R-111-Potash 13-1115

# R-111-POTASH

Form 3160-3
(March 2012)

OCD Artesia

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

JCS 2-4-2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

## APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NM-019246

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
NASH UNIT NMNM-70992X

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

8. Lease Name and Well No.
NASH UNIT #45H <303152>

2. Name of Operator XTO ENERGY, INC. <5380>

9. API Well No.
30-015-42048

3a. Address 200 N. LORAINE, SUITE 800
MIDLAND, TX. 79701

3b. Phone No. *(include area code)*
(432) 620-4323 (CHIP AMROCK)

10. Field and Pool, or Exploratory
NASH DRAW; ~~BRUSHY CANYON~~ Delaware <4

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface 550 FNL & 1250 FWL
At proposed prod. zone 330 FNL & 1980 FWL

11. Sec., T. R. M. or Blk. and Survey or Area
SHL: SECTION 18, T. 23 S., R. 30 E.
BHL: SECTION 6, T. 23 S., R. 30 E.

14. Distance in miles and direction from nearest town or post office*
8 MILES EAST OF LOVING, 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)
SHL: 70'
BHL: 330'

16. No. of acres in lease
120 (STATE LEASE)
1240 (NM-019246)

17. Spacing Unit dedicated to this well
320.15

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
SHL: 50' (#44)
BHL: 140' (#7)

19. Proposed Depth
TVD: 6974'
MD: 17,528'

20. BLM/BIA Bond No. on file
UTB000138

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3012' GL

22. Approximate date work will start*

23. Estimated duration
40 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 Barry W. Hunt
Name *(Printed/Typed)* BARRY W. HUNT
Date 11/26/13

Title
PERMIT AGENT FOR XTO ENERGY, INC.

Approved by *(Signature)* /s/Aden L. Seidlitz
Name *(Printed/Typed)*
Date JAN 24 2014

Title STATE DIRECTOR
Office NM STATE 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)

Carlsbad Controlled Water Basin

RECEIVED
FEB 03 2014
NMOCD ARTESIA

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

* COA - cannot produce well prior to application for down hole non-standard Location (NSL) TES

**CERTIFICATION**

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access road proposed herein; that I am familiar with the conditions that presently 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 XTO Energy, Inc. 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 19th day of August 2013.

Signed: Barry W. Hunt

Printed Name: Barry Hunt
Position: Agent for XTO Energy, Inc.
Address: 1403 Springs Farm Place, Carlsbad, NM 88220
Telephone: (575) 361-4078
E-mail: specialtpermitting@gmail.com
Field Representative: Jeff Raines, XTO Energy, Inc.
Address: 200 N. Loraine, Midland, Tx. 79701
Telephone:(432) 557-3159

XTO ENERGY

December 8, 2010

To Whom It May Concern:

Mr. Barry Hunt is employed by XTO Energy Inc: to sign as their agent for APD's and Right of Ways in the state of New Mexico and Texas.

If you have any questions, please contact me at my office at 432-682-8873.

Sincerely,

Don Eubank
XTO Energy Inc.
Drilling Manager

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
DISTRICT II
811 South First, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
DISTRICT IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to Appropriate District Office

# OIL CONSERVATION DIVISION

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

☐ AMENDED REPORT

## WELL LOCATION AND ACREAGE DEDICATION PLAT

| API Number | Pool Code | Pool Name |
|---|---|---|
| 30-015-42048 | 47545 | DELAWARE NASH DRAW, ~~BRUSHY CANYON~~ |

| Property Code | Property Name | Well Number |
|---|---|---|
| 303152 | NASH UNIT | 45H |

| OGRID No. | Operator Name | Elevation |
|---|---|---|
| 005380 | XTO Energy Inc. | 3012 feet |

### Surface Location

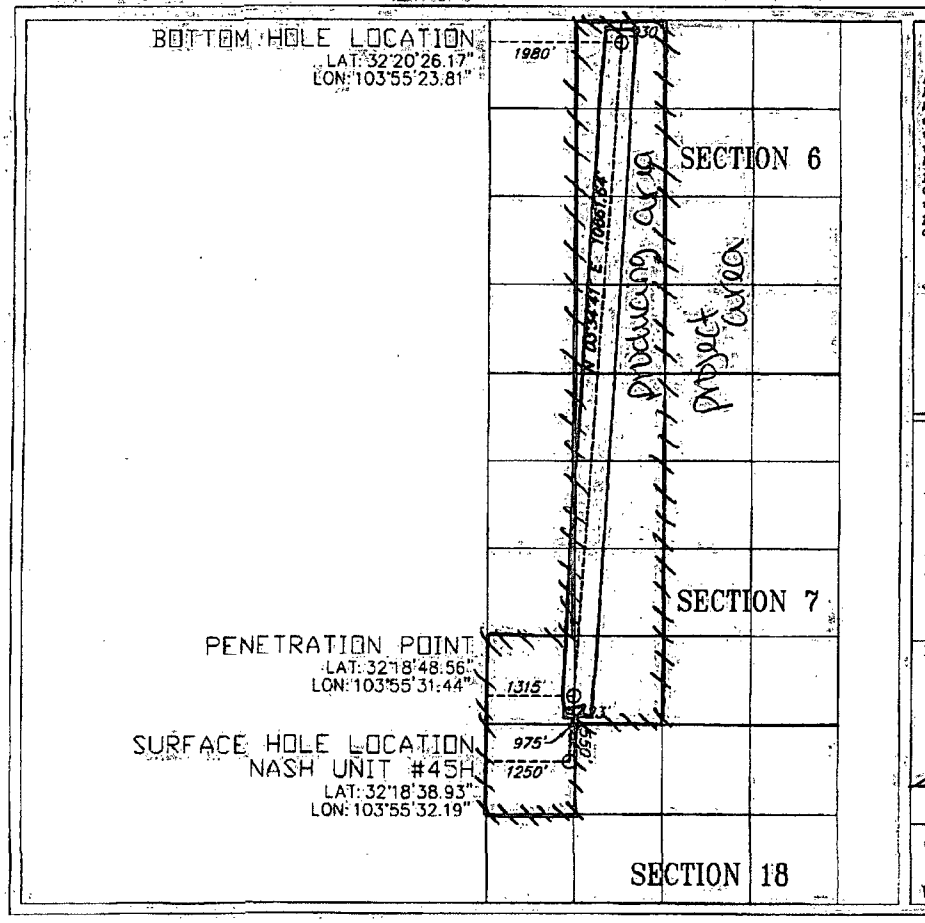
| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | 23-S | 30-E | | 550 | North | 1250 | West | EDDY |

### 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 |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 6 | 23-S | 30-E | | 330 | North | 1980 | West | EDDY |

| Dedicated Acres | Joint or Infill | Consolidation Code | Order No. |
|---|---|---|---|
| ~~320~~ 400.41 | | | 17528 1-24 |

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 compulsory pooling order heretofore entered by the division.*

Stephanie Rabadue 11.13.13
Signature Date

Stephanie Rabadue
Printed Name

11.13.13
Date

### 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.*

11/5/2013
Date Surveyed

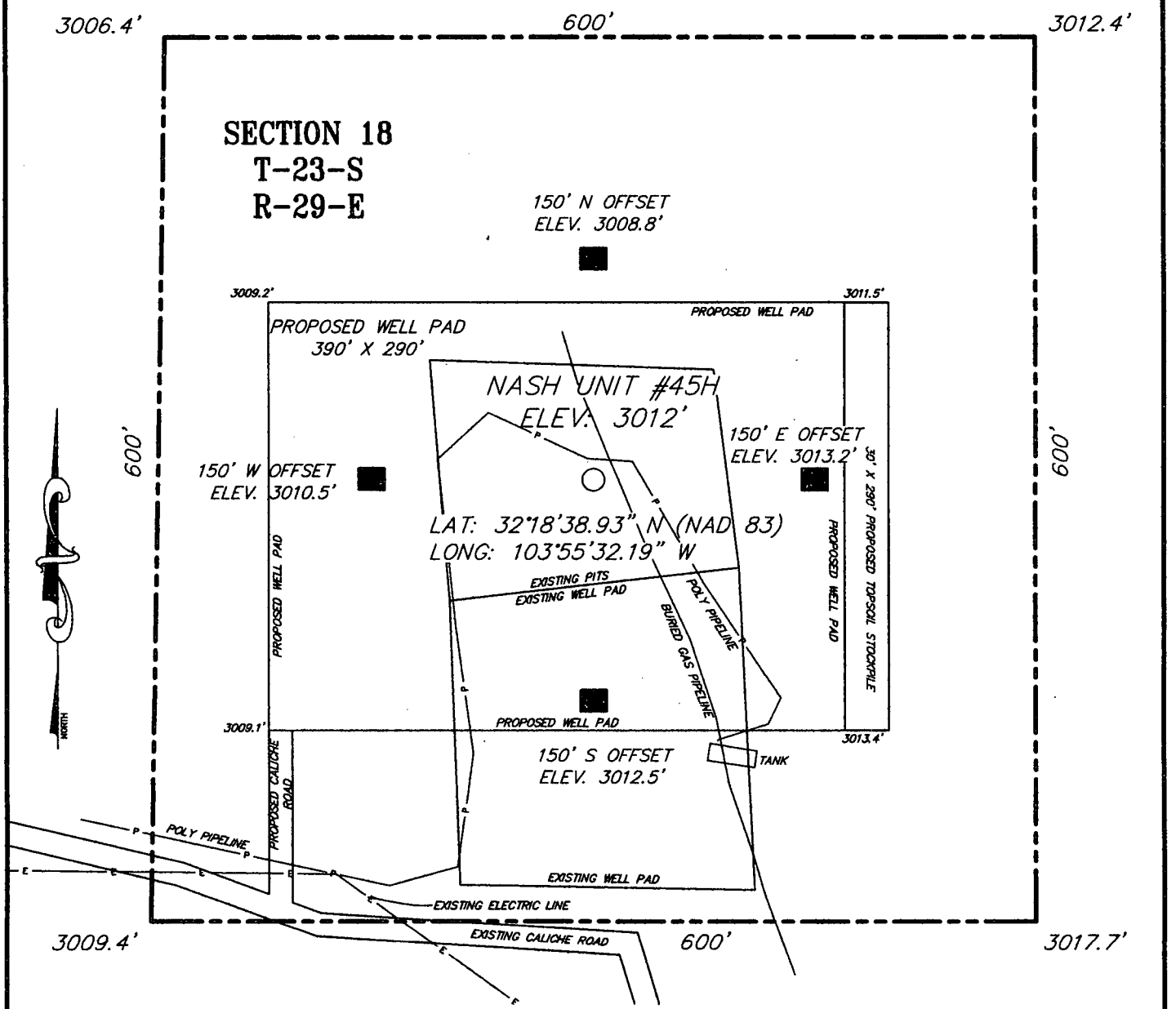
Signature & Seal of Professional Surveyor

PROFESSIONAL ENGINEER AND LAND SURVEYOR STATE OF NEW MEXICO WILSON D. WATSON JR. NO. 3959

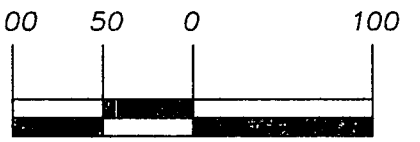
Certificate No. WILSON D. WATSON JR. P.L.S. #3959

WATSON PROFESSSIONAL GROUP INC

EDDY COUNTY, NEW MEXICO
SECTION 18, TOWNSHIP 23 SOUTH, RANGE 30 EAST
NEW MEXICO PRINCIPAL MERIDIAN




DIRECTIONS TO LOCATION
BEGINNING AT THE INTERSECTION OF US HIGHWAY 128 AND RAWHIDE ROAD.
THENCE SOUTH ALONG SAID ROAD A DISTANCE OF 2.0 MILES TO A CALICHE ROAD,
THENCE EAST ALONG SAID ROAD A DISTANCE OF 0.2 MILE TO A POINT,
NASH UNIT #45H IS 311 FEET NORTH.




SCALE 1"= 100'
GRID


John F. Watson & Company
LAND & DEVELOPMENT SERVICES
PROFESSIONAL LAND SURVEYORS
200 N. Loraine, Suite 220
Midland, Texas 79701
jwatson@windearthwater.com
off. (432) 520-2400
fax. (432) 520-2404
mob. (432) 528-0074
Your Partner for Responsible Development

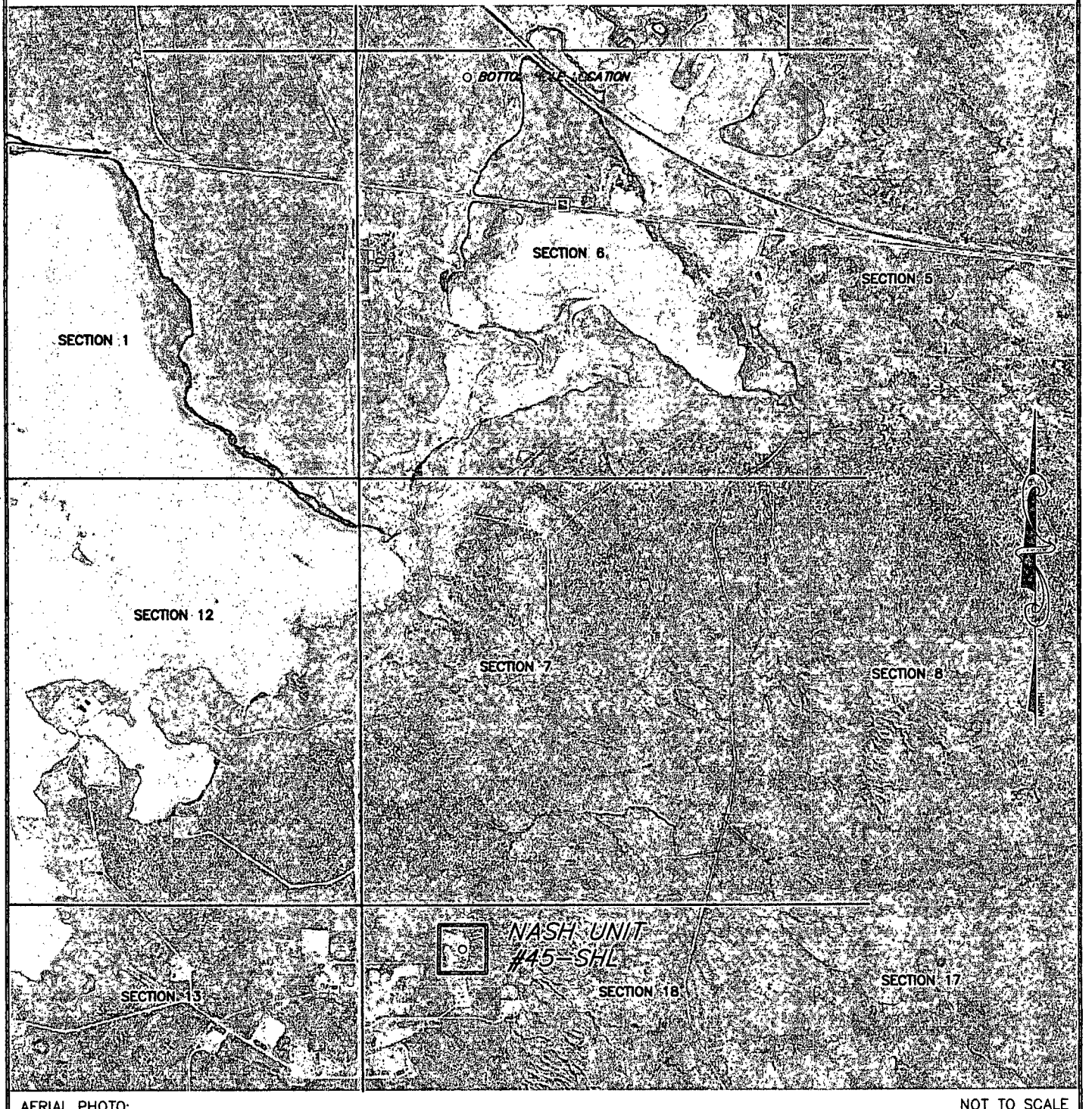
Watson Professional Group Inc
CONSULTING ENGINEERS, LAND SURVEYORS & PLANNERS
P.O. DRAWER 11188
MIDLAND, TEXAS
79702
(432) 520-9200
FAX (432)
520-9212
wdwatson@wpg-us.com


XTO ENERGY, INC.
NASH UNIT #45H
1250' FWL & 550' FNL
SECTION 18
T-23-S, R-30-E,
EDDY COUNTY,
NEW MEXICO

DATE: 03/11/2013
REVISED: ---
JOB No.: 12-0370
FIELD BOOK: 139/1
DRAWN BY: KP
CKD BY: JFW/KP
FILE: S:\2012\NASH UNIT\NASH UNIT.DWG
PAGE 1 OF 1

# AERIAL PHOTO

EDDY COUNTY, NEW MEXICO
SECTION 18, TOWNSHIP 23 SOUTH, RANGE 30 EAST
NEW MEXICO PRINCIPAL MERIDIAN




AERIAL PHOTO:
GOOGLE EARTH–MARCH 2013

NOT TO SCALE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MIDLAND, TEXAS
79702
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FAX (432)
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XTO ENERGY, INC.
NASH UNIT #45H
1250' FWL & 550' FNL
SECTION 18
T-23-S, R-30-E,
EDDY COUNTY,
NEW MEXICO

