                                                                                                                                                          |                      | Approval Date: AUG 13 2010 Expiration Date:              |  |
| E-mail Address: jerrys@mec.com                                                                                                                                                                                                                                                                                                                                   |                      |                                                          |  |
| Date: 8/4/10                                                                                                                                                                                                                                                                                                                                                     | Phone: (575)748-1288 | Conditions of Approval Attached <input type="checkbox"/> |  |

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DISTRICT I  
1625 N. FRENCH DR., HOBBS, NM 88240

AUG 05 2010

HOBBSOCD

DISTRICT II  
1301 W. GRAND AVENUE, ARTESIA, NM 88210DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410DISTRICT IV  
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505State of New Mexico  
Energy, Minerals and Natural Resources Department

## OIL CONSERVATION DIVISION

1220 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505Form C-102  
Revised October 12, 2005  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

|                            |                                          |                          |
|----------------------------|------------------------------------------|--------------------------|
| API Number<br>30-025-27241 | Pool Code<br>91019                       | Pool Name<br>Wildcat Abo |
| Property Code<br>38274     | Property Name<br>BULL BAT STATE          | Well Number<br>1         |
| OGRID No.<br>013837        | Operator Name<br>MACK ENERGY CORPORATION | Elevation<br>4279'       |

## Surface Location

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| M             | 2       | 15-S     | 32-E  |         | 660           | SOUTH            | 660           | WEST           | LEA    |

## Bottom Hole Location If Different From Surface

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| P             | 2       | 15-S     | 32-E  |         | 660           | SOUTH            | 330           | EAST           | LEA    |

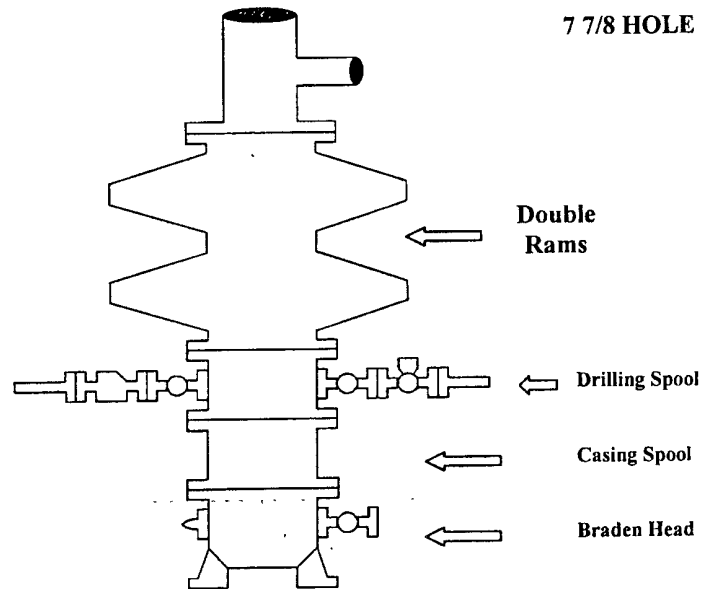
| Dedicated Acres | Joint or Infill | Consolidation Code | Order No |
|-----------------|-----------------|--------------------|----------|
| 160             |                 |                    |          |

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

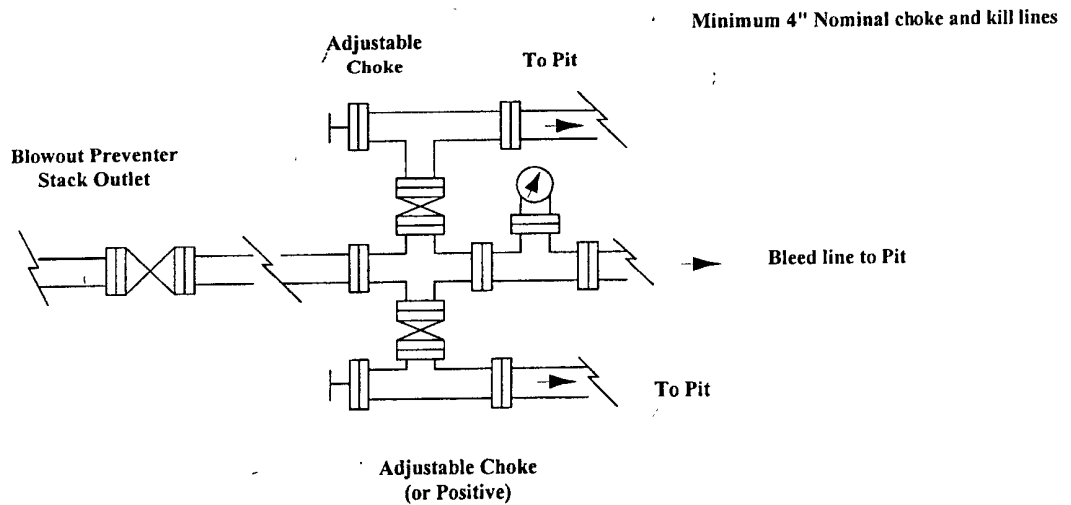
|  |                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>GEODETIC COORDINATES<br/>NAD 27 NME<br/>SURFACE LOCATION<br/>Y=742767.3 N<br/>X=695838.9 E</p> <p>LAT = 33.040292° N<br/>LONG = 103.694269° W</p> <p>BOTTOM HOLE LOCATION<br/>Y=742783.7 N<br/>X=700124.7 E</p>                                                                                                                                           | <p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division</p> <p><i>Jerry W. Sherrell</i> 8/4/10<br/>Signature Date</p> <p>Jerry W. Sherrell<br/>Printed Name</p> |
|  | <p><b>SURVEYOR CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p><i>Ronald J. Eidson</i><br/>Signature &amp; Seal of Professional Surveyor</p> <p>10/11/0929</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  | <p>GRID. AZ. -89°46'48"<br/>HORZ. DIST. -4286.8'</p>                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  | <p>Certificate No. RONALD EIDSON 3239</p>                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

# Mack Energy Corporation

## Exhibit #1-A BOPE Schematic



Choke Manifold Requirement (3000 psi WP)  
No Annular Required



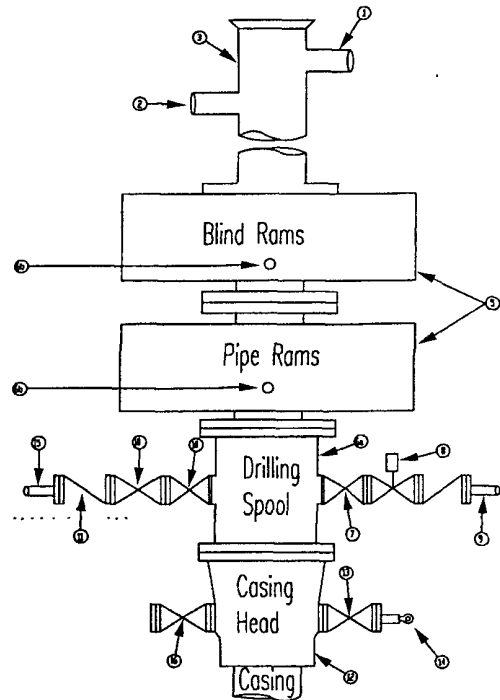
**Mack Energy Corporation**  
**Minimum Blowout Preventer Requirements**  
 3000 psi Working Pressure  
 3 MWP  
 EXHIBIT #1-A

**Stack Requirements**

| NO | Items                                                                          | Min. I.D. | Min. Nominal |
|----|--------------------------------------------------------------------------------|-----------|--------------|
| 1  | Flowline                                                                       |           | 2"           |
| 2  | Fill up line                                                                   |           | 2"           |
| 3  | Drilling nipple                                                                |           |              |
| 4  | Annular preventer                                                              |           |              |
| 5  | Two single or one dual hydraulically operated rams                             |           |              |
| 6a | Drilling spool with 2" min kill line and 3" min choke line outlets             |           | 2" Choke     |
| 6b | 2" min kill line and 3" min. choke line outlets in ram (Alternate to 6a above) |           |              |
| 7  | Valve Gate Plug                                                                | 3 1/8     |              |
| 8  | Gate valve-power operated                                                      | 3 1/8     |              |
| 9  | Line to choke manifold                                                         |           | 3"           |
| 10 | Valve Gate Plug                                                                | 2 1/16    |              |
| 11 | Check valve                                                                    | 2 1/16    |              |
| 12 | Casing head                                                                    |           |              |
| 13 | Valve Gate Plug                                                                | 1 13/16   |              |
| 14 | Pressure gauge with needle valve                                               |           |              |
| 15 | Kill line to rig mud pump manifold                                             |           | 2"           |

**OPTIONAL**

|    |               |         |  |
|----|---------------|---------|--|
| 16 | Flanged Valve | 1 13/16 |  |
|----|---------------|---------|--|



**CONTRACTOR'S OPTION TO FURNISH.**

- 1 All equipment and connections above bradenhead or casinghead Working pressure of preventers to be 3000 psi minimum
- 2 Automatic accumulator (80 gallon, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure
- 3 BOP controls, to be located near drillers' position.
- 4 Kelly equipped with Kelly cock.
- 5 Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
- 6 Kelly saver-sub equipped with rubber casing protector at all times.
- 7 Plug type blowout preventer tester
- 8 Extra set pipe rams to fit drill pipe in use on location at all times.
- 9 Type RX ring gaskets in place of Type R.

