

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
N.M. Oil Cons. Div. Dist. 2  
1301 W. Grand Avenue  
Artesia, NM 88210

Form approved.

## APPLICATION FOR PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK: DRILL ☒ DEEPEN ☐

b. TYPE OF WELL:  
OIL WELL ☒ GAS WELL ☐ Other 6137 SINGLE ZONE ☒ MULTIPLE ZONE ☐

2. NAME OF OPERATOR  
DEVON ENERGY PRODUCTION COMPANY, L.P.

3. ADDRESS AND TELEPHONE NO.  
20 N. BROADWAY, SUITE 1500, OKC, OK 73102 Wally Frank Senior Ops Engr.

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\* 405-552-4595  
At surface 635' FNL & 680' FEL, Unit A, Section 34-T21S-R24E, Eddy Cnty, NM

At top proposed prod. zone 760' FNL & 1980' FEL, Unit B, Section 34-T21S-R24E, Eddy Cnty, NM

**SUBJECT TO LIKE APPROVAL BY STATE**

5. LEASE DESIGNATION AND SERIAL NO.  
SHL & BHL: NM-NM53218

6. IF INDIAN, ALLOTTEE OR TRIBE NAME  
N/A

7. UNIT AGREEMENT NAME  
N/A 31960

8. FARM OR LEASE NAME, WELL NO.  
RIGHTHAND CANYON "34" FEDERAL #8

9. API WELL NO.  
30-015- 32771

10. FIELD AND POOL, OR WILDCAT  
Indian Basin (Upper Penn) Assoc.

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
SHL: Unit A, Section 34-T21S-R24E  
BHL: Unit B, Section 34-T21S-R24E

12. COUNTY OR PARISH  
Eddy County

13. STATE  
New Mexico

17. NO. OF ACRES ASSIGNED TO THIS WELL  
320.00

20. ROTARY OR CABLE TOOLS\*  
Rotary

22. APPROX. DATE WORK WILL START\*  
April, 2003

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
25 miles NW of Carlsbad, NM

15. DISTANCE FROM PROPOSED LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT.  
760'

16. NO. OF ACRES IN LEASE  
1134.47

18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.  
TVD 8,600'

19. PROPOSED DEPTH  
TVD 8,600'

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
GL 3658'

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
25"	Conductor 20"		40'	Redi-mix to surface
12 1/4"	H-40 9 5/8"	36#	1,600'	400 sx Pozmix C+ 200 sx Class C
8 3/4"	L-80/J-55/HCL-80 7"	23#	8,600'	320 sx Class H

We plan to circulate cement to surface on the 9 5/8" casing string. The cement top will be brought to approximately 6,000' on the 7" casing string.

Devon Energy proposes to drill a Penn gas well to TVD 8,600'± for commercial quantities. If the well is deemed noncommercial, the well bore will be plugged and abandoned per Federal regulations. Programs to adhere to onshore oil and gas regulations are outlined in the following exhibits and attachments.

## Drilling Program

## Surface Use and Operating Plan

Exhibits #1 = Blowout Prevention Equipment

Exhibit #2 = Location and Elevation Plat

Exhibits #3 = Road Map and Topo Map

Exhibit #4 = Wells Within 1 Mile Radius

Exhibits #5 = Production Facilities Plat

Exhibit #6 = Rotary Rig Layout

Exhibit #7 = Casing Design

H<sub>2</sub>S Operating Plan

Cultural Resource Management Report

The undersigned accepts all applicable terms, conditions, stipulations and restrictions concerning operations conducted on the leased land or portions thereof, as described below.

## Legal Description:

SHL &amp; BHL= NM-NM53218; all of Section 34-T21S-R24E

Bond Coverage: Nationwide

BLM Bond #: CO-1104

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

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present production and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

SIGNED Candace R. GrahamCandace R. Graham  
TITLE Engineering Technician405-235-3611 X4520  
DATE February 5, 2002

\*(This space for Federal or State office use)

PERMIT NO. \_\_\_\_\_ APPROVAL DATE \_\_\_\_\_

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:

APPROVED BY /S/ JOE G. LARATITLE FIELD MANAGERDATE APR 25 2003

See Instructions On Reverse Side

**APPROVAL FOR 1 YEAR**

Title 18 U.S.C. Section 1001, makes 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

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II  
P.O. Drawer DD, Artesia, NM 88211-0719

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

DISTRICT IV  
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

State of New Mexico

Energy, Minerals and Natural Resources Department

EXHIBIT 2

Form C-102

Revised February 10, 1994

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-	Pool Code 33685	Pool Name INDIAN BASIN (UPPER PENN) ASSOC.
Property Code	Property Name RIGHTHAND CANYON 34 FEDERAL	Well Number 8
OGRID No. 6137	Operator Name DEVON ENERGY PRODUCTION COMPANY, L.P.	Elevation 3658'

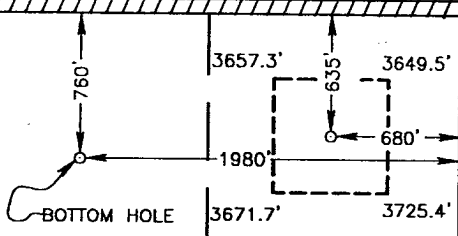
Surface Location

UL or lot No. A	Section 34	Township 21-S	Range 24-E	Lot Idn	Feet from the 635'	North/South line NORTH	Feet from the 680'	East/West line EAST	County EDDY
--------------------	---------------	------------------	---------------	---------	-----------------------	---------------------------	-----------------------	------------------------	----------------

Bottom Hole Location If Different From Surface

UL or lot No. B	Section 34	Township 21-S	Range 24-E	Lot Idn	Feet from the 760'	North/South line NORTH	Feet from the 1980'	East/West line EAST	County EDDY
Dedicated Acres 320	Joint or Infill	Consolidation Code	Order No.						