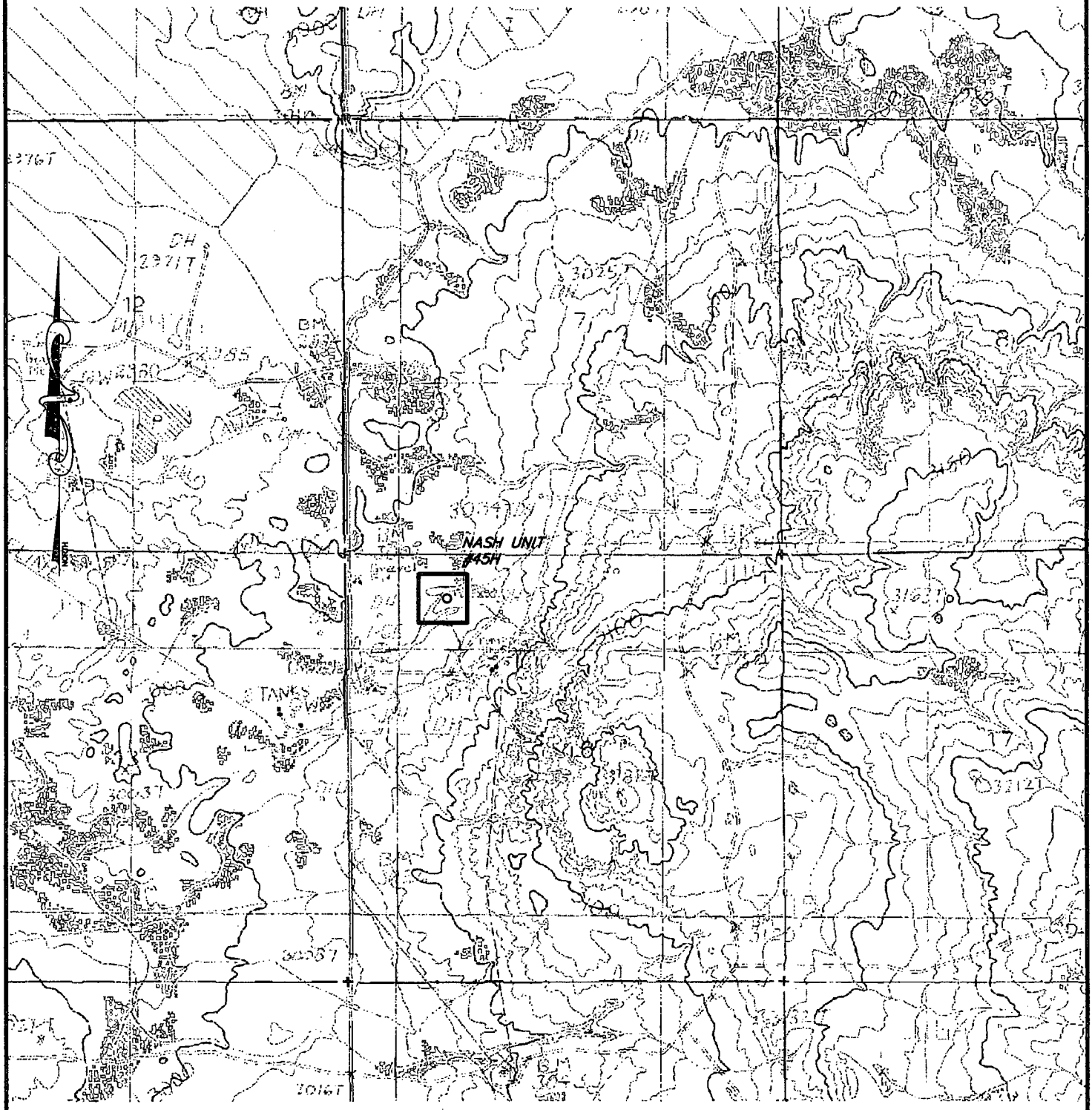
DATE: 03/11/2013
REVISED: ---
JOB No.: 13-0339
FIELD BOOK: 128/1
DRAWN BY: KP
CKD BY: JFW/KP
FILE: S:\2013\NASH UNIT\NASH UNIT.DWG
PAGE 1 OF 1

# LOCATION VERIFICATION MAP

EDDY COUNTY, NEW MEXICO

SECTION 18, TOWNSHIP 23 SOUTH, RANGE 30 EAST

NEW MEXICO PRINCIPAL MERIDIAN




USGS QUAD MAP:
REMUDA BASIN

NOT TO SCALE

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1250' FWL & 550' FNL
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T-23-S, R-30-E,
EDDY COUNTY,
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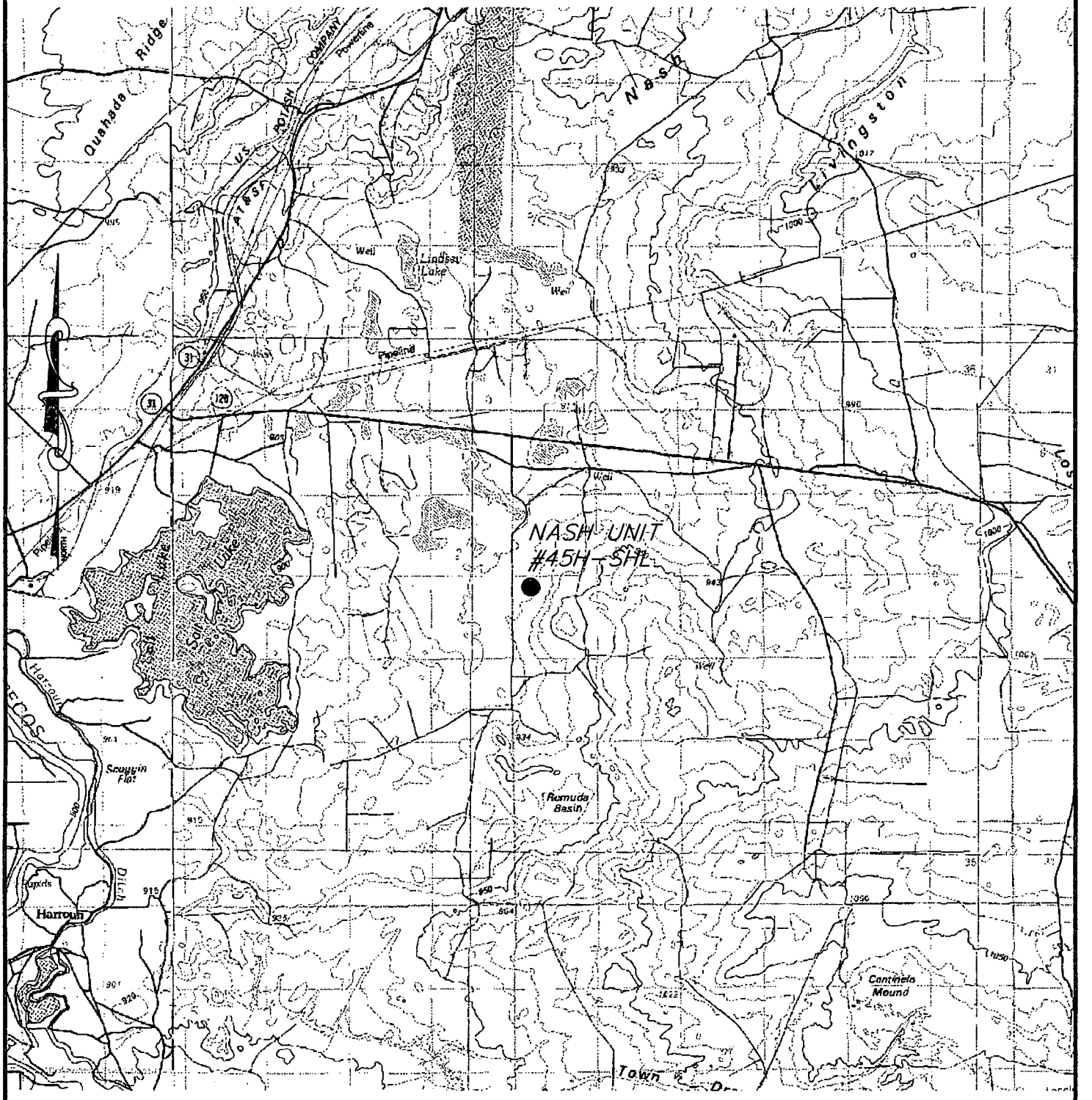
CKD BY: JFW/KP
FILE: S:\2012\NASH UNIT\NASH UNIT.DWG
PAGE 1 OF 1

# VICINITY MAP

EDDY COUNTY, NEW MEXICO

SECTION 18, TOWNSHIP 23 SOUTH, RANGE 30 EAST

NEW MEXICO PRINCIPAL MERIDIAN




NOT TO SCALE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PAGE 1 OF 1

# Exhibit A Access

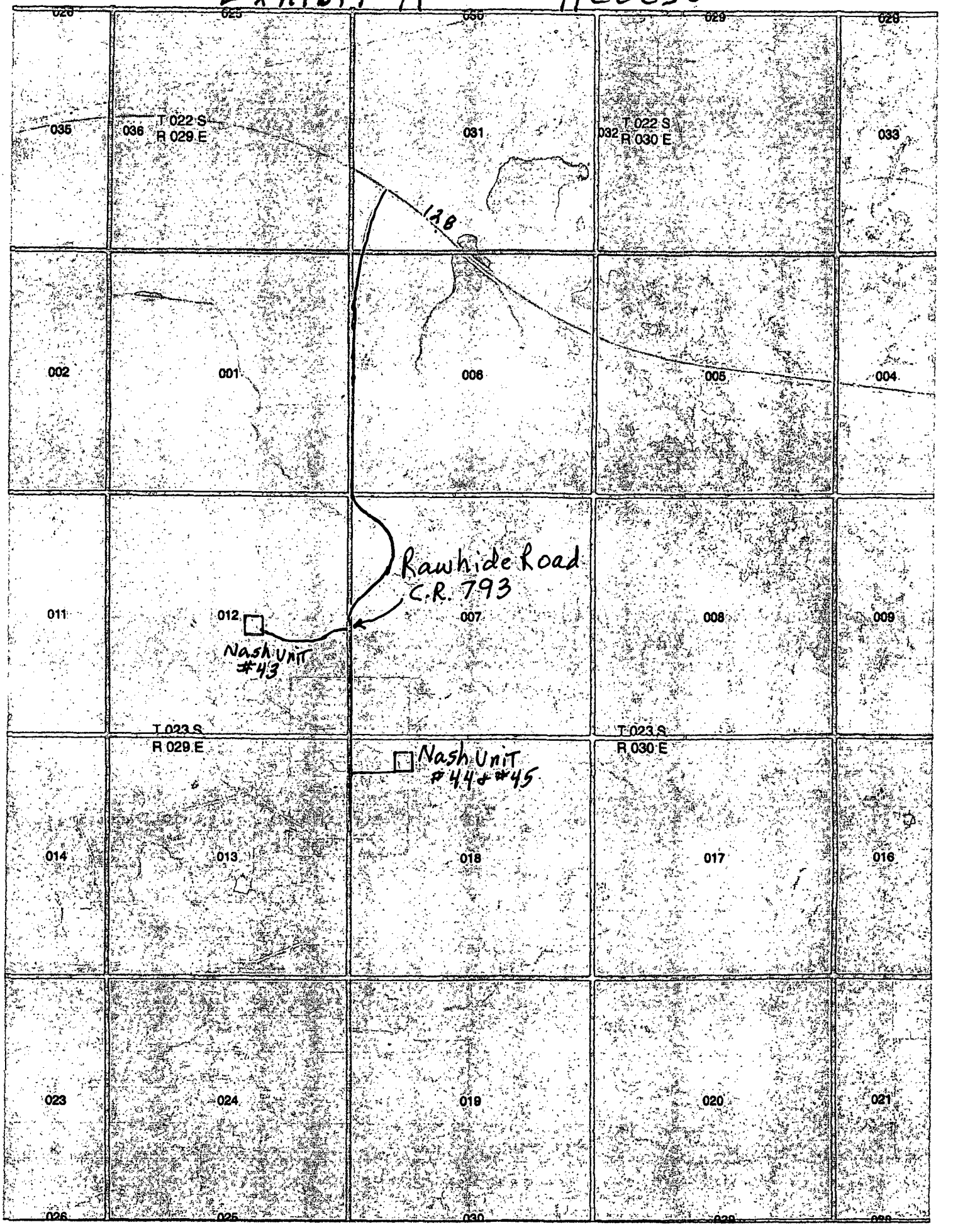
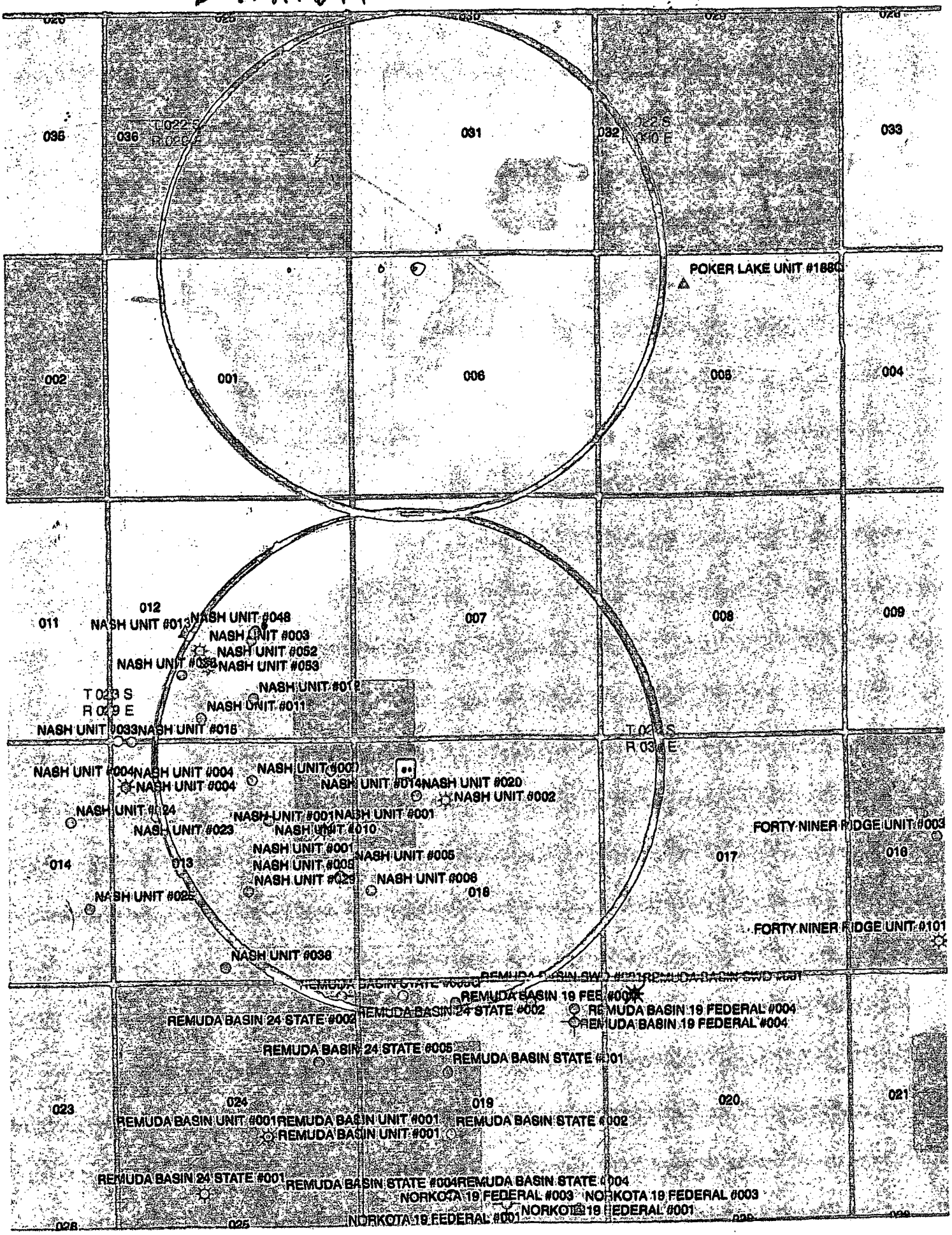


Exhibit B 2" = 1 mile



DRILLING PLAN: BLM COMPLIANCE
(Supplement to BLM 3160-3)

XTO Energy Inc.
Nash Well #45H
Projected TD: 17528' MD / TVD: 6974'
SHL: 550' FNL & 1250' FWL , SECTION 18, T23S, R30E (1)
BHL: 330' FNL & 1980' FWL, SECTION 6, T23S, R30E (3)
Eddy County, NM

**1. GEOLOGIC NAME OF SURFACE FORMATION:**

A. Salado

**2. ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:**

| Formation | Subsea Depth | Well Depth | Water / Oil / Gas |
|---|---|---|---|
| Rustler | | 67' | Water |
| Salado | | 320' | Water |
| Base of Castille | | 3235' | Water |
| Bell Canyon | | 3264' | Water/Oil/Gas |
| Cherry Canyon | | 4128' | Water/Oil/Gas |
| Top Brushy Canyon | | 5701' | Water/Oil/Gas |
| Base Brushy Canyon | | 6736' | Water/Oil/Gas |
| Brushy Canyon E5 Zone | | 6913' | Water/Oil/Gas |
| Target/Land Curve | | 6974' | Water/Oil/Gas |
| TD/MD | | 17528' | Water/Oil/Gas |

*** Hydrocarbons @ Brushy Canyon
*** Groundwater depth 75'.

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 13-3/8" casing @ ~~325'~~ 175' in the Salado and circulating cement back to surface. Potash/fresh water sands will be protected by setting 9-5/8" casing at ~~3300'~~ 3200' and circulating cement to surface. The Brushy Canyon intervals will be isolated by setting 7" casing to the end of the directional curve at 7400' +/- and cementing back to surface. A 6-1/8" lateral hole will be drilled to MD/TD and 4-1/2" casing with Halliburton swell packers will be run for completion.

**3. CASING PROGRAM:**

See COA

| Hole Size | Depth | OD Csg | Weight | Collar | Grade | New/Used | SF Burst | SF Collapse | SF Tension |
|---|---|---|---|---|---|---|---|---|---|
| 17-1/2" | 0' – ~~325'~~ 175' | 13-3/8" | 48# | STC | H-40 | New | 10.81 | 4.6 | 4.56 |
| 12-1/4" | 0' – ~~3300'~~ 3200' | 9-5/8" | 36# | LTC | J-55 | New | 1.82 | 1.05 | 3.35 |
| 8-3/4" | 0' – 7400' | 7" | 26# | LTC | HCP-110 | New | 2.6 | 1.6 | 2.87 |
| 6-1/8" | 7250 – 17528' | 4-1/2" | 11.6# | LTC | P-110 | New | 2.77 | 1.96 | 4.73 |

11/26/2013

**WELLHEAD:**

A. Starting head: 13-5/8" 3000 psi top flange x 13-3/8" SOW bottom
B. 'B' Section/ Drilling Spool: 13-5/8" 3000psi top flange x 11" 5M SOW bottom
C. Tubing Head: 11" 5000psi bottom flange x 7-1/16" 10,000psi top flange

**4. CEMENT PROGRAM: (Note yields and DV tool depts. If multiple stages)**

A. **Surface Casing:** 13-3/8", 48#, NEW H-40, STC casing to be set at ± ~~325'~~ 175'.

500 sx HalCem-C + 2% CaCl (14.80 ppg, 1.35 cu ft/sx, 6.39gal/sx wtr)
Compr Strengths: 12 hr -950 psi 24 hr – 1425 psi
***All volumes 100% excess. Cement to surface.

In the event that loss circulation is encountered while drilling the surface hole ( i.e. Nash #39H, #40H, #41H), an alternate cementing procedure will be to pump 150 sx Thixotropic + 10 pps CalSeal + 10 pps Gilsonite + 2% CaCl (14 ppg, 1.7 cu ft/sx) Compr Strengths 12 hr – 468 psi 24 hr – 739 psi followed by 200 sx HalCem C + 2% CaCl (properties above) Run temp survey to locate top of cement, top out with 1" to surface with the required amount of "Thixotropic" cement. These events and procedures to be coordinated and communicated with the designated BLM representative.

B. **1st Interm. Casing:** 9-5/8",36#, NEW J-55, LTC casing to be set at ± ~~3300'~~ 3200'.

**Stage 1:**

Lead: 20 bbls FW, then 1000 sx EconoCem-HLC + 5% salt (mixed at 12.8 ppg, 1.92 $ft^3$/sk, 9.94 gal/sx wtr) Compr Strengths 12 hr – 397 psi 24 hr – 802 psi

Tail: 250 sx HalCem-C + 1% CaCl (mixed at 14.8 ppg, 1.34 $ft^3$/sk, 6.36 gal/sx wtr)
Compr Strengths: 12 hr – 984 psi 24 hr – 1650 psi
***All volumes 100% excess. Cement to surface.

C. **2nd Interm. Casing:** 7", 26#, NEW HCP-110, LTC casing to be set at ± 7400'

**Stage 1:**

Lead: 165 sx Tuned Light + 0.25lnm/sk Poly-E-Flake + 0.2% HR-601 (10.2ppg, 3.08 cuft/sx, 15.18 gal/sx wtr). Compr Strengths: 12 hr – 149 psi 24 hr – 586 psi.

