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AT 5-08-311

APR - 3 2008

OCD-ARTESIA

Form 3160-3  
(April 2004)

OCD-ARTESIA

491

FORM APPROVED  
OMB No 1004-0137  
Expires March 31, 2007

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NM-060894
1b Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6 If Indian, Allottee or Tribe Name
2 Name of Operator Mack Energy Corporation 13837		7 If Unit or CA Agreement, Name and No
3a Address P.O. Box 960 Artesia, NM 88211-0960	3b Phone No (include area code) (505)748-1288	8, Lease Name and Well No. Longhorns Federal #1
4 Location of Well (Report location clearly and announce with any State requirements*) At surface 2410 FNL & 2310 FWL At proposed prod zone 2310 FNI & 2310 FWL		9 API Well No. 30-015-36259
14 Distance in miles and direction from nearest town or post office* 7 miles southeast of Artesia, NM		10 Field and Pool, or Exploratory Red Lake; Glorieta-Yeso
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg unit line, if any) 345	16. No. of acres in lease 356.61	11 Sec., T. R. M. or Blk. and Survey or Area Sec. 6 T18S R27E
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease; ft 585	19. Proposed Depth 4710 MTD 4700 TVD	12 County or Parish Eddy
20. BLM/BIA Bond No on file NMB000286	21 Elevations (Show whether DF, KDB, RT, GL, etc) 3415' GR	13 State NM
22 Approximate date work will start* 4/1/08	23 Estimated duration 12 days	

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

- |   |   |
|---|---|
| 1. Well plat certified by a registered surveyor   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above),   |
| 2. A Drilling Plan.   | 5. Operator certification   |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer |

25 Signature <i>Jerry W. Sherrell</i>	Name (Printed/Typed) Jerry W. Sherrell	Date 2/8/08
Title Production Clerk		
Approved by (Signature) <i>/s/ Don Peterson</i>	Name (Printed/Typed) <i>/s/ Don Peterson</i>	Date APR 01 2008
Title FOR FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Conditions of approval, if any, are attached

**APPROVAL FOR TWO YEARS**

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.

\*(Instructions on page 2)

**ROSWELL CONTROLLED WATER BASIN**

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

**APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED**

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

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102

DISTRICT II  
1301 W. GRAND AVENUE, ARTESIA, NM 88210

**OIL CONSERVATION DIVISION**  
1220 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505

Revised October 12, 2005  
Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV  
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

AMENDED REPORT

API Number	Pool Code 51120	Pool Name Red Lake;Glorieta-Yeso
Property Code <b>37109</b>	Property Name LONGHORNS FEDERAL	Well Number 1
OGRID No. 013837	Operator Name MACK ENERGY CORPORATION	Elevation 3415'

Surface Location

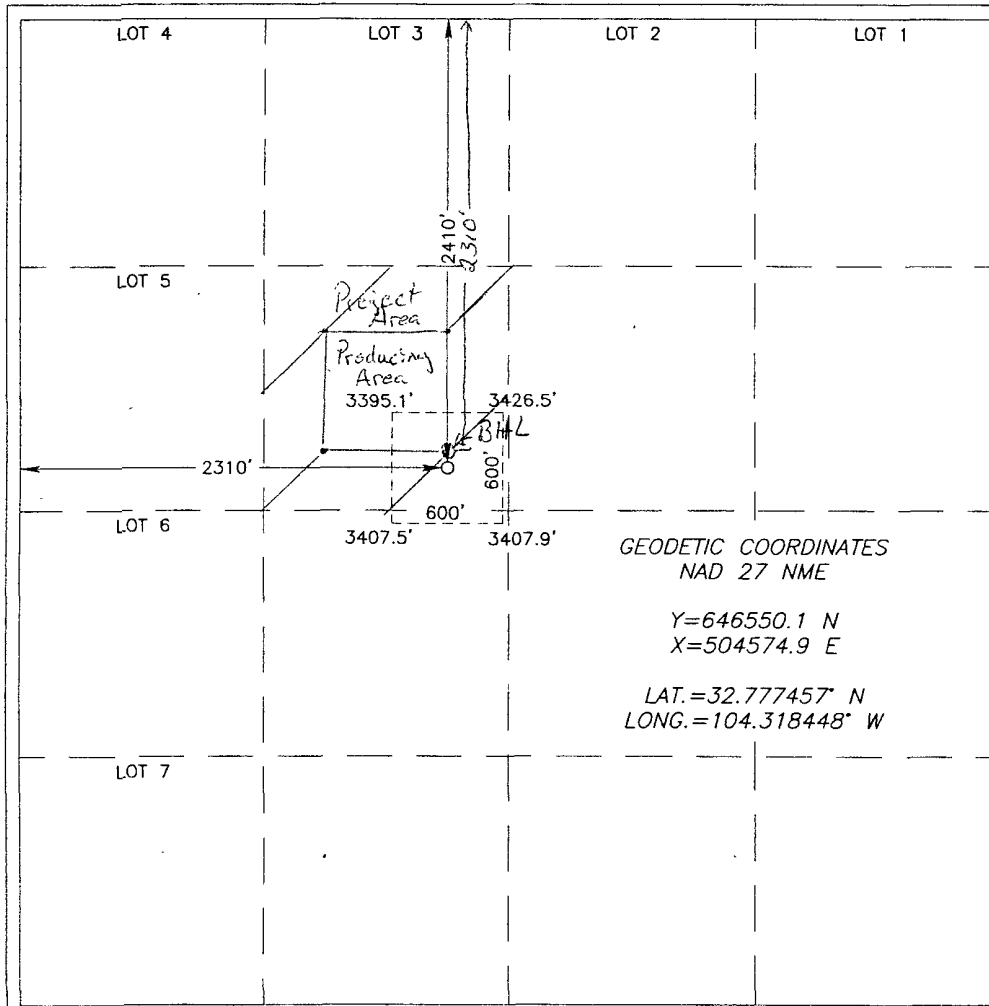
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/EAST line	County
F	6	18-S	27-E		2410	NORTH	2310	WEST	EDDY

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/EAST line	County
F	6	18S	27E		2310	NORTH	2310	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
40			

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



**OPERATOR CERTIFICATION**

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.