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

	<b>OPERATOR CERTIFICATION</b>  I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.  <u>Candace R. Graham</u> Signature Candace R. Graham Printed Name Engineering Tech. Title February 5, 2003 Date
	<b>SURVEYOR CERTIFICATION</b>  I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.  DECEMBER 27, 2002 Date Surveyed AWB Signature & Seal of Professional Surveyor <u>Ronald J. Edson</u> 1/05/03 02.11/018
	Certificate No. RONALD J. EDSON 3239 GARY EDSON 12641

# MINIMUM BLOWOUT PREVENTER REQUIREMENTS

3,000 psi Working Pressure

3 MWP

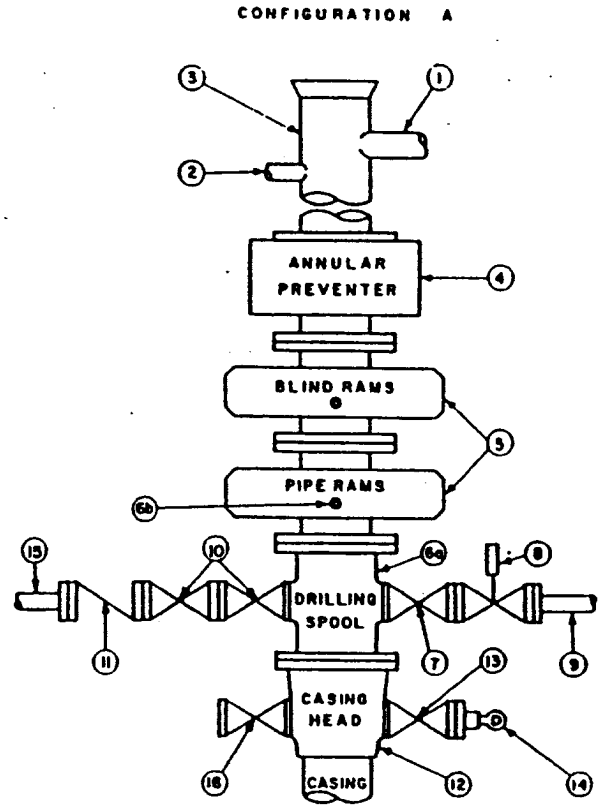
EXHIBIT # 1

## STACK REQUIREMENTS

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

## OPTIONAL

16	Flanged valve	1-13/16"	
----	---------------	----------	--



## CONTRACTOR'S OPTION TO FURNISH:

1. All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 3,000 psi, minimum.
2. Automatic accumulator (80 gallon, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure.
3. BOP controls, to be located near drillers position.
4. Kelly equipped with Kelly cock.
5. Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
6. Kelly saver-sub equipped with rubber casing protector at all times.
7. Plug type blowout preventer tester.
8. Extra set pipe rams to fit drill pipe in use on location at all times.
9. Type RX ring gaskets in place of Type R.

## MEC TO FURNISH:

1. Bradenhead or casinghead and side valves.
2. Wear bushing, if required.

## GENERAL NOTES:

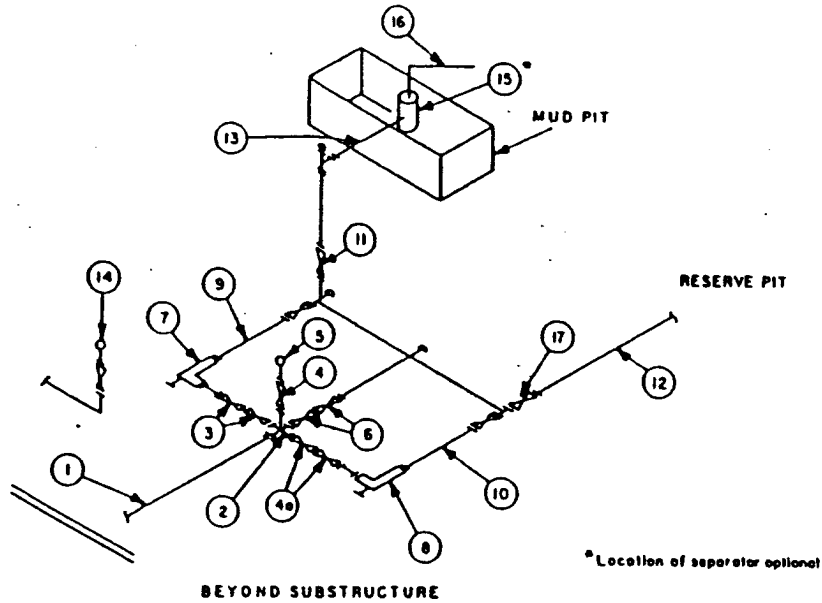
1. Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager.
2. All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working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

7. Handwheels and extensions to be connected and ready for use.
8. Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency.
9. All seamless steel control piping (3000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted.
10. Casinghead connections shall not be used except in case of emergency.
11. Do not use kill line for routine fill-up operations.

