14-554

SECRETARY'S POTASH

OCD Artesia

Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

5. Lease Serial No. NMLC 068399, NMLC 063537, NMNM 0000783, NMNM0001084

6. If Indian, Allotee or Tribe Name

TES 9-10-14

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
BIG EDDY UNIT NM 68249X

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

8. Lease Name and Well No. <313462>
BIG EDDY UNIT 331H

2. Name of Operator MANZANO, LLC - as Agent for BOPCO, L.P. <231429>

9. API Well No.
30-015-42493

3a. Address
PO BOX 2107
ROSWELL, NM 88202-2107

3b. Phone No. *(include area code)*
575-623-1996

10. Field and Pool, or Exploratory
WC WILLIAMS SINK (BONE SPRING) <97650>

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface 2050' FNL & 1975' FWL - SECTION 10 - T20S - R31E

At proposed prod. zone BHL: 2000' FNL & 330' FEL - SECTION 11-T20S-R31E

11. Sec., T. R. M. or Blk. and Survey or Area
SECTION 10 - T20S - R31E

14. Distance in miles and direction from nearest town or post office*
30 MILES NE OF CARLSBAD, NM

12. County or Parish
EDDY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
330'

16. No. of acres in lease
1,518.31

17. Spacing Unit dedicated to this well
240 ACRES (S2NE - SECTION 10 & S2N2OF SECTION 11-T20S-R31E)

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
NONE

19. Proposed Depth
TVD 9370'
MD 17289'

20. BLM/BIA Bond No. on file
NM-2567

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3476' GL

22. Approximate date work will start*
07/01/2014

23. Estimated duration
45 DAYS

24. Attachments

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

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

25. Signature Mike Hanagan — Name *(Printed/Typed)* MIKE HANAGAN — Date 04/04/2014

Title
MANAGING MEMBER

Approved by *(Signature)* /s/George MacDonell — Name *(Printed/Typed)* — Date JUN - 8 2014

Title **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.

(Continued on page 2)

*(Instructions on page 2)

Capitan Controlled Water Basin

NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 08 2014
RECEIVED

SEE ATTACHED FOR CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-42493	97650	WC Williams Sink (Bone Spring)

Property Code	Property Name	Well Number
313462	N BIG EDDY UNIT	331H

OGRID No.	Operator Name	Elevation
231429	MANZANO LLC	3476'

Surface Location

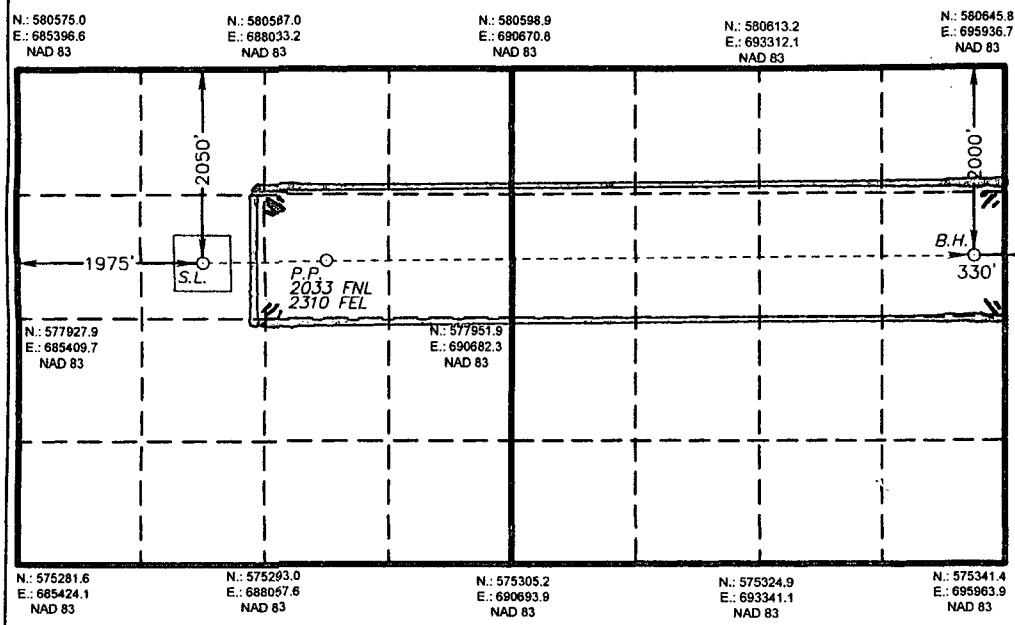
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	10	20 S	31 E		2050	NORTH	1975	WEST	EDDY

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/West line	County
H	11	20 S	31 E		2000	NORTH	330	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
240			

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 contained 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 a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Mike Hanagan 3/11/14
Signature Date

MIKE HANAGAN
Printed Name

mike@manzanoenergy.com
Email Address

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 supervison, and that the same is true and correct to the best of my belief.

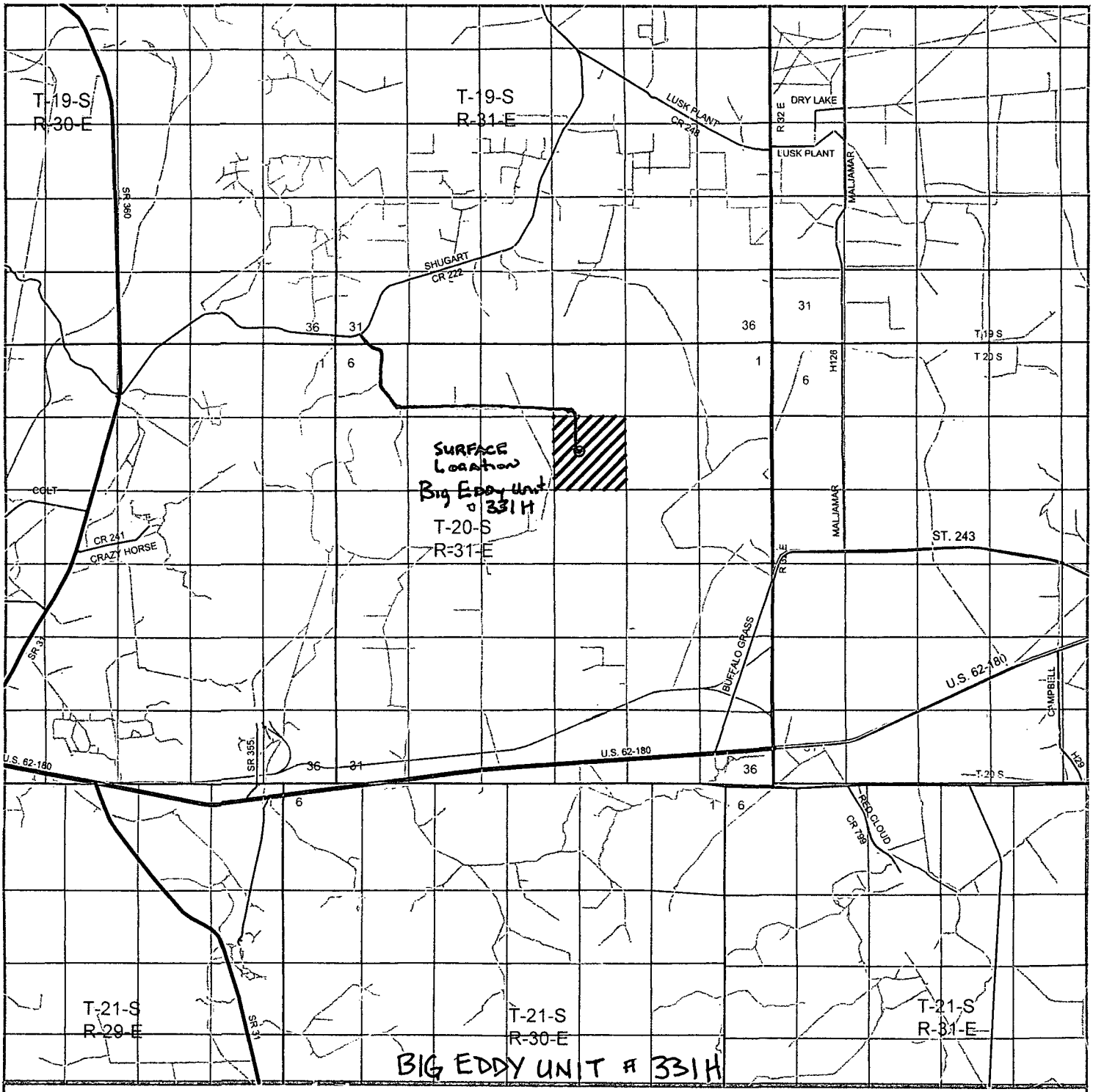
AUGUST 13, 2013
Date Surveyed L. JONES

Signature & Seal of Professional Surveyor

Certificate No. Gary L. Jones 7977

0' 1000' 2000' 3000' 4000'
SCALE: 1" = 2000'
WO Num.: 29148

SURFACE USE PLAN - EXHIBIT 1



Located 2050' FNL and 1975' FWL
Section 10, Township 20 South, Range 31 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

0 1 MI 2 MI 3 MI 4 MI
SCALE: 1" = 2 MILES

W.O. Number: JMS 29148

Survey Date: 09-19-2013

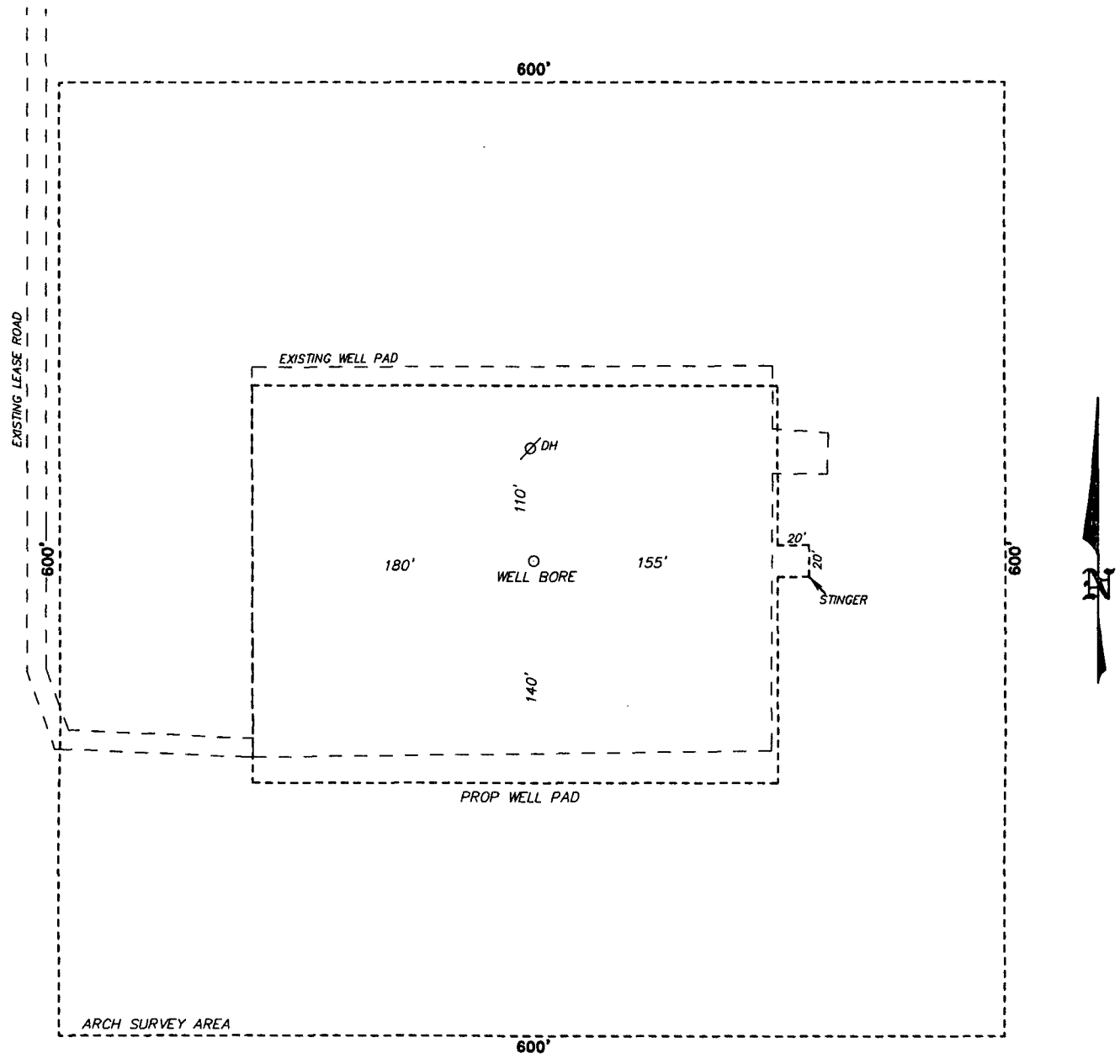
YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

N

Manzano, LLC

SURFACE USE PLAN - Exhibit 2

SECTION 10, TOWNSHIP 20 SOUTH, RANGE 31 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.