*Jerry W. Sherrell* 2/8/08  
Signature Date  
Jerry W. Sherrell  
Printed Name

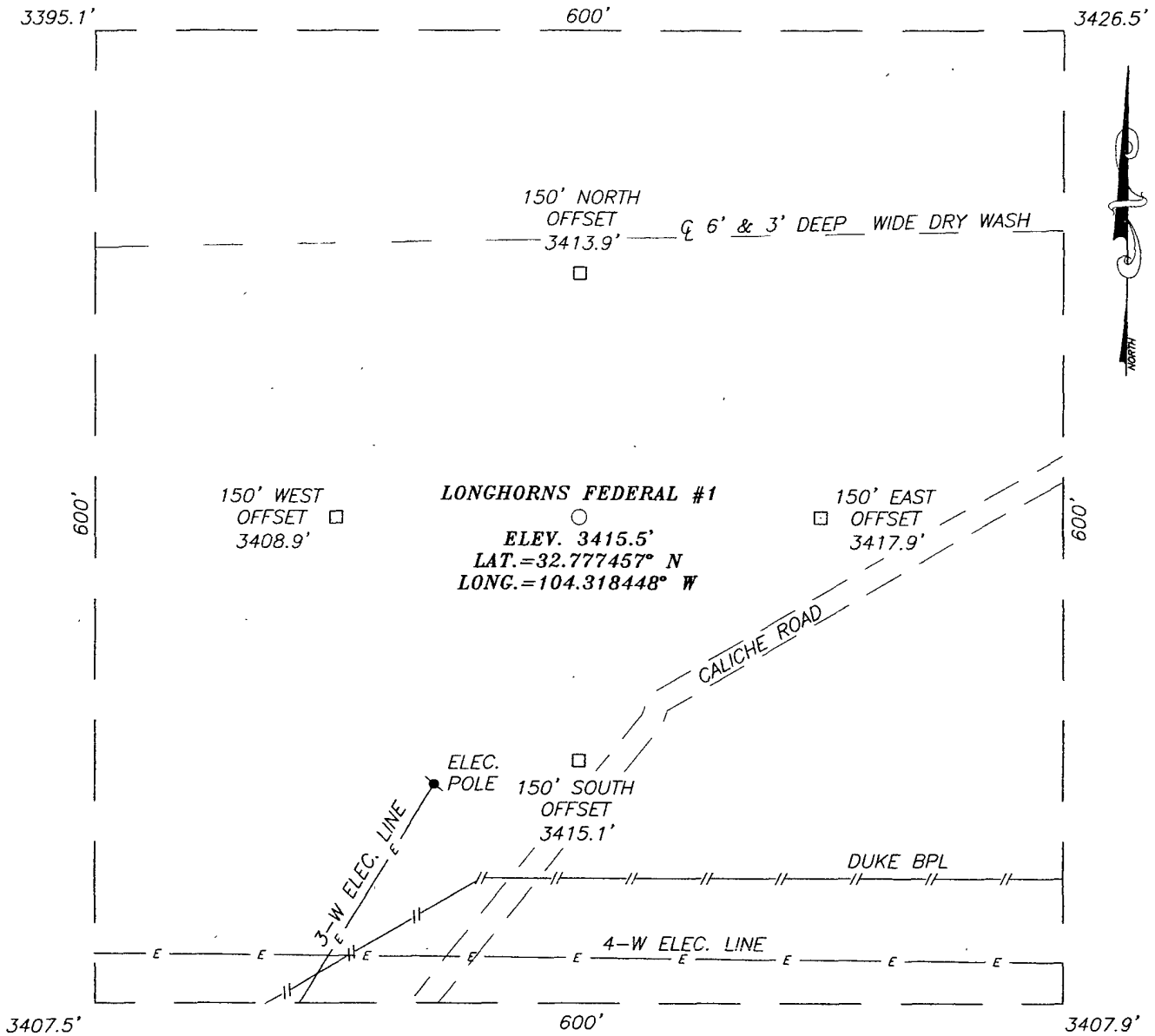
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**SURVEYOR CERTIFICATION**

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.

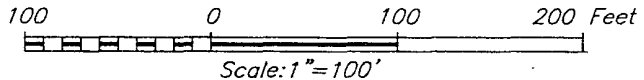
JANUARY 11 2008  
Date Surveyed  
Signature & Seal of Professional Surveyor  
*Ronald J. Edson*  
3239  
01-11-2008  
Certificate No. GARY, G. EIDSON 12841  
RONALD J. EIDSON 3239

SECTION 6, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M.,  
 EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

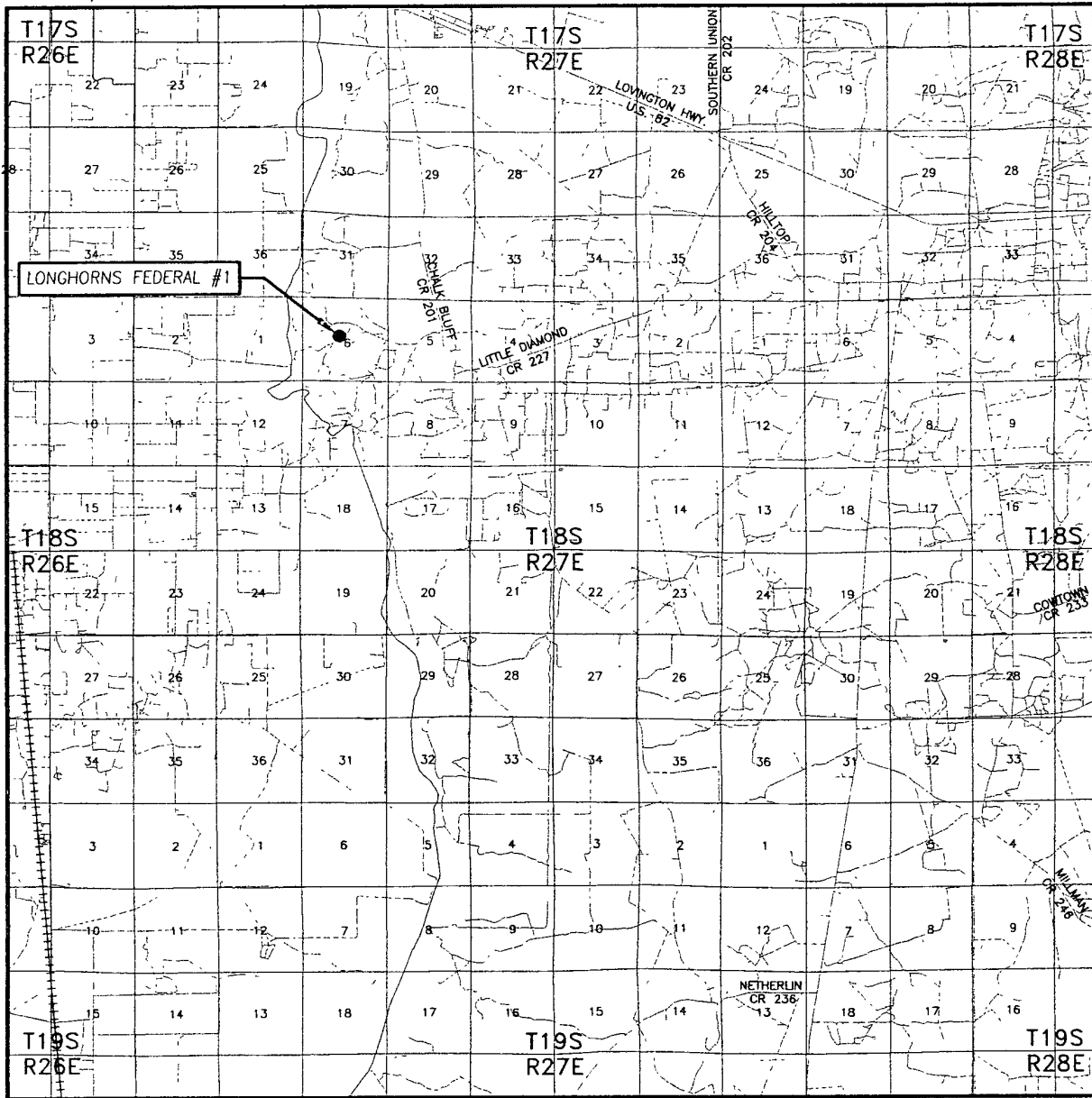
FROM THE INTERSECTION OF STATE HIGHWAY 82 AND COUNTY ROAD 201 (CHALK BLUFF ROAD), GO SOUTH ON COUNTY ROAD 201 APPROX. 4.0 MILES. TURN RIGHT ON CALICHE ROAD AND GO WESTERLY ALONG MEANDERING ROAD APPROX. 1.1 MILES. BEND LEFT AT "Y" INTERSECTION AND GO SOUTHWEST APPROX. 0.2 MILES. THIS LOCATION IS APPROX. 125 FEET NORTHWEST.