**MINIMUM CHOKE MANIFOLD**  
3,000, 5,000 and 10,000 PSI Working Pressure

3 MWP - 5 MWP - 10 MWP

EXHIBIT # 1



MINIMUM REQUIREMENTS										
No		3,000 MWP			5,000 MWP			10,000 MWP		
		I.D.	NOMINAL	RATING	I.D.	NOMINAL	RATING	I.D.	NOMINAL	RATING
1	Line from drilling spool		3"	3,000		3"	5,000		3"	10,000
2	Cross 3"x3"x3"x2"			3,000			5,000			
	Cross 3"x3"x3"x3"									10,000
3	Valves(1) Gate <input type="checkbox"/> Plug <input type="checkbox"/> (2)	3-1/8"		3,000	3-1/8"		5,000	3-1/8"		10,000
4	Valve Gate <input type="checkbox"/> Plug <input type="checkbox"/> (2)	1-13/16"		3,000	1-13/16"		5,000	1-13/16"		10,000
4a	Valves(1)	2-1/16"		3,000	2-1/16"		5,000	3-1/8"		10,000
5	Pressure Gauge			3,000			5,000			10,000
6	Valves Gate <input type="checkbox"/> Plug <input type="checkbox"/> (2)	3-1/8"		3,000	3-1/8"		5,000	3-1/8"		10,000
7	Adjustable Choke(3)	2"		3,000	2"		5,000	2"		10,000
8	Adjustable Choke	1"		3,000	1"		5,000	2"		10,000
9	Line		3"	3,000		3"	5,000		3"	10,000
10	Line		2"	3,000		2"	5,000		3"	10,000
11	Valves Gate <input type="checkbox"/> Plug <input type="checkbox"/> (2)	3-1/8"		3,000	3-1/8"		5,000	3-1/8"		10,000
12	Lines		3"	1,000		3"	1,000		3"	2,000
13	Lines		3"	1,000		3"	1,000		3"	2,000
14	Remote reading compound standpipe pressure gauge			3,000			5,000			10,000
15	Gas Separator		2'x5'			2'x5'			2'x5'	
16	Line		4"	1,000		4"	1,000		4"	2,000
17	Valves Gate <input type="checkbox"/> Plug <input type="checkbox"/> (2)	3-1/8"		3,000	3-1/8"		5,000	3-1/8"		10,000

(1) Only one required in Class 3M.

(2) Gate valves only shall be used for Class 10M.

(3) Remote operated hydraulic choke required on 5,000 psi and 10,000 psi for drilling.

**EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTIONS**

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

Attachment to Exhibit #1  
NOTES REGARDING BLOWOUT PREVENTORS  
Devon Energy Production Company, L.P.  
**Righthand Canyon "34" Federal #8**  
SHL= 635' FNL & 680' FEL, Unit A; BHL= 760' FNL & 1980' FEL, Unit B  
Section 34-T21S-R24E, Eddy County, New Mexico

1. Drilling nipple will be constructed so it can be removed mechanically without the aid of a welder. The minimum internal diameter will equal BOP bore.
2. Wear ring will be properly installed in head.
3. Blowout preventor and all associated fittings will be in operable condition to withstand a minimum 3000 psi working pressure.
4. All fittings will be flanged.
5. A full bore safety valve tested to a minimum 3000 psi WP with proper thread connections will be available on the rotary rig floor at all times.
6. All choke lines will be anchored to prevent movement.
7. All BOP equipment will be equal to or larger in bore than the internal diameter of the last casing string.
8. Will maintain a kelly cock attached to the kelly.
9. Hand wheels and wrenches will be properly installed and tested for safe operation.
10. Hydraulic floor control for blowout preventor will be located as near in proximity to driller's controls as possible.
11. All BOP equipment will meet API standards and include a minimum 40 gallon accumulator having two independent means of power to initiate closing operation.

## DRILLING PROGRAM - Attachment to Form 3160-3

Devon Energy Production Company, L.P.

### **Righthand Canyon "34" Federal #8**

SHL= 635' FNL & 680' FEL, Unit A; BHL= 760' FNL & 1980' FEL, Unit B

Section 34-T21S-R24E, Eddy County, New Mexico

*All depths assumed TVD unless otherwise qualified*

1. Geologic Name of Surface Formation

Quaternary Aeolian deposits

2. Estimated Tops of Important Geologic Markers

San Andres	550'
Glorieta	2,556'
Bone Spring	3,550'
3rd Bone Spring	6,675'
Wolfcamp	7,040'
Cisco	7,667'
Canyon	8,300'
ETD	8,600'

3. Estimated Depths of Anticipated Fresh Water, Oil or Gas

The estimated depths at which water, oil and gas will be encountered are as follows.