100 0 100 200 FEET

SCALE: 1" = 100'

Manzano, LLC

REF: MAD DOG FEDERAL COM 1H / WELL PAD TOPO

BIG EDDY UNIT 331H ~~331H~~ LOCATED 2050' FROM THE NORTH LINE AND 1975' FROM THE WEST LINE OF SECTION 10, TOWNSHIP 20 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

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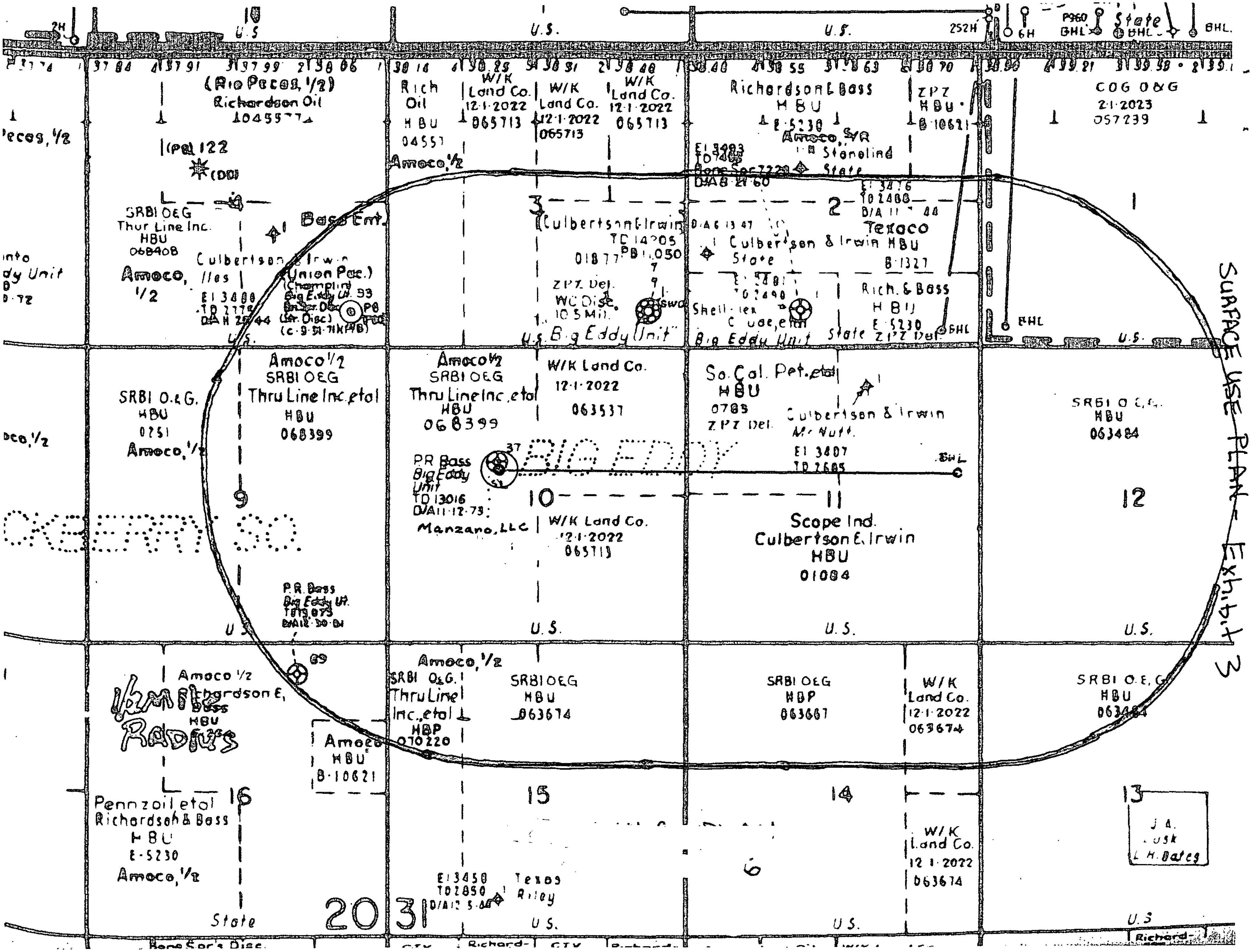
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 29148	Drawn By: J. SMALL	Date: 08-09-2013	Survey Date: 09-19-2013	Sheet 1 of 1 Sheets



SURFACE USE PLAN - Exhibit 3
1/2 mile Radius
BIG EDDY
U.S.
(Rio Pecos, 1/2)
Richardson Oil
Rich Oil
HBU
W/K Land Co.
12-1-2022
065713
Amoco, 1/2
Richardson & Bass
HBU
E-5230
Amoco, S/R
Stanolind
State
ZPZ
HBU
B-10621
COG O&G
2-1-2023
057239
Culbertson & Irwin
TD 14205
PB 11050
ZPZ Del.
WC Disc.
10.5 Mil.
Big Eddy Unit
Texaco
Culbertson & Irwin HBU
B-1327
Rich. & Bass
HBU
E-5230
ZPZ Del.
SRBI O&G
Thru Line Inc.
HBU
068408
Amoco, 1/2
Culbertson & Irwin
Iles
(Union Pac.)
(Champlin)
Big Eddy Ut. 93
Bass Ent.
Shell
State
Amoco 1/2
SRBI O&G
Thru Line Inc. etal
HBU
068399
W/K Land Co.
12-1-2022
063537
So. Col. Pet. etal
HBU
0783
ZPZ Del.
Culbertson & Irwin
McNutt
EI 3807
TD 2685
SRBI O&G
HBU
063484
SRBI O.&G.
HBU
0751
PR Bass
Big Eddy Unit
TD 13016
D/A 11-12-73
Manzano, LLC
Scope Ind.
Culbertson & Irwin
HBU
01084
P.R. Bass
Big Eddy Ut.
Amoco 1/2
Richardson &
Bass
HBU
Amoco, 1/2
SRBI O&G.
Thru Line
Inc., etal
HBP
070220
SRBI O&G
HBU
063674
SRBI O&G
HBP
063667
W/K
Land Co.
12-1-2022
063674
SRBI O.&G.
HBU
Amoco
HBU
B-10621
Pennzoil etal
Richardson & Bass
HBU
E-5230
Amoco, 1/2
Texas
Riley
J.A.
Lusk
L.H. Bates
State
2031
1
2
3
9
10
11
12
13
14
15
16
BHL

MANZANO, LLC
DRILLING PLAN

BIG EDDY UNIT #331H
SHL: 2050' FNL & 1975' FWL
Section 10-T20S-R31E
BHL: 2000' FNL & 330' FEL
Section 11-T20S-R31E
Eddy County, New Mexico

In conjunction with Form 3160-3, Application for Permit to Drill subject well, Manzano, LLC submits the following Drilling Plan in accordance with BLM Onshore Oil and Gas Order Number 1 Section III.D.3. and BLM Onshore Oil and Gas Order Number 2 Section III.A-C.:

a. The estimated tops of geologic markers are as follows:

Geologic Marker	Depth (TVD)
Red Beds	Surface
Rustler Anhydrite	755'
Top of Salt	1040'
Base of Salt	2410'
Yates	2690'
Capitan Reef	2990'
Base Capitan Porosity	4160'
Delaware	4320'
Bone Spring	7175'
1st Bone Spring Sand	8400'
Kick Off Point	8780'
2nd Bone Spring Sand	9100'TVD/9077'MD
End Of Curve	9258'TVD/9523'MD
TD @ End Of Lateral	9370'TVD/17289'MD

b. The estimated depths at which anticipated water, oil or gas formations are expected to be encountered:

Water	200'MD
Oil/Gas in Bone Springs	8400'MD-8600'MD
Oil/Gas in Bone Springs	9100'MD-TD

No other formations are expected to give up oil, gas, or fresh water in measurable quantities.

The surface fresh water sands will be protected by drilling an 18.125" hole with fresh water gel and setting 16.00" casing at ~~875~~ 900' (~100' into the Rustler Anhydrite and below the Magenta Dolomite Marker) and circulating cement back to surface.

After the 16" casing is set and cemented, the hole size will be reduced to 14.75" and drilling will continue into the top of the Yates Formation to a depth of ~~2700~~ 2800'. The salt section will be isolated by setting 13.375" casing to ~~2700~~ 2800' ("Salt String") and circulating cement back to surface.

The 13.375" casing will be drilled out with a 12.25" bit. Drilling will continue to a depth of 4200 feet which will be below the base of the porosity in the Capitan Reef and prior to drilling into the Delaware Formation. The Capitan reef section will be isolated by running 9.625" casing to 4200 feet ("Reef String"). Manzano proposes to use an external casing packer with a DV tool set ~100 +/- above the top of the Capitan Reef at a depth of 2900 feet to insure good cement over the Capitan reef. Cement will be circulated on both stages.

The 9.625" casing will be drilled out with a 8.75" bit. Drilling will continue to the depth of 8780 feet. At that point, directional drilling tools will be installed and the well will be "kicked off" and drilled at a rate of 12 degree's of angle per 100' of depth to a Target Depth of 9258'TVD/9523'MD in the 2nd Bone Spring Sand. Once the curve has been landed at 90 degree's, we propose to set 7.00" casing thru the curve to an approximate depth of 9258'TVD/9550'MD and cemented in 2 stages with the DV Tool at approximately 5000'MD

The 7" casing will be drilled out with a 6.125" bit and the lateral will be drilled eastward at an azimuth of 89.25 degree's and an inclination 89.17 degrees to an anticipated total measured depth of 17,289 feet and true vertical depth of 9370 feet.

Upon reaching Total Depth, a 4 ½" liner with "port and packer" system for zonal isolation will be run into the open hole lateral. The top of the liner will be hung off at a depth of approximately 8700'MD (80' above the kick off point) and back-to-back open hole packers will be placed at ~10,075'MD to insure that all of the productive interval is isolated east of the 330' hardline of 2310' from the east line of section 10-T20S-R31E.

c. Minimum Specifications for Pressure Control:

With the exception of the 20" Rotating Head/Diverter, all blowout preventer and related equipment shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 Section III.A.2.a-h and API RP 53 section 17.

After running the 16" surface casing we request a variance to Onshore Order No. 2 so that we may install a 20"x2000# Rotating Head/Diverter. (see Drilling Plan-Exhibit 1).