**MEC TO FURNISH.**

- 1 Bradenhead or casing head and side valves.
- 2 Wear bushing. If required

**GENERAL NOTES:**

- 1 Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager.
- 2 All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke valves must be full opening and suitable for high pressure mud service
3. Controls to be of standard design and each marked, showing opening and closing position
4. Chokes will be positioned so as not to hamper or delay changing of choke beans. Replaceable parts for adjustable choke, or bean sizes, retainers, and choke wrenches to be conveniently located for immediate use.
5. All valves to be equipped with handwheels or handles ready for immediate use.
6. Choke lines must be suitably anchored.

7. Handwheels and extensions to be connected and ready for use
- 8 Valves adjacent to drilling spool to be kept open Use outside valves except for emergency
9. All seamless steel control piping (2000 psi working pressure) to have flexible joints to avoid stress Hoses will be permitted.
- 10 Casinghead connections shall not be used except in case of emergency
11. Do not use kill line for routine fill up operations

# Mack Energy Corporation

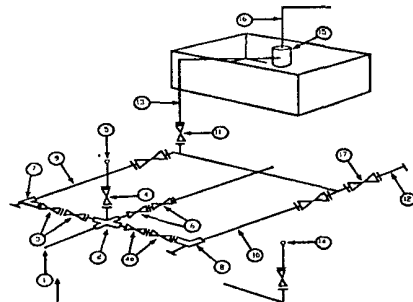
Exhibit #1-A

## MINIMUM CHOKE MANIFOLD

3,000, 5,000, and 10,000 PSI Working Pressure

3 M will be used or greater

3 MWP - 5 MWP - 10 MWP



Mud Pit

Reserve Pit

\* Location of separator optional

Below Substructure

### Minimum requirements

| No. |                                                  | 3,000 MWP |         |        | 5,000 MWP |         |        | 10,000 MWP |         |        |
|-----|--------------------------------------------------|-----------|---------|--------|-----------|---------|--------|------------|---------|--------|
|     |                                                  | I.D.      | NOMINAL | Rating | I.D.      | Nominal | Rating | I.D.       | Nominal | Rating |
| 1   | Line from drilling Spool                         |           | 3"      | 3,000  |           | 3"      | 5,000  |            | 3"      | 10,000 |
| 2   | Cross 3" x 3" x 3" x 2"                          |           |         | 3,000  |           |         | 5,000  |            |         | 10,000 |
| 2   | Cross 3" x 3" x 3" x 2"                          |           |         |        |           |         |        |            |         | 10,000 |
| 3   | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |
| 4   | Valve Gate Plug                                  | 1 13/16   |         | 3,000  | 1 13/16   |         | 5,000  | 1 13/16    |         | 10,000 |
| 4a  | Valves (1)                                       | 2 1/16    |         | 3,000  | 2 1/16    |         | 5,000  | 2 1/16     |         | 10,000 |
| 5   | Pressure Gauge                                   |           |         | 3,000  |           |         | 5,000  |            |         | 10,000 |
| 6   | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |
| 7   | Adjustable Choke (3)                             | 2"        |         | 3,000  | 2"        |         | 5,000  | 2"         |         | 10,000 |
| 8   | Adjustable Choke                                 | 1"        |         | 3,000  | 1"        |         | 5,000  | 2"         |         | 10,000 |
| 9   | Line                                             |           | 3"      | 3,000  |           | 3"      | 5,000  |            | 3"      | 10,000 |
| 10  | Line                                             |           | 2"      | 3,000  |           | 2"      | 5,000  |            | 2"      | 10,000 |
| 11  | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |
| 12  | Line                                             |           | 3"      | 1,000  |           | 3"      | 1,000  |            | 3"      | 2,000  |
| 13  | Line                                             |           | 3"      | 1,000  |           | 3"      | 1,000  |            | 3"      | 2,000  |
| 14  | Remote reading compound Standpipe pressure quage |           |         | 3,000  |           |         | 5,000  |            |         | 10,000 |
| 15  | Gas Separator                                    |           | 2' x 5' |        |           | 2' x 5' |        |            | 2' x 5' |        |
| 16  | Line                                             |           | 4"      | 1,000  |           | 4"      | 1,000  |            | 4"      | 2,000  |
| 17  | Valve Gate Plug                                  | 3 1/8     |         | 3,000  | 3 1/8     |         | 5,000  | 3 1/8      |         | 10,000 |

- (1) Only one required in Class 3M
- (2) Gate valves only shall be used for Class 10 M
- (3) Remote operated hydraulic choke required on 5,000 psi and 10,000 psi for drilling.

### EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTION

1. All connections in choke manifold shall be welded, studded, flanged or Cameron clamp of comparable rating
2. All flanges shall be API 6B or 6BX and ring gaskets shall be API RX or BX. Use only BX for 10 MWP.
3. All lines shall be securely anchored.
4. Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available.
5. Choke manifold pressure and standpipe pressure gauges shall be available at the choke manifold to assist in regulating chokes. As an alternate with automatic chokes, a choke manifold pressure gauge shall be located on the rig floor in conjunction with the standpipe pressure gauge.
6. Line from drilling spool to choke manifold should be as straight as possible. Lines downstream from chokes shall make turns by large bends or 90 degree bends using bull plugged tees



## **Mack Energy**

**Lea County  
Bull Bat State  
#1H  
OH**

**RECEIVED**

**AUG 05 2010  
HOBBSOCD**

**Plan: Plan #1**

## **Pathfinder X & Y Planning Report**

**27 July, 2010**

# **PATHFINDER**



# Pathfinder

## Pathfinder X & Y Planning Report



|                  |                |                                     |                                       |
|------------------|----------------|-------------------------------------|---------------------------------------|
| <b>Company:</b>  | Mack Energy    | <b>Local Co-ordinate Reference:</b> | Well #1H                              |
| <b>Project:</b>  | Lea County     | <b>TVD Reference:</b>               | WELL @ 4309.00ft (Original Well Elev) |
| <b>Site:</b>     | Bull Bat State | <b>MD Reference:</b>                | WELL @ 4309.00ft (Original Well Elev) |
| <b>Well:</b>     | #1H            | <b>North Reference:</b>             | Grid                                  |
| <b>Wellbore:</b> | OH             | <b>Survey Calculation Method:</b>   | Minimum Curvature                     |
| <b>Design:</b>   | Plan #1        | <b>Database:</b>                    | Midland Database                      |

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project     |                                      | Lea 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                  |  | Bull Bat State |  |                              |  |
| Site Position:        |  | Northing:      |  | 742,767.300 ft               |  |
| From: Map             |  | Easting:       |  | 695,838.900 ft               |  |
| Position Uncertainty: |  | Slot Radius:   |  | "                            |  |
| 0.00 ft               |  |                |  | Latitude: 33° 2' 25.053 N    |  |
|                       |  |                |  | Longitude: 103° 41' 39.370 W |  |
|                       |  |                |  | Grid Convergence: 0.35 °     |  |

|                      |      |         |                     |                |               |                   |
|----------------------|------|---------|---------------------|----------------|---------------|-------------------|
| Well                 |      | #1H     |                     |                |               |                   |
| Well Position        | +N-S | 0.00 ft | Northing:           | 742,767.300 ft | Latitude:     | 33° 2' 25.053 N   |
|                      | +E-W | 0.00 ft | Easting:            | 695,838.900 ft | Longitude:    | 103° 41' 39.370 W |
| Position Uncertainty |      | 0.00 ft | Wellhead Elevation: | ft             | Ground Level: | 4,279.00 ft       |

|           |            |             |                    |                  |                        |
|-----------|------------|-------------|--------------------|------------------|------------------------|
| Wellbore  | OH         |             |                    |                  |                        |
| Magnetics | Model Name | Sample Date | Declination<br>(°) | Dip Angle<br>(°) | Field Strength<br>(nT) |
|           | IGRF200510 | 07/23/2010  | 7.80               | 60.96            | 49,208                 |

|                   |                  |         |               |           |
|-------------------|------------------|---------|---------------|-----------|
| Design            |                  | Plan #1 |               |           |
| Audit Notes:      |                  |         |               |           |
| Version:          | Phase:           | PLAN    | Tie On Depth: | 0.00      |
| Vertical Section: | Depth From (TVD) | +N-S    | +E-W          | Direction |
|                   | (ft)             | (ft)    | (ft)          | (°)       |
|                   | 0.00             | 0.00    | 0.00          | 89.78     |

|                     |            |                   |           |                |
|---------------------|------------|-------------------|-----------|----------------|
| Survey Tool Program |            | Date 07/27/2010   |           |                |
| From<br>(ft)        | To<br>(ft) | Survey (Wellbore) | Tool Name | Description    |
| 0.00                | 12,854.70  | Plan #1 (OH)      | MWD       | MWD - Standard |