Water: Capitan Reef at surface to 1600'

Oil: Glorieta, Yeso, Bone Spring

Gas: Wolfcamp, Cisco-Canyon

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 9 5/8" casing at  $\pm 1,600'$  and circulating cement back to surface. The oil and gas intervals will be isolated by setting 7" casing to  $\pm 8,600'$  TD and bringing the cement top to approximately 6000' (or 500' above the Wolfcamp).

4. Casing Program

<u>Hole Size</u>	<u>Interval</u>	<u>Casing OD</u>	<u>Weight</u>	<u>Grade</u>	<u>Type</u>
25"	0' - $\pm 40'$	20"		Conductor	
12 1/4"	0' - $\pm 1600'$	9 5/8"	36#	H-40	8rd ST&C
8 3/4"	0' - to TD	7"	23#	L-80/J-55/HCL-80	8rd LT&C

Cementing Program

20" Conductor Casing: -- Cement to surface -- Redi-mix.

9 5/8" Surface Casing: -- Cement to surface -- 400 sx 35/65 Poz (Fly Ash)/Class C with 2%  $\text{CaCl}_2$ , 1/4 lb/sx Cellophane flakes, 3 lbs/sx Kol Seal and 6% Bentonite + 200 sx Class C with 2%  $\text{CaCl}_2$  and 1/4 lb/sx Celloflakes.

7" Production Casing: -- Cement to 6000' -- 320 sx 15/61/11 Poz (Fly Ash)/Class C with 5 lb/sx LCM-1, 2%  $\text{KCl}_2$ , 1% EC-1, 0.6% FL-25, 0.6% FL-52, 0.3% CD-32, 0.3% Sodium Metasilicate, and 1/4 lb/sx Celloflakes.

The cement volumes for the 7" casing will be revised pending the caliper measurement from open hole logs.

5. Minimum Specifications for Pressure Control

The blowout preventor equipment (BOP) shown in Exhibit #1 will consist of a (3M system) double ram type (3000 psi WP) preventor and a bag-type (Hydril) preventor (3000 psi WP). Both units will be hydraulically operated and the ram type preventor will be equipped with blind rams on top and 4 1/2" drill pipe rams on bottom. Both BOP's will be installed on the 9 5/8" surface casing and utilized continuously until total depth is reached. As per BLM Drilling Operations Order #2, prior to drilling out the 9 5/8" casing shoe, the BOP's and Hydril will be function tested.

Pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These functional tests will be documented on the daily drillers log. A 2" kill line and 3" choke line will be

incorporated in the drilling spool below the ram-type BOP. Other accessory BOP equipment will include a kelly cock, floor safety valve, choke lines and choke manifold having 3000 psi WP rating.

6. Types and Characteristics of the Proposed Mud System

The well will be drilled to total depth brine with starch mud systems. Depths of systems are as follows.

<u>Depth</u>	<u>Type</u>	<u>Weight (ppg)</u>	<u>Viscosity (1/sec)</u>	<u>Water Loss (cc)</u>
0' - 1600'	Air or Fresh Water	8 - 8.6	28 - 31	No control
1600' - TD	Fresh water or Cut Brine with starch	8.4 - 8.8	28 - 31	8 - 16

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

7. Auxiliary Well Control and Monitoring Equipment

- A. A kelly cock will be in the drill string at all times.
- B. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- C. Hydrogen Sulfide detection equipment (Compliance Package) will be in operation from drilling out 9 5/8" casing shoe until 7" casing is cemented.

8. Logging, Testing and Coring Program

- A. Drill stem tests will be run only if geological sample shows warrant same.
- B. The open hole electrical logging program will be as follows.
  - a) Platform Express HALS with CNL-LDT from TD to base of the surface casing at 1,600' with NGT from TD to 6,000' and GR-Neutron through casing to surface.
  - b) FMI from TD to top of Cisco-Canyon (Devon geologist may revise this interval after seeing Platform Express log).
- C. No coring program is planned.
- D. Additional testing will be initiated subsequent to setting the 7" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.
- E. Mud logger may be placed on hole at the discretion of Devon engineers.