After running the 13.375" "Salt String" casing, a 13.625"x3000# minimum pressure BOP/BOPE system with a 3000# minimum pressure choke manifold will be installed, used, maintained and tested as per Onshore Oil and Gas Order No. 2 Section III.A.2.i.i-xi (see Drilling Plan-Exhibit 2). In addition to the high pressure test, a low pressure (250 psig) test will be performed.
After running the 9.625" "Reef String" casing, A 11.00" x 3000# minimum pressure BOP/BOPE with a 3000# minimum pressure choke manifold will be installed, used, maintained and tested as per Onshore Oil and Gas Order No. 2 Section III.A.2.i.i-xi (see Drilling Plan-Exhibit 3). In addition to the high pressure test, a low pressure (250 psig) test will be performed.
After running the 7.00" intermediate casing, A 11.00" x 3000# minimum pressure BOP/BOPE with a 3000# minimum pressure choke manifold will be installed, used, maintained and tested as per Onshore Oil and Gas Order No. 2 Section III.A.2.i.i-xi (see Drilling Plan-Exhibit 3). In addition to the high pressure test, a low pressure (250 psig) test will be performed.

Pressure tests will be conducted by independent testers prior to drilling out all casing strings. The BLM shall be notified a minimum of 4 hours in advance of such tests with the results of each test reported to the BLM.
BOPE will be inspected and operated as recommended in Onshore Order #2 Section III.A.2.a-i.
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 will include; (a) a Kelly cock will be in the drill string at all times, a full opening drill pipe stabbing valve with the appropriate connections will be on the rig floor at all times, choke lines and choke manifold with the appropriate WP rating.

d. **Proposed Casing Program:** The proposed casing program was designed in accordance with Onshore Oil and Gas Order No.1Section III.D.3.d and Onshore Oil and Gas Order No.2 Section III.B. All casing is new and API approved.

See COA

Hole Size	Hole Interval	Casing Size	Wt./Ft.	Grade & Coupling	String Length
18.125"	0-~~875~~ 900 1800	16.000"	84#	J-55 BT&C	0'-~~875~~ 900'
14.75"	~~875~~'-~~2700~~	13.375"	68#	HCL-80 UFJ	0'-~~2700~~' 2800'
12.25"	~~2700~~'-4200'	9.625"	40#	J-55 LT&C	0'-4200'
8.75"	4200'-9550'	7.000"	26#	HCP-110 LT&C	0'-9550'
6.125"	9550'-17,289	4.500"	11.6#	HCP-110 LT&C	8700'-17289"

Minimum casing design factors: Collapse of 1.125, Burst of 1.125 and tensile strength of 1.6.

e. **Proposed Cement Program:** The proposed cementing program has been designed in accordance with Onshore Oil and Gas Order No.1Section III.D.3.e and Onshore Oil and Gas Order No.2 Section III.B.

16"surface casing at ~~875~~ 900': 750sx Class "C" w/4% bentonite + 2% CaCl2 + 0.25#/sk Flake + 3#/sk LCM-1 (yield=1.75ft3/sk, weight = 13.5ppg, mix @ 8.7

gps). Tail in w/250 sx Class "C" w/2% CaCl + 0.25#/sk Flake (yield =1.34ft3/sk, weight=14.8ppg, mix @ 6.3gps) Using 235+ % excess. Cement circulated to surface.

13.375" "Salt String" casing at ~~2700'~~ 2800': 600sx EconoCem-HLC w/5% CaCl2 + 5#/sk Gilsonite (yield=1.85ft3/sk, weight=12.9ppg, mix @ 9.3gps) Tail in w/250sx HalCem-C Neat (yield=1.35ft3/sk, weight=14.8 ppg, mix @ 6.3gps). Using 150% excess. Cement circulated to surface.

9.625" "Reef String" casing at 4200' with DV Tool/ECP set @ 2900': 1ST stage (DV tool & external casing packer @ 2900') - 750sx SwiftCem-Thixotropic (yield=1.67ft3/sk, weight=14.2ppg, mix @ 7.5gps). 2nd Stage – 200sx SwiftCem-Thixotropic(yield=1.67ft3/sk, weight=14.2ppg, mix @ 7.5gps) + 700sx EconoCem-HLC (yield=1.85ft3/sk, weight=12.9ppg, mix @ 9.3gps) & tail in w/100 sx HalCem-C Neat (yield=1.33ft3/sk, weight=14.8ppg, mix @ 6.3gps). Using 165% excess. Cement circulated to surface.

7.0" Intermediate casing at 9550' with DV Tool set @ 5000': 1st Stage (DV tool @ 5000' – 500sx Tuned Lite w/0.75% CFR-3 + 1.5#/sk CaCl (yield=2.76 cuft/sk, weight=10.2 ppg, mix @ 12.4 gl/sk) & tail in w/250sx VersaCem-PBSH2 w/0.4% Halad (yield=1.65, weight=13.0 ppg, mix @ 8.7 gl/sk). 2nd Stage - 500sx Tuned Lite w/0.75% CFR-3 + 1.5#/sk CaCl (yield=2.76 cuft/sk, weight=10.2 ppg, mix @ 12.4 gl/sk). Tail in w/250 sx HalCem-C Neat (yield=1.33 cuft/sk, weight=14.8 ppg, mix @ 6.3 gl/sk). Using 150+% excess. Cement circulated to surface.

4.5" production casing at 17,289 (MD): A 4 ½" liner with open hole packers and ports will be run for zonal isolation in the lateral and cementing will not be required for this interval

The above cement volumes could be revised pending the caliper measurement from the open hole logs and using fluid calipers to calculate cement volumes.

f. **Mud Program:** The proposed mud program has been designed in accordance with Onshore Oil and Gas Order No.1Section III.D.3.f and Onshore Oil and Gas Order No.2 Section III.C.1-7.The applicable depths and properties of this system are as follows:

See COA

Depth	Type System	Weight(lb/gal)	Viscosity	Water Loss
0-~~875'~~ 900' 2800'	Fresh water gel	8.4-9.2	32-50	No control
~~875'-2700'~~	Brine water	9.8-10.2	28-30	No control
2700'-4200'	Fresh water gel	8.4-9.0	28-34	No control
4200'-17,289'	Fresh water gel/starch	8.6-9.1	28-36	15-50cc

The necessary mud products for weight addition and fluid loss control will be on location at all times.

Visual mud monitoring equipment will be in place to detect volume changes indicating loss or gain of circulating fluid volume. Visual pit level monitors and audible alarms will be utilized and will be available to the control room and the supervisors. Mud properties will be monitored daily and reported on the automatic monitoring system. Although no abnormal pressures are expected, a mud-gas separator will be rigged up and operational prior to drilling out of the 13.375" casing.

See COA

g. Testing, Logging and Coring Program:

1. No drill stem test are planned
2. 10' samples from 4200' to TD.
3. A mud log will be run from 4200 to TD.
4. A gyro will be run from surface to the kick-off point & a Gamma Ray log will be run from the kick-off point to TD.
5. A cased hole Gamma Ray-Neutron log will be run from surface to the Kick-off point after the 5.5" production casing has been set and cemented.

h. Downhole Conditions, Estimated BHP & Potential Hazards:

From: 0' -875' 900 No abnormal downhole conditions. Maximum BHP @ 0.5#/ft=440psi)
From: 875-2700' 800 Possible water flows. Maximum BHP @ 0.5#/ft=1350#.
From: 2700-4200' Possible lost circulation. Maximum BHP @ 0.5#/ft=2100#.
From: 4200-17,289' Possible lost circulation in Delaware. Oil and Gas zones in Delaware & Bone Spring sands. Maximum potential BHP @ 0.5#/ft =4685#/Mud weight equivalent = 9.6ppg.

See COA

BHT is estimated at 125 deg F (maximum estimated BHT=140 deg F).

1. No abnormal pressures or temperatures are expected. H2S has sometimes been detected in the Delaware and Bone Spring zones in this area during drilling. Hydrogen sulfide detection equipment will be in operation prior to drilling out of the 16" casing shoe @ 875' and until production casing has been set at total depth (see attached Hydrogen Sulfide Drilling Operations Plan). The rig will be equipped with H2S monitors, H2S warning signs and pit monitors. Wind socks will indicate wind direction. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Estimated maximum BHP=4685 psi (9370' TVD @ 0.5#/ft = 4685 psi). Estimated maximum BHT: 140°.

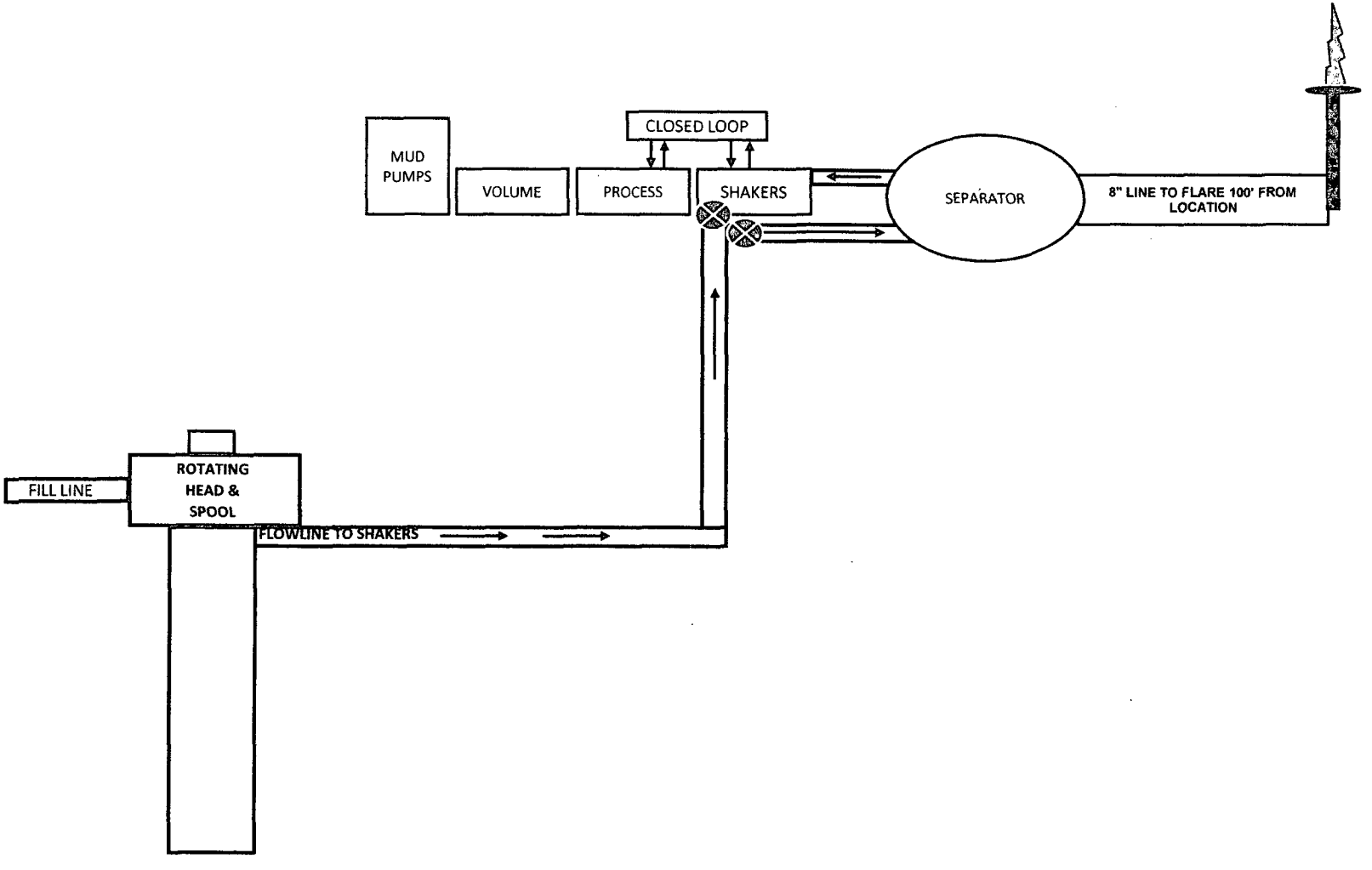
See COA

i. Anticipated Starting Date and Duration of Operations:

1. Road and location construction will begin after the receipt of an approved APD from the BLM. The anticipated spud date will be as soon as an acceptable drilling rig can be contracted after receipt of the approved APD from the BLM. It is our desire to be spud on or around July 1, 2014. Drilling operations are expected to take 35-50 days from rig move-in to rig move-out and completion operations will require another 30-45 days.