PROVIDING SURVEYING SERVICES  
 SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO  
 HOBBS, N.M. 88240  
 (505) 393-3117


<b>MACK ENERGY CORPORATION</b>			
LONGHORNS FEDERAL #1 WELL LOCATED 2410 FEET FROM THE NORTH LINE AND 2310 FEET FROM THE WEST LINE OF SECTION 6, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.			
Survey Date: 01/11/08	Sheet 1 of 1 Sheets		
W.O. Number: 07.11.1864	Dr By: DSS	Rev 1:N/A	
Date: 01/18/08	Disk: .	07111864	Scale: 1"=100'

# VICINITY MAP



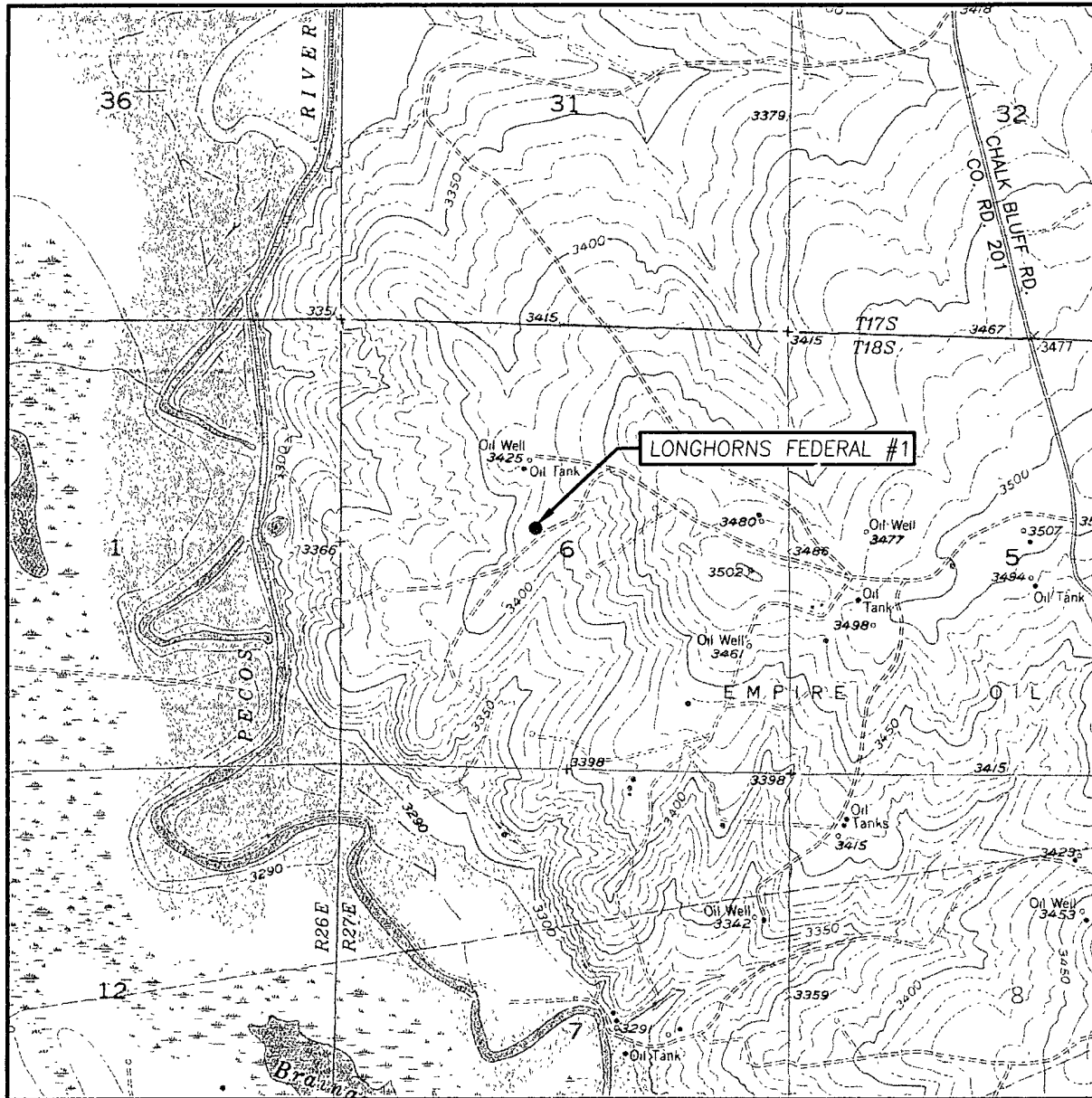
SCALE: 1" = 2 MILES

SEC. 6 TWP. 18-S RGE. 27-E  
 SURVEY N.M.P.M.  
 COUNTY EDDY STATE NEW MEXICO  
 DESCRIPTION 2410' FNL & 2310' FWL  
 ELEVATION 3415'  
 OPERATOR MACK ENERGY CORPORATION  
 LEASE LONGHORNS FEDERAL



PROVIDING SURVEYING SERVICES  
 SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO  
 HOBBS, N.M. 88240  
 (505) 393-3117

# LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:  
SPRING LAKE, N.M. - 10'

SEC. 6 TWP. 18-S RGE. 27-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 2410' FNL & 2310' FWL


ELEVATION 3415'

OPERATOR MACK ENERGY CORPORATION

LEASE LONGHORNS FEDERAL

U.S.G.S. TOPOGRAPHIC MAP

SPRING LAKE, N.M.



PROVIDING SURVEYING SERVICES  
 SINCE 1946  
**JOHN WEST SURVEYING COMPANY**  
 412 N. DAL PASO  
 HOBBS, N.M. 88240  
 (505) 393-3117

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

## DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

### 2. Estimated Tops of Important Geologic Markers:

Quaternary	Surface
Queen	550'
San Andres	1220'
Glorieta	2560'
Abo	4720'

### 3. Estimated Depths of Anticipated Fresh Water, Oil and Gas:

Water Sand	50'	Fresh Water
San Andres	1220'	Oil/Gas
Glorieta	2560'	Oil/Gas
Abo	4720'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Surface casing will be 8 5/8" casing to 1150' and circulating cement back to surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them by cementing 5 1/2" production casing, sufficient cement will be pumped to circulate back to surface.

### 4. Casing Program:

Hole Size	Interval	OD Casing	Wt, Grade, Jt, cond, collapse/burst/tension
12 1/4"	0-1150'	8 5/8"	24#, J-55, ST&C, New, 2.664/5.054/5.9
7 7/8"	0-4700'	5 1/2"	17#, J-55, LT&C, New, 2.009/1.773/1.773

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

**5. Cement Program:**

8 5/8 Surface Casing: Class C, 550sx, yield 1.32.

5 1/2" Production Casing: Class C, 1500sx, yield 1.32.

**6. Minimum Specifications for Pressure Control:**

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (3000 psi WP) minimum preventer. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on bottom. The conductor pipe will have a flow nipple installed. The BOP will then be nipped up on the 8 5/8" surface casing and tested by a 3<sup>rd</sup> party to 2000 psi and used continuously until TD is reached. All BOP's and accessory equipment will be tested to 2000 psi before drilling out of surface casing. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment (Exhibit #10) will include a Kelly cock and floor safety valve and choke lines and choke manifold (Exhibit #11) with a minimum 3000 psi WP rating.

*2 M  
System  
Shown*

**7. Types and Characteristics of the Proposed Mud System:**

The well will be drilled to TD with a combination of brine, cut brine and polymer mud system. The applicable depths and properties of this system are as follows:

DEPTH	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-1150'	Fresh Water	8.5	28	N.C.
1150'-TD	Cut Brine	9.1	29	N.C.

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the well site at all times.

**8. Auxiliary Well Control and Monitoring Equipment:**

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

**9. Logging, Testing and Coring Program:**

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be ran from T.D. to 8 5/8 casing shoe.

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

**10. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:**

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 120 degrees and estimated maximum bottom hole pressure is 2444 psig. Low levels of Hydrogen sulfide have been monitors in producing wells in the area, so H2S may be present while drilling of the well a plan is attached to the Drilling program. No major loss of circulation zones has been reported in offsetting wells.

**11. Anticipated Starting Date and Duration of Operations:**

Road and location work will not begin until approval has been received from the BLM. The anticipated spud date is March 8, 2008. Once commenced, the drilling operation should be finished in approximately 12 days. If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities.