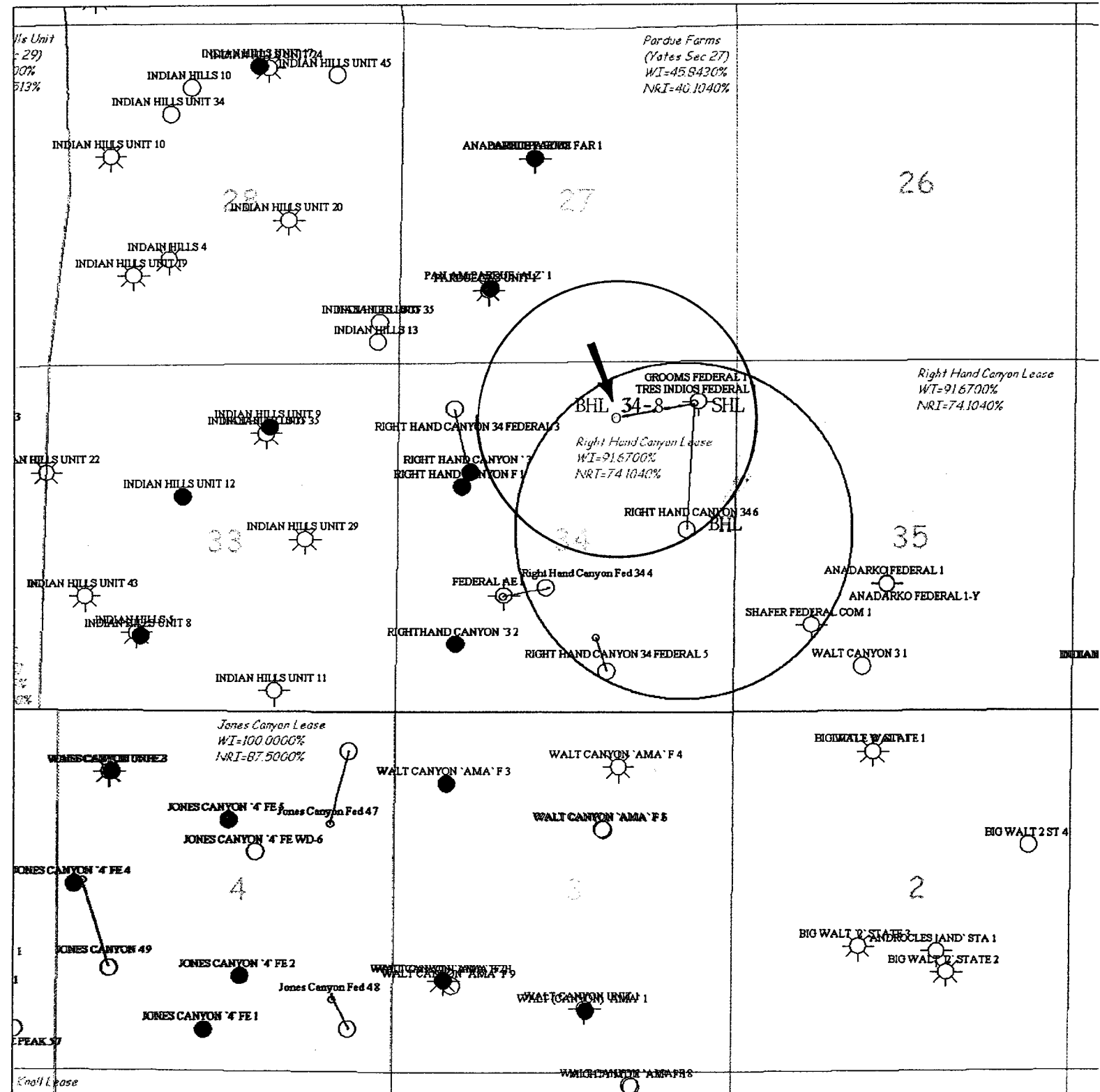
9. Abnormal Pressures, Temperatures and Potential Hazards

No abnormal pressures or temperatures are foreseen. The anticipated bottom hole temperature at total depth is 144 degrees and maximum bottom hole pressure is 3800 psig. Hydrogen sulfide gas is associated with the Penn formation in this area. A hydrogen sulfide operations plan will be implemented prior to penetrating the Penn formation (see attached "Hydrogen Sulfide Operations Plan"). No major loss circulation intervals have been encountered in adjacent wells.