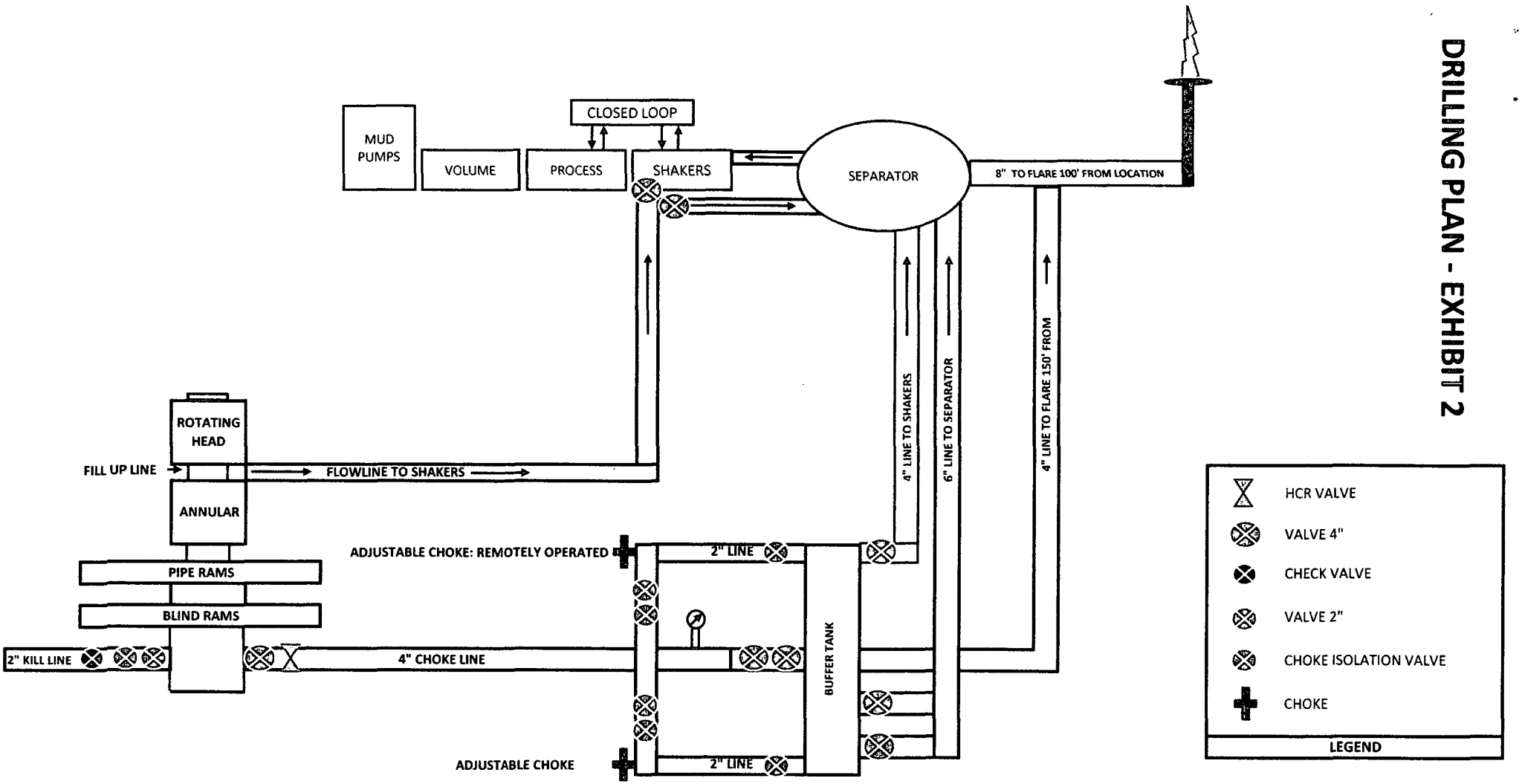
2. Drilling Plan-Exhibit 4 is a directional well plan for this well.

16" CASING w/20" X 2000psi ROTATING HEAD AND CLOSED LOOP EQUIPMENT SCHEMATIC



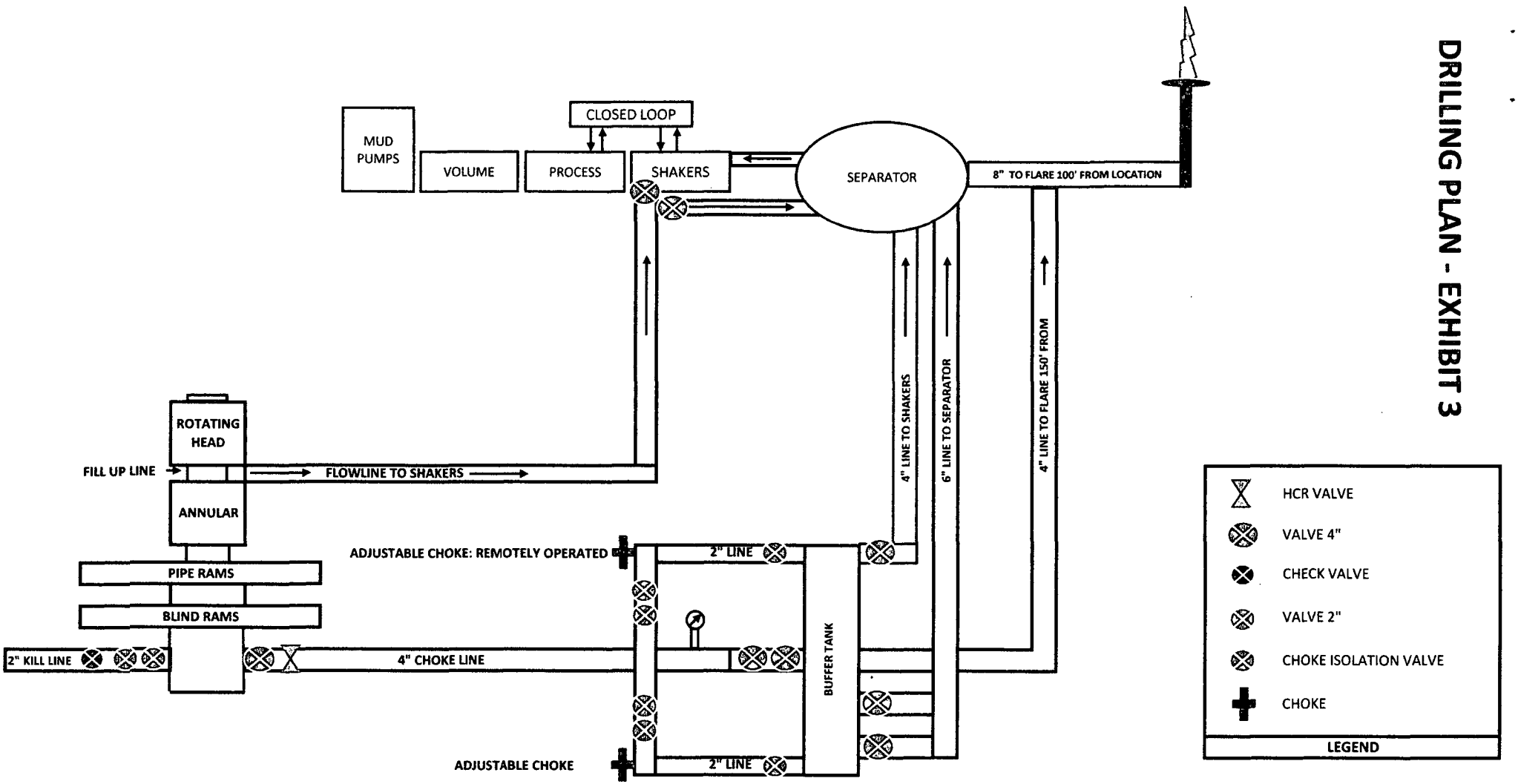
DRILLING PLAN - EXHIBIT 1

13-5/8" 3M BOPE AND CLOSED LOOP EQUIPMENT SCHEMATIC



DRILLING PLAN - EXHIBIT 2

11" x 3M BOPE AND CLOSED LOOP EQUIPMENT SCHEMATIC



DRILLING PLAN - EXHIBIT 4

5D Plan Report

Manzano LLC

Field Name: *Eddy Co, NM (Nad 83 NM EZ)*
Site Name: *Big Eddy Unit #331H*
Well Name: *Big Eddy Unit #331H*
Plan: *P1:V1*

12 March 2014

Weatherford®

Manzano LLC
Big Eddy Unit #331H
Eddy Co, NM

Plan Data for Big Eddy Unit #331H

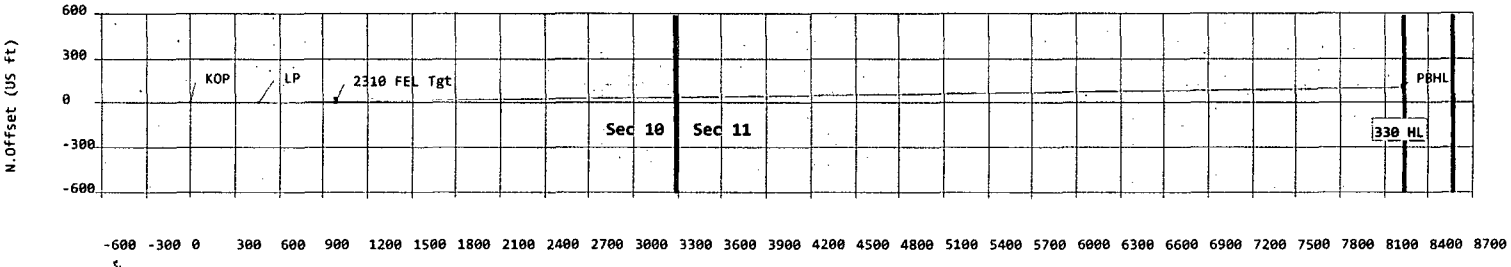
Plan Point Information:
DogLeg Severity Unit: °/100.00ft Position offsets from Slot centre

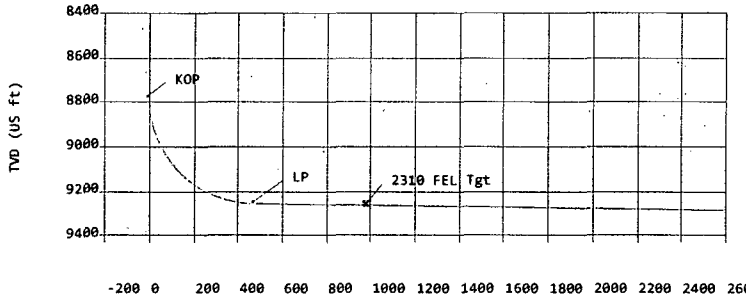
MD (USft)	Inc (°)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Northing (USft)	Easting (USft)	VSec (USft)	DLS (DLSU)
0.00	0.00	0.00	0.00	0.00	0.00	578534.20	687381.90	0.00	0.00
8780.09	0.00	0.00	8780.09	0.00	0.00	578534.20	687381.90	0.00	0.00
9523.17	89.17	89.25	9257.50	6.14	470.51	578540.34	687852.41	470.51	12.00
10040.55	89.17	89.25	9265.00	12.89	987.79	578547.09	688369.69	987.80	0.00
17289.21	89.17	89.25	9370.01	107.47	8235.07	578641.67	695616.97	8235.16	0.00

Plan Data for Big Eddy Unit #331H

Slot: Big Eddy Unit #331H
Position:
Offset is from Site centre
+N/-S: 0.00USft Northing: 578534.20USft Latitude: 32°35'22.4"
+E/-W: 0.00USft Easting: 687381.90USft Longitude: -103°51'32.9"
Elevation Above VRD: 3467.00USft