## Mack Energy Corp.

Eddy County, NM (NAD 27 NME)

Longhorns Fed #1

Longhorns Fed #1

OH

Plan: Plan #1

## Standard Planning Report

15 February, 2008

RECEIVED

2008 FEB 27 PM 2:56



Scientific Drilling  
Directional Drilling Operations



Scientific Drilling  
Planning Report



<b>Database:</b>	EDM 2003.16 Single User-Db	<b>Local Co-ordinate Reference:</b>	Well Longhorns Fed #1
<b>Company:</b>	Mack Energy Corp	<b>TVD Reference:</b>	KB Elev @ 3432.00ft (Original Well Elev)
<b>Project:</b>	Eddy County NM (NAD 27 NME)	<b>MD Reference:</b>	KB Elev @ 3432.00ft (Original Well Elev)
<b>Site:</b>	Longhorns Fed #1	<b>North Reference:</b>	Grid
<b>Well:</b>	Longhorns Fed #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

<b>Project:</b>	Eddy County NM (NAD 27 NME)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	New Mexico East 3001		

<b>Site:</b>	Longhorns Fed #1			
<b>Site Position:</b>	<b>Northing:</b>	646,550.10 ft	<b>Latitude:</b>	32° 46' 38.845 N
<b>From:</b> Map	<b>Easting:</b>	504,574.90 ft	<b>Longitude:</b>	104° 19' 6.414 W
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	"	<b>Grid Convergence:</b> 0.01 °

<b>Well:</b>	Longhorns Fed #1			
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	646,550.10 ft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	504,574.90 ft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	3,432.00 ft	<b>Ground Level:</b> 3,415.00 ft

<b>Wellbore:</b>	OH
------------------	----

Magnetics	Model Name	Sample Date	Declination (°)	Dip/Angle (°)	Field Strength (nT)
	IGRF200510	2/15/2008	8.36	60.66	49,220

<b>Design:</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	354.55

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate ("/100ft)	Turn Rate ("/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,535.87	13.43	354.55	1,532.80	39.02	-3.72	4.00	4.00	0.00	354.55	
1,674.05	13.43	354.55	1,667.20	70.98	-6.78	0.00	0.00	0.00	0.00	
2,009.92	0.00	0.01	2,000.00	110.00	-10.50	4.00	-4.00	0.00	180.00	TG1-Longhorns Fed #
4,709.92	0.00	0.01	4,700.00	110.00	-10.50	0.00	0.00	0.00	0.01	PBHL-Longhorns Fed



Scientific Drilling  
Planning Report



<b>Database:</b>	EDM 2003 16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well: Longhorns Fed #1
<b>Company:</b>	Mack Energy Corp	<b>TVD Reference:</b>	KB Elev @ 3432.00ft (Original Well Elev)
<b>Project:</b>	Eddy County NM (NAD 27, NME)	<b>MD Reference:</b>	KB Elev @ 3432.00ft (Original Well Elev)
<b>Site:</b>	Longhorns Fed #1	<b>North Reference:</b>	Grid
<b>Well:</b>	Longhorns Fed #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0 00	0.00	0 00	0 00	0.00	0 00	0.00	0 00	0 00	0 00
<b>EHL-LF #1 - SHL-LF #1</b>									
1,150.00	0 00	0 00	1,150.00	0 00	0 00	0 00	0 00	0 00	0 00
<b>8 5/8" Casing</b>									
1,200 00	0 00	0 00	1,200 00	0 00	0 00	0 00	0 00	0 00	0 00
<b>KOP Start 4.00°/100'</b>									
1,300 00	4 00	354.55	1,299.92	3.47	-0.33	3.49	4.00	4.00	0 00
1,400 00	8 00	354.55	1,399.35	13.88	-1.32	13.94	4.00	4.00	0 00
1,500 00	12 00	354.55	1,497.81	31.16	-2.97	31.30	4.00	4.00	0 00
1,535 87	13 43	354.55	1,532.80	39.02	-3.72	39.20	4.00	4.00	0 00
<b>EOC hold 13.43°</b>									
1,600 00	13 43	354.55	1,595.18	53.85	-5.14	54.10	0 00	0 00	0 00
1,674 05	13 43	354.55	1,667.20	70.98	-6.78	71.30	0 00	0 00	0 00
<b>Start Drop 4.00°/100'</b>									
1,700 00	12.40	354.55	1,692.49	76.75	-7.33	77.10	4.00	-4.00	0 00
1,800 00	8.40	354.55	1,790.83	94.71	-9.04	95.15	4.00	-4.00	0 00
1,900 00	4.40	354.55	1,890.19	105.80	-10.10	106.28	4.00	-4.00	0 00
2,000 00	0.40	354.55	1,990.08	109.97	-10.50	110.47	4.00	-4.00	0 00
2,009 92	0.00	0 00	2,000.00	110 00	-10.50	110 50	4.00	-4.00	0 00
<b>EOC hold 0.0° - TG1-Longhorns Fed #1</b>									
4,709 92	0 00	0 01	4,700.00	110 00	-10.50	110 50	0 00	0 00	0 00
<b>PBHL-Longhorns Fed #1</b>									

Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL-Longhorns Fed #1	- plan hits target - Circle (radius 10 00)	0.00	0.00	4,700 00	110 00	-10.50	646,660 10	504,564 40	32° 46' 39.933 N	104° 19' 6.537 W
SHL-LF #1	- plan misses by 100 00ft at 0 00ft MD (0 00 TVD, 0 00 N, 0 00 E) - Rectangle (sides WD 00 H500 00 D0.00)	0 00	0 00	0 00	100 00	-0.50	646,650 10	504,574 40	32° 46' 39.834 N	104° 19' 6.420 W
EHL-LF #1	- plan misses by 100 00ft at 0 00ft MD (0 00 TVD, 0 00 N, 0 00 E) - Rectangle (sides W500 00 H0.00 D0.00)	0 00	0 00	0 00	100 00	-0.50	646,650 10	504,574 40	32° 46' 39.834 N	104° 19' 6.420 W
TG1-Longhorns Fed #1	- plan hits target - Point	0 00	0 00	2,000 00	110 00	-10.50	646,660 10	504,564 40	32° 46' 39.933 N	104° 19' 6.537 W

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,150.00	1,150 00	8 5/8" Casing	8-5/8	12-1/4



Scientific Drilling  
Planning Report



<b>Database:</b>	EDM 2003 16 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Longhorns Fed #1
<b>Company:</b>	Mack Energy Corp.	<b>TVD Reference:</b>	KB Elev @ 3432.00ft (Original Well Elev)
<b>Project:</b>	Eddy County, NM (NAD 27 NME)	<b>MD Reference:</b>	KB Elev @ 3432.00ft (Original Well Elev)
<b>Site:</b>	Longhorns Fed #1	<b>North Reference:</b>	Grid
<b>Well:</b>	Longhorns Fed #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
1,200.00	1,200.00	0.00	0.00	KOP Start 4.00°/100'
1,535.87	1,532.80	39.02	-3.72	EOC hold 13.43°
1,674.05	1,667.20	70.98	-6.78	Start Drop 4.00°/100'
2,009.92	2,000.00	110.00	-10.50	EOC hold 0.0°