Pathfinder  
Pathfinder X & Y Planning Report



|           |                |                              |                                       |
|-----------|----------------|------------------------------|---------------------------------------|
| Company:  | Mack Energy    | Local Co-ordinate Reference: | Well #1H                              |
| Project:  | Lea County     | TVD Reference:               | WELL @ 4309.00ft (Original Well Elev) |
| Site:     | Bull Bat State | MD Reference:                | WELL @ 4309.00ft (Original Well Elev) |
| Well:     | #1H            | North Reference:             | Grid                                  |
| Wellbore: | OH             | Survey Calculation Method:   | Minimum Curvature                     |
| Design:   | Plan #1        | Database:                    | Midland Database                      |

| Planned Survey |            |            |             |               |             |             |                |                   |                  |                 |  |
|----------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|--|
| MD<br>(ft)     | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |  |
| 0.00           | 0.00       | 0.00       | 0.00        | -4,309.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 100.00         | 0.00       | 0.00       | 100.00      | -4,209.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 200.00         | 0.00       | 0.00       | 200.00      | -4,109.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 300.00         | 0.00       | 0.00       | 300.00      | -4,009.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 400.00         | 0.00       | 0.00       | 400.00      | -3,909.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 500.00         | 0.00       | 0.00       | 500.00      | -3,809.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 600.00         | 0.00       | 0.00       | 600.00      | -3,709.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 700.00         | 0.00       | 0.00       | 700.00      | -3,609.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 800.00         | 0.00       | 0.00       | 800.00      | -3,509.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 900.00         | 0.00       | 0.00       | 900.00      | -3,409.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,000.00       | 0.00       | 0.00       | 1,000.00    | -3,309.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,100.00       | 0.00       | 0.00       | 1,100.00    | -3,209.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,200.00       | 0.00       | 0.00       | 1,200.00    | -3,109.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,300.00       | 0.00       | 0.00       | 1,300.00    | -3,009.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,400.00       | 0.00       | 0.00       | 1,400.00    | -2,909.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,500.00       | 0.00       | 0.00       | 1,500.00    | -2,809.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,600.00       | 0.00       | 0.00       | 1,600.00    | -2,709.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,700.00       | 0.00       | 0.00       | 1,700.00    | -2,609.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,800.00       | 0.00       | 0.00       | 1,800.00    | -2,509.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 1,900.00       | 0.00       | 0.00       | 1,900.00    | -2,409.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,000.00       | 0.00       | 0.00       | 2,000.00    | -2,309.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,100.00       | 0.00       | 0.00       | 2,100.00    | -2,209.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,200.00       | 0.00       | 0.00       | 2,200.00    | -2,109.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,300.00       | 0.00       | 0.00       | 2,300.00    | -2,009.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,400.00       | 0.00       | 0.00       | 2,400.00    | -1,909.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,500.00       | 0.00       | 0.00       | 2,500.00    | -1,809.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |
| 2,600.00       | 0.00       | 0.00       | 2,600.00    | -1,709.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |  |





# Pathfinder

## Pathfinder X & Y Planning Report



|           |                |                              |                                       |
|-----------|----------------|------------------------------|---------------------------------------|
| Company:  | Mack Energy    | Local Co-ordinate Reference: | Well #1H                              |
| Project:  | Lea County     | TVD Reference:               | WELL @ 4309.00ft (Original Well Elev) |
| Site:     | Bull Bat State | MD Reference:                | WELL @ 4309.00ft (Original Well Elev) |
| Well:     | #1H            | North Reference:             | Grid                                  |
| Wellbore: | OH             | Survey Calculation Method:   | Minimum Curvature                     |
| Design:   | Plan #1        | Database:                    | Midland Database                      |

### Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |
|------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|
| 2,700.00   | 0.00       | 0.00       | 2,700.00    | -1,609.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 2,800.00   | 0.00       | 0.00       | 2,800.00    | -1,509.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 2,900.00   | 0.00       | 0.00       | 2,900.00    | -1,409.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,000.00   | 0.00       | 0.00       | 3,000.00    | -1,309.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,100.00   | 0.00       | 0.00       | 3,100.00    | -1,209.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,200.00   | 0.00       | 0.00       | 3,200.00    | -1,109.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,300.00   | 0.00       | 0.00       | 3,300.00    | -1,009.00     | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,400.00   | 0.00       | 0.00       | 3,400.00    | -909.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,500.00   | 0.00       | 0.00       | 3,500.00    | -809.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,600.00   | 0.00       | 0.00       | 3,600.00    | -709.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,700.00   | 0.00       | 0.00       | 3,700.00    | -609.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,800.00   | 0.00       | 0.00       | 3,800.00    | -509.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 3,900.00   | 0.00       | 0.00       | 3,900.00    | -409.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 4,000.00   | 0.00       | 0.00       | 4,000.00    | -309.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 4,100.00   | 0.00       | 0.00       | 4,100.00    | -209.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 4,200.00   | 0.00       | 0.00       | 4,200.00    | -109.00       | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 4,220.00   | 0.00       | 0.00       | 4,220.00    | -89.00        | 0.00        | 0.00        | 0.00           | 0.00              | 742,767.30       | 695,838.90      |
| 4,300.00   | 2.00       | 90.00      | 4,299.98    | -9.02         | 0.00        | 1.40        | 1.40           | 2.50              | 742,767.30       | 695,840.30      |
| 4,400.00   | 4.50       | 90.00      | 4,399.82    | 90.82         | 0.00        | 7.06        | 7.06           | 2.50              | 742,767.30       | 695,845.96      |
| 4,500.00   | 7.00       | 90.00      | 4,499.30    | 190.30        | 0.00        | 17.08       | 17.08          | 2.50              | 742,767.30       | 695,855.98      |
| 4,517.50   | 7.44       | 90.00      | 4,516.66    | 207.66        | 0.00        | 19.28       | 19.28          | 2.50              | 742,767.30       | 695,858.18      |
| 4,600.00   | 7.44       | 90.00      | 4,598.47    | 289.47        | 0.00        | 29.96       | 29.96          | 0.00              | 742,767.30       | 695,868.86      |
| 4,700.00   | 7.44       | 90.00      | 4,697.63    | 388.63        | 0.00        | 42.91       | 42.90          | 0.00              | 742,767.30       | 695,881.81      |
| 4,800.00   | 7.44       | 90.00      | 4,796.79    | 487.79        | 0.00        | 55.85       | 55.85          | 0.00              | 742,767.30       | 695,894.75      |
| 4,900.00   | 7.44       | 90.00      | 4,895.95    | 586.95        | 0.00        | 68.79       | 68.79          | 0.00              | 742,767.30       | 695,907.69      |
| 5,000.00   | 7.44       | 90.00      | 4,995.11    | 686.11        | 0.00        | 81.74       | 81.74          | 0.00              | 742,767.30       | 695,920.64      |
| 5,100.00   | 7.44       | 90.00      | 5,094.26    | 785.26        | 0.00        | 94.68       | 94.68          | 0.00              | 742,767.30       | 695,933.58      |



# Pathfinder

## Pathfinder X & Y Planning Report



|           |                |                              |                                       |
|-----------|----------------|------------------------------|---------------------------------------|
| Company:  | Mack Energy    | Local Co-ordinate Reference: | Well #1H                              |
| Project:  | Lea County     | TVD Reference:               | WELL @ 4309.00ft (Original Well Elev) |
| Site:     | Bull Bat State | MD Reference:                | WELL @ 4309.00ft (Original Well Elev) |
| Well:     | #1H            | North Reference:             | Grid                                  |
| Wellbore: | OH             | Survey Calculation Method:   | Minimum Curvature                     |
| Design:   | Plan #1        | Database:                    | Midland Database                      |

| Planned Survey |            |            |             |               |             |             |                |                   |                  |                 |  |
|----------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|--|
| MD<br>(ft)     | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |  |
| 5,200.00       | 7.44       | 90.00      | 5,193.42    | 884.42        | 0.00        | 107.63      | 107.63         | 0.00              | 742,767.30       | 695,946.53      |  |
| 5,300.00       | 7.44       | 90.00      | 5,292.58    | 983.58        | 0.00        | 120.57      | 120.57         | 0.00              | 742,767.30       | 695,959.47      |  |
| 5,400.00       | 7.44       | 90.00      | 5,391.74    | 1,082.74      | 0.00        | 133.52      | 133.51         | 0.00              | 742,767.30       | 695,972.42      |  |
| 5,500.00       | 7.44       | 90.00      | 5,490.90    | 1,181.90      | 0.00        | 146.46      | 146.46         | 0.00              | 742,767.30       | 695,985.36      |  |
| 5,600.00       | 7.44       | 90.00      | 5,590.06    | 1,281.06      | 0.00        | 159.40      | 159.40         | 0.00              | 742,767.30       | 695,998.30      |  |
| 5,700.00       | 7.44       | 90.00      | 5,689.22    | 1,380.22      | 0.00        | 172.35      | 172.35         | 0.00              | 742,767.30       | 696,011.25      |  |
| 5,764.67       | 7.44       | 90.00      | 5,753.34    | 1,444.34      | 0.00        | 180.72      | 180.72         | 0.00              | 742,767.30       | 696,019.62      |  |
| 5,800.00       | 6.55       | 90.00      | 5,788.41    | 1,479.41      | 0.00        | 185.02      | 185.02         | 2.50              | 742,767.30       | 696,023.92      |  |
| 5,900.00       | 4.05       | 90.00      | 5,887.97    | 1,578.97      | 0.00        | 194.27      | 194.26         | 2.50              | 742,767.30       | 696,033.17      |  |
| 6,000.00       | 1.55       | 90.00      | 5,987.85    | 1,678.85      | 0.00        | 199.16      | 199.16         | 2.50              | 742,767.30       | 696,038.06      |  |
| 6,062.16       | 0.00       | 0.00       | 6,050.00    | 1,741.00      | 0.00        | 200.00      | 200.00         | 2.50              | 742,767.30       | 696,038.90      |  |
| Vert PT(BB#2H) |            |            |             |               |             |             |                |                   |                  |                 |  |
| 6,100.00       | 0.00       | 0.00       | 6,087.84    | 1,778.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,200.00       | 0.00       | 0.00       | 6,187.84    | 1,878.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,300.00       | 0.00       | 0.00       | 6,287.84    | 1,978.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,400.00       | 0.00       | 0.00       | 6,387.84    | 2,078.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,500.00       | 0.00       | 0.00       | 6,487.84    | 2,178.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,600.00       | 0.00       | 0.00       | 6,587.84    | 2,278.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,700.00       | 0.00       | 0.00       | 6,687.84    | 2,378.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,800.00       | 0.00       | 0.00       | 6,787.84    | 2,478.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 6,900.00       | 0.00       | 0.00       | 6,887.84    | 2,578.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,000.00       | 0.00       | 0.00       | 6,987.84    | 2,678.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,100.00       | 0.00       | 0.00       | 7,087.84    | 2,778.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,200.00       | 0.00       | 0.00       | 7,187.84    | 2,878.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,300.00       | 0.00       | 0.00       | 7,287.84    | 2,978.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,400.00       | 0.00       | 0.00       | 7,387.84    | 3,078.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,500.00       | 0.00       | 0.00       | 7,487.84    | 3,178.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |



# Pathfinder

## Pathfinder X & Y Planning Report



|           |                |                              |                                       |
|-----------|----------------|------------------------------|---------------------------------------|
| Company:  | Mack Energy    | Local Co-ordinate Reference: | Well #1H                              |
| Project:  | Lea County     | TVD Reference:               | WELL @ 4309.00ft (Original Well Elev) |
| Site:     | Bull Bat State | MD Reference:                | WELL @ 4309.00ft (Original Well Elev) |
| Well:     | #1H            | North Reference:             | Gnd                                   |
| Wellbore: | OH             | Survey Calculation Method:   | Minimum Curvature                     |
| Design:   | Plan #1        | Database:                    | Midland Database                      |

| Planned Survey |            |            |             |               |             |             |                |                   |                  |                 |  |
|----------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|--|
| MD<br>(ft)     | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |  |
| 7,600.00       | 0.00       | 0.00       | 7,587.84    | 3,278.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,700.00       | 0.00       | 0.00       | 7,687.84    | 3,378.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,800.00       | 0.00       | 0.00       | 7,787.84    | 3,478.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 7,900.00       | 0.00       | 0.00       | 7,887.84    | 3,578.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,000.00       | 0.00       | 0.00       | 7,987.84    | 3,678.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,100.00       | 0.00       | 0.00       | 8,087.84    | 3,778.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,200.00       | 0.00       | 0.00       | 8,187.84    | 3,878.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,300.00       | 0.00       | 0.00       | 8,287.84    | 3,978.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,400.00       | 0.00       | 0.00       | 8,387.84    | 4,078.84      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,417.16       | 0.00       | 0.00       | 8,405.00    | 4,096.00      | 0.00        | 200.00      | 200.00         | 0.00              | 742,767.30       | 696,038.90      |  |
| 8,450.00       | 3.06       | 89.72      | 8,437.82    | 4,128.82      | 0.00        | 200.88      | 200.88         | 9.33              | 742,767.30       | 696,039.78      |  |
| 8,500.00       | 7.73       | 89.72      | 8,487.59    | 4,178.59      | 0.03        | 205.58      | 205.58         | 9.33              | 742,767.33       | 696,044.48      |  |
| 8,550.00       | 12.39      | 89.72      | 8,536.80    | 4,227.80      | 0.07        | 214.31      | 214.31         | 9.33              | 742,767.37       | 696,053.21      |  |
| 8,600.00       | 17.06      | 89.72      | 8,585.15    | 4,276.15      | 0.13        | 227.02      | 227.01         | 9.33              | 742,767.43       | 696,065.92      |  |
| 8,650.00       | 21.72      | 89.72      | 8,632.30    | 4,323.30      | 0.21        | 243.61      | 243.61         | 9.33              | 742,767.51       | 696,082.51      |  |
| 8,700.00       | 26.39      | 89.72      | 8,677.95    | 4,368.95      | 0.31        | 263.98      | 263.98         | 9.33              | 742,767.61       | 696,102.88      |  |
| 8,750.00       | 31.05      | 89.72      | 8,721.78    | 4,412.78      | 0.43        | 288.00      | 288.00         | 9.33              | 742,767.73       | 696,126.90      |  |
| 8,800.00       | 35.72      | 89.72      | 8,763.52    | 4,454.52      | 0.56        | 315.51      | 315.51         | 9.33              | 742,767.86       | 696,154.41      |  |
| 8,850.00       | 40.38      | 89.72      | 8,802.89    | 4,493.89      | 0.72        | 346.31      | 346.31         | 9.33              | 742,768.02       | 696,185.21      |  |
| 8,900.00       | 45.04      | 89.72      | 8,839.61    | 4,530.61      | 0.88        | 380.22      | 380.22         | 9.33              | 742,768.18       | 696,219.12      |  |
| 8,950.00       | 49.71      | 89.72      | 8,873.46    | 4,564.46      | 1.06        | 417.00      | 417.00         | 9.33              | 742,768.36       | 696,255.90      |  |
| 9,000.00       | 54.37      | 89.72      | 8,904.21    | 4,595.21      | 1.25        | 456.41      | 456.41         | 9.33              | 742,768.55       | 696,295.31      |  |
| 9,050.00       | 59.04      | 89.72      | 8,931.65    | 4,622.65      | 1.46        | 498.19      | 498.20         | 9.33              | 742,768.76       | 696,337.09      |  |
| 9,100.00       | 63.70      | 89.72      | 8,955.60    | 4,646.60      | 1.67        | 542.07      | 542.07         | 9.33              | 742,768.97       | 696,380.97      |  |
| 9,150.00       | 68.37      | 89.72      | 8,975.90    | 4,666.90      | 1.89        | 587.75      | 587.75         | 9.33              | 742,769.19       | 696,426.65      |  |
| 9,200.00       | 73.03      | 89.72      | 8,992.42    | 4,683.42      | 2.13        | 634.92      | 634.93         | 9.33              | 742,769.43       | 696,473.82      |  |
| 9,250.00       | 77.70      | 89.72      | 9,005.05    | 4,696.05      | 2.36        | 683.29      | 683.29         | 9.33              | 742,769.66       | 696,522.19      |  |



# Pathfinder

## Pathfinder X & Y Planning Report



Company: Mack Energy  
Project: Lea County  
Site: Bull Bat State  
Well: #1H  
Wellbore: OH  
Design: Plan #1

Local Co-ordinate Reference: Well #1H  
TVD Reference: WELL @ 4309.00ft (Original Well Elev)  
MD Reference: WELL @ 4309.00ft (Original Well Elev)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: Midland Database

### Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |
|------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|
| 9,300.00   | 82.36      | 89.72      | 9,013.71    | 4,704.71      | 2.60        | 732.52      | 732.52         | 9.33              | 742,769.90       | 696,571.42      |
| 9,350.00   | 87.03      | 89.72      | 9,018.33    | 4,709.33      | 2.85        | 782.29      | 782.29         | 9.33              | 742,770.15       | 696,621.19      |
| 9,368.05   | 88.71      | 89.72      | 9,019.00    | 4,710.00      | 2.93        | 800.32      | 800.33         | 9.33              | 742,770.23       | 696,639.22      |
| 9,400.00   | 88.07      | 89.73      | 9,019.90    | 4,710.90      | 3.09        | 832.26      | 832.27         | 2.00              | 742,770.39       | 696,671.16      |
| 9,448.98   | 87.09      | 89.75      | 9,021.96    | 4,712.96      | 3.31        | 881.20      | 881.20         | 2.00              | 742,770.61       | 696,720.10      |
| 9,500.00   | 87.09      | 89.75      | 9,024.55    | 4,715.55      | 3.54        | 932.15      | 932.16         | 0.00              | 742,770.84       | 696,771.05      |
| 9,567.93   | 87.09      | 89.75      | 9,028.00    | 4,719.00      | 3.84        | 999.99      | 1,000.00       | 0.00              | 742,771.14       | 696,838.89      |
| TGT1(BB#1) |            |            |             |               |             |             |                |                   |                  |                 |
| 9,600.00   | 87.73      | 89.76      | 9,029.45    | 4,720.45      | 3.98        | 1,032.03    | 1,032.04       | 2.00              | 742,771.28       | 696,870.93      |
| 9,650.94   | 88.75      | 89.78      | 9,031.01    | 4,722.01      | 4.18        | 1,082.94    | 1,082.95       | 2.00              | 742,771.48       | 696,921.84      |
| 9,700.00   | 88.75      | 89.78      | 9,032.08    | 4,723.08      | 4.37        | 1,131.99    | 1,132.00       | 0.00              | 742,771.67       | 696,970.89      |
| 9,800.00   | 88.75      | 89.78      | 9,034.26    | 4,725.26      | 4.75        | 1,231.97    | 1,231.98       | 0.00              | 742,772.05       | 697,070.87      |
| 9,900.00   | 88.75      | 89.78      | 9,036.44    | 4,727.44      | 5.13        | 1,331.94    | 1,331.95       | 0.00              | 742,772.43       | 697,170.84      |
| 10,000.00  | 88.75      | 89.78      | 9,038.62    | 4,729.62      | 5.51        | 1,431.92    | 1,431.93       | 0.00              | 742,772.81       | 697,270.82      |
| 10,100.00  | 88.75      | 89.78      | 9,040.80    | 4,731.80      | 5.89        | 1,531.89    | 1,531.91       | 0.00              | 742,773.19       | 697,370.79      |
| 10,200.00  | 88.75      | 89.78      | 9,042.98    | 4,733.98      | 6.28        | 1,631.87    | 1,631.88       | 0.00              | 742,773.58       | 697,470.77      |
| 10,300.00  | 88.75      | 89.78      | 9,045.16    | 4,736.16      | 6.66        | 1,731.84    | 1,731.86       | 0.00              | 742,773.96       | 697,570.74      |
| 10,400.00  | 88.75      | 89.78      | 9,047.33    | 4,738.33      | 7.04        | 1,831.82    | 1,831.83       | 0.00              | 742,774.34       | 697,670.72      |
| 10,500.00  | 88.75      | 89.78      | 9,049.51    | 4,740.51      | 7.42        | 1,931.80    | 1,931.81       | 0.00              | 742,774.72       | 697,770.70      |
| 10,568.21  | 88.75      | 89.78      | 9,051.00    | 4,742.00      | 7.68        | 1,999.99    | 2,000.00       | 0.00              | 742,774.98       | 697,838.89      |
| TGT2(BB#1) |            |            |             |               |             |             |                |                   |                  |                 |
| 10,600.00  | 88.75      | 89.78      | 9,051.69    | 4,742.69      | 7.80        | 2,031.77    | 2,031.79       | 0.00              | 742,775.10       | 697,870.67      |
| 10,700.00  | 88.75      | 89.78      | 9,053.87    | 4,744.87      | 8.18        | 2,131.75    | 2,131.76       | 0.00              | 742,775.48       | 697,970.65      |
| 10,800.00  | 88.75      | 89.78      | 9,056.05    | 4,747.05      | 8.56        | 2,231.72    | 2,231.74       | 0.00              | 742,775.86       | 698,070.62      |
| 10,900.00  | 88.75      | 89.78      | 9,058.23    | 4,749.23      | 8.94        | 2,331.70    | 2,331.72       | 0.00              | 742,776.24       | 698,170.60      |
| 11,000.00  | 88.75      | 89.78      | 9,060.41    | 4,751.41      | 9.33        | 2,431.67    | 2,431.69       | 0.00              | 742,776.63       | 698,270.57      |
| 11,100.00  | 88.75      | 89.78      | 9,062.59    | 4,753.59      | 9.71        | 2,531.65    | 2,531.67       | 0.00              | 742,777.01       | 698,370.55      |



# Pathfinder

## Pathfinder X & Y Planning Report



|           |                |                              |                                       |
|-----------|----------------|------------------------------|---------------------------------------|
| Company:  | Mack Energy    | Local Co-ordinate Reference: | Well #1H                              |
| Project:  | Lea County     | TVD Reference:               | WELL @ 4309.00ft (Original Well Elev) |
| Site:     | Bull Bat State | MD Reference:                | WELL @ 4309.00ft (Original Well Elev) |
| Well:     | #1H            | North Reference:             | Gnd                                   |
| Wellbore: | OH             | Survey Calculation Method:   | Minimum Curvature                     |
| Design:   | Plan #1        | Database:                    | Midland Database                      |

| Planned Survey |            |            |             |               |             |             |                |                   |                  |                 |  |
|----------------|------------|------------|-------------|---------------|-------------|-------------|----------------|-------------------|------------------|-----------------|--|
| MD<br>(ft)     | Inc<br>(°) | Azi<br>(°) | TVD<br>(ft) | TVDSS<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | V. Sec<br>(ft) | DLeg<br>(°/100ft) | Northing<br>(ft) | Easting<br>(ft) |  |
| 11,200.00      | 88.75      | 89.78      | 9,064.77    | 4,755.77      | 10.09       | 2,631.62    | 2,631.64       | 0.00              | 742,777.39       | 698,470.52      |  |
| 11,300.00      | 88.75      | 89.78      | 9,066.95    | 4,757.95      | 10.47       | 2,731.60    | 2,731.62       | 0.00              | 742,777.77       | 698,570.50      |  |
| 11,400.00      | 88.75      | 89.78      | 9,069.13    | 4,760.13      | 10.85       | 2,831.58    | 2,831.60       | 0.00              | 742,778.15       | 698,670.48      |  |
| 11,500.00      | 88.75      | 89.78      | 9,071.31    | 4,762.31      | 11.23       | 2,931.55    | 2,931.57       | 0.00              | 742,778.53       | 698,770.45      |  |
| 11,568.44      | 88.75      | 89.78      | 9,072.80    | 4,763.80      | 11.49       | 2,999.98    | 3,000.00       | 0.00              | 742,778.79       | 698,838.88      |  |
| 11,568.47      | 88.75      | 89.78      | 9,072.80    | 4,763.80      | 11.49       | 3,000.01    | 3,000.03       | 0.00              | 742,778.79       | 698,838.91      |  |
| TGT3(BB#1)     |            |            |             |               |             |             |                |                   |                  |                 |  |
| 11,581.14      | 88.50      | 89.78      | 9,073.10    | 4,764.10      | 11.54       | 3,012.67    | 3,012.69       | 2.00              | 742,778.84       | 698,851.57      |  |
| 11,600.00      | 88.50      | 89.78      | 9,073.60    | 4,764.60      | 11.61       | 3,031.52    | 3,031.55       | 0.00              | 742,778.91       | 698,870.42      |  |
| 11,700.00      | 88.50      | 89.78      | 9,076.22    | 4,767.22      | 12.00       | 3,131.49    | 3,131.51       | 0.00              | 742,779.30       | 698,970.39      |  |
| 11,800.00      | 88.50      | 89.78      | 9,078.84    | 4,769.84      | 12.39       | 3,231.45    | 3,231.48       | 0.00              | 742,779.69       | 699,070.35      |  |
| 11,900.00      | 88.50      | 89.78      | 9,081.46    | 4,772.46      | 12.77       | 3,331.42    | 3,331.44       | 0.00              | 742,780.07       | 699,170.32      |  |
| 12,000.00      | 88.50      | 89.78      | 9,084.09    | 4,775.09      | 13.16       | 3,431.38    | 3,431.41       | 0.00              | 742,780.46       | 699,270.28      |  |
| 12,100.00      | 88.50      | 89.78      | 9,086.71    | 4,777.71      | 13.55       | 3,531.35    | 3,531.37       | 0.00              | 742,780.85       | 699,370.25      |  |
| 12,200.00      | 88.50      | 89.78      | 9,089.33    | 4,780.33      | 13.93       | 3,631.31    | 3,631.34       | 0.00              | 742,781.23       | 699,470.21      |  |
| 12,300.00      | 88.50      | 89.78      | 9,091.95    | 4,782.95      | 14.32       | 3,731.28    | 3,731.31       | 0.00              | 742,781.62       | 699,570.18      |  |
| 12,400.00      | 88.50      | 89.78      | 9,094.57    | 4,785.57      | 14.71       | 3,831.24    | 3,831.27       | 0.00              | 742,782.01       | 699,670.14      |  |
| 12,500.00      | 88.50      | 89.78      | 9,097.20    | 4,788.20      | 15.09       | 3,931.21    | 3,931.24       | 0.00              | 742,782.39       | 699,770.11      |  |
| 12,568.79      | 88.50      | 89.78      | 9,099.00    | 4,790.00      | 15.36       | 3,999.97    | 4,000.00       | 0.00              | 742,782.66       | 699,838.87      |  |
| TGT4(BB#1)     |            |            |             |               |             |             |                |                   |                  |                 |  |
| 12,573.86      | 88.60      | 89.79      | 9,099.13    | 4,790.13      | 15.38       | 4,005.04    | 4,005.07       | 2.00              | 742,782.68       | 699,843.94      |  |
| 12,600.00      | 88.60      | 89.79      | 9,099.77    | 4,790.77      | 15.47       | 4,031.17    | 4,031.20       | 0.00              | 742,782.77       | 699,870.07      |  |
| 12,700.00      | 88.60      | 89.79      | 9,102.21    | 4,793.21      | 15.84       | 4,131.14    | 4,131.17       | 0.00              | 742,783.14       | 699,970.04      |  |
| 12,800.00      | 88.60      | 89.79      | 9,104.66    | 4,795.66      | 16.20       | 4,231.11    | 4,231.14       | 0.00              | 742,783.50       | 700,070.01      |  |
| 12,854.70      | 88.60      | 89.79      | 9,106.00    | 4,797.00      | 16.40       | 4,285.80    | 4,285.83       | 0.00              | 742,783.70       | 700,124.70      |  |
| PBHL(BB#1)     |            |            |             |               |             |             |                |                   |                  |                 |  |



Pathfinder  
Pathfinder X & Y Planning Report

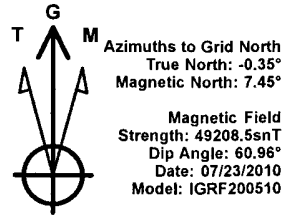


|           |                |                              |                                       |
|-----------|----------------|------------------------------|---------------------------------------|
| Company:  | Mack Energy    | Local Co-ordinate Reference: | Well #1H                              |
| Project:  | Lea County     | TVD Reference:               | WELL @ 4309.00ft (Original Well Elev) |
| Site:     | Bull Bat State | MD Reference:                | WELL @ 4309.00ft (Original Well Elev) |
| Well:     | #1H            | North Reference:             | Grid                                  |
| Wellbore: | OH             | Survey Calculation Method:   | Minimum Curvature                     |
| Design:   | Plan #1        | Database:                    | Midland Database                      |

| Targets                                                                                  |           |          |          |       |          |             |             |                 |                   |
|------------------------------------------------------------------------------------------|-----------|----------|----------|-------|----------|-------------|-------------|-----------------|-------------------|
| Target Name                                                                              | Dip Angle | Dip Dir. | TVD      | +N/-S | +E/-W    | Northing    | Easting     | Latitude        | Longitude         |
| - hit/miss target                                                                        | (°)       | (°)      | (ft)     | (ft)  | (ft)     | (ft)        | (ft)        |                 |                   |
| - Shape                                                                                  |           |          |          |       |          |             |             |                 |                   |
| Vert PT(BB#2H)                                                                           | 0.00      | 0 00     | 6,050.00 | 0.00  | 200.00   | 742,767.300 | 696,038.900 | 33° 2' 25.041 N | 103° 41' 37.020 W |
| - plan hits target center                                                                |           |          |          |       |          |             |             |                 |                   |
| - Point                                                                                  |           |          |          |       |          |             |             |                 |                   |
| TGT3(BB#1)                                                                               | 0.00      | 0.00     | 9,074.00 | 11.52 | 2,999.98 | 742,778.819 | 698,838.878 | 33° 2' 24.985 N | 103° 41' 4.128 W  |
| - plan misses target center by 1.20ft at 11568.47ft MD (9072.80 TVD, 11.49 N, 3000.00 E) |           |          |          |       |          |             |             |                 |                   |
| - Point                                                                                  |           |          |          |       |          |             |             |                 |                   |
| TGT1(BB#1)                                                                               | 0.00      | 0.00     | 9,028.00 | 3.84  | 999.99   | 742,771.140 | 696,838.893 | 33° 2' 25.030 N | 103° 41' 27.622 W |
| - plan hits target center                                                                |           |          |          |       |          |             |             |                 |                   |
| - Point                                                                                  |           |          |          |       |          |             |             |                 |                   |
| TGT4(BB#1)                                                                               | 0.00      | 0.00     | 9,099.00 | 15.36 | 3,999.97 | 742,782.659 | 699,838.871 | 33° 2' 24.961 N | 103° 40' 52.381 W |
| - plan hits target center                                                                |           |          |          |       |          |             |             |                 |                   |
| - Point                                                                                  |           |          |          |       |          |             |             |                 |                   |
| TGT2(BB#1)                                                                               | 0.00      | 0.00     | 9,051.00 | 7.68  | 1,999.99 | 742,774.979 | 697,838.885 | 33° 2' 25.008 N | 103° 41' 15.875 W |
| - plan hits target center                                                                |           |          |          |       |          |             |             |                 |                   |
| - Point                                                                                  |           |          |          |       |          |             |             |                 |                   |
| PBHL(BB#1)                                                                               | 0.00      | 0.00     | 9,106.00 | 16.40 | 4,285.80 | 742,783.700 | 700,124.700 | 33° 2' 24.954 N | 103° 40' 49.023 W |
| - plan hits target center                                                                |           |          |          |       |          |             |             |                 |                   |
| - Point                                                                                  |           |          |          |       |          |             |             |                 |                   |

|                   |                    |             |
|-------------------|--------------------|-------------|
| Checked By: _____ | Approved By: _____ | Date: _____ |
|-------------------|--------------------|-------------|



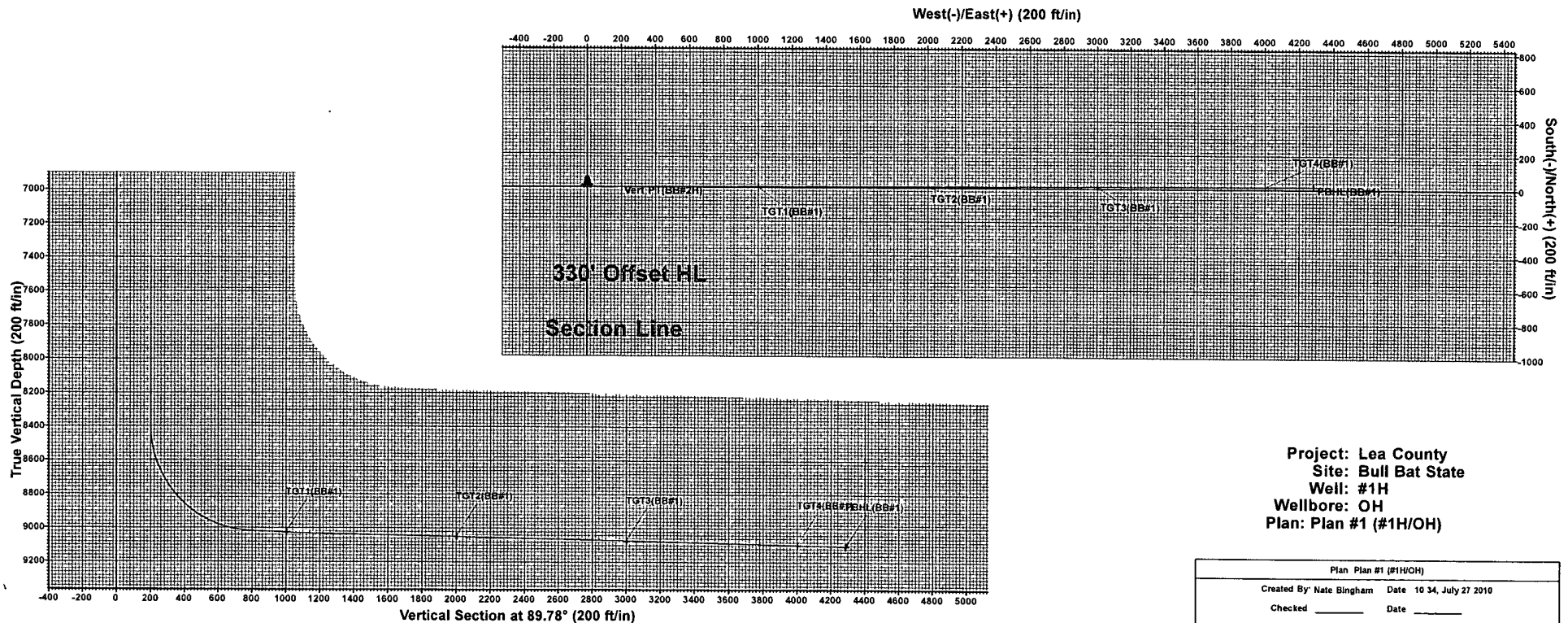


| WELL DETAILS #1H |      |                                       |            |                 |                   |      |  |
|------------------|------|---------------------------------------|------------|-----------------|-------------------|------|--|
| Ground Elevation |      | 4279.00                               |            |                 |                   |      |  |
| RKB Elevation    |      | WELL @ 4309.00ft (Original Well Elev) |            |                 |                   |      |  |
| Rig Name         |      | Original Well Elev                    |            |                 |                   |      |  |
| +N-S             | +E-W | Northing                              | Easting    | Latitude        | Longitude         | Slot |  |
| 0.00             | 0.00 | 742767.300                            | 695838.900 | 33° 2' 25.053 N | 103° 41' 39.370 W |      |  |