Big Eddy Unit #331H

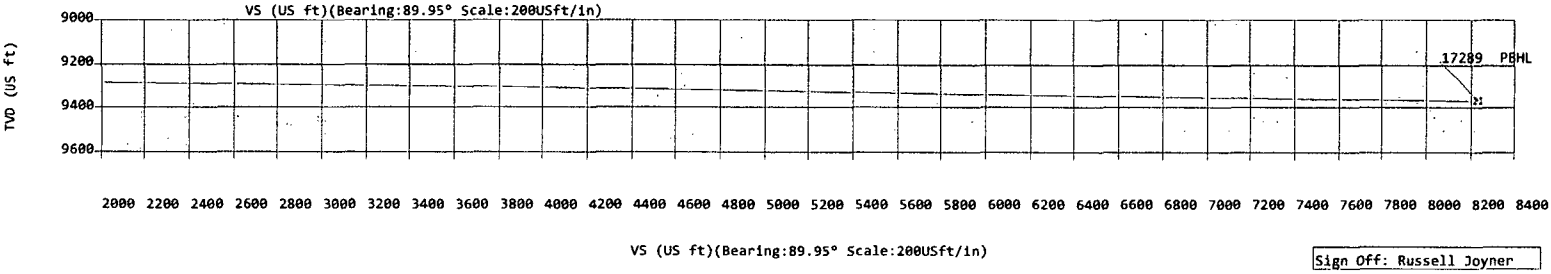




Plan Data for Big Eddy Unit #331H

Target Set Information:
Name: Big Eddy Unit #331H
Position offsets from Slot centre

Name	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Northing (USft)	Easting (USft)	Shape	Comment
LP Tgt	9265.00	12.89	987.79	578547.09	688369.69	Cuboid	
PBHL	9370.00	107.47	8235.07	578641.67	695616.97	Cuboid	



Sign Off: Russell Joyner

Big Eddy Unit #331H

Field Name
Eddy Co, NM (Nad 83 NM EZ)

Map Units : US ft **Company Name :** Manzano LLC
Vertical Reference Datum (VRD) : Mean Sea Level
Projected Coordinate System : NAD83 / New Mexico East (ftUS)
Comment :

Site Name
Big Eddy Unit #331H

Units : US ft **North Reference** : Grid **Convergence Angle :** 0.26
Position **Northing :** 578534.20 US ft **Latitude :** 32° 35' 22.38"
Easting : 687381.90 US ft **Longitude :** -103° 51' 32.93"
Elevation above Mean Sea Level: 3467.00 US ft
Comment :

Slot Name
Big Eddy Unit #331H

Position (Offsets relative to Site Centre)
+N / -S : 0.00 US ft **Northing :** 578534.20 US ft **Latitude :** 32°35'22.38"
+E / -W : 0.00 US ft **Easting :** 687381.90 US ft **Longitude :** -103°51'32.93"
Slot TVD Reference : Ground Elevation
Elevation above Mean Sea Level : 3467.00 US ft
Comment :

Well Name
Big Eddy Unit #331H

Type : Main well **UWI :** **Plan :** P1:V1
Rig Height ***Drill Floor*** **:** 18.00 US ft **Comment :**
Relative to Mean Sea Level: 3485.00 US ft
Closure Distance : 8235.77 US ft **Closure Azimuth :** 89.2523°
Vertical Section (Position of Origin Relative to Slot)
+N / -S : 0.00 US ft **+E / -W :** 0.00 US ft **Az :** 89.95°
Magnetic Parameters
Model : BGGM **Field Strength :** 48518.6nT **Dec :** 7.52° **Dip :** 60.39° **Date :** 30/Apr/2014

Target Set

Name : Big Eddy Unit #331H **Number of Targets :** 2

Comment :

Target Name:
LP Tgt

Position (Relative to Slot centre)
+N / -S : 12.89 US ft **Northing :** 578547.09 US ft **Latitude :** 32°35'22.46"
+E / -W : 987.79 US ft **Easting :** 688369.69 US ft **Longitude :** -103°51'21.38"
TVD (Drill Floor) : 9265.00 US ft

Shape:
Cuboid

Orientation **Azimuth :** 0.00° **Inclination :** 0.00°
Dimensions **Length :** 20.00 US ft **Breadth :** 20.00 US ft **Height :** 20.00 US ft

5D Plan Report

Target Name:	Position (Relative to Slot centre)		
PBHL	+N / -S : 107.47US ft	Northing : 578641.67 US ft	Latitude : 32°35'23.07"
Shape:	+E / -W : 8235.07 US ft	Easting : 695616.97US ft	Longitude : -103°49'56.67"
Cuboid	TVD (Drill Floor) : 9370.00 US ft		
	Orientation Azimuth : 0.00°	Inclination : 0.00°	
	Dimensions Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft

Well path created using minimum curvature

Salient Points (Relative to Slot centre, TVD relative to Drill Floor)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100 US ft)	VS (US ft)	B.Rate (°/100 US ft)	T.Rate (°/100 US ft)	T.Face (°)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8780.09	0.00	0.00	8780.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP
9523.17	89.17	89.25	9257.50	6.14	470.51	12.00	470.51	12.00	0.00	89.25	LP
10040.55	89.17	89.25	9265.00	12.89	987.79	0.00	987.80	0.00	0.00	0.00	2310 FEL Tgt
17289.21	89.17	89.25	9370.01	107.47	8235.07	0.00	8235.16	0.00	-0.00	324.74	PBHL

Interpolated Points (Relative to Slot centre, TVD relative to Drill Floor)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment
8700.00	0.00	0.00	8700.00	0.00	0.00	0.00	0.00	578534.20	687381.90	
8780.09	0.00	0.00	8780.09	0.00	0.00	0.00	0.00	578534.20	687381.90	KOP
8800.00	2.39	89.25	8799.99	0.01	0.42	0.42	12.00	578534.21	687382.32	
8900.00	14.39	89.25	8898.74	0.20	14.98	14.98	12.00	578534.40	687396.88	
9000.00	26.39	89.25	8992.31	0.65	49.75	49.75	12.00	578534.85	687431.65	
9100.00	38.39	89.25	9076.60	1.35	103.21	103.21	12.00	578535.55	687485.11	
9200.00	50.39	89.25	9147.92	2.26	173.03	173.03	12.00	578536.46	687554.93	
9300.00	62.39	89.25	9203.18	3.34	256.15	256.16	12.00	578537.54	687638.05	
9400.00	74.39	89.25	9239.94	4.55	348.95	348.95	12.00	578538.75	687730.85	
9500.00	86.39	89.25	9256.61	5.84	447.36	447.36	12.00	578540.04	687829.26	
9523.17	89.17	89.25	9257.50	6.14	470.51	470.51	12.00	578540.34	687852.41	LP
9600.00	89.17	89.25	9258.62	7.14	547.32	547.32	0.00	578541.34	687929.22	
9700.00	89.17	89.25	9260.07	8.45	647.30	647.31	0.00	578542.65	688029.20	
9800.00	89.17	89.25	9261.52	9.75	747.28	747.29	0.00	578543.95	688129.18	
9900.00	89.17	89.25	9262.96	11.06	847.26	847.27	0.00	578545.26	688229.16	
10000.00	89.17	89.25	9264.41	12.36	947.24	947.25	0.00	578546.56	688329.14	
10040.55	89.17	89.25	9265.00	12.89	987.79	987.80	0.00	578547.09	688369.69	2310 FEL Tgt
10100.00	89.17	89.25	9265.86	13.67	1047.22	1047.23	0.00	578547.87	688429.12	
10200.00	89.17	89.25	9267.31	14.97	1147.20	1147.22	0.00	578549.17	688529.10	
10300.00	89.17	89.25	9268.76	16.27	1247.18	1247.20	0.00	578550.47	688629.08	
10400.00	89.17	89.25	9270.21	17.58	1347.16	1347.18	0.00	578551.78	688729.06	
10500.00	89.17	89.25	9271.66	18.88	1447.15	1447.16	0.00	578553.08	688829.05	
10600.00	89.17	89.25	9273.10	20.19	1547.13	1547.14	0.00	578554.39	688929.03	
10700.00	89.17	89.25	9274.55	21.49	1647.11	1647.13	0.00	578555.69	689029.01	
10800.00	89.17	89.25	9276.00	22.80	1747.09	1747.11	0.00	578557.00	689128.99	
10900.00	89.17	89.25	9277.45	24.10	1847.07	1847.09	0.00	578558.30	689228.97	
11000.00	89.17	89.25	9278.90	25.41	1947.05	1947.07	0.00	578559.61	689328.95	
11100.00	89.17	89.25	9280.35	26.71	2047.03	2047.05	0.00	578560.91	689428.93	
11200.00	89.17	89.25	9281.80	28.02	2147.01	2147.03	0.00	578562.22	689528.91	
11299.99	89.17	89.25	9283.25	29.32	2246.99	2247.02	0.00	578563.52	689628.89	
11399.99	89.17	89.25	9284.69	30.63	2346.97	2347.00	0.00	578564.83	689728.87	
11499.99	89.17	89.25	9286.14	31.93	2446.95	2446.98	0.00	578566.13	689828.85	
11599.99	89.17	89.25	9287.59	33.24	2546.93	2546.96	0.00	578567.44	689928.83	
11699.99	89.17	89.25	9289.04	34.54	2646.92	2646.94	0.00	578568.74	690028.82	