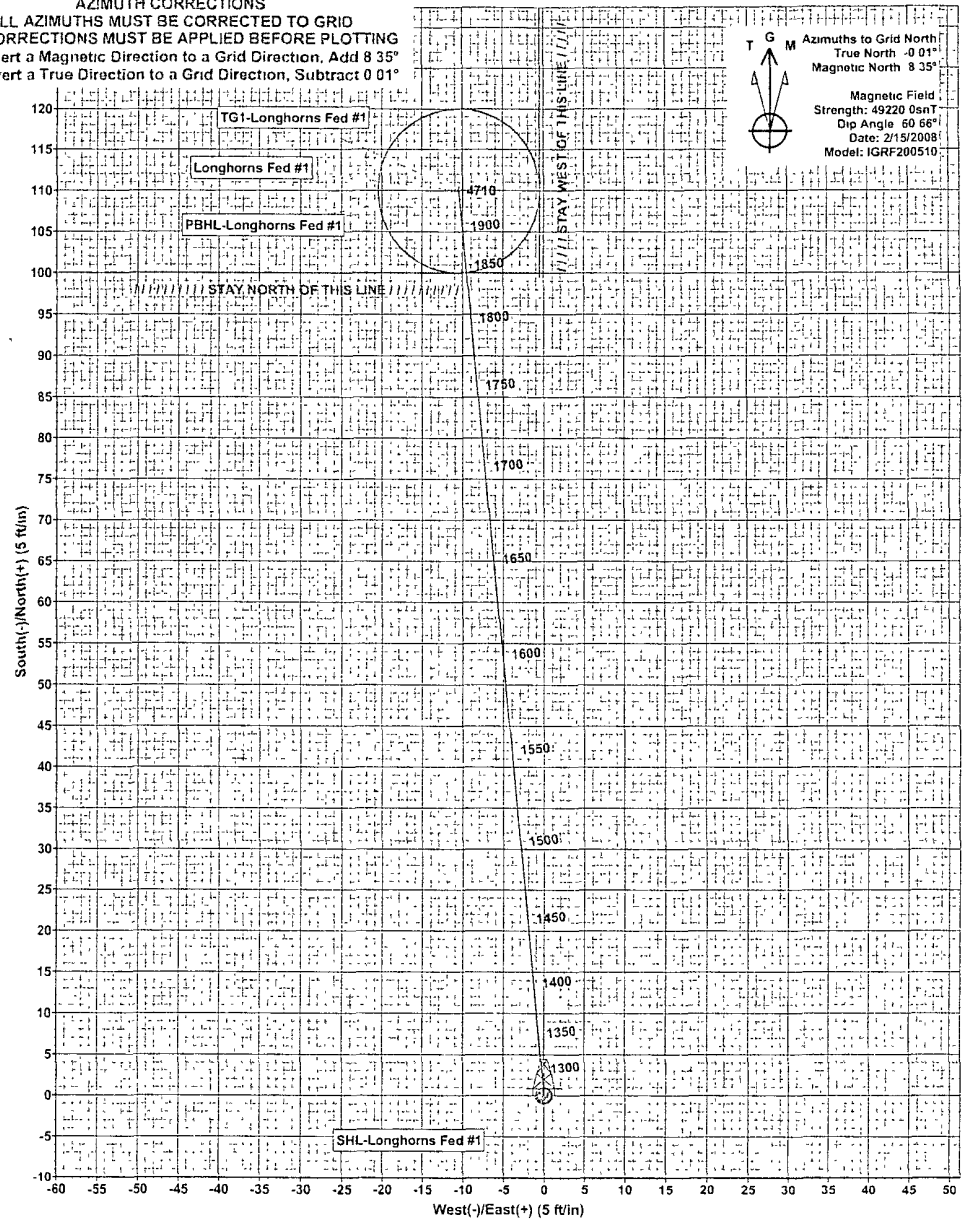
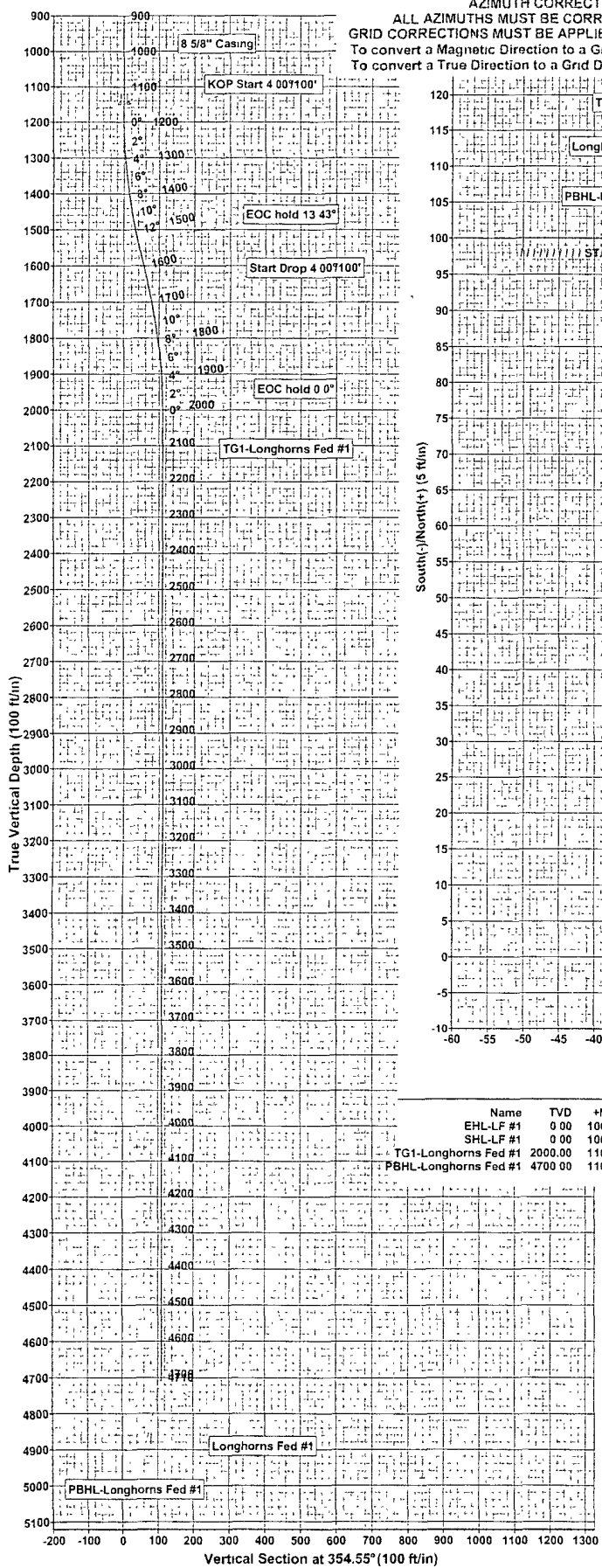


Scientific Drilling for Mack Energy Corp.  
 Site: Eddy County, NM (NAD 27 NME)  
 Well: Longhorns Fed #1  
 Wellbore: OH  
 Design: Plan #1



**AZIMUTH CORRECTIONS**  
 ALL AZIMUTHS MUST BE CORRECTED TO GRID  
**GRID CORRECTIONS MUST BE APPLIED BEFORE PLOTTING**  
 To convert a Magnetic Direction to a Grid Direction, Add 8 35"  
 To convert a True Direction to a Grid Direction, Subtract 0 01"

**Magnetic Field**  
 Strength: 49220 OsnT  
 Dip Angle: 60 66"  
 Date: 2/15/2008  
 Model: IGRF200510



**WELLBORE TARGET DETAILS (MAP CO-ORDINATES)**

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
EHL-LF #1	0 00	100 00	-0 50	646650 10	504574 40	32°46' 39 834 N	104°19' 6 420 W	Rectangle (Sides L500 00 W0 00)
SHL-LF #1	0 00	100 00	-0 50	646650 10	504574 40	32°46' 39 834 N	104°19' 6 420 W	Rectangle (Sides L0 00 W500 00)
TG1-Longhorns Fed #1	2000 00	110 00	-10 50	646660 10	504564 40	32°46' 39 933 N	104°19' 6 537 W	Point
PBHL-Longhorns Fed #1	4700 00	110 00	-10 50	646660 10	504564 40	32°46' 39 933 N	104°19' 6 537 W	Circle (Radius 10 00)