SEE COA

Tail (Csg Shoe Cmt): 160 sx HalCem-H + 0.5% LAP-1 + 0.25% CFR-3 + 5 pps Kol-Seal + 0.25 lb/sx D-air 5000 (15.8 ppg, 1.18 cuft/sx, 4. 8 gal/sx
Compr Strengths - 12 hr – 1500 psi 24 hr – 2296 psi *** Cement to 4400' (base of waterflow area)

**Cement to be pumped down the 7" x 9-5/8" annulus to eliminate and isolate the water flow area – cement to fill from 4400' to surface.**

Lead: 500 sx EconoCem HLC + 5% Salt (mixed at 12.8 ppg, 1.89 cuft/sx, 10.16 gal/sx wtr)
Compr Strengths: 12 hr – 431 psi 24 hr – 745 psi

Tail: 50 sx HalCem C (mixed at 14.8 ppg, 1.33 cuft/sx, 6.34 gal/sx wtr)
Compr Strengths: 12 hr – 1270 psi 24 hr – 1670 psi *** Cement to Surface.

## 5. PRESSURE CONTROL EQUIPMENT:

The blow out preventer equipment (BOP) for this well consists of a 13-5/8" 3M Hydril and a 13-5/8" 5M Double Ram BOP.

All BOP testing will be done by an independent service company. When nippling up on the 13-5/8" 3M bradenhead and flange pressure testing BOP will be limited to 3000psi. When nippling up on the 9-5/8" and 7" pressure testing BOP will be limited to 5000psi. The 5M BOP diagram is attached.

## 6. PROPOSED MUD CIRCULATION SYSTEM:

See COA

| INTERVAL | Hole Size | Mud Type | MW (ppg) | Viscosity (sec/qt) | Fluid Loss (cc) |
|---|---|---|---|---|---|
| 0' to ~~295'~~ 175' | 17-1/2" | FW/Native | 8.5-8.8 | 35-40 | NC |
| ~~280'~~ to 3300' +/- 3200' | 12-1/4" | Brine/Gel Sweeps | 9.8-10.2 | 30-32 | NC |
| ~~3300'~~ to 7400' | 8-3/4" | Cut Brine/ Poly-Sweeps | 9.2-9.6 | 29-32 | NC-30 |
| 7400' to 17528' | 6-1/8" | Cut Brine/Poly-Starch | 8.6-9 | 32-38 | NC -30 |

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

Spud with fresh water/native mud. Drill out from under 13-3/8" surface casing with brine solution. A 9.8ppg-10.2ppg brine mud will be used while drilling through the salt formation. Use fibrous materials as needed to control seepage and lost circulation. Pump viscous sweeps as needed for hole cleaning. Pump speed will be recorded on a daily drilling report after mudding up. A Pason or Totco will be used to detect changes in loss or gain of mud volume. A mud test will be performed every 24 hours to determine: density, viscosity, strength, filtration and pH as necessary. Use available solids controls equipment to help keep mud weight down after mud up. Rig up Dynamic Energy Systems' solids control equipment to operate as a closed loop system.

## 7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:

See COA

A. A Kelly cock will be in the drill string at all times.
B. A full opening drill pipe stabbing valve having appropriate connections will be on the rig floor at all times.
C. H2S monitors will be on location when drilling the 12-1/4" hole.

## 8. LOGGING, CORING AND TESTING PROGRAM: See COA

A. Mud Logger: Suttles Mud Logging Unit (2 man) on @ 5600'.
Catch 10' samples from 5600' to TD/MD.
Send 1 set of dry samples to Midland Sample Library.

At the end of well, run GR-Neutron-CBL in casing from KOP to +/- 6000'.

## 9. ABNORMAL PRESSURES AND TEMPERATURES / POTENTIAL HAZARDS:

None anticipated. Max bottom hole pressure should not exceed 2500psi. BHT of 175 F is anticipated. H2S can be present from 4600 – TD. Should these circumstances be encountered the operator and drilling contractor are prepared to take all necessary steps to ensure safety of all personnel and environment. Lost circulation could occur but is not expected to be a serious problem in this area and hole seepage will be compensated for by additions of small amounts of LCM in the drilling fluid.

## 10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:

A. Road and location construction will begin after Santa Fe & BLM has approved APD. Anticipated spud date will be as soon after Santa Fe and BLM approval and as soon as rig will be available. Move in operations and drilling is expected to take 40 days. If production casing is run then an additional 30 days will be needed to complete well and construct surface facilities and/or lay flow lines in order to place well on production.

## 11. SPECIAL INSTRUCTIONS:

A. Reports should be filled out on the XTO Drilling Report form, and the Casing/Cementing Detail Forms provided.

B. Deviation:
Surface Hole: Maximum of 1° and not more than 1° change per 100'.
Intermediate Hole: Maximum of 4° and not more than 1.5° change per 100'.
Production hole: Maximum of 6° and not more than 1.5° change per 100'.
**Note: Maximum distance between surveys is 500'.**

C. WOC a minimum of 24 hours before drilling out shoe joint on surface and intermediate casing strings. Use minimal WOB and RPM until drill collars are below the shoe joints.

D. Check BOP blind rams each trip and pipe rams each day. Strap out of hole for logging and/or casing jobs.

E. A trash trailer will be provided on each location. Keep trash picked up and the location as clean as possible. All drilling line, oil filters, etc. should be hauled away at the Drilling Contractor's expense. At the conclusion of drilling operations, the contents of the trash trailer will be disposed of into a commercial sanitary landfill.

F. The reserve pits should be lined with a plastic liner in order to contain the drill cuttings and drilling fluids. At the conclusion of the drilling operations, all re-usable drilling fluid should be moved to the next well in the drilling order.

G. XTO recognizes that the first 40 acres of production are stranded due to surface hole location availability correlation to the directional drill plan curve. These 40 acres will not be included in our designated acreage.

# 5D Plan Report

## XTO Energy

**Field Name:** *Eddy Co., NM (NAD 83 NME)*
**Site Name:** *Nash Unit #45H*
**Well Name:** *Nash Unit #45H*
**Plan:** *P3:V1*

07 November 2013

XTO ENERGY

Nash Unit #45H
Eddy Co., New Mexico

**Plan Data for Nash Unit #45H**

**Site: Nash Unit #45H**
Unit: USFeet TVD Reference:
Company Name: XTO Energy
Position: Northing: 476985.90USft Latitude: 32°18'38.5"
Easting: 626116.20USft Longitude: -103°55'30.4"
North Reference: Grid Grid Convergence: 0.22°
Elevation Above VRD: 3012.00USft

**Plan Data for Nash Unit #45H**

**Slot: Nash Unit 45H**
Position:
Offset is from Site centre
+N/-S: 0.00USft Northing: 476985.90USft Latitude: 32°18'38.5"
+E/-W: 0.00USft Easting: 626116.20USft Longitude: -103°55'30.4"
Elevation Above VRD: 3012.00USft

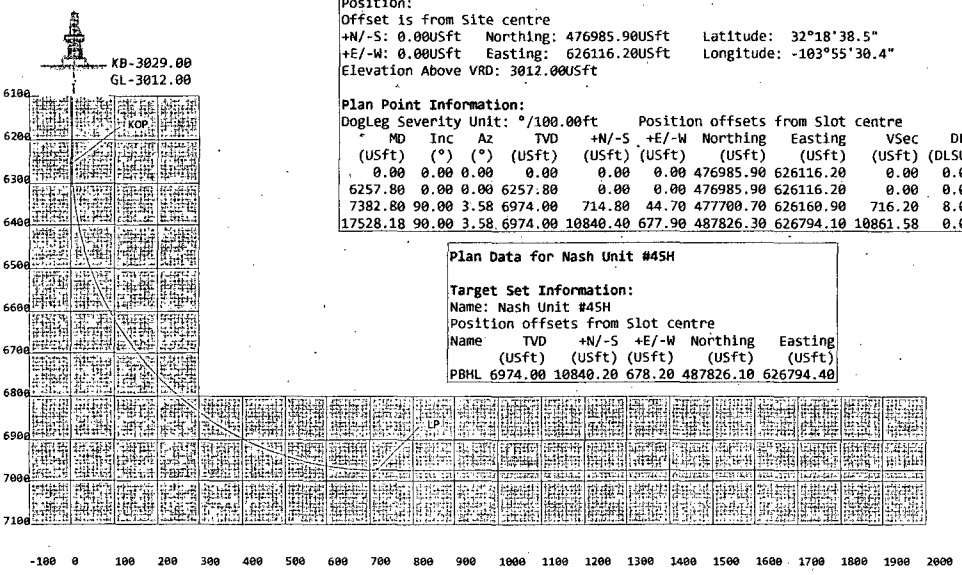
**Plan Point Information:**
DogLeg Severity Unit: °/100.00ft Position offsets from Slot centre

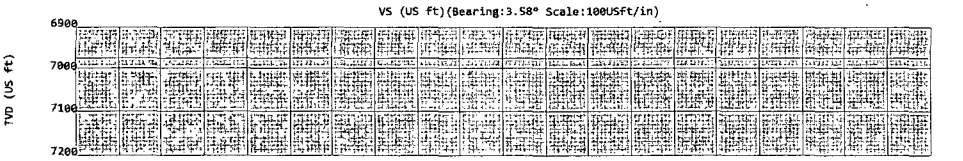
| MD (USft) | Inc (°) | Az (°) | TVD (USft) | +N/-S (USft) | +E/-W (USft) | Northing (USft) | Easting (USft) | VSec (USft) | DLS (DLSU) |
|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 476985.90 | 626116.20 | 0.00 | 0.00 |
| 6257.80 | 0.00 | 0.00 | 6257.80 | 0.00 | 0.00 | 476985.90 | 626116.20 | 0.00 | 0.00 |
| 7382.80 | 90.00 | 3.58 | 6974.00 | 714.80 | 44.70 | 477700.70 | 626160.90 | 716.20 | 8.00 |
| 17528.18 | 90.00 | 3.58 | 6974.00 | 10840.40 | 677.90 | 487826.30 | 626794.10 | 10861.58 | 0.00 |

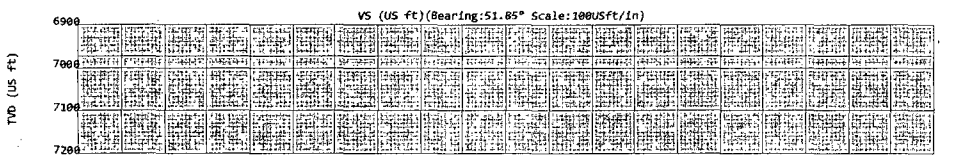
**Plan Data for Nash Unit #45H**

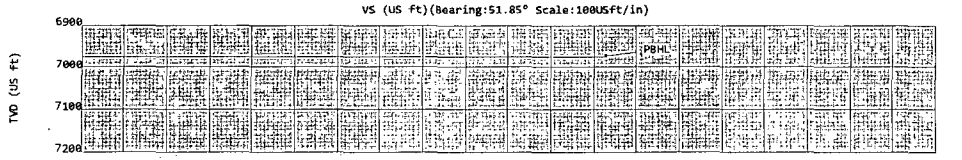
**Target Set Information:**
Name: Nash Unit #45H
Position offsets from Slot centre

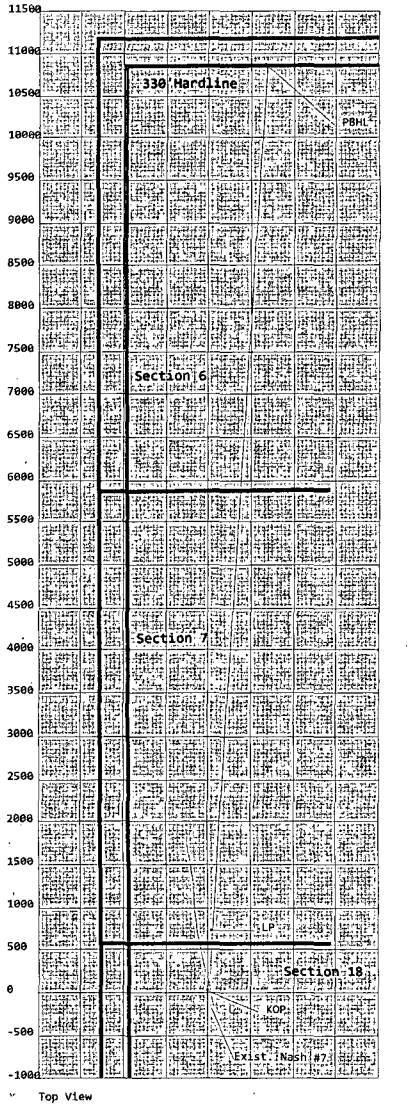
| Name | TVD (USft) | +N/-S (USft) | +E/-W (USft) | Northing (USft) | Easting (USft) |
|---|---|---|---|---|---|
| PBHL | 6974.00 | 10840.20 | 678.20 | 487826.10 | 626794.40 |




Weatherford

Sign Off: Patrick Rudolph

Weatherford

# Nash Unit #45H

**Field Name**
Eddy Co., NM (NAD 83 NME)

**Map Units :** US ft
**Company Name :** XTO Energy
**Vertical Reference Datum (VRD) :**
**Projected Coordinate System :** NAD27 / New Mexico East
**Comment :**

**Site Name**
Nash Unit #45H

**Units :** US ft **North Reference** : Grid **Convergence Angle :** 0.22
**Position** **Northing :** 476985.90 US ft **Latitude :** 32°18'38.49"
**Easting :** 626116.20 US ft **Longitude :** -103°55'30.43"
**Elevation above VRD:** 6024.00 US ft
**Comment :**

**Slot Name**
Nash Unit 45H

**Position (Offsets relative to Site Centre)**
**+N / -S :** 0.00 US ft **Northing :** 476985.90 US ft **Latitude :** 32°18'38.49"
**+E / -W :** 0.00 US ft **Easting :** 626116.20 US ft **Longitude :** -103°55'30.43"
**Slot TVD Reference :** Ground Elevation
**Elevation above VRD :** 3012.00 US ft
**Comment :**

**Well Name**
Nash Unit #45H

**Type :** Main well **UWI :** **Plan :** P3:V1
**Rig Height *Drill Floor* :** 17.00 US ft **Comment :**
**Relative to VRD:** 3029.00 US ft
**Closure Distance :** 10861.6 US ft **Closure Azimuth :** 3.57831°
**Vertical Section (Position of Origin Relative to Slot )**
**+N / -S :** 0.00 US ft **+E / -W :** 0.00 US ft **Az :** 3.58°
**Magnetic Parameters**
**Model :** Default **Field Strength :** 50000.0nT **Dec :** 0.00° **Dip :** 0.00° **Date :** 06/Nov/2013

## Target Set

**Name :** Nash Unit #45H **Number of Targets :** 1

**Comment :**

**Target Name:**
PBHL

**Position (Relative to Slot centre)**
**+N / -S :** 10840.20 US ft **Northing :** 487826.10 US ft **Latitude :** 32°20'25.73"
**+E / -W :** 678.20 US ft **Easting :** 626794.40 US ft **Longitude :** -103°55'22.04"