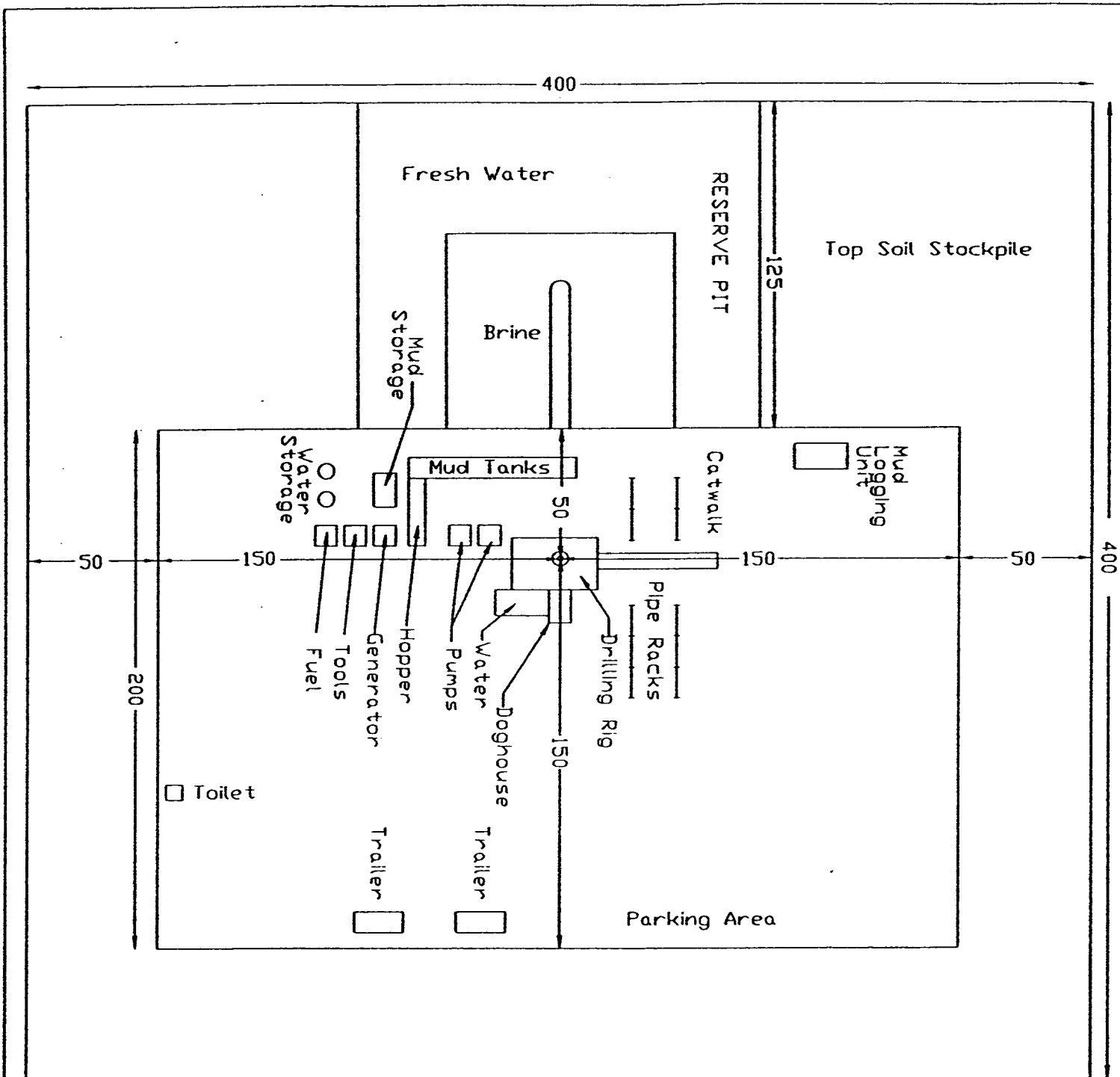
10. Anticipated Starting Date and Duration of Operations

A Cultural Resources examination has been completed by Southern New Mexical Archaeological Services, Inc. as report #SNMAS-02NM-928 and was submitted to the BLM in Carlsbad, New Mexico. This BLM office has performed the onsite inspection for the proposed pad site of this location. Road and location preparation will not be undertaken until approval has been received from the BLM. If approved, this well will be drilled as part of a development project. The anticipated spud date for the project is anticipated to be April, 2003. The drilling operation should require approximately 35 days. If the well is deemed productive, completion operations will require, at minimum, an additional 21 days of testing to ascertain whether permanent production facilities will be constructed.

EXHIBIT 4  
RIGHTHAND CANYON "34" FEDERAL 8







GL 3658'

**devon**

# **INDIAN BASIN AREA**

EDDY COUNTY, NEW MEXICO

DRILLING RIG LAYOUT AND ELEVATIONS  
 RIGHTHAND CANYON 34 FEDERAL 8  
**EXHIBIT 6**

Well name:	<b>Right Hand Canyon 34-8</b>
Operator:	<b>Devon Energy Production Company L.P.</b>
String type:	<b>Surface</b>
Location:	<b>Section 34, T21S, R24E</b>

**Design parameters:****Collapse**

Mud weight: 8.500 ppg  
Design is based on evacuated pipe.

**Minimum design factors:****Collapse:**

Design factor 1.125

**Burst:**

Design factor 1.00

**Environment:**

H2S considered? No  
Surface temperature: 75 °F  
Bottom hole temperature: 88 °F  
Temperature gradient: 0.80 °F/100ft  
Minimum section length: 1,000 ft  
Minimum Drift: 8.750 in

**Burst**

Max anticipated surface pressure: 914 psi  
Internal gradient: 0.000 psi/ft  
Calculated BHP 914 psi  
  
Annular backup: 8.50 ppg

**Tension:**

8 Round STC: 1.80 (J)  
8 Round LTC: 1.80 (J)  
Buttress: 1.60 (J)  
Premium: 1.50 (J)  
Body yield: 1.60 (B)

Non-directional string.

Tension is based on air weight.  
Neutral point: 1,399 ft

**Re subsequent strings:**

Next setting depth: 8,600 ft  
Next mud weight: 9.000 ppg  
Next setting BHP: 4,021 psi  
Fracture mud wt: 11.000 ppg  
Fracture depth: 1,600 ft  
Injection pressure 914 psi

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
1	1600	9.625	36.00	H-40	ST&C	1600	1600	8.765	14372
Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
1	706	1720	2.43	914	2560	2.80	57.6	294	5.10 J

Prepared W.M. Frank  
by: Devon Energy

Phone: (405) 552-4595  
FAX: (405) 552-4621

Date: January 17, 2003  
Oklahoma City, Oklahoma

**Remarks:**

Collapse is based on a vertical depth of 1600 ft, a mud weight of 8.5 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

*Engineering responsibility for use of this design will be that of the purchaser.*

Well name:	<b>Right Hand Canyon 34-8</b>
Operator:	<b>Devon Energy Production Company L.P.</b>
String type:	<b>Production</b>
Location:	<b>Section 34, T21S, R24E</b>

**Design parameters:****Collapse**

Mud weight: 9.000 ppg  
Design is based on evacuated pipe.