**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	1200 00	0 00	0 00	1200 00	0 00	0 00	0 00	0 00	0 00	
3	1535 87	13 43	354 55	1532 80	39 02	-3 72	4 00	354 55	39 20	
4	1674 05	13 43	354 55	1667 20	70 98	-6 78	0 00	0 00	71 30	
5	2009 92	0 00	0 01	2000 00	110 00	-10 50	4 00	180 00	110 50	TG1-Longhorns Fed #1
6	4709 92	0 00	0 01	4700 00	110 00	-10 50	0 00	0 01	110 50	PBHL-Longhorns Fed #1

**WELL DETAILS: Longhorns Fed #1**

+N/-S	+E/-W	Northing	Easting	Ground Level	Latitude	Longitude	Slot
0 00	0 00	646550 10	504574 90	3415 00	32°46' 38 845 N	104°19' 6 414 W	

**PROJECT DETAILS: Eddy County, NM (NAD 27 NME)** Plan: Plan #1 (Longhorns Fed #1/OH)

Geodetic System: US State Plane 1927 (Exact solution) Created By: Julio Pina Date: 15-Feb-08  
 Datum: NAD 1927 (NADCON CONUS)  
 Ellipsoid: Clarke 1866 Checked: \_\_\_\_\_ Date: \_\_\_\_\_  
 Zone: New Mexico East 3001 Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_  
 System Datum: Mean Sea Level Approved: \_\_\_\_\_ Date: \_\_\_\_\_

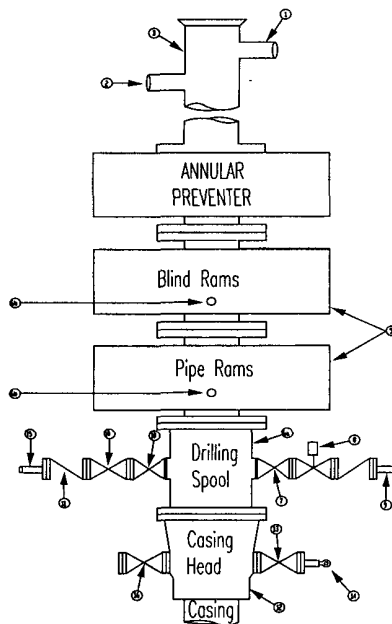
**Mack Energy Corporation**  
**Minimum Blowout Preventer Requirements**  
 3000 psi Working Pressure  
 3 MWP  
 EXHIBIT #1-A

**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 (3000 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.

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**Attachment to Exhibit #9**  
**NOTES REGARDING THE BLOWOUT PREVENTERS**  
**Longhorns Federal #1**  
**Eddy County, New Mexico**

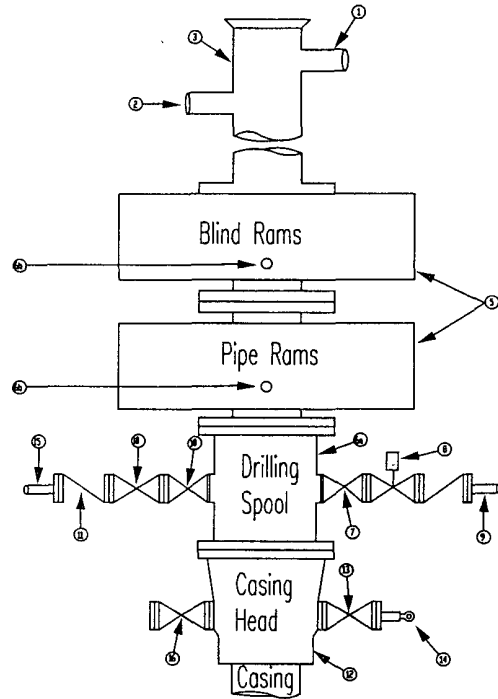
1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

**Mack Energy Corporation**  
**Minimum Blowout Preventer Requirements**  
 3000 psi Working Pressure  
~~3-MWP~~  
**EXHIBIT #10**

*2 M BOP*

**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

5. All valves to be equipped with hand-wheels 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

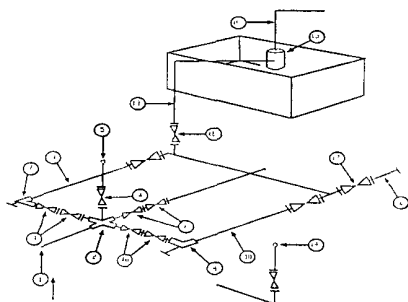
Exhibit #11

## MINIMUM CHOKE MANIFOLD

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

3M will be used

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' x5'			2' x5'			2' x5'	
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.

## SURFACE USE AND OPERATING PLAN

### 1. Existing & Proposed Access Roads

- A. The well site and elevation plat for the proposed well is shown in Exhibit #1. It was staked by John West Engineering, Hobbs, NM.
- B. All roads to the location are shown in Exhibit below. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling well will be done where necessary.
- C. Directions to Location: From the intersection of State Hwy 82 and CR 201 go south on 201 4 miles, turn right/west 1.1 miles, left at Y .2 mile, this location is approx. 125' northwest.
- D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

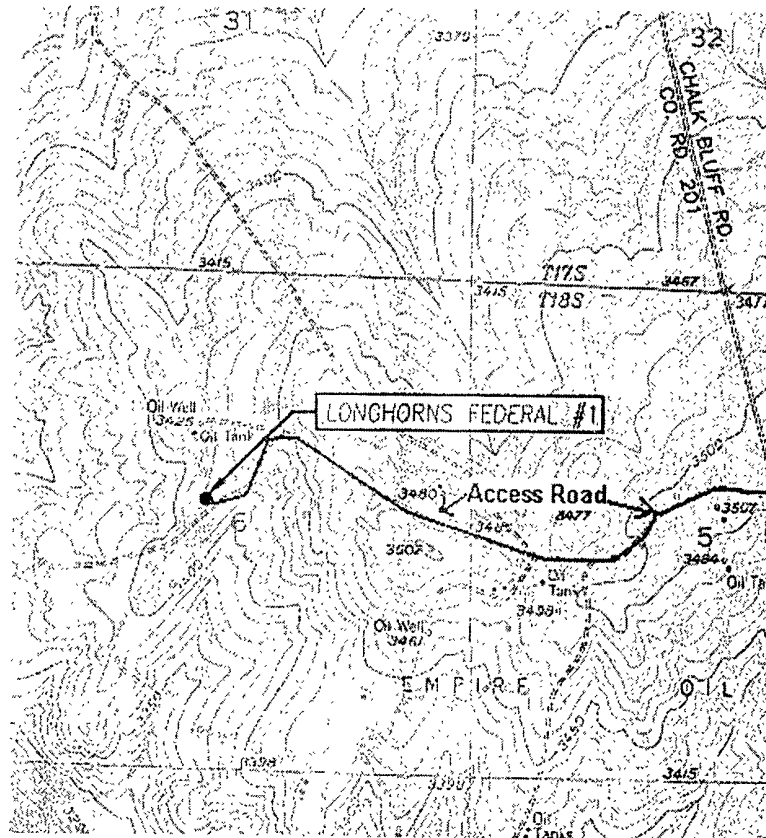


Exhibit #4

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

## 2. Proposed Access Road:

Exhibit #3 shows the 0<sup>7</sup> of new access road to be constructed. The road will be constructed as follows:

- A. The Maximum width of the running surface will be 14'. The road will be crowned and ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.
- B. The average grade will be less than 1%.
- C. No turnouts are planned.
- D. No culverts, cattleguard, gates, low water crossings or fence cuts are necessary.
- E. Surfacing material will consist of native caliche. Caliche will be obtained from the nearest BLM approved caliche pit or reserve pit area.
- F. The proposed access road as shown in Exhibit #3 has been centerline flagged by John West Engineering, Hobbs, New Mexico.