**Shape:**
Cuboid

**TVD (Drill Floor) :** 6974.00 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

5D Plan Report

**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) | Northing (US ft) | Easting (US ft) | DLS (°/100 US ft) | VS (US ft) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 476985.90 | 626116.20 | 0.00 | 0.00 | |
| 6257.80 | 0.00 | 0.00 | 6257.80 | 0.00 | 0.00 | 476985.90 | 626116.20 | 0.00 | 0.00 | KOP |
| 7382.80 | 90.00 | 3.58 | 6974.00 | 714.80 | 44.70 | 477700.70 | 626160.90 | 8.00 | 716.20 | LP |
| 17528.18 | 90.00 | 3.58 | 6974.00 | 10840.40 | 677.90 | 487826.30 | 626794.10 | 0.00 | 10861.58 | 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) | Northing (US ft) | Easting (US ft) | DLS (°/100 US ft) | VS (US ft) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 6200.00 | 0.00 | 0.00 | 6200.00 | 0.00 | 0.00 | 476985.90 | 626116.20 | 0.00 | 0.00 | |
| 6257.80 | 0.00 | 0.00 | 6257.80 | 0.00 | 0.00 | 476985.90 | 626116.20 | 0.00 | 0.00 | KOP |
| 6300.00 | 3.38 | 3.58 | 6299.98 | 1.24 | 0.08 | 476987.14 | 626116.28 | 8.00 | 1.24 | |
| 6400.00 | 11.38 | 3.58 | 6399.07 | 14.04 | 0.88 | 476999.94 | 626117.08 | 8.00 | 14.07 | |
| 6500.00 | 19.38 | 3.58 | 6495.41 | 40.49 | 2.53 | 477026.39 | 626118.73 | 8.00 | 40.56 | |
| 6600.00 | 27.38 | 3.58 | 6587.13 | 80.05 | 5.01 | 477065.95 | 626121.21 | 8.00 | 80.21 | |
| 6700.00 | 35.38 | 3.58 | 6672.44 | 131.97 | 8.25 | 477117.87 | 626124.45 | 8.00 | 132.23 | |
| 6800.00 | 43.38 | 3.58 | 6749.67 | 195.24 | 12.21 | 477181.14 | 626128.41 | 8.00 | 195.62 | |
| 6900.00 | 51.38 | 3.58 | 6817.34 | 268.62 | 16.80 | 477254.52 | 626133.00 | 8.00 | 269.14 | |
| 7000.00 | 59.38 | 3.58 | 6874.11 | 350.68 | 21.93 | 477336.58 | 626138.13 | 8.00 | 351.36 | |
| 7100.00 | 67.38 | 3.58 | 6918.89 | 439.83 | 27.50 | 477425.73 | 626143.70 | 8.00 | 440.69 | |
| 7200.00 | 75.38 | 3.58 | 6950.80 | 534.33 | 33.41 | 477520.23 | 626149.61 | 8.00 | 535.37 | |
| 7300.00 | 83.38 | 3.58 | 6969.22 | 632.35 | 39.54 | 477618.25 | 626155.74 | 8.00 | 633.58 | |
| 7382.80 | 90.00 | 3.58 | 6974.00 | 714.80 | 44.70 | 477700.70 | 626160.90 | 8.00 | 716.20 | LP |
| 7400.00 | 90.00 | 3.58 | 6974.00 | 731.97 | 45.77 | 477717.87 | 626161.97 | 0.00 | 733.40 | |
| 7500.00 | 90.00 | 3.58 | 6974.00 | 831.77 | 52.01 | 477817.67 | 626168.21 | 0.00 | 833.40 | |
| 7600.00 | 90.00 | 3.58 | 6974.00 | 931.58 | 58.26 | 477917.48 | 626174.46 | 0.00 | 933.40 | |
| 7700.00 | 90.00 | 3.58 | 6974.00 | 1031.38 | 64.50 | 478017.28 | 626180.70 | 0.00 | 1033.40 | |
| 7800.00 | 90.00 | 3.58 | 6974.00 | 1131.19 | 70.74 | 478117.09 | 626186.94 | 0.00 | 1133.40 | |
| 7900.00 | 90.00 | 3.58 | 6974.00 | 1230.99 | 76.98 | 478216.89 | 626193.18 | 0.00 | 1233.40 | |
| 8000.00 | 90.00 | 3.58 | 6974.00 | 1330.80 | 83.22 | 478316.70 | 626199.42 | 0.00 | 1333.40 | |
| 8100.00 | 90.00 | 3.58 | 6974.00 | 1430.60 | 89.46 | 478416.50 | 626205.66 | 0.00 | 1433.40 | |
| 8200.00 | 90.00 | 3.58 | 6974.00 | 1530.41 | 95.70 | 478516.31 | 626211.90 | 0.00 | 1533.40 | |
| 8300.00 | 90.00 | 3.58 | 6974.00 | 1630.21 | 101.94 | 478616.11 | 626218.14 | 0.00 | 1633.40 | |
| 8400.00 | 90.00 | 3.58 | 6974.00 | 1730.02 | 108.19 | 478715.92 | 626224.39 | 0.00 | 1733.40 | |
| 8500.00 | 90.00 | 3.58 | 6974.00 | 1829.82 | 114.43 | 478815.72 | 626230.63 | 0.00 | 1833.40 | |
| 8600.00 | 90.00 | 3.58 | 6974.00 | 1929.63 | 120.67 | 478915.53 | 626236.87 | 0.00 | 1933.40 | |
| 8700.00 | 90.00 | 3.58 | 6974.00 | 2029.43 | 126.91 | 479015.33 | 626243.11 | 0.00 | 2033.40 | |
| 8800.00 | 90.00 | 3.58 | 6974.00 | 2129.24 | 133.15 | 479115.14 | 626249.35 | 0.00 | 2133.40 | |
| 8900.00 | 90.00 | 3.58 | 6974.00 | 2229.04 | 139.39 | 479214.94 | 626255.59 | 0.00 | 2233.40 | |
| 9000.00 | 90.00 | 3.58 | 6974.00 | 2328.85 | 145.63 | 479314.75 | 626261.83 | 0.00 | 2333.40 | |
| 9100.00 | 90.00 | 3.58 | 6974.00 | 2428.65 | 151.87 | 479414.55 | 626268.07 | 0.00 | 2433.40 | |
| 9200.00 | 90.00 | 3.58 | 6974.00 | 2528.46 | 158.12 | 479514.36 | 626274.32 | 0.00 | 2533.40 | |
| 9300.00 | 90.00 | 3.58 | 6974.00 | 2628.26 | 164.36 | 479614.16 | 626280.56 | 0.00 | 2633.40 | |
| 9400.00 | 90.00 | 3.58 | 6974.00 | 2728.07 | 170.60 | 479713.97 | 626286.80 | 0.00 | 2733.40 | |
| 9500.00 | 90.00 | 3.58 | 6974.00 | 2827.87 | 176.84 | 479813.77 | 626293.04 | 0.00 | 2833.40 | |
| 9600.00 | 90.00 | 3.58 | 6974.00 | 2927.68 | 183.08 | 479913.58 | 626299.28 | 0.00 | 2933.40 | |
| 9700.00 | 90.00 | 3.58 | 6974.00 | 3027.48 | 189.32 | 480013.38 | 626305.52 | 0.00 | 3033.40 | |
| 9800.00 | 90.00 | 3.58 | 6974.00 | 3127.29 | 195.56 | 480113.19 | 626311.76 | 0.00 | 3133.40 | |
| 9900.00 | 90.00 | 3.58 | 6974.00 | 3227.09 | 201.80 | 480212.99 | 626318.00 | 0.00 | 3233.40 | |
| 10000.00 | 90.00 | 3.58 | 6974.00 | 3326.90 | 208.05 | 480312.80 | 626324.25 | 0.00 | 3333.40 | |
| 10100.00 | 90.00 | 3.58 | 6974.00 | 3426.70 | 214.29 | 480412.60 | 626330.49 | 0.00 | 3433.40 | |
| 10200.00 | 90.00 | 3.58 | 6974.00 | 3526.51 | 220.53 | 480512.41 | 626336.73 | 0.00 | 3533.40 | |
| 10300.00 | 90.00 | 3.58 | 6974.00 | 3626.31 | 226.77 | 480612.21 | 626342.97 | 0.00 | 3633.40 | |
| 10400.00 | 90.00 | 3.58 | 6974.00 | 3726.12 | 233.01 | 480712.02 | 626349.21 | 0.00 | 3733.40 | |
| 10500.00 | 90.00 | 3.58 | 6974.00 | 3825.92 | 239.25 | 480811.82 | 626355.45 | 0.00 | 3833.40 | |
| 10600.00 | 90.00 | 3.58 | 6974.00 | 3925.73 | 245.49 | 480911.63 | 626361.69 | 0.00 | 3933.40 | |
| 10700.00 | 90.00 | 3.58 | 6974.00 | 4025.53 | 251.74 | 481011.43 | 626367.94 | 0.00 | 4033.40 | |
| 10800.00 | 90.00 | 3.58 | 6974.00 | 4125.34 | 257.98 | 481111.24 | 626374.18 | 0.00 | 4133.40 | |
| 10900.00 | 90.00 | 3.58 | 6974.00 | 4225.14 | 264.22 | 481211.04 | 626380.42 | 0.00 | 4233.40 | |
| 11000.00 | 90.00 | 3.58 | 6974.00 | 4324.95 | 270.46 | 481310.85 | 626386.66 | 0.00 | 4333.40 | |

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) | Northing (US ft) | Easting (US ft) | DLS (°/100 US ft) | VS (US ft) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 11100.00 | 90.00 | 3.58 | 6974.00 | 4424.75 | 276.70 | 481410.65 | 626392.90 | 0.00 | 4433.40 | |
| 11200.00 | 90.00 | 3.58 | 6974.00 | 4524.56 | 282.94 | 481510.46 | 626399.14 | 0.00 | 4533.40 | |
| 11300.00 | 90.00 | 3.58 | 6974.00 | 4624.36 | 289.18 | 481610.26 | 626405.38 | 0.00 | 4633.40 | |
| 11400.00 | 90.00 | 3.58 | 6974.00 | 4724.17 | 295.42 | 481710.07 | 626411.62 | 0.00 | 4733.40 | |
| 11500.00 | 90.00 | 3.58 | 6974.00 | 4823.97 | 301.67 | 481809.87 | 626417.87 | 0.00 | 4833.40 | |
| 11600.00 | 90.00 | 3.58 | 6974.00 | 4923.78 | 307.91 | 481909.68 | 626424.11 | 0.00 | 4933.40 | |
| 11700.00 | 90.00 | 3.58 | 6974.00 | 5023.58 | 314.15 | 482009.48 | 626430.35 | 0.00 | 5033.40 | |
| 11800.00 | 90.00 | 3.58 | 6974.00 | 5123.39 | 320.39 | 482109.29 | 626436.59 | 0.00 | 5133.40 | |
| 11900.00 | 90.00 | 3.58 | 6974.00 | 5223.19 | 326.63 | 482209.09 | 626442.83 | 0.00 | 5233.40 | |
| 12000.00 | 90.00 | 3.58 | 6974.00 | 5323.00 | 332.87 | 482308.90 | 626449.07 | 0.00 | 5333.40 | |
| 12100.00 | 90.00 | 3.58 | 6974.00 | 5422.80 | 339.11 | 482408.70 | 626455.31 | 0.00 | 5433.40 | |
| 12200.00 | 90.00 | 3.58 | 6974.00 | 5522.61 | 345.35 | 482508.51 | 626461.55 | 0.00 | 5533.40 | |
| 12300.00 | 90.00 | 3.58 | 6974.00 | 5622.41 | 351.60 | 482608.31 | 626467.80 | 0.00 | 5633.40 | |
| 12400.00 | 90.00 | 3.58 | 6974.00 | 5722.22 | 357.84 | 482708.12 | 626474.04 | 0.00 | 5733.40 | |
| 12500.00 | 90.00 | 3.58 | 6974.00 | 5822.02 | 364.08 | 482807.92 | 626480.28 | 0.00 | 5833.40 | |
| 12600.00 | 90.00 | 3.58 | 6974.00 | 5921.83 | 370.32 | 482907.73 | 626486.52 | 0.00 | 5933.40 | |
| 12700.00 | 90.00 | 3.58 | 6974.00 | 6021.63 | 376.56 | 483007.53 | 626492.76 | 0.00 | 6033.40 | |
| 12800.00 | 90.00 | 3.58 | 6974.00 | 6121.44 | 382.80 | 483107.34 | 626499.00 | 0.00 | 6133.40 | |
| 12900.00 | 90.00 | 3.58 | 6974.00 | 6221.24 | 389.04 | 483207.14 | 626505.24 | 0.00 | 6233.40 | |
| 13000.00 | 90.00 | 3.58 | 6974.00 | 6321.05 | 395.28 | 483306.95 | 626511.48 | 0.00 | 6333.40 | |
| 13100.00 | 90.00 | 3.58 | 6974.00 | 6420.85 | 401.53 | 483406.75 | 626517.73 | 0.00 | 6433.40 | |
| 13200.00 | 90.00 | 3.58 | 6974.00 | 6520.66 | 407.77 | 483506.56 | 626523.97 | 0.00 | 6533.40 | |
| 13300.00 | 90.00 | 3.58 | 6974.00 | 6620.46 | 414.01 | 483606.36 | 626530.21 | 0.00 | 6633.40 | |
| 13400.00 | 90.00 | 3.58 | 6974.00 | 6720.27 | 420.25 | 483706.17 | 626536.45 | 0.00 | 6733.40 | |
| 13500.00 | 90.00 | 3.58 | 6974.00 | 6820.07 | 426.49 | 483805.97 | 626542.69 | 0.00 | 6833.40 | |
| 13600.00 | 90.00 | 3.58 | 6974.00 | 6919.88 | 432.73 | 483905.78 | 626548.93 | 0.00 | 6933.40 | |
| 13700.00 | 90.00 | 3.58 | 6974.00 | 7019.68 | 438.97 | 484005.58 | 626555.17 | 0.00 | 7033.40 | |
| 13800.00 | 90.00 | 3.58 | 6974.00 | 7119.49 | 445.21 | 484105.39 | 626561.41 | 0.00 | 7133.40 | |
| 13900.00 | 90.00 | 3.58 | 6974.00 | 7219.29 | 451.46 | 484205.19 | 626567.66 | 0.00 | 7233.40 | |
| 14000.00 | 90.00 | 3.58 | 6974.00 | 7319.10 | 457.70 | 484305.00 | 626573.90 | 0.00 | 7333.40 | |
| 14100.00 | 90.00 | 3.58 | 6974.00 | 7418.90 | 463.94 | 484404.80 | 626580.14 | 0.00 | 7433.40 | |
| 14200.00 | 90.00 | 3.58 | 6974.00 | 7518.71 | 470.18 | 484504.61 | 626586.38 | 0.00 | 7533.40 | |
| 14300.00 | 90.00 | 3.58 | 6974.00 | 7618.51 | 476.42 | 484604.41 | 626592.62 | 0.00 | 7633.40 | |
| 14400.00 | 90.00 | 3.58 | 6974.00 | 7718.32 | 482.66 | 484704.22 | 626598.86 | 0.00 | 7733.40 | |
| 14500.00 | 90.00 | 3.58 | 6974.00 | 7818.12 | 488.90 | 484804.02 | 626605.10 | 0.00 | 7833.40 | |
| 14600.00 | 90.00 | 3.58 | 6974.00 | 7917.93 | 495.14 | 484903.83 | 626611.34 | 0.00 | 7933.40 | |
| 14700.00 | 90.00 | 3.58 | 6974.00 | 8017.73 | 501.39 | 485003.63 | 626617.59 | 0.00 | 8033.40 | |
| 14800.00 | 90.00 | 3.58 | 6974.00 | 8117.54 | 507.63 | 485103.44 | 626623.83 | 0.00 | 8133.40 | |
| 14900.00 | 90.00 | 3.58 | 6974.00 | 8217.34 | 513.87 | 485203.24 | 626630.07 | 0.00 | 8233.40 | |
| 15000.00 | 90.00 | 3.58 | 6974.00 | 8317.15 | 520.11 | 485303.05 | 626636.31 | 0.00 | 8333.40 | |
| 15100.00 | 90.00 | 3.58 | 6974.00 | 8416.96 | 526.35 | 485402.86 | 626642.55 | 0.00 | 8433.40 | |
| 15200.00 | 90.00 | 3.58 | 6974.00 | 8516.76 | 532.59 | 485502.66 | 626648.79 | 0.00 | 8533.40 | |
| 15300.00 | 90.00 | 3.58 | 6974.00 | 8616.57 | 538.83 | 485602.47 | 626655.03 | 0.00 | 8633.40 | |
| 15400.00 | 90.00 | 3.58 | 6974.00 | 8716.37 | 545.07 | 485702.27 | 626661.27 | 0.00 | 8733.40 | |
| 15500.00 | 90.00 | 3.58 | 6974.00 | 8816.18 | 551.32 | 485802.08 | 626667.52 | 0.00 | 8833.40 | |
| 15600.00 | 90.00 | 3.58 | 6974.00 | 8915.98 | 557.56 | 485901.88 | 626673.76 | 0.00 | 8933.40 | |
| 15700.00 | 90.00 | 3.58 | 6974.00 | 9015.79 | 563.80 | 486001.69 | 626680.00 | 0.00 | 9033.40 | |
| 15800.00 | 90.00 | 3.58 | 6974.00 | 9115.59 | 570.04 | 486101.49 | 626686.24 | 0.00 | 9133.40 | |
| 15900.00 | 90.00 | 3.58 | 6974.00 | 9215.40 | 576.28 | 486201.30 | 626692.48 | 0.00 | 9233.40 | |
| 16000.00 | 90.00 | 3.58 | 6974.00 | 9315.20 | 582.52 | 486301.10 | 626698.72 | 0.00 | 9333.40 | |
| 16100.00 | 90.00 | 3.58 | 6974.00 | 9415.01 | 588.76 | 486400.91 | 626704.96 | 0.00 | 9433.40 | |
| 16200.00 | 90.00 | 3.58 | 6974.00 | 9514.81 | 595.00 | 486500.71 | 626711.20 | 0.00 | 9533.40 | |
| 16300.00 | 90.00 | 3.58 | 6974.00 | 9614.62 | 601.25 | 486600.52 | 626717.45 | 0.00 | 9633.40 | |
| 16400.00 | 90.00 | 3.58 | 6974.00 | 9714.42 | 607.49 | 486700.32 | 626723.69 | 0.00 | 9733.40 | |
| 16500.00 | 90.00 | 3.58 | 6974.00 | 9814.23 | 613.73 | 486800.13 | 626729.93 | 0.00 | 9833.40 | |
| 16600.00 | 90.00 | 3.58 | 6974.00 | 9914.03 | 619.97 | 486899.93 | 626736.17 | 0.00 | 9933.40 | |
| 16700.00 | 90.00 | 3.58 | 6974.00 | 10013.84 | 626.21 | 486999.74 | 626742.41 | 0.00 | 10033.40 | |
| 16800.00 | 90.00 | 3.58 | 6974.00 | 10113.64 | 632.45 | 487099.54 | 626748.65 | 0.00 | 10133.40 | |
| 16900.00 | 90.00 | 3.58 | 6974.00 | 10213.45 | 638.69 | 487199.35 | 626754.89 | 0.00 | 10233.40 | |

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) | Northing (US ft) | Easting (US ft) | DLS (°/100 US ft) | VS (US ft) | Comment |
| 17000.00 | 90.00 | 3.58 | 6974.00 | 10313.25 | 644.93 | 487299.15 | 626761.13 | 0.00 | 10333.40 | |
| 17100.00 | 90.00 | 3.58 | 6974.00 | 10413.06 | 651.18 | 487398.96 | 626767.38 | 0.00 | 10433.40 | |
| 17200.00 | 90.00 | 3.58 | 6974.00 | 10512.86 | 657.42 | 487498.76 | 626773.62 | 0.00 | 10533.40 | |
| 17300.00 | 90.00 | 3.58 | 6974.00 | 10612.67 | 663.66 | 487598.57 | 626779.86 | 0.00 | 10633.40 | |
| 17400.00 | 90.00 | 3.58 | 6974.00 | 10712.47 | 669.90 | 487698.37 | 626786.10 | 0.00 | 10733.40 | |
| 17500.00 | 90.00 | 3.58 | 6974.00 | 10812.28 | 676.14 | 487798.18 | 626792.34 | 0.00 | 10833.40 | |
| 17528.18 | 90.00 | 3.58 | 6974.00 | 10840.40 | 677.90 | 487826.30 | 626794.10 | 0.00 | 10861.58 | PBHL |

# 5D Anti-Collision Report

## XTO Energy

**Field Name:** *Eddy Co., NM (NAD 83 NME)*
**Site Name:** *Nash Unit #45H*
**Well Name:** *Nash Unit #45H*

07 November 2013

Weatherford

# Nash Unit #45H

**Field Name**
Eddy Co., NM (NAD 83 NME)

**Map Units :** US ft
**Company Name :** XTO Energy
**Vertical Reference Datum (VRD) :**
**Projected Coordinate System :** NAD27 / New Mexico East
**Comment :**

**Site Name**
Nash Unit #45H

**Units :** US ft **North Reference** : Grid **Convergence Angle :** 0.22
**Position** **Northing :** 476985.90 US ft **Latitude :** 32° 18' 38.49"
**Easting :** 626116.20 US ft **Longitude :** -103° 55' 30.43"
**Elevation above VRD:** 6024.00 US ft
**Comment :**

**Slot Name**
Nash Unit 45H

**Position (Offsets relative to Site Centre)**
**+N / -S :** 0.00 US ft **Northing :** 476985.90 US ft **Latitude :** 32°18'38.49"
**+E / -W :** 0.00 US ft **Easting :** 626116.20 US ft **Longitude :** -103°55'30.43"
**Slot TVD Reference :** Ground Elevation
**Elevation above VRD :** 3012.00 US ft
**Comment :**

**Well Name**
Nash Unit #45H

**Type :** Main well **UWI :** **Plan :** Working Plan
**Rig Height** ***Drill Floor*** **:** 17.00 US ft **Comment :**
**Relative to VRD:** 3029.00 US ft
**Closure Distance :** 10861.4 US ft **Closure Azimuth :** 3.57995°
**Vertical Section (Position of Origin Relative to Slot )**
**+N / -S :** 0.00 US ft **+E / -W :** 0.00 US ft **Az :** 3.58°
**Magnetic Parameters**
**Model :** Default **Field Strength :** 50000.0nT **Dec :** 0.00° **Dip :** 0.00° **Date :** 06/Nov/2013

**Collision / Uncertainty Analysis**

| Primary Well | Start MD (US ft) | End MD (US ft) | Collision Risk Interval | No. of Std Deviations in Error Computation |
|---|---|---|---|---|
| Nash Unit #45H (p) | 6200.00 | 30000.00 | 100.00 | 2 |

**Secondary Well Names**

Exist. Nash #7 (s)

**Anti-Collision Report Terminology**

**S.Minor, S.Major** : Radii of the ellipse of uncertainty at the current location as seen in the along hole direction.
**PHI** : Angle between high-side vector and semi-minor axis
**HS Ell Dim, LA Ell Dim, AH Ell Dim** : Maximum extents of ellipsoid in the high-side, lateral and along-hole directions.
**TVD Spread** : Total TVD range of the ellipsoid of uncertainty at the current location
**ES** : Distance between the primary and secondary uncertainty ellipsoids in the direction Cr-Cr
**T.Face to Sec** : Angle between the Hi-Side vector of the primary well at the current location and line of closest approach between the two wells

**AC Filter Info: The following filter(s) have been applied: Separation Factor, Depth Range.**

**Separation factors calculated using Vector Separation (Independent Uncertainty). Well path created using minimum curvature.**

5D Anti-Collision Report

## Anti Collision Proximity Summary (TVD relative to )

SF

| Secondary Well Name | Pri MD (US ft) | Sec MD (US ft) | TVD (US ft) | CC (US ft) | ES (US ft) | SF | Risk |
|---|---|---|---|---|---|---|---|
| Exist. Nash #7 (s) | 6275.39 | 6267.56 | 6275.39 | 190.03 | 162.34 | 6.86 | |

### Secondary Well : Exist. Nash #7 (s) (TVD Relative to Drill Floor (Primary) ; All Azimuth Relative to GRID NORTH)

| Pri MD (US ft) | Sec MD (US ft) | TVD (US ft) | S.Major (US ft) | S.Minor (US ft) | TVD Spread (US ft) | CC (US ft) | SF | ES (US ft) | T.Face to Sec (°) | Survey Tool | Risk |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6200.00 | 6192.81 | 6199.41 | 12.89 | 12.88 | 15.79 | 189.50 | 6.92 | 162.13 | 163.92 | MWD (MWD Svy) | |
| 6300.00 | 6291.88 | 6298.48 | 13.10 | 13.08 | 16.09 | 191.18 | 6.88 | 163.38 | 160.52 | MWD (MWD Svy) | |
| 6400.00 | 6390.47 | 6397.07 | 13.31 | 13.29 | 16.40 | 204.21 | 7.23 | 175.98 | 161.53 | MWD (MWD Svy) | |
| 6500.00 | 6486.90 | 6493.49 | 13.51 | 13.49 | 16.71 | 230.44 | 8.04 | 201.78 | 163.16 | MWD (MWD Svy) | |
| 6600.00 | 6578.45 | 6585.04 | 13.70 | 13.68 | 17.00 | 269.52 | 9.27 | 240.46 | 164.81 | MWD (MWD Svy) | |
| 6700.00 | 6662.40 | 6668.98 | 13.88 | 13.86 | 17.28 | 321.10 | 10.90 | 291.65 | 166.16 | MWD (MWD Svy) | |
| 6800.00 | 6738.90 | 6745.48 | 14.04 | 14.02 | 17.53 | 384.37 | 12.90 | 354.58 | 167.06 | MWD (MWD Svy) | |
| 6900.00 | 6807.13 | 6813.70 | 14.18 | 14.16 | 17.75 | 457.70 | 15.21 | 427.60 | 167.41 | MWD (MWD Svy) | |
| 7000.00 | 6864.55 | 6871.12 | 14.30 | 14.28 | 17.95 | 539.65 | 17.78 | 509.29 | 167.00 | MWD (MWD Svy) | |
| 7100.00 | 6909.23 | 6915.80 | 14.40 | 14.38 | 18.10 | 628.67 | 20.58 | 598.12 | 165.29 | MWD (MWD Svy) | |
| 7200.00 | 6938.69 | 6945.26 | 14.46 | 14.44 | 18.20 | 723.15 | 23.58 | 692.47 | 160.54 | MWD (MWD Svy) | |
| 7300.00 | 6999.73 | 7006.27 | 14.59 | 14.55 | 18.41 | 820.52 | 26.57 | 789.64 | 154.45 | MWD (MWD Svy) | |
| 7400.00 | 7012.44 | 7018.97 | 14.61 | 14.57 | 18.45 | 919.74 | 29.73 | 888.81 | 125.62 | MWD (MWD Svy) | |
| 7500.00 | 7019.44 | 7025.96 | 14.63 | 14.58 | 18.48 | 1019.41 | 32.93 | 988.45 | 129.59 | MWD (MWD Svy) | |
| 7600.00 | 7027.03 | 7033.54 | 14.64 | 14.60 | 18.50 | 1119.10 | 36.12 | 1088.12 | 133.44 | MWD (MWD Svy) | |
| 7700.00 | 7035.29 | 7041.78 | 14.66 | 14.61 | 18.53 | 1218.80 | 39.31 | 1187.80 | 137.13 | MWD (MWD Svy) | |
| 7800.00 | 7044.31 | 7050.79 | 14.68 | 14.63 | 18.56 | 1318.52 | 42.48 | 1287.48 | 140.64 | MWD (MWD Svy) | |
| 7900.00 | 7054.20 | 7060.66 | 14.70 | 14.65 | 18.60 | 1418.23 | 45.65 | 1387.17 | 143.96 | MWD (MWD Svy) | |
| 8000.00 | 7065.09 | 7071.53 | 14.72 | 14.67 | 18.63 | 1517.94 | 48.81 | 1486.84 | 147.09 | MWD (MWD Svy) | |
| 8100.00 | 7074.92 | 7081.34 | 14.74 | 14.68 | 18.67 | 1617.65 | 51.95 | 1586.51 | 149.52 | MWD (MWD Svy) | |
| 8200.00 | 7084.90 | 7091.30 | 14.76 | 14.70 | 18.70 | 1717.35 | 55.09 | 1686.18 | 151.67 | MWD (MWD Svy) | |
| 8300.00 | 7095.46 | 7101.83 | 14.78 | 14.72 | 18.74 | 1817.04 | 58.22 | 1785.83 | 153.67 | MWD (MWD Svy) | |
| 8400.00 | 7106.66 | 7113.01 | 14.81 | 14.74 | 18.78 | 1916.73 | 61.33 | 1885.48 | 155.52 | MWD (MWD Svy) | |
| 8500.00 | 7118.56 | 7124.87 | 14.83 | 14.77 | 18.82 | 2016.41 | 64.44 | 1985.11 | 157.24 | MWD (MWD Svy) | |
| 8600.00 | 7131.22 | 7137.49 | 14.86 | 14.79 | 18.86 | 2116.07 | 67.52 | 2084.73 | 158.83 | MWD (MWD Svy) | |
| 8700.00 | 7144.71 | 7150.94 | 14.88 | 14.81 | 18.91 | 2215.72 | 70.59 | 2184.33 | 160.32 | MWD (MWD Svy) | |
| 8800.00 | 7272.27 | 7277.77 | 15.15 | 15.00 | 19.36 | 2315.19 | 73.19 | 2283.55 | 168.39 | MWD (MWD Svy) | |
| 8900.00 | 7310.15 | 7315.30 | 15.22 | 15.07 | 19.49 | 2414.22 | 76.10 | 2382.49 | 169.74 | MWD (MWD Svy) | |
| 9000.00 | 7348.76 | 7353.49 | 15.30 | 15.15 | 19.62 | 2513.10 | 78.98 | 2481.28 | 170.87 | MWD (MWD Svy) | |
| 9100.00 | 7364.45 | 7368.99 | 15.33 | 15.18 | 19.68 | 2611.92 | 81.93 | 2580.04 | 171.27 | MWD (MWD Svy) | |
| 9200.00 | 7380.17 | 7384.52 | 15.37 | 15.21 | 19.74 | 2710.75 | 84.87 | 2678.81 | 171.66 | MWD (MWD Svy) | |
| 9300.00 | 7395.92 | 7400.09 | 15.40 | 15.24 | 19.79 | 2809.57 | 87.79 | 2777.56 | 172.02 | MWD (MWD Svy) | |

5D Anti-Collision Report

| Secondary Well : Exist. Nash #7 (S) (TVD Relative to Drill Floor (Primary)) ; All Azimuth Relative to GRID NORTH) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pri MD (US ft) | Sec MD (US ft) | TVD (US ft) | S.Major (US ft) | S.Minor (US ft) | TVD Spread (US ft) | CC (US ft) | SF | ES (US ft) | T.Face to Sec (°) | Survey Tool | Risk |
| 9400.00 | 7411.71 | 7415.69 | 15.43 | 15.27 | 19.85 | 2908.39 | 90.70 | 2876.32 | 172.37 | MWD (MWD Svy) | |
| 9500.00 | 7427.54 | 7431.32 | 15.47 | 15.31 | 19.91 | 3007.21 | 93.60 | 2975.08 | 172.69 | MWD (MWD Svy) | |
| 9600.00 | 7447.68 | 7451.22 | 15.51 | 15.35 | 19.98 | 3106.02 | 96.45 | 3073.82 | 173.09 | MWD (MWD Svy) | |
| 9700.00 | 7480.42 | 7483.53 | 15.58 | 15.41 | 20.10 | 3204.77 | 99.22 | 3172.48 | 173.68 | MWD (MWD Svy) | |
| 9800.00 | 7515.51 | 7518.12 | 15.65 | 15.47 | 20.23 | 3303.44 | 101.96 | 3271.04 | 174.24 | MWD (MWD Svy) | |
| 9900.00 | 7612.32 | 7613.34 | 15.85 | 15.65 | 20.58 | 3401.93 | 104.31 | 3369.32 | 175.50 | MWD (MWD Svy) | |
| 10000.00 | 7647.88 | 7648.21 | 15.93 | 15.72 | 20.71 | 3500.07 | 106.96 | 3467.34 | 175.86 | MWD (MWD Svy) | |
| 10100.00 | 7673.04 | 7672.87 | 15.99 | 15.77 | 20.80 | 3598.17 | 109.66 | 3565.36 | 176.10 | MWD (MWD Svy) | |
| 10200.00 | 7698.62 | 7697.93 | 16.04 | 15.82 | 20.90 | 3696.24 | 112.34 | 3663.34 | 176.34 | MWD (MWD Svy) | |
| 10300.00 | 7726.76 | 7725.49 | 16.11 | 15.87 | 21.00 | 3794.28 | 114.98 | 3761.28 | 176.59 | MWD (MWD Svy) | |
| 10400.00 | 7762.28 | 7760.24 | 16.19 | 15.94 | 21.13 | 3892.25 | 117.54 | 3859.14 | 176.89 | MWD (MWD Svy) | |
| 10500.00 | 7799.23 | 7796.34 | 16.27 | 16.01 | 21.27 | 3990.14 | 120.08 | 3956.91 | 177.18 | MWD (MWD Svy) | |
| 10600.00 | 7838.49 | 7834.67 | 16.36 | 16.09 | 21.42 | 4087.94 | 122.56 | 4054.59 | 177.47 | MWD (MWD Svy) | |
| 10700.00 | 7879.96 | 7875.14 | 16.46 | 16.17 | 21.58 | 4185.65 | 125.01 | 4152.16 | 177.72 | MWD (MWD Svy) | |
| 10800.00 | 7994.45 | 7986.54 | 16.73 | 16.36 | 22.01 | 4283.06 | 126.87 | 4249.30 | 178.29 | MWD (MWD Svy) | |
| 10900.00 | 8031.69 | 8022.65 | 16.83 | 16.44 | 22.16 | 4380.19 | 129.27 | 4346.31 | 178.47 | MWD (MWD Svy) | |
| 11000.00 | 8069.91 | 8059.68 | 16.92 | 16.51 | 22.30 | 4477.24 | 131.63 | 4443.23 | 178.64 | MWD (MWD Svy) | |
| 11100.00 | 8496.57 | 8466.52 | 18.12 | 17.14 | 23.96 | 4571.87 | 130.60 | 4536.87 | 180.42 | MWD (MWD Svy) | |
| 11200.00 | 8517.97 | 8486.59 | 18.19 | 17.19 | 24.05 | 4666.43 | 132.91 | 4631.33 | 180.52 | MWD (MWD Svy) | |
| 11300.00 | 8539.07 | 8506.40 | 18.25 | 17.25 | 24.13 | 4761.07 | 135.21 | 4725.86 | 180.61 | MWD (MWD Svy) | |
| 11400.00 | 8558.83 | 8524.96 | 18.32 | 17.30 | 24.21 | 4855.79 | 137.51 | 4820.48 | 180.69 | MWD (MWD Svy) | |
| 11500.00 | 8574.87 | 8540.05 | 18.37 | 17.35 | 24.28 | 4950.60 | 139.83 | 4915.20 | 180.76 | MWD (MWD Svy) | |
| 11600.00 | 8590.61 | 8554.86 | 18.42 | 17.39 | 24.34 | 5045.52 | 142.15 | 5010.02 | 180.82 | MWD (MWD Svy) | |
| 11700.00 | 8606.05 | 8569.42 | 18.46 | 17.44 | 24.41 | 5140.53 | 144.46 | 5104.94 | 180.89 | MWD (MWD Svy) | |
| 11800.00 | 8621.21 | 8583.73 | 18.51 | 17.48 | 24.47 | 5235.64 | 146.75 | 5199.96 | 180.95 | MWD (MWD Svy) | |
| 11900.00 | 8636.10 | 8597.78 | 18.56 | 17.52 | 24.53 | 5330.84 | 149.05 | 5295.07 | 181.00 | MWD (MWD Svy) | |
| 12000.00 | 8650.12 | 8611.03 | 18.60 | 17.56 | 24.59 | 5426.13 | 151.34 | 5390.28 | 181.06 | MWD (MWD Svy) | |
| 12100.00 | 8661.30 | 8621.61 | 18.64 | 17.60 | 24.64 | 5521.52 | 153.64 | 5485.58 | 181.10 | MWD (MWD Svy) | |
| 12200.00 | 8672.24 | 8631.98 | 18.67 | 17.63 | 24.68 | 5617.01 | 155.94 | 5580.99 | 181.14 | MWD (MWD Svy) | |
| 12300.00 | 8682.96 | 8642.15 | 18.71 | 17.67 | 24.73 | 5712.61 | 158.23 | 5676.50 | 181.18 | MWD (MWD Svy) | |
| 12400.00 | 8693.45 | 8652.11 | 18.74 | 17.70 | 24.77 | 5808.29 | 160.51 | 5772.11 | 181.21 | MWD (MWD Svy) | |
| 12500.00 | 8703.72 | 8661.88 | 18.77 | 17.74 | 24.82 | 5904.07 | 162.79 | 5867.80 | 181.25 | MWD (MWD Svy) | |
| 12600.00 | 8713.79 | 8671.46 | 18.81 | 17.77 | 24.86 | 5999.94 | 165.05 | 5963.59 | 181.28 | MWD (MWD Svy) | |
| 12700.00 | 8723.65 | 8680.85 | 18.84 | 17.80 | 24.90 | 6095.90 | 167.31 | 6059.46 | 181.31 | MWD (MWD Svy) | |
| 12800.00 | 8733.31 | 8690.07 | 18.87 | 17.83 | 24.94 | 6191.93 | 169.56 | 6155.42 | 181.34 | MWD (MWD Svy) | |

| Secondary Well : Exist. Nash #7 (s) (TVD Relative to Drill Floor (Primary) ; All Azimuth Relative to GRID NORTH) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pri MD (US ft) | Sec MD (US ft) | TVD (US ft) | S.Major (US ft) | S.Minor (US ft) | TVD Spread (US ft) | CC (US ft) | SF | ES (US ft) | T.Face to Sec (°) | Survey Tool | Risk |
| 12900.00 | 8743.48 | 8699.78 | 18.90 | 17.86 | 24.98 | 6288.06 | 171.80 | 6251.45 | 181.37 | MWD (MWD Svy) | |
| 13000.00 | 8756.44 | 8712.16 | 18.94 | 17.90 | 25.04 | 6384.24 | 173.99 | 6347.55 | 181.41 | MWD (MWD Svy) | |
| 13100.00 | 8769.19 | 8724.36 | 18.98 | 17.93 | 25.10 | 6480.50 | 176.16 | 6443.71 | 181.45 | MWD (MWD Svy) | |
| 13200.00 | 8781.75 | 8736.37 | 19.02 | 17.96 | 25.15 | 6576.81 | 178.33 | 6539.93 | 181.48 | MWD (MWD Svy) | |
| 13300.00 | 8794.11 | 8748.21 | 19.06 | 18.00 | 25.20 | 6673.18 | 180.49 | 6636.20 | 181.52 | MWD (MWD Svy) | |
| 13400.00 | 9572.94 | 9482.60 | 22.02 | 19.48 | 28.62 | 6768.76 | 172.92 | 6729.62 | 182.67 | MWD (MWD Svy) | |
| 13500.00 | 9661.55 | 9564.25 | 22.42 | 19.68 | 29.02 | 6861.48 | 173.84 | 6822.01 | 182.79 | MWD (MWD Svy) | |
| 13600.00 | 9712.36 | 9611.01 | 22.66 | 19.80 | 29.25 | 6954.02 | 175.24 | 6914.33 | 182.85 | MWD (MWD Svy) | |
| 13700.00 | 9758.86 | 9653.75 | 22.87 | 19.91 | 29.47 | 7046.50 | 176.67 | 7006.62 | 182.91 | MWD (MWD Svy) | |
| 13800.00 | 9795.94 | 9687.83 | 23.05 | 20.01 | 29.64 | 7138.97 | 178.21 | 7098.91 | 182.95 | MWD (MWD Svy) | |
| 13900.00 | 9831.81 | 9720.83 | 23.21 | 20.11 | 29.81 | 7231.45 | 179.75 | 7191.22 | 182.99 | MWD (MWD Svy) | |
| 14000.00 | 9873.95 | 9759.60 | 23.41 | 20.23 | 30.00 | 7323.93 | 181.18 | 7283.51 | 183.03 | MWD (MWD Svy) | |
| 14100.00 | 9931.43 | 9812.47 | 23.69 | 20.36 | 30.27 | 7416.35 | 182.38 | 7375.68 | 183.08 | MWD (MWD Svy) | |
| 14200.00 | 9959.62 | 9838.38 | 23.82 | 20.44 | 30.41 | 7508.71 | 183.97 | 7467.90 | 183.10 | MWD (MWD Svy) | |
| 14300.00 | 9973.59 | 9851.23 | 23.89 | 20.50 | 30.47 | 7601.19 | 185.75 | 7560.27 | 183.11 | MWD (MWD Svy) | |
| 14400.00 | 9987.35 | 9863.91 | 23.95 | 20.55 | 30.54 | 7693.78 | 187.53 | 7652.76 | 183.13 | MWD (MWD Svy) | |
| 14500.00 | 10000.89 | 9876.41 | 24.02 | 20.60 | 30.60 | 7786.50 | 189.30 | 7745.36 | 183.14 | MWD (MWD Svy) | |
| 14600.00 | 10014.24 | 9888.74 | 24.08 | 20.64 | 30.67 | 7879.32 | 191.06 | 7838.08 | 183.15 | MWD (MWD Svy) | |
| 14700.00 | 10027.38 | 9900.91 | 24.15 | 20.69 | 30.73 | 7972.26 | 192.82 | 7930.92 | 183.16 | MWD (MWD Svy) | |
| 14800.00 | 10040.33 | 9912.90 | 24.21 | 20.74 | 30.79 | 8065.31 | 194.57 | 8023.86 | 183.17 | MWD (MWD Svy) | |
| 14900.00 | 10050.03 | 9921.90 | 24.25 | 20.78 | 30.84 | 8158.47 | 196.36 | 8116.92 | 183.17 | MWD (MWD Svy) | |
| 15000.00 | 10058.77 | 9930.01 | 24.29 | 20.81 | 30.88 | 8251.76 | 198.16 | 8210.11 | 183.18 | MWD (MWD Svy) | |
| 15100.00 | 10067.36 | 9938.00 | 24.33 | 20.85 | 30.92 | 8345.16 | 199.94 | 8303.42 | 183.18 | MWD (MWD Svy) | |
| 15200.00 | 10075.80 | 9945.87 | 24.37 | 20.88 | 30.96 | 8438.67 | 201.73 | 8396.84 | 183.19 | MWD (MWD Svy) | |
| 15300.00 | 10084.11 | 9953.61 | 24.41 | 20.91 | 31.01 | 8532.30 | 203.51 | 8490.38 | 183.20 | MWD (MWD Svy) | |
| 15400.00 | 10092.27 | 9961.23 | 24.45 | 20.95 | 31.05 | 8626.04 | 205.28 | 8584.02 | 183.20 | MWD (MWD Svy) | |
| 15500.00 | 10100.31 | 9968.73 | 24.48 | 20.98 | 31.08 | 8719.89 | 207.04 | 8677.77 | 183.21 | MWD (MWD Svy) | |
| 15600.00 | 10108.20 | 9976.12 | 24.52 | 21.01 | 31.12 | 8813.83 | 208.80 | 8771.62 | 183.21 | MWD (MWD Svy) | |
| 15700.00 | 10115.98 | 9983.40 | 24.55 | 21.04 | 31.16 | 8907.89 | 210.56 | 8865.58 | 183.22 | MWD (MWD Svy) | |
| 15800.00 | 10123.62 | 9990.57 | 24.59 | 21.07 | 31.20 | 9002.04 | 212.30 | 8959.63 | 183.22 | MWD (MWD Svy) | |
| 15900.00 | 10131.14 | 9997.63 | 24.62 | 21.10 | 31.24 | 9096.28 | 214.04 | 9053.79 | 183.23 | MWD (MWD Svy) | |
| 16000.00 | 10155.40 | 10020.42 | 24.73 | 21.16 | 31.37 | 9190.62 | 215.52 | 9147.97 | 183.24 | MWD (MWD Svy) | |
| 16100.00 | 10212.08 | 10073.68 | 24.98 | 21.31 | 31.66 | 9284.90 | 216.49 | 9242.01 | 183.27 | MWD (MWD Svy) | |
| 16200.00 | 10237.29 | 10097.38 | 25.10 | 21.38 | 31.79 | 9379.14 | 217.92 | 9336.10 | 183.27 | MWD (MWD Svy) | |
| 16300.00 | 10248.94 | 10108.34 | 25.15 | 21.42 | 31.85 | 9473.45 | 219.55 | 9430.31 | 183.28 | MWD (MWD Svy) | |