5D Plan Report

Interpolated Points (Relative to Slot centre, TVD relative to Drill Floor)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N Offset (US ft)	E Offset (US ft)	VS (US ft)	DLS (°/100 US ft)	Northing (US ft)	Easting (US ft)	Comment
11799.99	89.17	89.25	9290.49	35.85	2746.90	2746.93	0.00	578570.05	690128.80	
11899.99	89.17	89.25	9291.94	37.15	2846.88	2846.91	0.00	578571.35	690228.78	
11999.99	89.17	89.25	9293.39	38.45	2946.86	2946.89	0.00	578572.65	690328.76	
12099.99	89.17	89.25	9294.83	39.76	3046.84	3046.87	0.00	578573.96	690428.74	
12199.99	89.17	89.25	9296.28	41.06	3146.82	3146.85	0.00	578575.26	690528.72	
12299.99	89.17	89.25	9297.73	42.37	3246.80	3246.84	0.00	578576.57	690628.70	
12399.99	89.17	89.25	9299.18	43.67	3346.78	3346.82	0.00	578577.87	690728.68	
12499.99	89.17	89.25	9300.63	44.98	3446.76	3446.80	0.00	578579.18	690828.66	
12599.99	89.17	89.25	9302.08	46.28	3546.74	3546.78	0.00	578580.48	690928.64	
12699.99	89.17	89.25	9303.53	47.59	3646.72	3646.76	0.00	578581.79	691028.62	
12799.99	89.17	89.25	9304.98	48.89	3746.70	3746.75	0.00	578583.09	691128.60	
12899.99	89.17	89.25	9306.42	50.20	3846.68	3846.73	0.00	578584.40	691228.58	
12999.99	89.17	89.25	9307.87	51.50	3946.67	3946.71	0.00	578585.70	691328.57	
13099.99	89.17	89.25	9309.32	52.81	4046.65	4046.69	0.00	578587.01	691428.55	
13199.99	89.17	89.25	9310.77	54.11	4146.63	4146.67	0.00	578588.31	691528.53	
13299.99	89.17	89.25	9312.22	55.42	4246.61	4246.65	0.00	578589.62	691628.51	
13399.99	89.17	89.25	9313.67	56.72	4346.59	4346.64	0.00	578590.92	691728.49	
13499.99	89.17	89.25	9315.12	58.03	4446.57	4446.62	0.00	578592.23	691828.47	
13599.99	89.17	89.25	9316.56	59.33	4546.55	4546.60	0.00	578593.53	691928.45	
13699.99	89.17	89.25	9318.01	60.64	4646.53	4646.58	0.00	578594.84	692028.43	
13799.99	89.17	89.25	9319.46	61.94	4746.51	4746.56	0.00	578596.14	692128.41	
13899.99	89.17	89.25	9320.91	63.24	4846.49	4846.55	0.00	578597.44	692228.39	
13999.99	89.17	89.25	9322.36	64.55	4946.47	4946.53	0.00	578598.75	692328.37	
14099.99	89.17	89.25	9323.81	65.85	5046.45	5046.51	0.00	578600.05	692428.35	
14199.99	89.17	89.25	9325.26	67.16	5146.44	5146.49	0.00	578601.36	692528.34	
14299.99	89.17	89.25	9326.70	68.46	5246.42	5246.47	0.00	578602.66	692628.32	
14399.99	89.17	89.25	9328.15	69.77	5346.40	5346.46	0.00	578603.97	692728.30	
14499.99	89.17	89.25	9329.60	71.07	5446.38	5446.44	0.00	578605.27	692828.28	
14599.99	89.17	89.25	9331.05	72.38	5546.36	5546.42	0.00	578606.58	692928.26	
14699.99	89.17	89.25	9332.50	73.68	5646.34	5646.40	0.00	578607.88	693028.24	
14799.99	89.17	89.25	9333.95	74.99	5746.32	5746.38	0.00	578609.19	693128.22	
14899.99	89.17	89.25	9335.40	76.29	5846.30	5846.37	0.00	578610.49	693228.20	
14999.99	89.17	89.25	9336.84	77.60	5946.28	5946.35	0.00	578611.80	693328.18	
15099.99	89.17	89.25	9338.29	78.90	6046.26	6046.33	0.00	578613.10	693428.16	
15199.99	89.17	89.25	9339.74	80.21	6146.24	6146.31	0.00	578614.41	693528.14	
15299.99	89.17	89.25	9341.19	81.51	6246.22	6246.29	0.00	578615.71	693628.12	
15399.99	89.17	89.25	9342.64	82.82	6346.20	6346.27	0.00	578617.02	693728.10	
15499.99	89.17	89.25	9344.09	84.12	6446.19	6446.26	0.00	578618.32	693828.09	
15599.99	89.17	89.25	9345.54	85.43	6546.17	6546.24	0.00	578619.63	693928.07	
15699.99	89.17	89.25	9346.98	86.73	6646.15	6646.22	0.00	578620.93	694028.05	
15799.99	89.17	89.25	9348.43	88.03	6746.13	6746.20	0.00	578622.23	694128.03	
15899.99	89.17	89.25	9349.88	89.34	6846.11	6846.18	0.00	578623.54	694228.01	
15999.99	89.17	89.25	9351.33	90.64	6946.09	6946.17	0.00	578624.84	694327.99	
16099.99	89.17	89.25	9352.78	91.95	7046.07	7046.15	0.00	578626.15	694427.97	
16199.99	89.17	89.25	9354.23	93.25	7146.05	7146.13	0.00	578627.45	694527.95	
16299.98	89.17	89.25	9355.68	94.56	7246.03	7246.11	0.00	578628.76	694627.93	
16399.98	89.17	89.25	9357.12	95.86	7346.01	7346.09	0.00	578630.06	694727.91	
16499.98	89.17	89.25	9358.57	97.17	7445.99	7446.08	0.00	578631.37	694827.89	
16599.98	89.17	89.25	9360.02	98.47	7545.97	7546.06	0.00	578632.67	694927.87	
16699.98	89.17	89.25	9361.47	99.78	7645.95	7646.04	0.00	578633.98	695027.85	
16799.98	89.17	89.25	9362.92	101.08	7745.94	7746.02	0.00	578635.28	695127.84	
16899.98	89.17	89.25	9364.37	102.39	7845.92	7846.00	0.00	578636.59	695227.82	
16999.98	89.17	89.25	9365.82	103.69	7945.90	7945.98	0.00	578637.89	695327.80	
17099.98	89.17	89.25	9367.26	105.00	8045.88	8045.97	0.00	578639.20	695427.78	
17199.98	89.17	89.25	9368.71	106.30	8145.86	8145.95	0.00	578640.50	695527.76	
17289.21	89.17	89.25	9370.01	107.47	8235.07	8235.16	0.00	578641.67	695616.97	PBHL

Weatherford Drilling Services

GeoDec v5.03

Report Date:	March 12, 2014
Job Number:	
Customer:	Manzano, LLC
Well Name:	Big Eddy Unit #331H
API Number:	
Rig Name:	
Location:	Eddy Co, New Mexico
Block:	
Engineer:	R Joyner

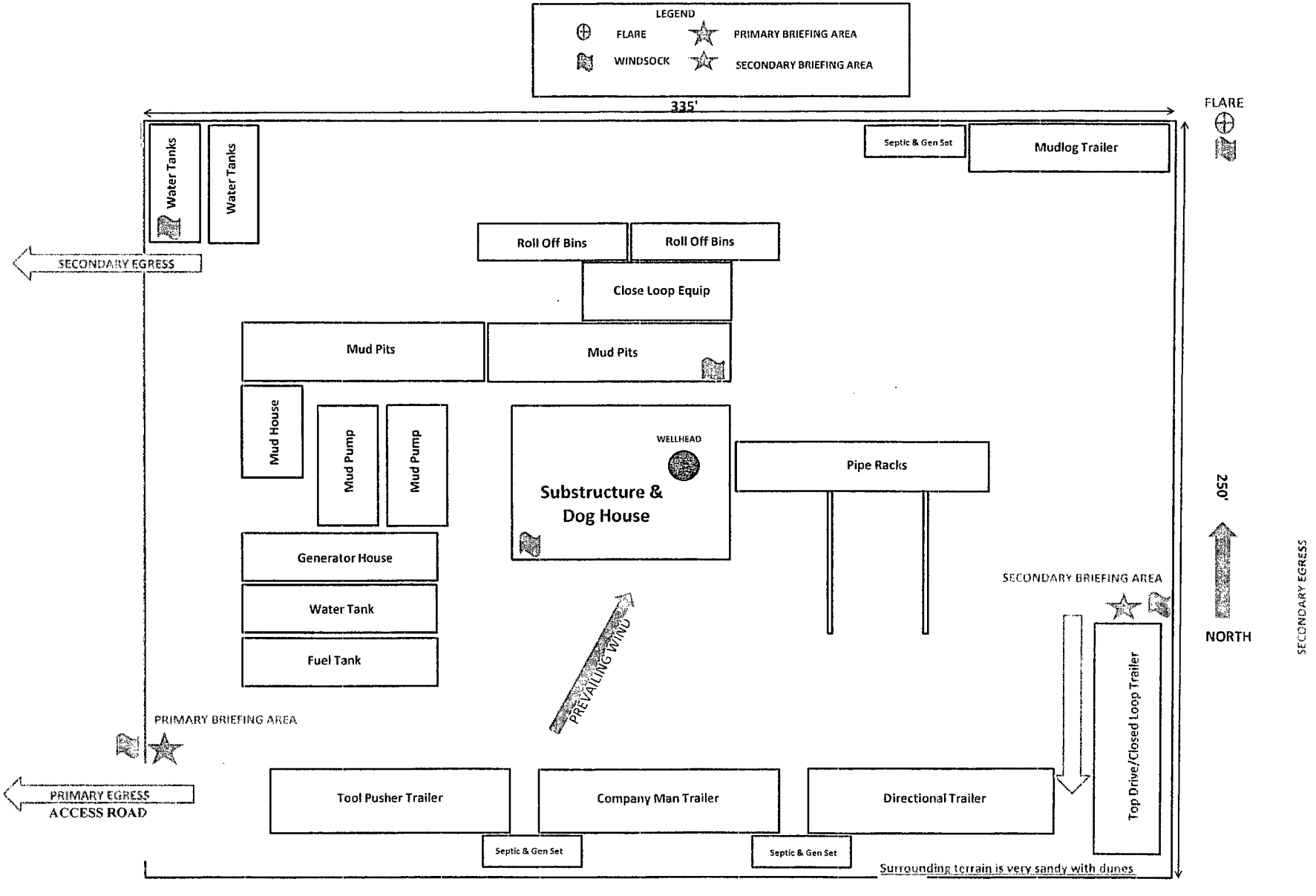
US State Plane 1983	Geodetic Latitude / Longitude
System: New Mexico Eastern Zone	System: Latitude / Longitude
Projection: Transverse Mercator/Gauss Kruger	Projection: Geodetic Latitude and Longitude
Datum: North American Datum 1983	Datum: North American Datum 1983
Ellipsoid: GRS 1980	Ellipsoid: GRS 1980
North/South 578534.200 USFT	Latitude 32.5895491 DEG
East/West 687381.900 USFT	Longitude -103.8591473 DEG
Grid Convergence: .26°	
Total Correction: +7.26°	

Geodetic Location WGS84	Elevation =	0.0 Meters
Latitude =	32.58955° N	32° 35 min 22.377 sec
Longitude =	103.85915° W	103° 51 min 32.930 sec

Magnetic Declination =	7.52°	[True North Offset]	
Local Gravity =	.9988 g	CheckSum =	6684
Local Field Strength =	48519 nT	Magnetic Vector X =	23766 nT
Magnetic Dip =	60.39°	Magnetic Vector Y =	3136 nT
Magnetic Model =	bggm2013	Magnetic Vector Z =	42183 nT
Spud Date =	Apr 30, 2014	Magnetic Vector H =	23972 nT

Signed: _____ Date: 3/12/14

MANZANO, LLC
H2S WELLSITE DIAGRAM
Drilling Equipment Layout



MANZANO, LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

BIG EDDY UNIT #331H
SHL: 2050' FNL & 1975' FWL
Section 10-T20S-R31E
BHL: 2000' FNL & 330' FEL
Section 11-T20S-R31E
Eddy County, New Mexico

This H2S Drilling Operations Plan is submitted with Form 3160-3, Application for Permit to Drill, in accordance with BLM Onshore Oil and Gas Order Number 6 Section III.A.1., covering the above described well.

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:

A. The hazards and characteristics of hydrogen sulfide (H_2S).

B. The proper use and maintenance of personal protective equipment and life support systems.

C. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.

D. The proper techniques for first aid and rescue procedures.

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

A. The effects of H_2S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.

B. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.

C. The contents and requirements of the H_2S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H_2S zone (within 3 days or 500 feet) and weekly H_2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

II. H_2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H_2S 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 reasonably expected to contain H_2S (prior to drilling out of the 13 3/8" surface casing shoe for this well).

A. Well Control Equipment (All BOP and BOP equipment is shown in Drilling Plan-Exhibits 1-4).
   Flare line.
   Choke manifold and remotely operated chokes.
   Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
   Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

B. Protective equipment for essential personnel:
   Mark II Surviveair 30-minute units located in the dog house and at briefing areas.

C. H_2S detection and monitoring equipment:

   2 - Portable H_2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H_2S levels of 20 ppm are reached.

D. Visual warning systems:

   Caution/Danger signs 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.

E. Mud Program: The mud program has been designed to minimize the volume of H_2S circulated to the surface

F. Metallurgy:
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H_2S service.

G. Communication:
Company vehicles equipped with cellular telephone.

Manzano has conducted a review to determine if an H2S Contingency Plan is needed for this well and has determined that there is minimal potential for the accumulation for any hazardous concentration of H2S; therefore, no H2S Contingency Plan has been submitted for this well.