PROJECT DETAILS: Lea County  
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

| WELLBORE TARGET DETAILS |         |       |         |       |
|-------------------------|---------|-------|---------|-------|
| Name                    | TVD     | +N-S  | +E-W    | Shape |
| Vert PT(BB#2H)          | 6050.00 | 0.00  | 200.00  | Point |
| TGT1(BB#1)              | 9028.00 | 3.84  | 999.99  | Point |
| TGT2(BB#1)              | 9051.00 | 7.68  | 1999.99 | Point |
| TGT3(BB#1)              | 9074.00 | 11.52 | 2999.99 | Point |
| TGT4(BB#1)              | 9099.00 | 15.36 | 3999.97 | Point |
| PBHL(BB#1)              | 9106.00 | 16.40 | 4285.80 | Point |

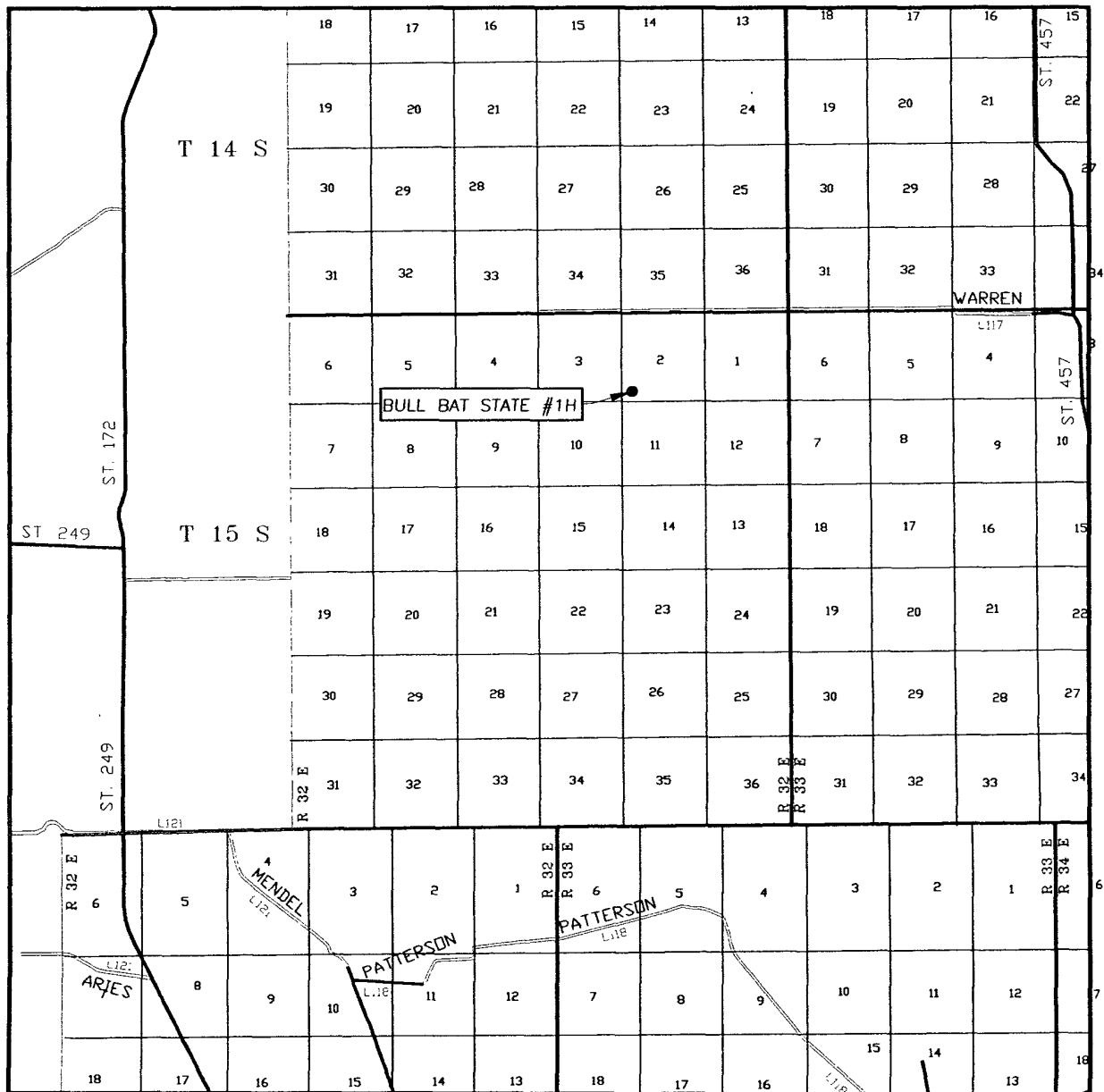
| SECTION DETAILS |          |       |       |         |       |         |      |         |         |                |
|-----------------|----------|-------|-------|---------|-------|---------|------|---------|---------|----------------|
| Sec             | MD       | Inc   | Azi   | TVD     | +N-S  | +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               | 4220.00  | 0.00  | 0.00  | 4220.00 | 0.00  | 0.00    | 0.00 | 0.00    | 0.00    |                |
| 3               | 4517.50  | 7.44  | 90.00 | 4516.66 | 0.00  | 19.28   | 2.50 | 90.00   | 19.28   |                |
| 4               | 5764.67  | 7.44  | 90.00 | 5753.34 | 0.00  | 180.72  | 0.00 | 0.00    | 180.72  |                |
| 5               | 6062.16  | 0.00  | 0.00  | 6050.00 | 0.00  | 200.00  | 2.50 | 180.00  | 200.00  | Vert PT(BB#2H) |
| 6               | 8417.16  | 0.00  | 0.00  | 8405.00 | 0.00  | 200.00  | 0.00 | 0.00    | 200.00  |                |
| 7               | 9368.05  | 88.71 | 89.72 | 9019.00 | 2.93  | 800.32  | 9.33 | 89.72   | 800.33  |                |
| 8               | 9448.98  | 87.09 | 89.75 | 9021.96 | 3.31  | 881.20  | 2.00 | 179.11  | 881.20  |                |
| 9               | 9567.93  | 87.09 | 89.75 | 9028.00 | 3.84  | 999.99  | 0.00 | 0.00    | 1000.00 | TGT1(BB#1)     |
| 10              | 9650.94  | 88.75 | 89.78 | 9031.01 | 4.16  | 1082.94 | 2.00 | 1.26    | 1082.95 |                |
| 11              | 11058.21 | 88.75 | 89.78 | 9051.00 | 7.68  | 1999.99 | 0.00 | 0.00    | 2000.00 | TGT2(BB#1)     |
| 12              | 11568.44 | 88.75 | 89.78 | 9072.80 | 11.49 | 2999.98 | 0.00 | 0.00    | 3000.00 | TGT3(BB#1)     |
| 13              | 11581.14 | 88.50 | 89.78 | 9073.10 | 11.54 | 3012.67 | 2.00 | -179.32 | 3012.69 |                |
| 14              | 12568.79 | 88.50 | 89.78 | 9099.00 | 15.36 | 3999.97 | 0.00 | 0.00    | 4000.00 | TGT4(BB#1)     |
| 15              | 12573.86 | 88.60 | 89.79 | 9099.13 | 15.38 | 4005.04 | 2.00 | 7.33    | 4005.07 |                |
| 16              | 12894.70 | 88.60 | 89.79 | 9106.00 | 16.40 | 4285.80 | 0.00 | 0.00    | 4285.83 | PBHL(BB#1)     |



Project: Lea County  
Site: Bull Bat State  
Well: #1H  
Wellbore: OH  
Plan: Plan #1 (#1H/OH)

| Plan Plan #1 (#1H/OH)    |                  |
|--------------------------|------------------|
| Created By: Nate Bingham | Date: 10/31/2010 |
| Checked: _____           | Date: _____      |

# VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 2 TWP. 15-S RGE. 32-E

SURVEY N.M.P.M.