**Minimum design factors:****Collapse:**

Design factor 1.125

**Burst:**

Design factor 1.00

**Environment:**

H2S considered? Yes  
Surface temperature: 75 °F  
Bottom hole temperature: 144 °F  
Temperature gradient: 0.80 °F/100ft  
Minimum section length: 1,000 ft

**Burst**

Max anticipated surface pressure: 4,021 psi  
Internal gradient: 0.000 psi/ft  
Calculated BHP 4,021 psi  
  
Annular backup: 9.00 ppg

**Tension:**

8 Round STC: 1.80 (J)  
8 Round LTC: 1.80 (J)  
Buttress: 1.60 (J)  
Premium: 1.50 (J)  
Body yield: 1.60 (B)

**Directional Info - Build & Hold**

Kick-off point 5500 ft  
Departure at shoe: 1306 ft  
Maximum dogleg: 1.5 °/100ft  
Inclination at shoe: 34.11 °

Tension is based on air weight.  
Neutral point: 7,531 ft

Estimated cost: 66,635 (\$)

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
3	1200	7	23.00	L-80	LT&C	1200	1200	6.25	10763
2	4300	7	23.00	J-55	LT&C	5500	5500	6.25	22562
1	3431	7	23.00	HCL-80	LT&C	8600	8931	6.25	33310

Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
3	561	3325	5.93	4021	6340	1.58	197.8	435	2.20 J
2	2571	3046	1.18	3460	4360	1.26	170.2	313	1.84 J
1	4021	5650	1.41	1449	6340	4.37	71.3	485	6.80 J

Prepared W.M. Frank  
by: Devon Energy

Phone: (405) 552-4595  
FAX: (405) 552-4621

Date: January 17, 2003  
Oklahoma City, Oklahoma

**Remarks:**

Collapse is based on a vertical depth of 8600 ft, a mud weight of 9 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

Collapse strength is (biaxially) derated for doglegs in directional wells by multiplying the tensile stress by the cross section area to calculate a

*Engineering responsibility for use of this design will be that of the purchaser.*

# **DEVON ENERGY CORPORATION**

## **HYDROGEN SULFIDE DRILLING OPERATIONS PLAN**

### **A. Hydrogen Sulfide Training**

All rig crews and company personnel will receive training from a qualified instructor in the following areas prior to penetrating any hydrogen sulfide bearing formations during drilling operations:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S).
2. The proper use and maintenance of the H<sub>2</sub>S safety equipment and of personal protective equipment to be utilized at the location such as H<sub>2</sub>S detection monitors, alarms and warning systems, and breathing equipment. Briefing areas and evacuation procedures will also be discussed and established.
3. Proper rescue techniques and procedures will be discussed and established.

In addition to the above, supervisory personnel will be trained in the prevention of oil and gas well blowouts in accordance with Minerals Management Service Standards Subpart - 0 - 250 - 212.

Prior to penetrating any known H<sub>2</sub>S bearing formation, H<sub>2</sub>S training will be required at the rig sight for all rig crews and company personnel that have not previously received such training. This instruction will be provided by a qualified instructor with each individual being required to pass a 20 question test regarding H<sub>2</sub>S safety procedures. All contract personnel employed on an unscheduled basis will be required to have received appropriate H<sub>2</sub>S training.

This Hydrogen Sulfide Drilling And Operations Plan shall be available at the wellsite during drilling operations.

### **B. H<sub>2</sub>S Safety Equipment And Systems**

All H<sub>2</sub>S safety equipment and systems will be installed, tested, and operational when drilling operations reach a depth approximately 500' above any known or probable H<sub>2</sub>S bearing formation. The safety systems to be utilized during drilling operations are as follows:

1. Well Control Equipment

- (a) Double ram BOP with a properly sized closing unit and pipe rams to accommodate all pipe sizes in use.
- (b) A choke manifold with a minimum of one remote choke.

2. H2S Detection And Monitoring Equipment

- (a) Three (3) H2S detection monitors will be placed in service at the location. One monitor will be placed near the bell nipple on the rig floor; one will be placed at the rig substructure; and, one will be at the working mud pits or shale shaker. This monitoring system will have warning lights and audible alarms that will alert personnel when H2S levels reach 10 ppm.
- (b) One (1) Sensidyne Pump with the appropriate detection tubes will also be available to perform spot checks for H2S concentrations in any remote or isolated areas.

3. Protective Equipment For Essential Personnel

Protective equipment will consist of the following:

- (a) Four (4) - five minute escape packs located at strategic points around the rig.
- (b) Two (2) - thirty minute rescue packs to be located at the designated briefing areas.

4. Visual Warning System

Visual warning system will consist of the following:

- (a) Two wind direction indicators.
- (b) One condition / warning sign which will be posted on the road providing direct access to the location. The sign will contain lettering of sufficient size to be readable at a reasonable distance from the immediate location. The sign will inform the public that a hydrogen sulfide gas environment could be encountered at the location.

5. Mud Program

The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. Proper mud weight and safe drilling practices (for example, keeping the hole filled during trips) will minimize hazards when drilling in H<sub>2</sub>S bearing formations.