## 3. Location of Existing Wells & Proposed flow lines for New Wells:

Exhibit #4 shows all existing wells within a one-mile radius of this well. Proposed flow lines, will stay on location. Tank Battery will be constructed on this location.

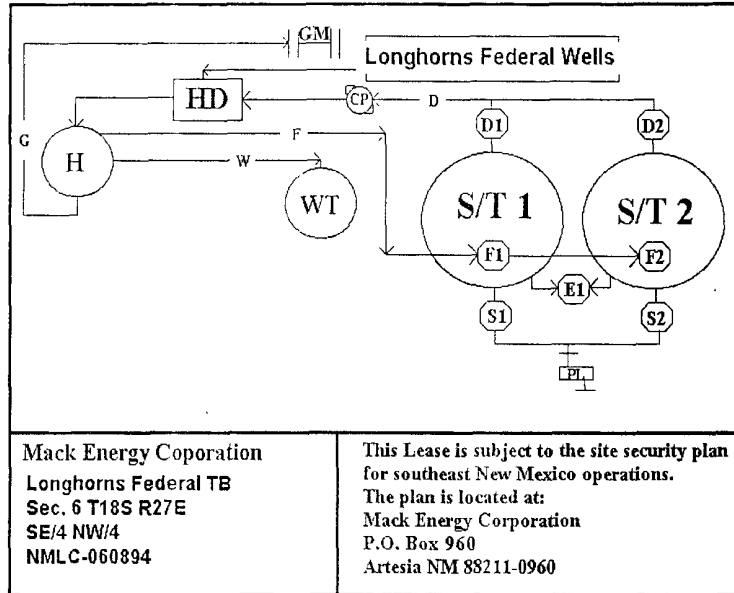
## 4. Location of Existing and/or Proposed Facilities:

- A. Mack Energy Corporation does not operate a production facility on this lease.
- B. If the well is productive, contemplated facilities will be as follows:
  - 1) Yeso Completion: Will be sent to the Longhorns Federal TB located at the #1 well. The Facility is shown in Exhibit #5.
  - 2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications.
  - 3) Any additional caliche will be obtained from a BLM approved caliche pit. Any additional construction materials will be purchased from contractors.

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

- 4) It will be necessary to run electric power if this well is productive. Power will be run by CVE and they will send in a separate plan for power.

Exhibit #5



A. If the well is productive, rehabilitation plans are as follows:

- 1) Topsoil removed from the drill site will be used to recontour the surrounding area to the original natural level, as nearly as possible, and reseeded as per BLM specifications.

**5. Location and Type of Water Supply:**

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. The water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Exhibit #4. If a commercial fresh water source is nearby, fasline may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

**6. Source of Construction Materials:**

All caliche required for construction of the drill pad and proposed new access road (approximately 2500 cubic yards) will be obtained from a BLM approved caliche pit.

**7. Methods of Handling Water Disposal:**

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

- A. Drill cuttings not retained for evaluation purposes will be disposed into the steel tanks and hauled to an approved facility.
- B. Drilling fluids will be contained in steel tanks using a closed loop system.
- C. Water produced from the well during completion may be disposed into a steel tank. After the well is permanently placed on production, produced water will be collected in tanks (fiberglass) until pumped or trucked to an approved disposal system; produced oil will be collected in steel tanks until sold.
- D. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. All water and fluids will be disposed of into an approved facility. No toxic waste or hazardous chemicals will be produced by this operation.
- E. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole only a dry hole marker will remain.

**8. Ancillary Facilities:**

No airstrip, campsite or other facilities will be built as a result of the operation on this well.

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

**9. Well Site Layout:**

- A. The drill pad layout, with elevations staked by John West Engineering, is shown in Exhibit #6. Dimensions of the pad are shown. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.
- B. Diagram below shows the proposed orientation of the location. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.

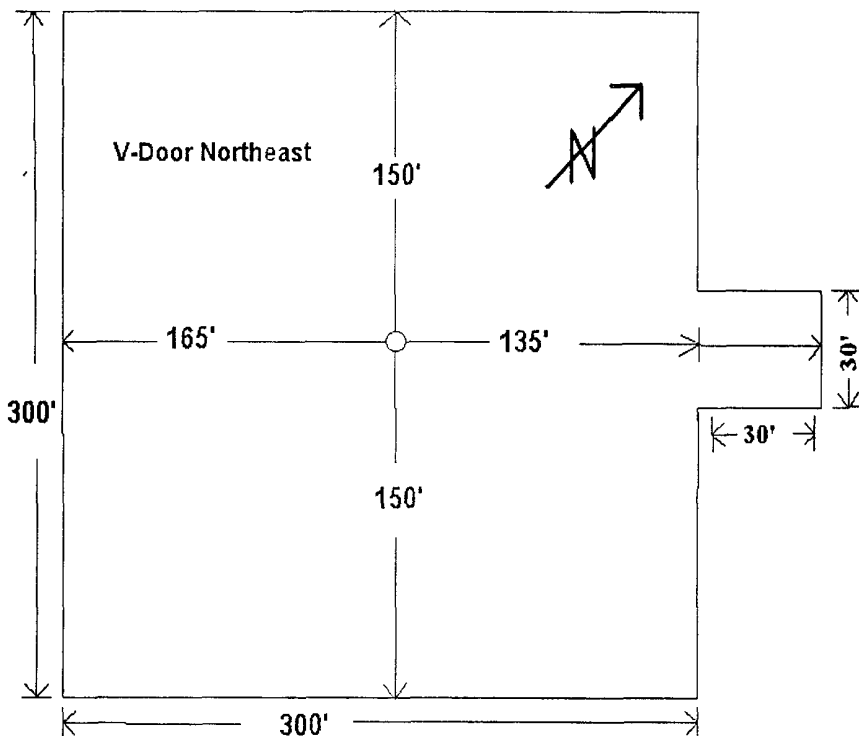


Exhibit #6

Attached to Form 3160-3  
Mack Energy Corporation  
Longhorns Federal #1  
2410 FNL & 2310 FWL  
SE/4 NW/4, Sec. 6 T18S R27E  
Eddy County, NM

**10. Plans for Restoration of the Surface:**

- A. Upon completion of the proposed operations, if the well is completed, any additional caliche required for facilities will be obtained from a BLM approved caliche pit.
- B. In the event of a dry hole. Topsoil removed from the drill site will be used to recontour the area to its original natural level and reseeded as per BLM specifications

**11. Surface Ownership:**

The well site and lease is located entirely on Federal surface. We have notified the surface lessee of the impending operations. According to BLM the lessee is Bogel Limited Company, Lewis Derrick, P.O. Box 460 Dexter, NM 88230.

**12. Other Information:**

- A. The area around the well site is grassland and the topsoil is sandy. The vegetation is native scrub grass with sagebrush.
- B. There is no permanent or live water in the immediate area.
- C. A Cultural Resources Examination has been requested and will be forwarded to your office in the near future.

**13. Lessee's and Operator's Representative:**

The Mack Energy Corporation representative responsible for assuring compliance with the surface use plan is as follows:

Jerry W. Sherrell  
Mack Energy Corporation  
P.O. Box 960  
Artesia, NM 88211-0960  
Phone (505) 748-1288 (office)

## Mack Energy Corporation

### Hydrogen Sulfide Drilling Operation Plan

#### I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile tubular are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H<sub>2</sub>S of wells in this area from surface to TD are low enough that a contingency plan is not required.**



## II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

### 1. Well Control Equipment:

- A. Flare line.
- B. Choke manifold.
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- D. Auxiliary equipment may include if applicable: annular preventer & rotating head.