WARNING

YOU ARE ENTERING AN H_2S AREA
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 IN WITH COMPANY MAN ON LOCATION***

Manzano, LLC

575-623-1996

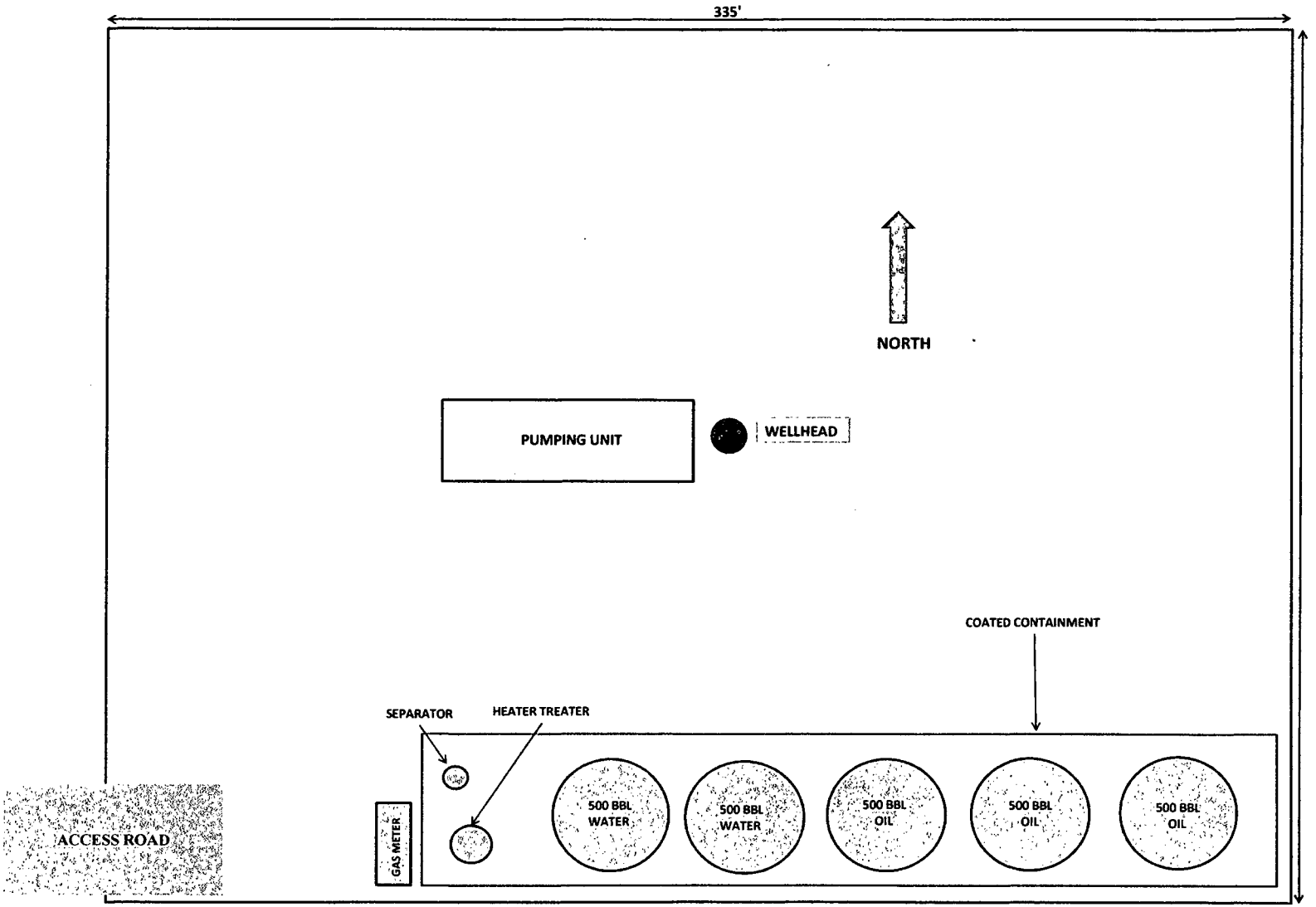
EMERGENCY CALL LIST

MANZANO, LLC OFFICE	**575-623-1996**
MIKE HANAGAN:	**575-623-1996 office** **575-420-8821 cell**

EMERGENCY RESPONSE NUMBERS
Eddy County, New Mexico

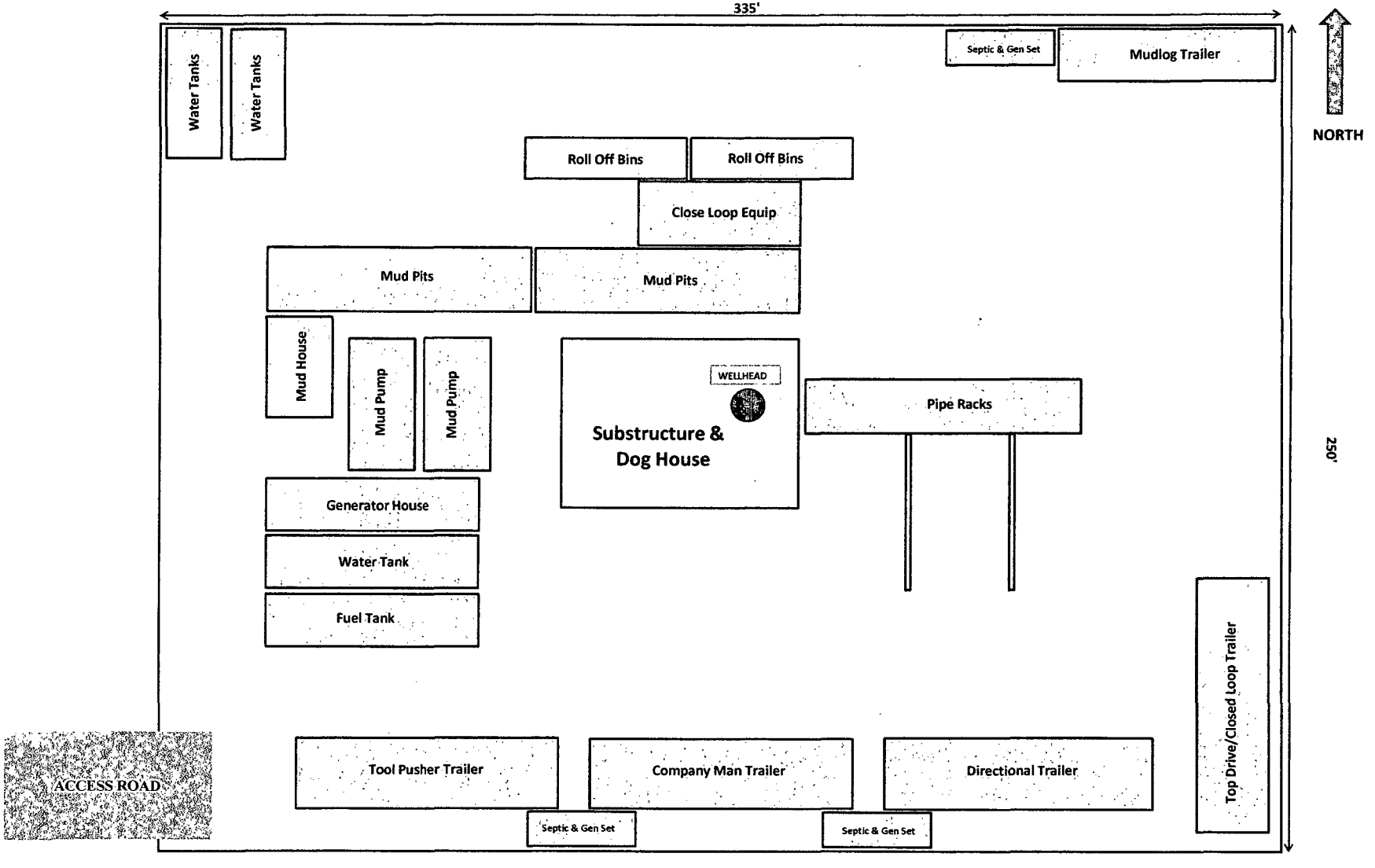
NEW MEXICO STATE POLICE	**575-885-3137**
EDDY COUNTY SHERIFF DEPT	**575-887-7551**
CARLSBAD MEDICAL CENTER	**575-885-1884**
CARLSBAD FIRE DEPT	**575-887-3798**
AMBULANCE	**911**
FLIGHT FOR LIFE (LUBBOCK)	**806-743-9911**
AEROCARE (LUBBOCK)	**806-747-8923**
MED FLIGHT (ALBQ)	**505-842-4433**

MANZANO, LLC
EXHIBIT 4
PRODUCTION FACILITIES



SURFACE USE PLAN - EXHIBIT 4

MANZANO, LLC
EXHIBIT 5
Drilling Equipment Layout



SURFACE USE PLAN - EXHIBIT 5

MANZANO, LLC
SURFACE USE AND PLAN

BIG EDDY UNIT #331H
SHL: 2050' FNL & 1975' FWL
Section 10-T20S-R31E
BHL: 2000' FNL & 330' FEL
Section 11-T20S-R31E
Eddy County, New Mexico

This Surface Use Plan is submitted with Form 3160-3, Application for Permit to Drill, in accordance with BLM Onshore Oil and Gas Order Number 1 Section III.D.4., covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved and the procedures to be followed in rehabilitating the surface after completion of the operations, so that a complete appraisal can be made of the environmental effect associated with the operations.

a. EXISTING ROADS:

1. The well site and elevation plat for the proposed well are attached to Form 3160-3 and reflect the proposed well site layout (NMOCD Form C-102). The well was staked by Basin Surveys, Inc.

2. Surface Use Plan-Exhibit 1 is a Vicinity map showing the well and roads in the vicinity of the proposed location. There are existing roads that provide access to the proposed location which is entirely on the old drill pad for the Perry Bass Big Eddy Unit #37 well which was plugged and abandoned in 1973. These existing roads are in good condition and will not require any additional disturbance for this well.

DIRECTIONS: From Carlsbad go northeast on Highway 62-180 approximately 12 miles. Turn left (north) onto State Road NM 31. Go north five miles to the intersection of NM 31 & CR 222 (Shugart Road). Turn right (east) onto CR 222 & go northeast for 4.2 miles. Turn right (south) onto lease road & go south for 1.7 miles. Turn left (east) and go east 2.4 miles, then veer right & go south 0.5 miles to the existing well pad and proposed well location.

3. If necessary, Right of Way using the proposed route is hereby being requested.

4. Routine grading and maintenance of the existing roads will be conducted as necessary to maintain their condition in the same or better condition

than before operations began for as long as any operations continue on this lease.

b. ACCESS ROAD AND DRILL PAD:

1. The proposed access road will require no new construction nor any new surface disturbance and will come into the southwest side of the existing drill pad utilized by the Perry Bass Big Eddy Unit Well #37. The proposed well site and the proposed access into the well site are shown on Surface Use Plan-Exhibit 2.

   The width of the ROW for proposed access road does not exceed 20' and the existing driving surface does not exceed 14'. The proposed access road is the existing lease road going into the Perry Bass Big Eddy Unit #37 which enters onto the southwest side of the drill pad. The proposed access road will not require the installation of any culverts or cattleguards, nor the modification or installation of any fence.

2. Surface Use Plan-Exhibit 2 also is a plat showing the well site layout and drill pad dimensions for a rig utilizing a closed loop system. This well will be drilled with a closed loop system so no reserve pits will be constructed.

   The drill pad will be 335' x 250' (see Surface Use Plan-Exhibit 2) and will require no additional disturbance. The drill pad is already surfaced with compacted caliche so no additional surfacing material will be needed. As there will be no new surface disturbance, there will be no topsoil to be stockpiled.

c. LOCATION OF EXISTING WELLS: Surface Use Plan-Exhibit 3 shows all wells within a one mile radius of the proposed well.

d. LOCATION OF EXISTING AND/OR PROPOSED PRODUCTION FACILITIES:

1. In the event the well is found productive, a tank battery will be constructed with three 500 bbl oil storage tanks, two 500 bbl fiberglass water tanks, a separator, a heater treater and a gas sales meter (see Surface Use Plan-Exhibit 4).

2. The well should be a producing oil well and will be produced initially with a submersible pump and then with a conventional pumping unit.