| Secondary Well # Exist. Nash 4-7 (s) (TVD Relative to Drill Floor (Primary)) All Azimuth Relative to GRID NORTH) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pri MD (US ft) | Sec MD (US ft) | TVD (US ft) | S.Major (US ft) | S.Minor (US ft) | TVD Spread (US ft) | CC (US ft) | SF | ES (US ft) | T.Face to Sec (°) | Survey Tool | Risk |
| 16400.00 | 10260.43 | 10119.16 | 25.20 | 21.46 | 31.91 | 9567.84 | 221.18 | 9524.58 | 183.28 | MWD (MWD Svy) | |
| 16500.00 | 10271.78 | 10129.85 | 25.25 | 21.49 | 31.97 | 9662.30 | 222.79 | 9618.93 | 183.28 | MWD (MWD Svy) | |
| 16600.00 | 10282.98 | 10140.41 | 25.30 | 21.53 | 32.03 | 9756.83 | 224.40 | 9713.36 | 183.29 | MWD (MWD Svy) | |
| 16700.00 | 10294.04 | 10150.84 | 25.35 | 21.56 | 32.08 | 9851.44 | 226.01 | 9807.85 | 183.29 | MWD (MWD Svy) | |
| 16800.00 | 10304.97 | 10161.16 | 25.40 | 21.60 | 32.14 | 9946.11 | 227.60 | 9902.41 | 183.29 | MWD (MWD Svy) | |
| 16900.00 | 10315.75 | 10171.35 | 25.45 | 21.63 | 32.20 | 10040.86 | 229.19 | 9997.05 | 183.30 | MWD (MWD Svy) | |
| 17000.00 | 10325.08 | 10180.16 | 25.49 | 21.66 | 32.24 | 10135.67 | 230.80 | 10091.75 | 183.30 | MWD (MWD Svy) | |
| 17100.00 | 10332.43 | 10187.12 | 25.52 | 21.69 | 32.28 | 10230.55 | 232.43 | 10186.54 | 183.30 | MWD (MWD Svy) | |
| 17200.00 | 10339.67 | 10193.98 | 25.55 | 21.71 | 32.32 | 10325.51 | 234.05 | 10281.40 | 183.30 | MWD (MWD Svy) | |
| 17300.00 | 10346.82 | 10200.76 | 25.58 | 21.74 | 32.36 | 10420.54 | 235.66 | 10376.33 | 183.30 | MWD (MWD Svy) | |
| 17400.00 | 10353.86 | 10207.44 | 25.61 | 21.76 | 32.40 | 10515.65 | 237.27 | 10471.33 | 183.30 | MWD (MWD Svy) | |
| 17500.00 | 10360.81 | 10214.04 | 25.64 | 21.79 | 32.43 | 10610.82 | 238.87 | 10566.40 | 183.30 | MWD (MWD Svy) | |
| 17528.00 | 10362.74 | 10215.87 | 25.65 | 21.79 | 32.44 | 10637.48 | 239.32 | 10593.03 | 183.30 | MWD (MWD Svy) | |

# Weatherford Drilling Services

GeoDec v5.03

| | |
|---|---|
| Report Date: | July 18, 2013 |
| Job Number: | |
| Customer: | XTO Energy |
| Well Name: | Nash Unit #45H |
| API Number: | |
| Rig Name: | |
| Location: | Eddy Con NM |
| Block: | |
| Engineer: | RWJ |

| | |
|---|---|
| US State Plane 1927 | Geodetic Latitude / Longitude |
| System: New Mexico East 3001 (NON-EXACT) | System: Latitude / Longitude |
| Projection: SPC27 Transverse Mercator | Projection: Geodetic Latitude and Longitude |
| Datum: NAD 1927 (NADCON CONUS) | Datum: NAD 1927 (NADCON CONUS) |
| Ellipsoid: Clarke 1866 | Ellipsoid: Clarke 1866 |
| North/South 476985.900 USFT | Latitude 32.3106904 DEG |
| East/West 626116.200 USFT | Longitude -103.9251189 DEG |
| Grid Convergence: .22° | |
| Total Correction: +7.35° | |

| | | |
|---|---|---|
| Geodetic Location WGS84 | Elevation = | 0.0 Meters |
| Latitude = | 32.31069° N | 32° 18 min 38.486 sec |
| Longitude = | 103.92512° W | 103° 55 min 30.428 sec |

| | | | |
|---|---|---|---|
| Magnetic Declination = | 7.57° | [True North Offset] | |
| Local Gravity = | .9988 g | CheckSum = | 6563 |
| Local Field Strength = | 48395 nT | Magnetic Vector X = | 23890 nT |
| Magnetic Dip = | 60.13° | Magnetic Vector Y = | 3177 nT |
| Magnetic Model = | bggm2013 | Magnetic Vector Z = | 41967 nT |
| Spud Date = | Nov 15, 2013 | Magnetic Vector H = | 24101 nT |

Signed:_____ Date:_____

# Drilling 12-1/4" hole below 13 3/8" Casing

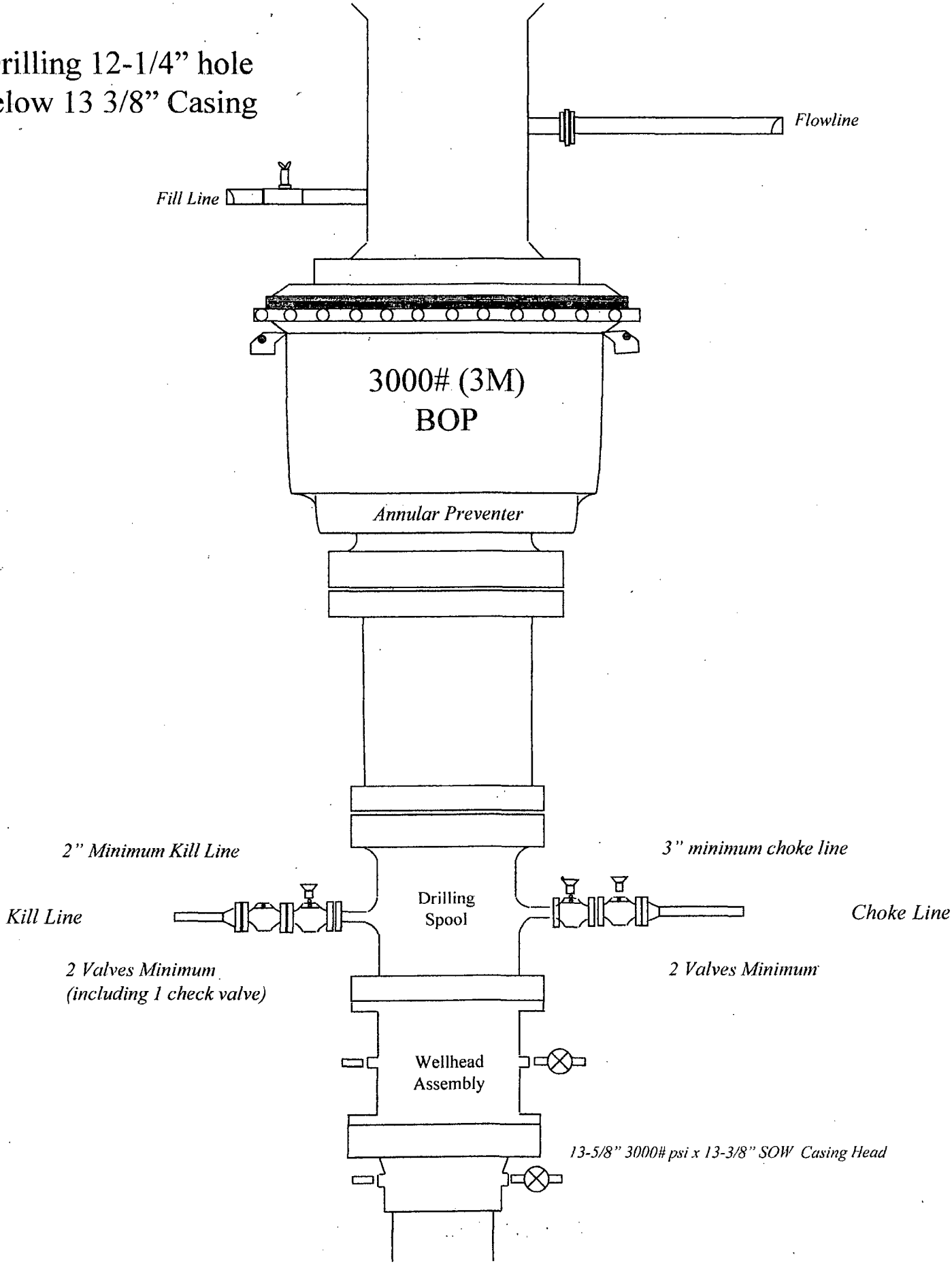



Exhibit E-1 – 3000# BOP

Drilling 8-3/4" hole
below 9 5/8" Casing

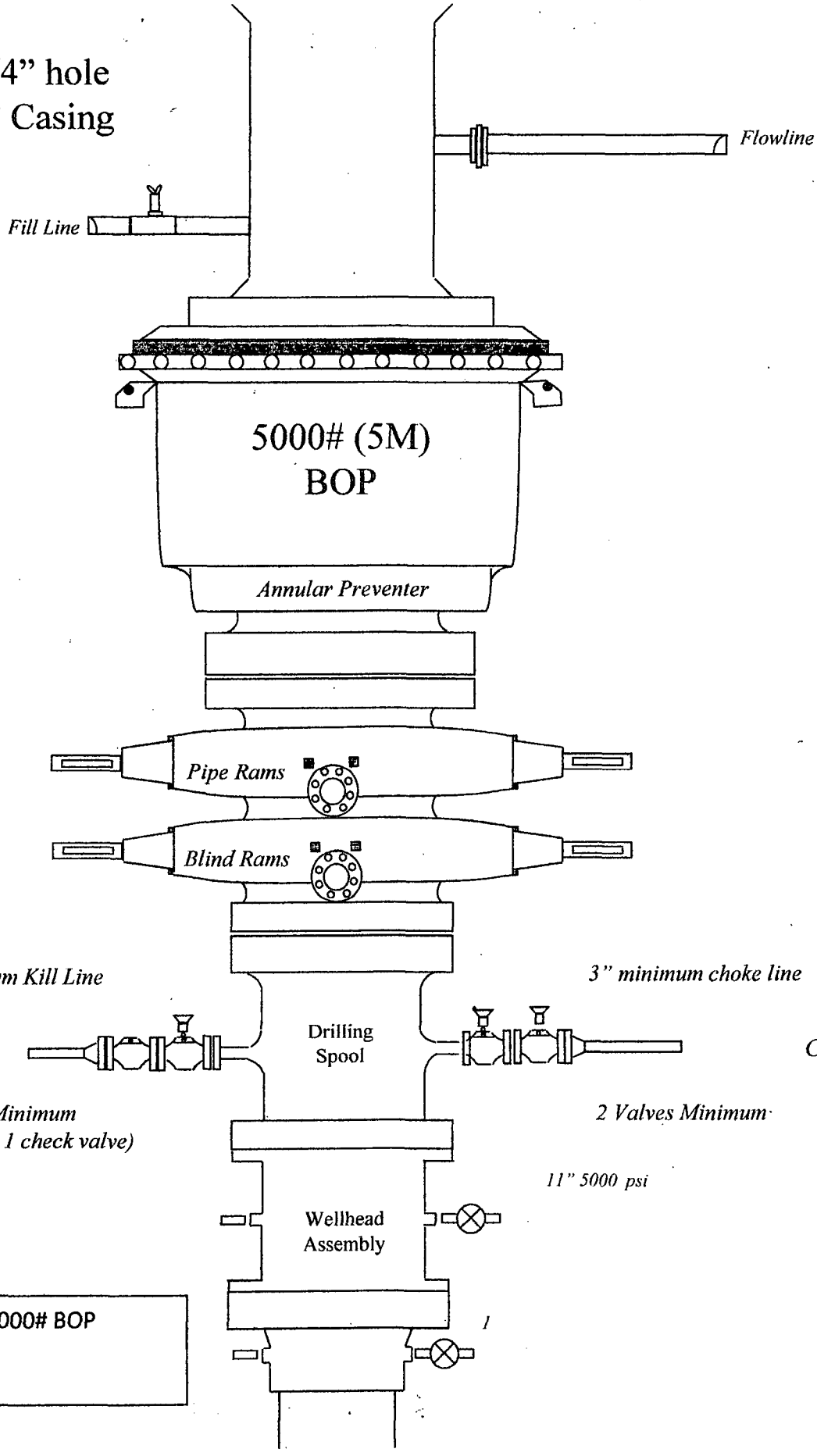
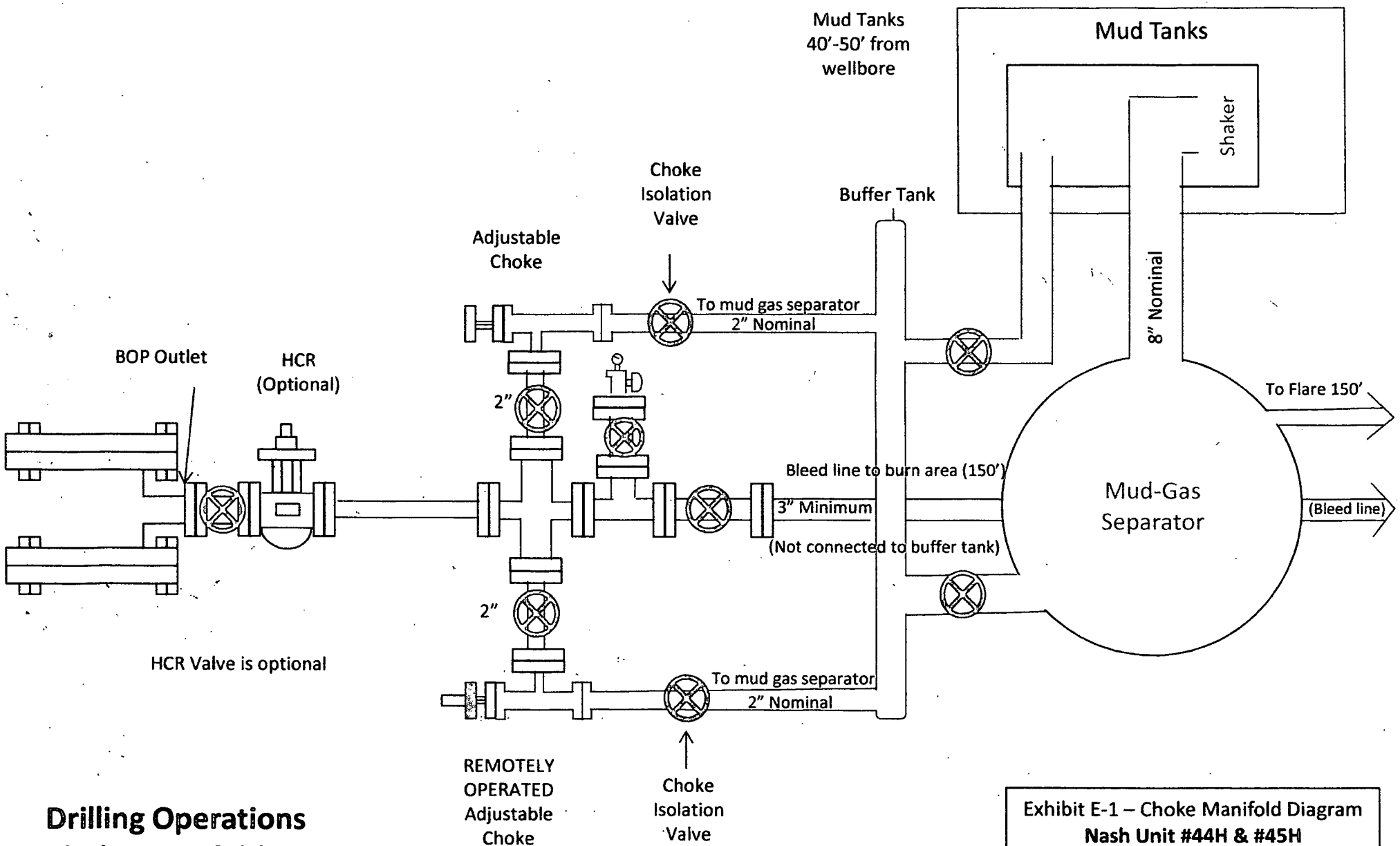



Exhibit E-1 –5000# BOP




**Drilling Operations**
**Choke Manifold**
**5M Service**

Exhibit E-1 – Choke Manifold Diagram
**Nash Unit #44H & #45H**
XTO Energy, Inc..