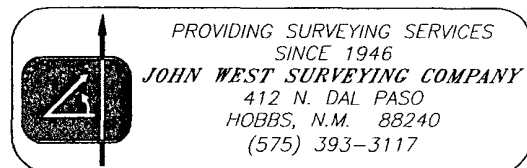
COUNTY LEA STATE NEW MEXICO

DESCRIPTION 660' FSL & 660' FWL

ELEVATION 4279'

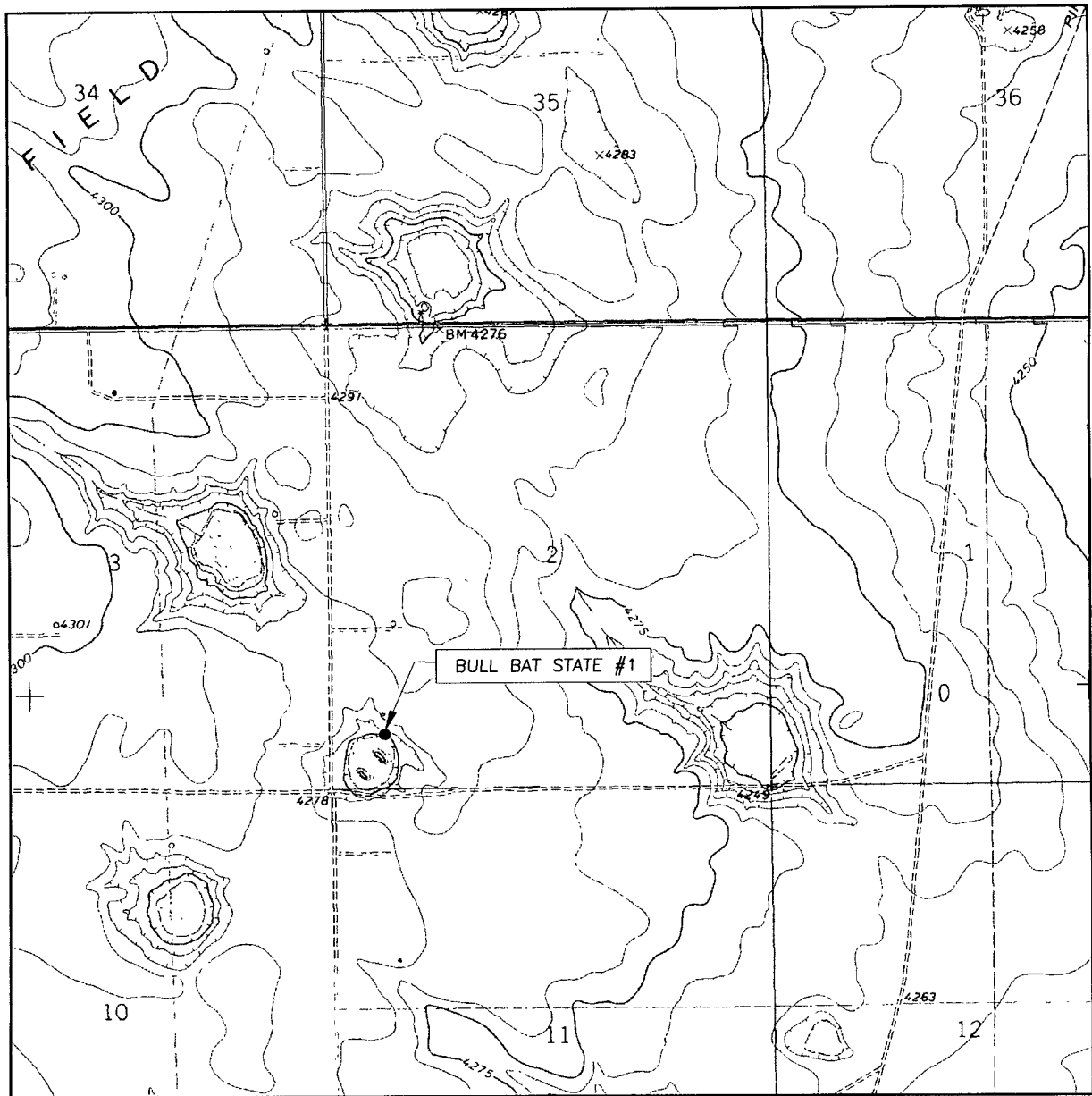
OPERATOR MACK ENERGY CORPORATION

LEASE BULL BAT STATE





# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL  
DEAN RANCH, N.M. - 5'

SEC. 2 TWP. 15-S RGE. 32-E

SURVEY \_\_\_\_\_ N.M.P.M.

COUNTY LEA STATE NEW MEXICO

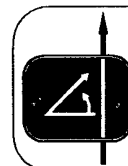
DESCRIPTION 660' FSL & 660' FWL

ELEVATION 4279'

OPERATOR MACK ENERGY CORPORATION

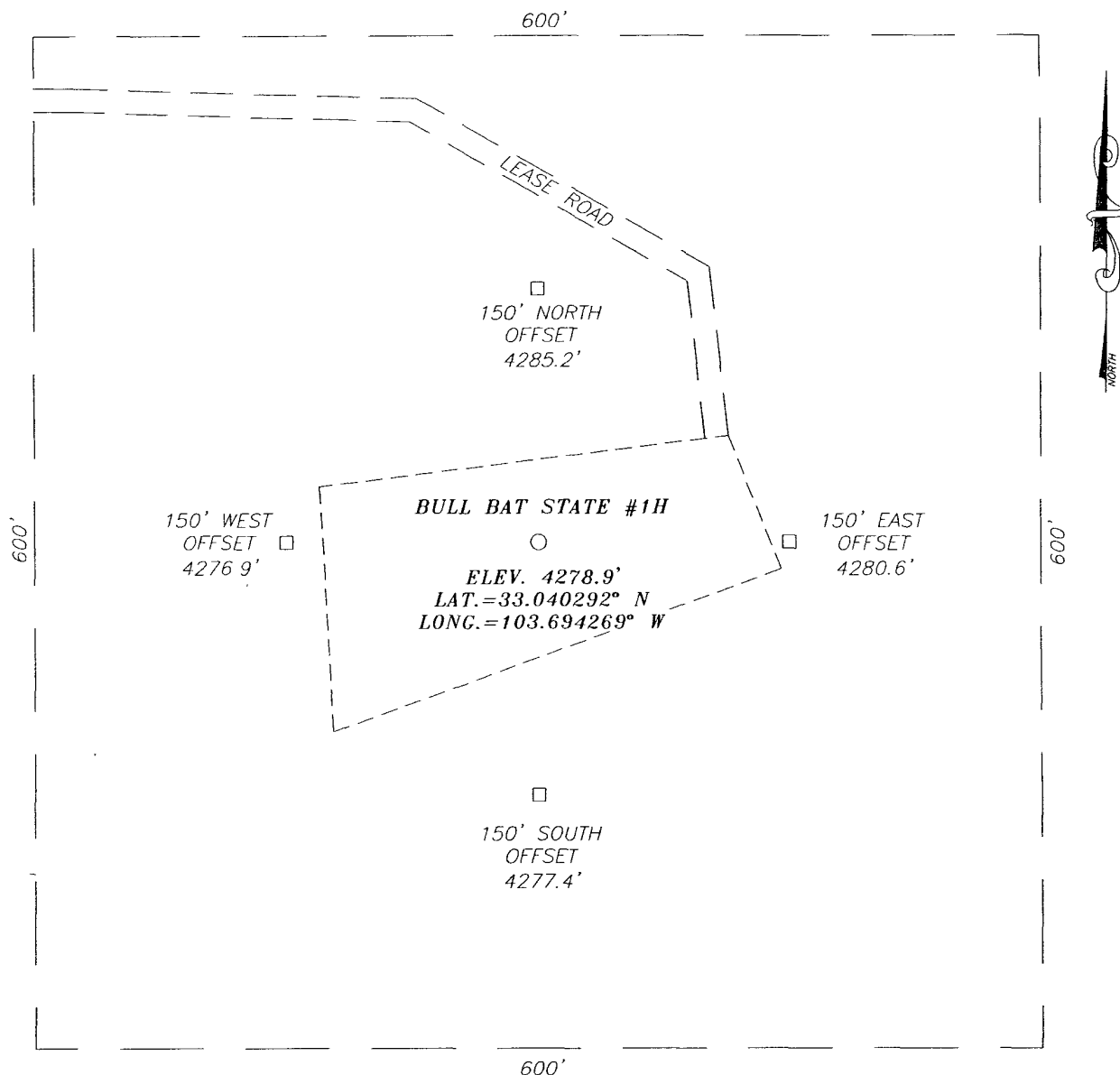
LEASE BULL BAT STATE

U.S.G.S. TOPOGRAPHIC MAP  
DEAN RANCH, N.M.



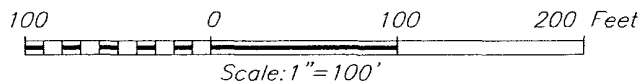
PROVIDING SURVEYING SERVICES  
SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
412 N. DAL PASO  
HOBBS, N.M. 88240  
(575) 393-3117

**SECTION 2, TOWNSHIP 15 SOUTH, RANGE 32 EAST, N.M.P.M.,**  
 LEA COUNTY, NEW MEXICO



**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF ST HWY. #457 AND CO. RD. #117 (WARREN ROAD) GO WEST ON WARREN ROAD APPROX. 5.5 MILES. TURN LEFT AND GO SOUTH APPROX. 0.8 MILES. TURN LEFT AND GO EAST APPROX. 750 FEET. CONTINUE SOUTH APPROX. 200 FEET TO THIS LOCATION



PROVIDING SURVEYING SERVICES  
 SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO  
 HOBBS, N.M. 88240  
 (575) 393-3117

**MACK ENERGY CORPORATION**

BULL BAT STATE #1H WELL  
 LOCATED 660 FEET FROM THE SOUTH LINE  
 AND 660 FEET FROM THE WEST LINE OF SECTION 2,  
 TOWNSHIP 15 SOUTH, RANGE 32 EAST, N.M.P.M.,  
 LEA COUNTY, NEW MEXICO.

|                         |                     |
|-------------------------|---------------------|
| Survey Date: 7/9/10     | Sheet 1 of 1 Sheets |
| W.O. Number: 10.11.0929 | Dr By: LA           |
| Date: 7/20/10           | 10110929            |
|                         | Scale: 1"=100'      |