6. Metallurgy

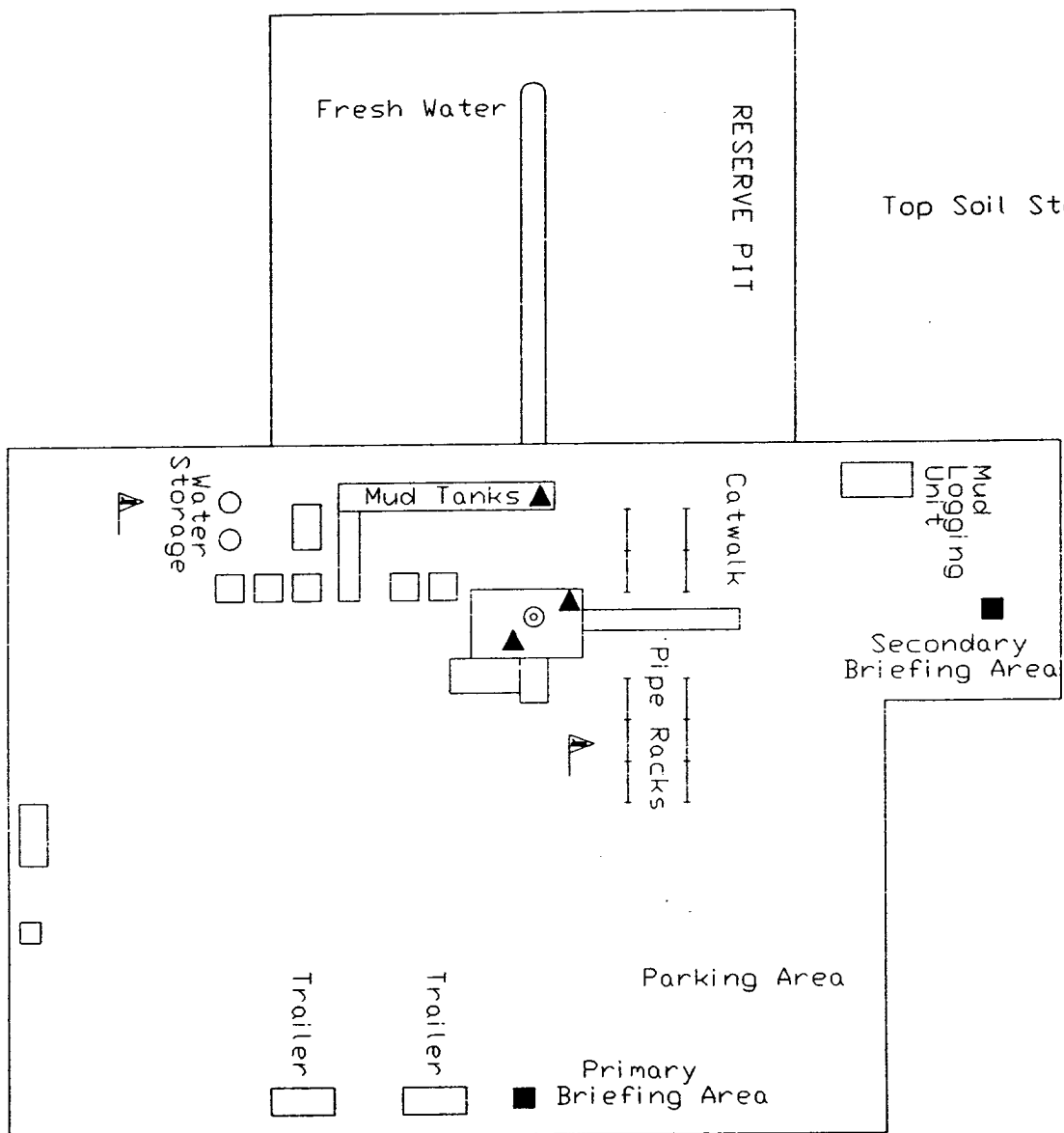
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spools, kill lines, choke manifold and lines and valves shall be suitable for H<sub>2</sub>S service.

7. Communication

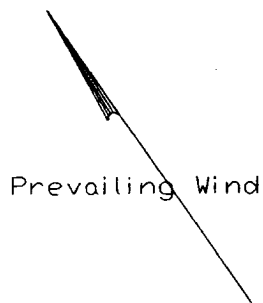
Cellular telephone communication will be available in company vehicles.

C. Diagram of Drilling Location

Attached is a diagram representing a typical location layout as well as the location of H<sub>2</sub>S monitors, briefing areas and wind direction indicators.



- ▲ H2S MONITORS WITH ALARMS AT THE BELL NIPPLE, SUBSTRUCTURE, AND SHALE SHAKER
- A WIND DIRECTION INDICATORS
- SAFE BRIEFING AREAS WITH CAUTION SIGNS AND PROTECTIVE BREATHING EQUIPMENT



File: Q:\NM\H2S-PLAN

EDDY COUNTY, NEW MEXICO	
<h2>H2S PLAN</h2>	
<p>Scale in Feet</p> <p>25 0 25 50 75 100</p>	
4/97	