### 2. Protective equipment for essential personnel:

- A. Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

### 3. H2S detection and monitoring equipment:

- A. 1 portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

### 4. Visual warning systems:

- A. Wind direction indicators as shown on well site diagram (Exhibit #8).
- B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

### 5. Mud program:

- A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

**6. Metallurgy:**

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
- B. All elastomers used for packing and seals shall be H2S trim.

**7. Communication:**

- A. Radio communications in company vehicles including cellular telephone and 2-way radio.
- B. Land line (telephone) communication at Office.

**8. Well testing:**

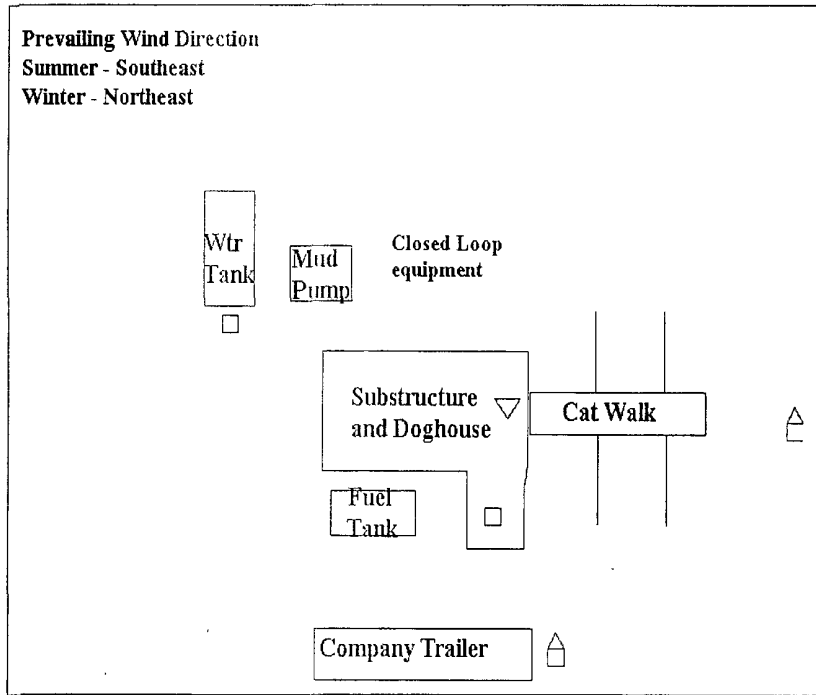
- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

**EXHIBIT #7****WARNING  
YOU ARE ENTERING AN H2S  
AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED**
- 2. HARD HATS REQUIRED**
- 3. SMOKING IN DESIGNATED AREAS ONLY**
- 4. BE WIND CONSCIOUS AT ALL TIMES**
- 5. CHECK WITH MACK ENERGY FOREMAN AT OFFICE**

**MACK ENERGY CORPORATION****1-505-748-1288**

**DRILLING LOCATION H2S SAFTY EQUIPMENT**  
Exhibit # 8



Prevailing Wind Direction  
Summer - Southeast  
Winter - Northeast

Wtr  
Tank

Mud  
Pump

Closed Loop  
equipment

Substructure  
and Doghouse

Fuel  
Tank

Cat Walk

Company Trailer

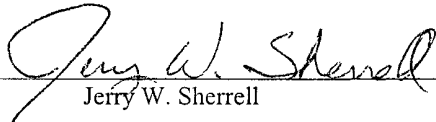
- ▽ H2S Monitors with alarms at the bell nipple
- Wind Direction Indicators
- △ Safe Briefing areas with caution signs and breathing equipment min 150 feet from

---

CERTIFICATION

I hereby certify that I, or person under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently exist; that the statements made in this APD are to the best of my knowledge, true and correct; and the work associated with the operations proposed herein will be performed by Mack Energy Corporation and its contractors and subcontractors in conformity with this plan and the terms and conditions which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Date: 2-8-08

Signed:   
Jerry W. Sherrell

# PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Mack Energy Corporation
LEASE NO.:	LC-060894
WELL NAME & NO.:	Longhorns Federal #1
SURFACE HOLE FOOTAGE:	2410' FNL & 2310' FWL
BOTTOM HOLE FOOTAGE:	2310' FNL & 2310' FWL
LOCATION:	Section 06, T. 18 S., R 27 E., NMPM
COUNTY:	Eddy County, New Mexico

## TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- General Provisions**
- Permit Expiration**
- Archaeology, Paleontology, and Historical Sites**
- Noxious Weeds**
- Special Requirements**
  - Cave/Karst
- Construction**
  - Notification
  - Topsoil
  - Reserve Pit
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- Road Section Diagram**
- Drilling**
- Production (Post Drilling)**
  - Well Structures & Facilities
- Interim Reclamation**
- Final Abandonment/Reclamation**

## **I. GENERAL PROVISIONS**

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## **II. PERMIT EXPIRATION**

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## **IV. NOXIOUS WEEDS**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

### Cave and Karst

#### Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

#### **Berming:**

Tank batteries will be bermed to contain 1 ½ times the content of the largest tank.

Bermed areas will be lined with a permanent 20 mil plastic liner and then lined with a 4 oz. felt liner to prevent tears or punctures in liner.

#### Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

#### **Lost Circulation:**

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 100 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the consequences of the situation and work with operator on corrective actions to resolve the problem.

#### **Delayed Blasting:**

Any blasting will be phased and time delayed.

#### **Abandonment Cementing:**

Upon well abandonment the well bore will be cemented completely from 100 feet below the bottom of the cave bearing zone to the surface.

#### **Record Keeping:**

The Operator will track customary drilling activities, including the rate of penetration, pump pressure, weight on bit, bit drops, percent of mud returns, and presence of absence of cuttings returning to the surface. As part of customary record keeping, each detectable void or sudden increase in the rate of penetration not attributable to a change in the formation type should be documented and evaluated as it is encountered.

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (505) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### **B. TOPSOIL**

There is no measurable soil on this well pad to stockpile. No topsoil stockpile is required.

### **C. RESERVE PITS**

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### **D. FEDERAL MINERAL MATERIALS PIT**

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the Carlsbad Field Office at (505) 234-5972.

### **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.



## VII. DRILLING

### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

**Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822

1. A Hydrogen Sulfide (H<sub>2</sub>S) Drilling Plan should be activated 500 feet prior to drilling into the **Yates** formation.
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

### B. CASING

**Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work.**

1. The **8-5/8** inch surface casing shall be set at **approximately 1150** feet and cemented to the surface. **Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement). **Please provide WOC times to inspector for cement slurries.**
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

- d. If cement falls back, remedial action will be done prior to drilling out that string.

**High cave/karst.**

**Possible lost circulation in the Grayburg and San Andres formations.**

**Possible water flows in the Yates and Seven Rivers formations.**

2. The minimum required fill of cement behind the 5-1/2 inch production casing is:
  - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

**C. PRESSURE CONTROL**

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. The tests shall be done by an independent service company.
  - b. The results of the test shall be reported to the appropriate BLM office.
  - c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
  - d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

**D. DRILL STEM TEST**

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

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## **VIII. PRODUCTION (POST DRILLING)**

### **A. WELL STRUCTURES & FACILITIES**

#### **Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

#### **Containment Structures**

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

#### **Painting Requirement**

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color Shale Green, Munsell Soil Color Chart # 5Y 4/2

## **IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE**

### **A. INTERIM RECLAMATION**

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

The operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

Seed Mixture 4, for Gypsum Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)\* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed\* per acre:

<u>Species</u>	<u>lb/acre</u>
Alkali Sacaton ( <i>Sporobolus airoides</i> )	1.0
DWS <u>□</u> Four-wing saltbush ( <i>Atriplex canescens</i> )	5.0

□DWS: DeWinged Seed

\*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed  
(Insert Seed Mixture Here)

## **X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS**

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.