# Plat for Closed Loop System

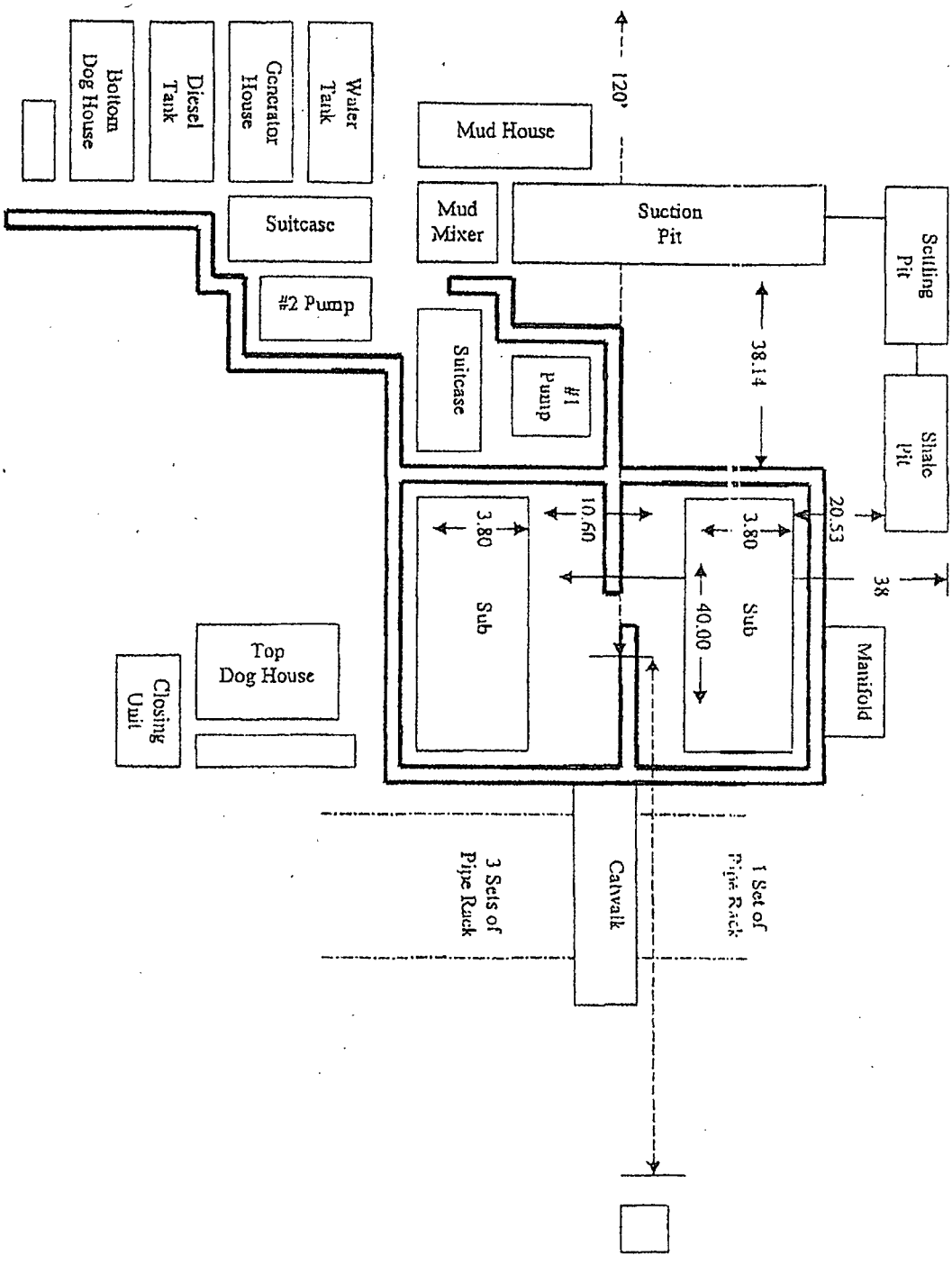
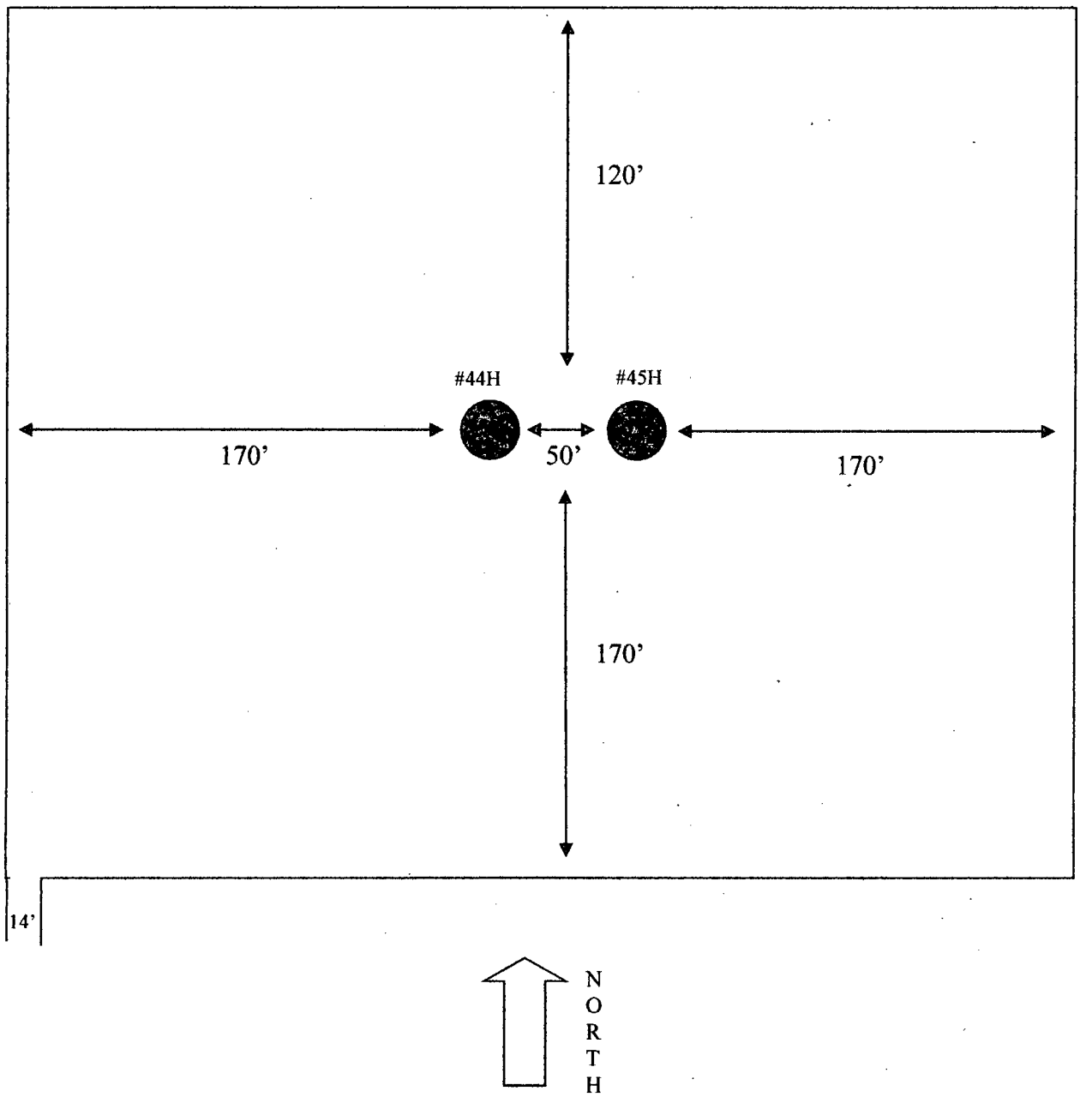


**EXHIBIT D**

# Rig Plat Only
# NASH UNIT #44H & #45H
# V-DOOR EAST



XTO ENERGY

# HYDROGEN SULFIDE (H2S) CONTINGENCY PLAN
## NASH UNIT #45H
## Assumed 100 ppm ROE = 3000'

100 ppm H2S concentration shall trigger activation of this plan.

**This is an open drilling site. $H_2S$ monitoring equipment and emergency response equipment will be rigged up and in use when the company drills out from under surface casing. $H_2S$ monitors, warning signs, wind indicators and flags will be in use.**

A. All personnel shall receive proper H2S training in accordance with Onshore Order 6 III.C.3.a

B. Briefing Area: Two perpendicular areas will be designated by signs and readily accessible.

C. Required Emergency Equipment:

- Well control equipment
  a. Flare line 150' from wellhead to be ignited by flare gun.
  b. Choke manifold with a remotely operated choke.
  c. Mud/Gas Separator.

- Protective Equipment for essential personnel.
  Breathing apparatus:
  a. Rescue Packs (SCBA) – 1 unit shall be placed at each briefing area. 2 units shall be stored in the safety trailer.
  b. Work/Escape packs – 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.
  c. Emergency Escape Packs – 4 packs shall be stored in the doghouse for emergency evacuation.

  Auxiliary Rescue Equipment:
  a. Stretcher
  b. Two OSHA full body harness
  c. 100 ft. 5/8" OSHA approved rope
  d. One 20# class ABC fire extinguisher

- H2S detection and monitoring Equipment:
  The stationary detector with three sensors will be placed in the upper doghouse, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor, Bell nipple, end of flare line or where well bore fluid is being discharged (Gas sample tubes will be stored in the safety trailer).

- Visual warning systems.
  a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
  b. A colored condition flag will be on display, reflecting the current condition, at the drilling site.
  c. Two wind socks will be placed in strategic locations being visible from all angles.

- Mud Program:
  The mud program has been designated to minimize the volume of H2S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H2S bearing zones.

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

- Communication:
  Communication will be via two way radio in emergency and company vehicles. Cell phones and land lines where available.

## $H_2S$ Operations

Though no $H_2S$ is anticipated during the drilling operation, this contingency plan will provide for methods to ensure the well is kept under control in the event an $H_2S$ reading of 100 ppm or more are encountered. Once personnel are safe and the proper protective gear is in place and on personnel, the operator and rig crew essential personnel will ensure the well is under control, suspend drilling operations and shut-in the well (unless pressure build up or other operational situations dictate suspending operations will prevent well control), increase the mud weight and circulate all gas from the hole utilizing the mud/gas separator downstream of the choke, the choke manifold and the emergency flare system located 150' from the well. Bring the mud system into compliance and the $H_2S$ level below 10 ppm, then notify all emergency officers that drilling ahead is practical and safe.

Proceed with drilling ahead only after all provisions of Onshore Order 6, Section III.C. have been satisfied.

## Ignition of Gas source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide ($SO_2$). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever this is an ignition of the gas.

**Characteristics of $H_2S$ and $SO_2$**

| Common Name | Chemical Formula | Specific Gravity | Threshold Limit | Hazardous Limit | Lethal Concentration |
|---|---|---|---|---|---|
| Hydrogen Sulfide | $H_2S$ | 1.189 Air = I | 10 ppm | 100 ppm/hr | 600 ppm |
| Sulfur Dioxide | $SO_2$ | 2.21 Air = I | 2 ppm | N/A | 1000 ppm |

## Contacting Authorities

XTO Energy Inc.'s personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. (Operator Name)'s response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

# EUNICE OFFICE – EDDY & LEA COUNTIES

EMSU @ Oil Center, NM, 8/10ths mile west of Hwy 8 on Hwy 175
Eunice, NM 575-394-2089

Buckeye Office @ Lea County: From Hobbs, NM take Hwy 62/180 West
Approx. 10 miles to SH 529, turn NW on SH 529 for 3 miles, turn North
On Hwy 238, proceed North approx 8 miles to Buckeye field office
(1/4 mile North of Buckeye store) 575-396-0542

**XTO ENERGY INC PERSONNEL:**

| | |
|---|---|
| Boogie Armes, Sr. Drilling Superintendent | 432-556-7403 |
| Bob Chance, Drilling Superintendent | 432-296-3926 |
| Chip Amrock, Sr. Drilling Engineer | 432-638-8372 |
| Jeff Raines, Construction Foreman | 432-557-3159 |
| Dudley McMinn, EH & S Manager | 432-557-7976 |
| Jerry Parker, Buckeye Production Foreman | 575-441-1628 |
| Guy Pearce, Eunice Monument Production Foreman | 575-441-2965 |
| Gene Hudson, Maintenance Foreman | 575-441-1634 |
| Rick Wilson, Production Superintendent | 575-441-1147 |

**SHERIFF DEPARTMENTS:**

| | |
|---|---|
| Eddy County | 575-887-7551 |
| Lea County | 575-396-3611 |

**NEW MEXICO STATE POLICE:** 575-392-5588

**FIRE DEPARTMENTS:**

| | |
|---|---|
| | 911 |
| Carlsbad | 575-885-2111 |
| Eunice | 575-394-2111 |
| Hobbs | 575-397-9308 |
| Jal | 575-395-2221 |
| Lovington | 575-396-2359 |

**HOSPITALS:**

| | |
|---|---|
| | 911 |
| Carlsbad Medical Emergency | 575-885-2111 |
| Eunice Medical Emergency | 575-394-2112 |
| Hobbs Medical Emergency | 575-397-9308 |
| Jal Medical Emergency | 575-395-2221 |
| Lovington Medical Emergency | 575-396-2359 |

**AGENT NOTIFICATIONS:**

| | |
|---|---|
| Bureau of Land Management | 575-393-3612 |
| New Mexico Oil Conservation Division | 575-393-6161 |
| Mosaic Potash - Carlsbad | 575-887-2871 |

**CONTRACTORS:**

| | |
|---|---|
| ABC Rental – Light Towers | 575-394-3155 |
| Bulldog Services – Trucking/Forklift | 575-391-8543 |
| Champion – Chemical | 575-393-7726 |
| Indian Fire & Safety | 575-393-3093 |
| Key – Dirt Contractor | 575-393-3180 |
| Key Tools – Light Towers | 575-393-2415 |
| Sweatt – Dirt Contractor | 575-397-4541 |
| RWI – Contract Gang | 575-393-5305 |

# H2S Briefing Areas & Alarm Locations

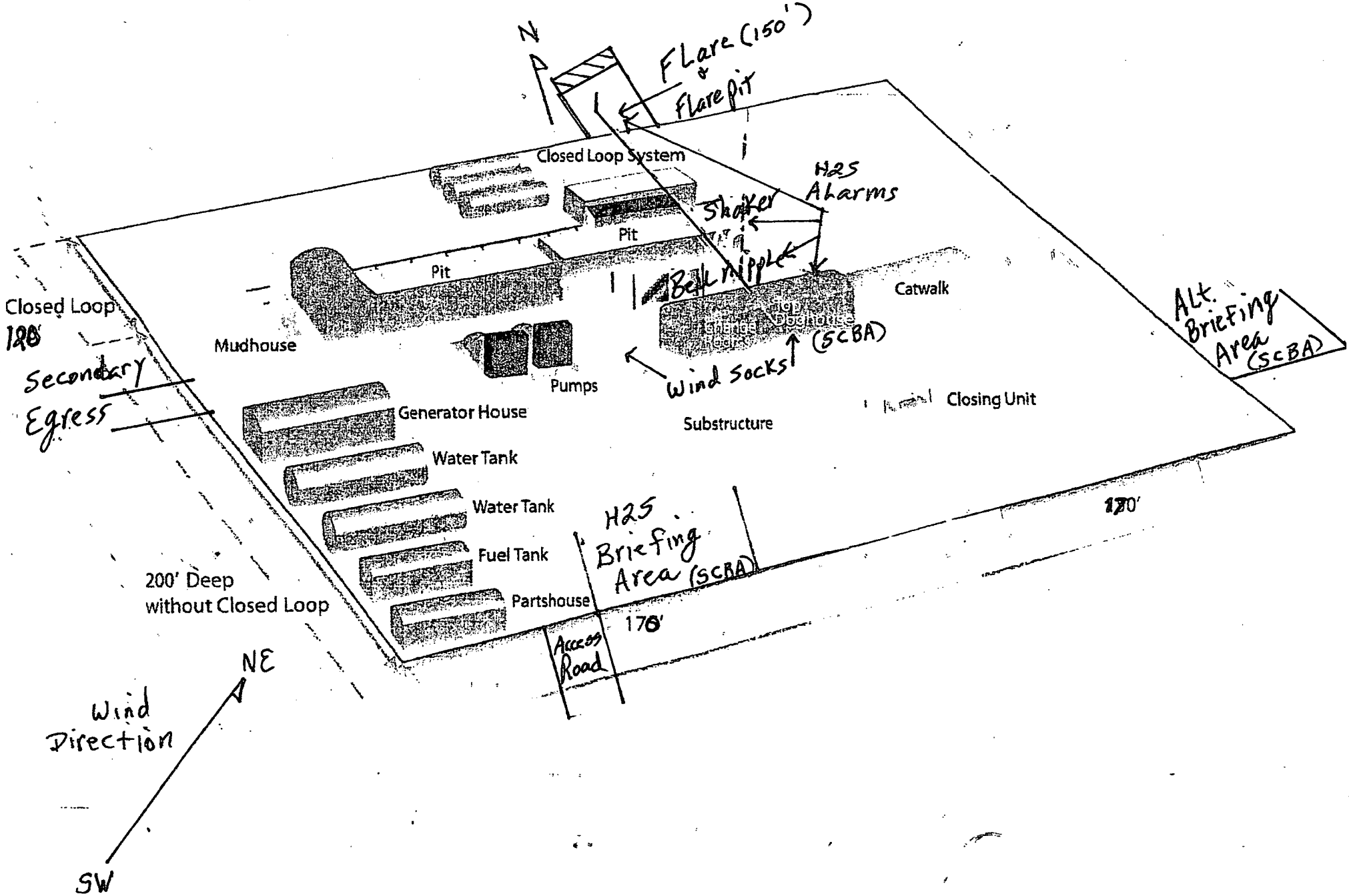
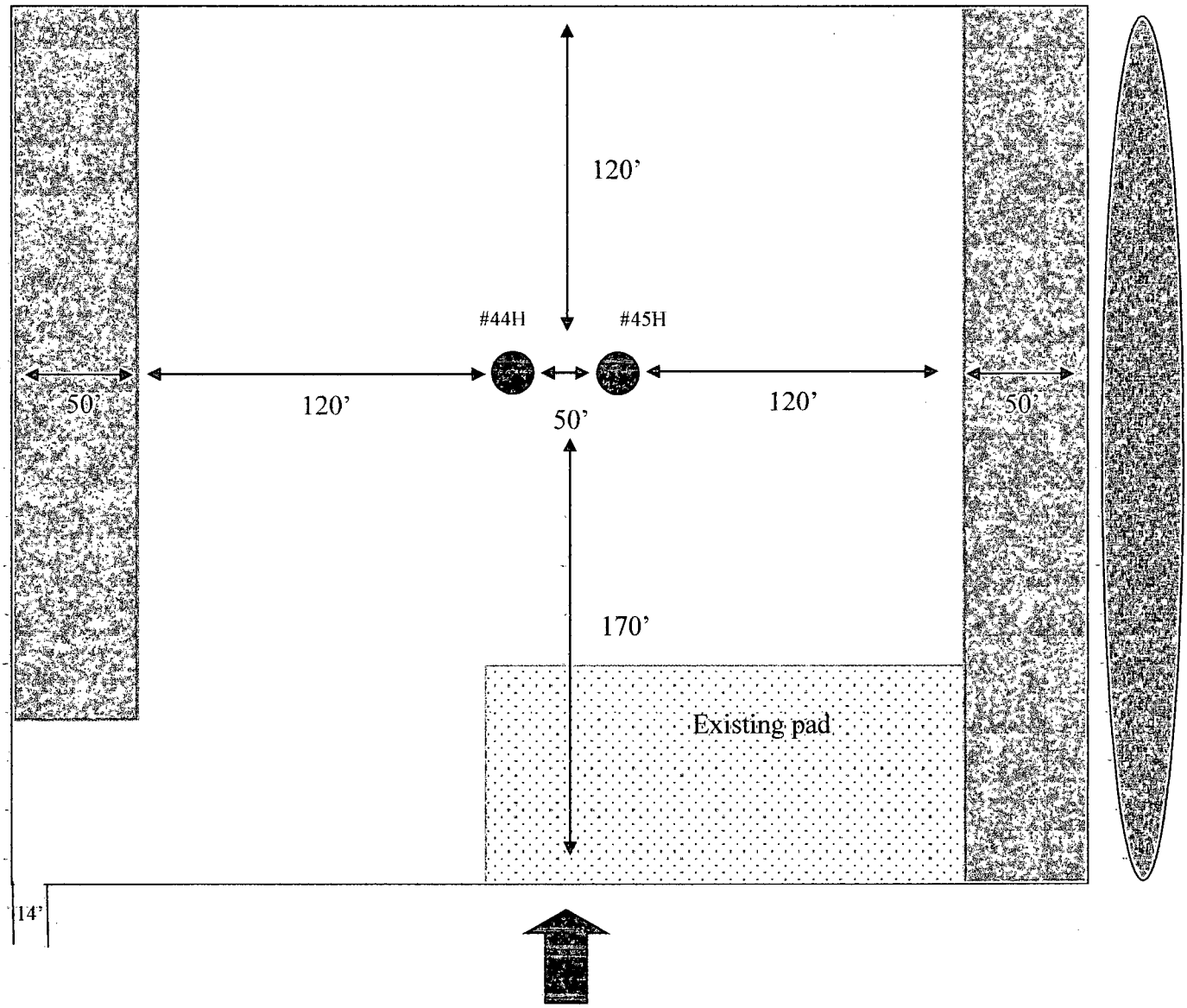


**EXHIBIT C**

# Interim Reclamation & Production Facilities
# NASH UNIT #44H & #45H
# V-DOOR EAST




LEGEND

Well Bore

Topsoil

Interim Reclamation

Berm

Production Facilities

NORTH

**SURFACE USE PLAN**

**XTO Energy, Inc.**
**NASH UNIT #45**
**Surface Hole: 550 FNL & 1250 FWL, Section 18, T. 23 S., R. 30 E.**
**Bottom Hole: 330 FNL & 1980 FWL, Section 6, T. 23 S., R. 30 E.**
**Eddy County, New Mexico**

This plan is submitted with form 3160-3, Application for Permit to Drill, 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.

1. EXISTING ROADS:

   A. DIRECTIONS: From the intersection of State Highway 128 (Jal Highway) and County Road 798 (Rawhide Road), go south on C.R. 793 for 2.0 miles. Turn east onto lease road for 0.2 miles to proposed well location. All existing roads are either paved or a caliche lease road.

   B. See attached plats and maps provided by Watson Professional Group Inc.

   C. The access route from County Road 793 to the well location is depicted on **EXHIBIT A**. The route highlighted in red will be the access and no ROW is required for this well.

   D. Existing roads on the access route will be improved and maintained to the standard set forth in Section 2 of this Surface Use Plan of Operations.

2. NEW OR RECONSTRUCTED ACCESS ROADS:

   A. The new road will run from the southwest corner of the well pad and run due south to the existing lease road. The distance of the new road will be 144 ft.

   B. The maximum width of the driving surface will be 14 feet. The road will be crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches will be 1 foot deep with 3:1 slopes. The driving surface will be made of 6" rolled and compacted caliche.


**Level Ground Section**

   C. Surface material will be native caliche. The average grade of the entire road will be approximately 3%.
   D. Fence Cuts: No
   E. Cattle guards: No
   F. Turnouts: No
   G. Culverts: No
   H. Cuts and Fills: Not significant
   I. Approximately 6 inches of topsoil (root zone) will be stripped from the proposed access road prior to any further construction activity. The topsoil that was stripped will be spread along the

edge of the road and within the ditch. The topsoil will be seeded with the proper seed mix designated by the BLM.

J. The access road will be constructed and maintained as necessary to prevent soil erosion and accommodate all-weather traffic. The road will be crowned and ditched with water turnouts installed as necessary to provide for proper drainage along the access road route.

K. The access road and associated drainage structures will be constructed and maintained in accordance with road guidelines contained in the joint BLM/USFS publication: Surface Operating Standards for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition and/or BLM Manual Section 9113 concerning road construction standards on projects subject to federal jurisdiction.

3. LOCATION OF EXISTING WELLS:

See attached map **(Exhibit B)** showing all wells within a one-mile radius.

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES:

A. In the event the well is found productive a 3" Poly, flowline of 3165', will be laid along side the existing roads, to the #42 battery (SW/4NW/4 section 18) **(SEE EXHIBIT E)**.

B. All permanent (on site six months or longer) aboveground structures constructed or installed on location and not subject to safety requirements will be painted to BLM specifications.

C. Containment berms will be constructed completely around any production facilities designed to hold fluids. The containment berns will be constructed or compacted subsoil, be sufficiently impervious, hold 1 ½ times the capacity of the largest tank and away from cut or fill areas.

5. LOCATION AND TYPE OF WATER SUPPLY:

The well will be drilled using a combination of water mud systems as outlined in the Drilling Program. The water will be obtained from commercial water stations in the area and hauled to the location by transport truck using the existing and proposed roads shown in the attached survey plats. If a commercial water well is nearby, a temporary, surface poly line, will be laid along existing roads or other ROW easements and the water pumped to the well. No water well will be drilled on the location.

6. SOURCE OF CONSTRUCTION MATERIALS:

Any construction material that may be required for surfacing of the drill pad and access road will be from a contractor having a permitted source of materials within the general area. No construction materials will be removed from Federal lands without prior approval from the appropriate surface management agency. All roads will be constructed of 6" rolled and compacted caliche.

7. METHODS OF HANDLING WASTE DISPOSAL:

A. The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud boxes and taken to an NMOCD approved disposal site.

B. Drilling fluids will be contained in steel mud pits.

C. Water produced from the well during completion will be held temporarily in steel tanks and then taken to an NMOCD approved commercial disposal facility.

D. Oil produced during operations will be stored in tanks until sold.

E. Portable, self-contained chemical toilets will be provided for human waste disposal.

Upon completion of operations, or as required, the toilet holding tanks will be pumped and the contents thereof disposed of in an approved sewage disposal facility. All state and local laws and regulations pertaining to disposal of human and solid waste will be complied with. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.

F. All trash, junk, and other waste materials will be contained in trash cages or bins to prevent scattering and will be removed and deposited in an approved sanitary landfill. Immediately after drilling all debris and other waste materials on and around the well location, not contained in the trash cage will be cleaned up and removed from the location. No potentially adverse materials or substances will be left on the location.

8. ANCILLARY FACILITIES:

No campsite, airstrip, or other facilities will be built as a result of the operation of this well. No staging areas are needed.

9. WELL SITE LAYOUT:

A. **Exhibit D** shows the dimensions of the proposed well pad.
B. The proposed well pad size will be 390' x 290' and will have two wells on one pad (50' apart). The #44 to the west and #45 to the east **(See Exhibit D).** There will be no reserve pit due to the well being drilled utilizing a closed loop mud system. The closed loop system will meet the NMOCD requirements 19.15.17 .
C. The Watson Surveyor's plat, Form C-102 and **Exhibit D**, shows the direction of the pad at a V-Door East.
D. A 600' x 600' area has been staked and flagged.
E. All equipment and vehicles will be confined to the approved disturbed areas of this APD (i.e., access road, well pad, and topsoil storage areas)

10. PLANS FOR SURFACE RECLAMATION:

A. After concluding the drilling and/or completion operations, if the well is found non-commercial, all the equipment will be removed, the surface material, caliche, will be removed from the well pad and road and transported to the original caliche pit or used for other roads. The original stock piled top soil will be returned to the pad and contoured, as close as possible, to the original topography. The access road will have the caliche removed and the road ripped, barricaded and seeded as directed by the BLM.
B. If the well is a producer, the portions of the pad not essential to production facilities or space required for workover operations, will be reclaimed and seeded as per BLM requirements for interim reclamation. **(SEE EXHIBIT C FOR INTERIM RECLAMATION PLAT FOR THIS WELL)**
C. Reclamation Performance Standards
The following reclamation performance standards will be met:

*Final Reclamation* – Includes disturbed areas where the original landform and a natural vegetative community will be restored and it is anticipated the site will not be redisturbed for future development.

- The original landform will be restored for all disturbed areas including well pads, production facilities, roads, pipelines, and utility corridors.
- A self-sustaining, vigorous, diverse, native (or otherwise approved) plant community will be established on the site, with a density

sufficient to control erosion and invasion by non-native plants and to re-establish wildlife habitat or forage production. At a minimum, the established plant community will consist of species included in the seed mix and/or desirable species occurring in the surrounding natural vegetation.

- Erosion features are equal to or less than surrounding area and erosion control is sufficient so that water naturally infiltrates into the soil and gullying, headcutting, slumping, and deep or excessive rills (greater than 3 inches) are not observed.
- The site will be free of State- or county-listed noxious weeds, oil field debris and equipment, and contaminated soil. Invasive and non-native weeds are controlled.

Seeding:

- Seedbed Preparation. Initial seedbed preparation will consist of recontouring to the appropriate interim or final reclamation standard. All compacted areas to be seeded will be ripped to a minimum depth of 18 inches with a minimum furrow spacing of 2 feet, followed by recontouring the surface and then evenly spreading the stockpiled topsoil. Prior to seeding, the seedbed will be scarified to a depth of no less than 4 – 6 inches. If the site is to be broadcast seeded, the surface will be left rough enough to trap seed and snow, control erosion, and increase water infiltration.
- If broadcast seeding is to be used and is delayed, final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
- Seed Application. Seeding will be conducted no more than two weeks following completion of final seedbed preparation. A certified weed-free seed mix designed by the BLM to meet reclamation standards will be used.
- If the site is harrowed or dragged, seed will be covered by no more than 0.25 inch of soil.

11. SURFACE OWNERSHIP:

A. The surface is owned by the State of New Mexico. The surface is multiple use with the primary uses of the region for the grazing of livestock and the production of oil and gas.

12. OTHER INFORMATION:

A. The area surrounding the well site is in a gentle sloped, rolling hills type area, east of Salt Lakes. The vegetation consists of Mesquite, Four-Wing Saltbush, White Thorn Acacia species.
B. There is no permanent or live water in the immediate area (1/2 mile northwest to salt lakes).
C. There are dwellings within 2 miles of this location.
D. A Class III Cultural Resources Examination has been completed by Boone Archaeological Services and the results will be forwarded to the BLM office.

13. BOND COVERAGE:

Bond Coverage is Nationwide; Bond Number UTB000138.

OPERATORS REPRESENTATIVE:

The XTO Energy, Inc. representatvies responsible for ensuring compliance of the surface use plan are listed below:

Surface:
Barry W. Hunt – Permit Agent
1403 Spring Farm Place
Carlsbad, NM 88220
(575) 885-1417 (Home)
(575) 361-4078 (Cell)

Drilling & Production:
Chip Amrock – XTO Energy, Inc.
200 N. Loraine, Suite 800
Midland, Tx. 79701
(432) 638-8372 (Office)

**ON-SITE PERFORMED ON 1/30/13 RESULTED IN PROPOSED LOCATION BEING LEFT WHERE STAKED. IT WAS AGREED TO TURN THE LOCATION TO A V-DOOR EAST. INTERIM RECLAMATION WOULD BE THE WEST AND EAST PORTION OF THE PAD. TOP SOIL TO BE TO THE EAST.**

**PRESENT AT ON-SITE:**
**JEFF RAINES – XTO ENERGY, INC.**
**AMANDA LYNCH – BLM**
**BECKIE HILL - BOONE ARCHAEOLOGICAL SERVICES**

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | **XTO Energy, Inc.** |
| **LEASE NO.:** | **NMNM-19246** |
| **WELL NAME & NO.:** | **Nash Unit 45H** |
| **SURFACE HOLE FOOTAGE:** | **0550' FNL & 1250' FWL** |
| **BOTTOM HOLE FOOTAGE** | **0330' FNL & 1980' FWL Sec. 06, T. 23 S., R 30 E.** |
| **LOCATION:** | **Section 18, T. 23 S., R 30 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.

## 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

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

#### Cave/Karst Surface Mitigation

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

**Construction:**
In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

**No Blasting:**
No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

**Pad Berming:**
The pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the pad. All sides will be bermed.

**Tank Battery Liners and Berms:**
Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

**Leak Detection System:**
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

**Automatic Shut-off Systems:**
Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

#### Cave/Karst Subsurface Mitigation

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

**Rotary Drilling with Fresh Water:**
Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

**Directional Drilling:**
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

**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 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

**Abandonment Cementing:**
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

**Pressure Testing:**
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

**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.

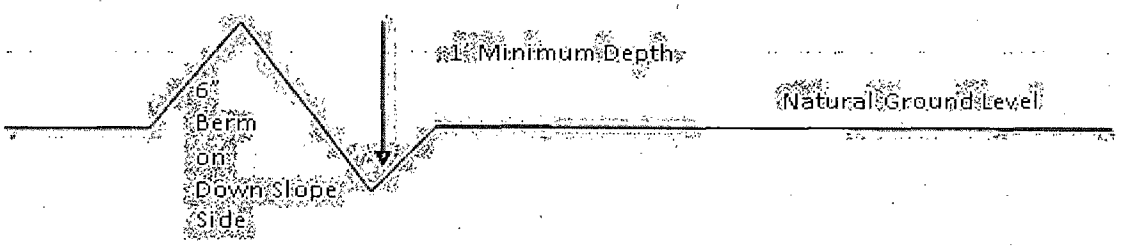
**Ditching**
Ditching shall be required on both sides of the road.

**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:

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

**Culvert Installations**
Appropriately sized culverts shall be installed at deep waterway channel flow crossings through the road.

**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

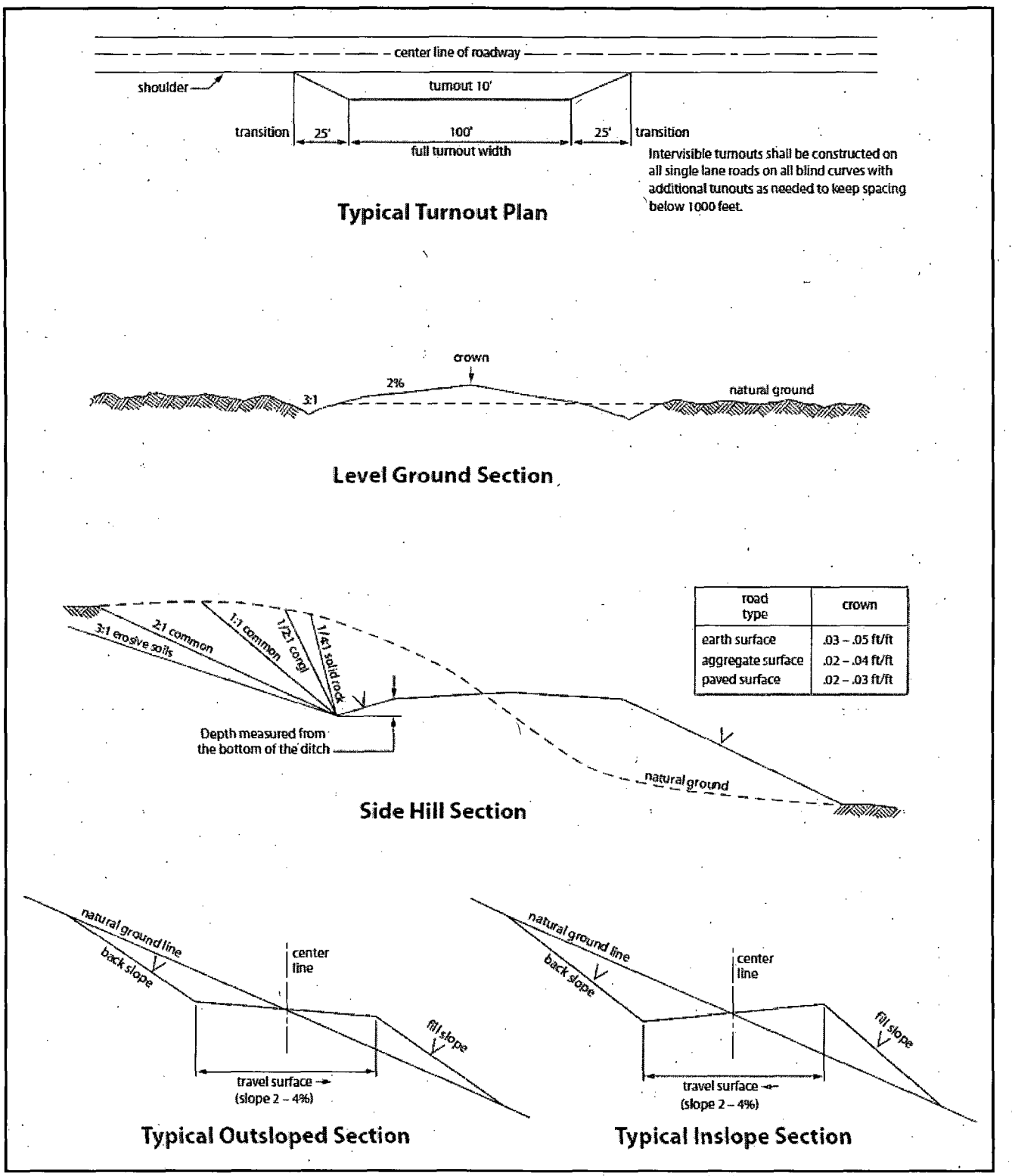



Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

# 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. 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.**

**R-111-P-Potash**
**High Cave/Karst**
**Possibility of water flows in the Salado.**
**Possibility of lost circulation in the Delaware.**

1. The **13-3/8** inch surface casing shall be set at approximately **175** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    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 **9-5/8** inch intermediate casing, which shall be set at approximately **3200** feet, 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 cave/karst and potash.**

**Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

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

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

   ☒ 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.**

**Operator must run a CBL from TD of the 7" casing to surface. Submit results to the BLM.**

**Formation below the 7" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.**

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

5. 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.

6. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

## 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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

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**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

   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.

   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.

**JAM 011414**

# 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).

## IX. 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.

Within six (6) months of well completion, 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).

Seed Mixture 1, for Loamy 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 regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/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 lovegrass (Eragrostis intermedia) | 0.5 |
| Sand dropseed (Sporobolus cryptandrus) | 1.0 |
| Sideoats grama (Bouteloua curtipendula) | 5.0 |
| Plains bristlegrass (Setaria macrostachya) | 2.0 |

*Pounds of pure live seed:

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