3. All flowlines will adhere to API standards.

4. Electricity is ~0.5 miles northwest of the location and will be supplied by Excel Energy. Excel will apply for ROW for their power lines.

e. LOCATION AND TYPES OF WATER SUPPLY:

1. This location will be drilled using a combination of water mud systems (outlined in the Section f of the Drilling Plan). The water will be obtained from commercial water stations in the area and hauled to location by transport truck using existing roads.

f. CONSTRUCTION MATERIALS; No surfacing materials will be required for this well.

g. METHODS OF HANDLING WASTE:

1. All trash, junk and other waste material, including broken sacks and/or pallets, will be removed from the wellsite within 30 days after finishing drilling and/or completion operations. All waste material will be contained in trash cages or trash bins to prevent scattering. When the job is completed, all contents will be removed and disposed of in an approved sanitary landfill.

2. All drilling fluids and cuttings will be trucked to an approved disposal facility.

3. A Porto-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete. Any trailer houses and/or temporary living quarters on the well site will be plumbed into a sanitary septic system.

4. Disposal of fluids to be transported by an approved disposal company.

h. ANCILLARY FACILITIES:

1. No campsite or other facilities will be constructed as a result of this well.

i. WELLSITE LAYOUT:

1. Surface Use Plan-Exhibit 2 shows the proposed well site layout with dimensions of the pad layout.

2. Surface Use Plan-Exhibit 5 is a schematic showing the rig equipment on the well pad.

3. As there will be no new surface disturbance associated with the proposed activity, there will be no top soil stockpiled.

4. Mud pits in the active circulating system will be steel pits and a closed loop system will be utilized.

j. PLANS FOR SURFACE RECLAMATION:

1. If the well is productive, there will be no interim reclamation associated with the proposed activity.

2. As there will be no new surface disturbance associated with the proposed activity, no top soil will be stock piled.

3. If the well is not productive, a dry hole marker will be installed, all caliche will be removed from the location and the location will be re-contoured as close as is practical to the original contour. The location will then be ripped and seeded. The existing access road will be reclaimed as directed by the BLM.

k. SURFACE OWNERSHIP:

1. The surface is owned by the BLM and is administered by the BLM. The surface is multiple use with the primary uses of the region for the grazing of livestock and the production of oil and gas.

l. OTHER INFORMATION:

1. The area surrounding the well site is sand dunes and grassland. The topsoil is predominantly red soils. The vegetation is moderately sparse with native prairie grass, some mesquite bushes and shinnery oak. No wildlife was observed but it is likely that deer, rabbits, coyotes, and rodents may be found in the area. During the on-site consultation the BLM wildlife biologist noted that the dune environment in this immediate area was occupied habit for the dune sagebrush lizard and that all activities would need to be confined to the existing pad area.

2. There is no permanent or live water in the general proximity of the location.

3. There are no dwellings within 2 miles of location.

MANZANO, LLC
STATEMENT OF CERTIFICATION

BIG EDDY UNIT #331H
SHL: 2050' FNL & 1975' FWL
Section 10-T20S-R31E
BHL: 2000' FNL & 330' FEL
Section 11-T20S-R31E
Eddy County, New Mexico

This Statement of Certification is submitted with Form 3160-3, Application for Permit to Drill in accordance with BLM Onshore Oil and Gas Order Number 1 Section III.D.6., covering the above described well.

CERTIFICATION:

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 11th day of March, 2014.

Mike Hanagan

Name: Mike Hanagan
Position Title: Managing Member, Manzano, LLC
Address: PO Box 2107 – Roswell, New Mexico 88202-2107
Telephone: 575-623-1996

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Manzano, LLC**
LEASE NO.:	**NMNM-01804**
WELL NAME & NO.:	**Big Eddy Unit 331H**
SURFACE HOLE FOOTAGE:	**2050' FNL & 1975' FWL**
BOTTOM HOLE FOOTAGE	**2000' FNL & 0330' FEL Sec. 11, T. 20 S., R 31 E.**
LOCATION:	**Section 10, T. 20 S., R 31 E., NMPM**
COUNTY:	**Eddy County, New Mexico**

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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**
- Lesser Prairie-Chicken Timing Stipulations
- Ground-level Abandoned Well Marker
- Constructing Over a Reserve Pit
- Construction of pad
- Commercial Well Determination
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☐ **Construction**
- Notification
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☐ **Production (Post Drilling)**
- Well Structures & Facilities

☒ **Interim Reclamation**
- Delayed 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)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

All construction activity will stay within approved area. South side of pad will not exceed 140 ft from center hole.

Constructing Over a Reserve Pit

Manzano shall not excavate any portion of the existing reserve pit area. No topsoil shall be stripped from the reserve pit area. Reclamation over the reserve pit area during interim reclamation or final reclamation must be satisfactory to the authorized officer. Manzano must comply with NMOCD rules when drilling over a reserve pit.

Pad Construction Restrictions

No additional or off-pad disturbance will be allowed on the south side of the pad to protect sand dunes.

This well does not appear to be in the current Unit Plan of Development. Operator must submit a revised UPOD.

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months.

Unit Wells

The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

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 (575) 234-5909 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

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

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

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 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.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad; the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

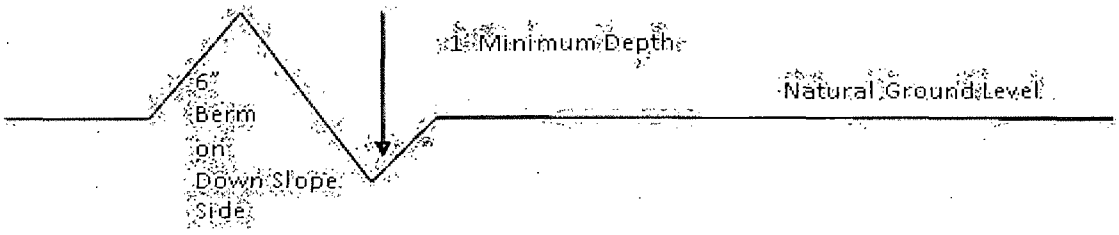
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

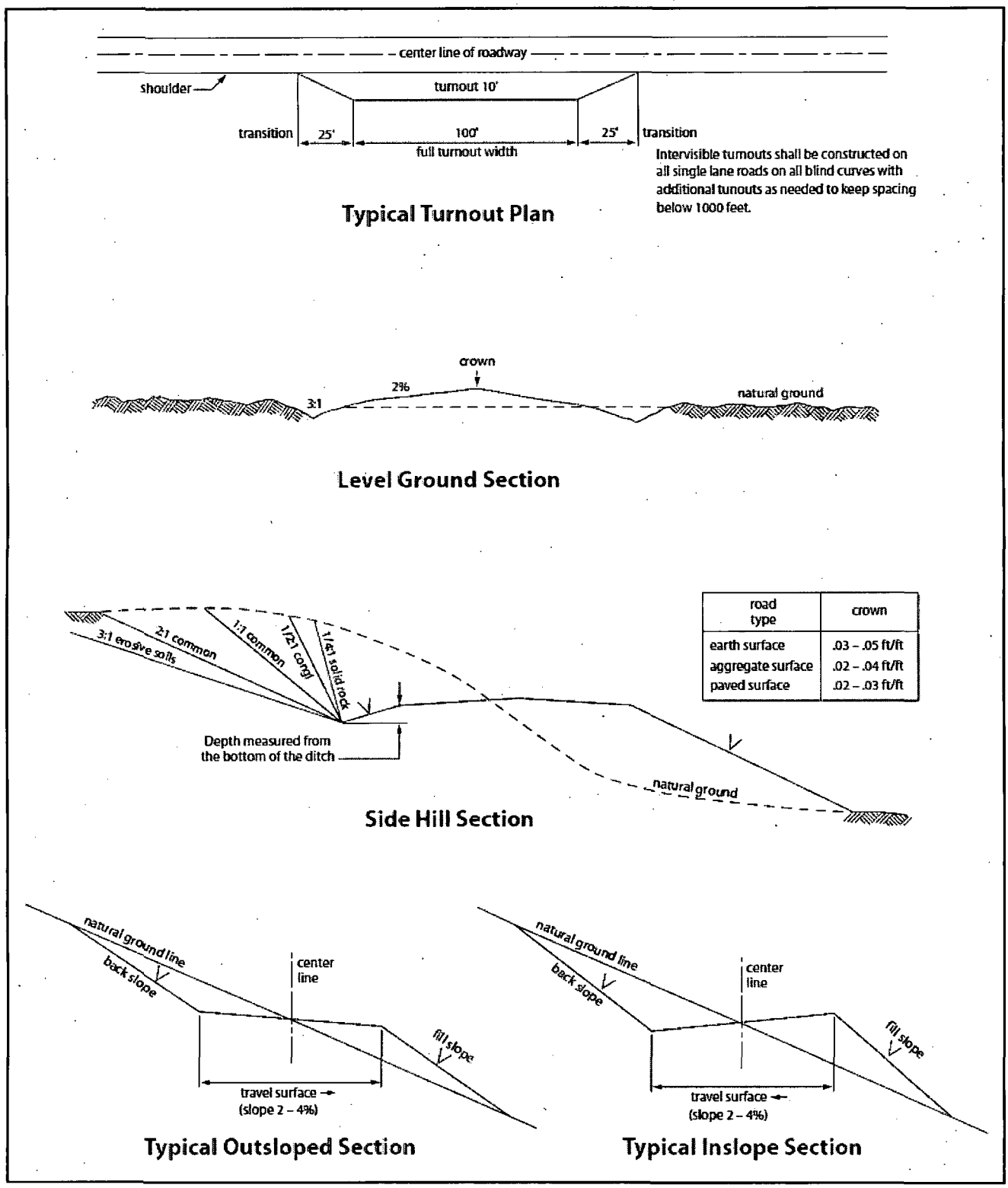


Figure 1: Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

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

1. **Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**

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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time prior to drilling out 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 for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. IF OPERATOR DOES NOT HAVE THE WELL SPECIFIC CEMENT DETAILS ONSITE PRIOR TO PUMPING THE CEMENT FOR EACH CASING STRING, THE WOC WILL BE 30 HOURS. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Secretary's Potash
Capitan Reef
Possibility of water flows in the Artesia Group and Salado.
Possibility of lost circulation in the Artesia Group, Rustler, Capitan Reef, and Delaware.

1. The **16** inch surface casing shall be set at approximately **900** feet (**in a competent bed <u>below the Magenta Dolomite</u>, which is a <u>Member of the Rustler</u>, and if salt is encountered, set casing at least 25 feet above the salt**) and cemented to the surface. **Fresh water mud to be used to setting depth.**

    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 surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

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 cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **13-3/8** inch 1st intermediate casing, which shall be set at approximately **2800** feet (Seven Rivers formation), is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash.**

3. The minimum required fill of cement behind the **9-5/8** inch 2nd intermediate casing is:

Operator has proposed DV tool at depth of 2900'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Potash and Capitan Reef.**

Centralizers required through the curve and a minimum of one every other joint.

4. The minimum required fill of cement behind the **7** inch production casing is:

Operator has proposed DV tool at depth of 5000'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Potash.**

5. Cement not required on the **4-1/2"** casing. **Packer system being used.**

6. 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. **A variance is granted for the use of a diverter on the 16" surface casing.**

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **13-3/8** 1st intermediate casing shoe shall be **3000 (3M)** psi.

4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

a. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.

b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

d. The results of the test shall be reported to the appropriate BLM office.

e. 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.**

f. 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. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

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

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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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.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the

largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

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** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES (Not applied for in APD)

C. ELECTRIC LINES (Not applied for in APD)

IX. INTERIM RECLAMATION

Since it is expected that multiple wells will be drilled from this location in the future, no interim reclamation will be required. However, during the life of the development, all disturbed areas not needed for future wells or active support of production operations should undergo reclamation in order to minimize the environmental impacts of development on other resources and uses. **If no additional wells are drilled from the location within 5 years of the drilling of this well, then Manzano must coordinate with the BLM regarding future development plans or downsize the location.**

Operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation 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 that is free of contaminants 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.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery 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:

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed