

RECEIVED

DEC 16 2013

NMNM-99040

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

13-644  
TCS  
12/16/2013

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

UNORTHODOX

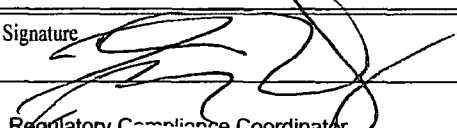

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM-99040; NMNM-06370
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator Devon Energy Production Company, L.P.		7. If Unit or CA Agreement, Name and No. NM128482
3a. Address 333 W. Sheridan Oklahoma City, OK 73102		8. Lease Name and Well No. Sirius 17 Fed Com 8H <38503>
3b. Phone No. (include area code) 405-235-3611		9. API Well No. 30-015-41888
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 962 FSL & 200 FWL M At proposed prod. zone 550 FSL & 340 FEL, P Sec 17 PP: 550 FSL & 715 FWL		10. Field and Pool, or Exploratory Hackberry; Bone Spring, NW <97020>
14. Distance in miles and direction from nearest town or post office* 15 miles SW of Maljamar, NM		11. Sec., T. R. M. or Blk. and Survey or Area Sec 17 T19S R31E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) See attached map	16. No. of acres in lease 481ac (NMNM-99040) 160ac (NMNM-06370)	12. County or Parish Eddy
17. Spacing Unit dedicated to this well 160ac	18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. See attached map	13. State NM
19. Proposed Depth TVD: 8015' MD: 12542'	20. BLM/BIA Bond No. on file CO-1104; NBM-000801	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3421.9' GL	22. Approximate date work will start*	23. Estimated duration 45 days

24. Attachments

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

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

25. Signature 	Name (Printed/Typed) Ryan DeLong	Date 11/06/2013
Title Regulatory Compliance Coordinator		
Approved by (Signature) 	Name (Printed/Typed) IS/ STEPHEN J. CAFFEY	Date DEC 11 2013
Title FIELD MANAGER IS/ STEPHEN J. CAFFEY CARLSBAD FIELD OFFICE		

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

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

Capitan Controlled Water Basin

Approval Subject to General Requirements  
& Special Stipulations Attached

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

## 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 Devon Energy Production Company, L.P. 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.

I hereby also certify that I, or Devon Energy Production Company, L.P. have made a good faith effort to provide the surface owner with a copy of the Surface Use Plan of Operations and any Conditions of Approval that are attached to the APD.

Executed this 25th day of March, 2013.

Printed Name: Ryan DeLong

Signed Name: 

Position Title: Regulatory Compliance Professional

Address: 333 W. Sheridan, OKC OK 73102

Telephone: (405)-228-8699

Field Representative (if not above signatory):

Address (if different from above):

Telephone (if different from above):

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

State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office  
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number <b>30-015-41888</b>	<sup>2</sup> Pool Code <b>97020</b>	<sup>3</sup> Pool Name <b>Hackberry; Bone Spring, NW</b>
<sup>4</sup> Property Code <b>38503</b>	<sup>5</sup> Property Name <b>SIRIUS "17" FED COM</b>	<sup>6</sup> Well Number <b>8H</b>
<sup>7</sup> OGRID No. <b>6137</b>	<sup>8</sup> Operator Name <b>DEVON ENERGY PRODUCTION COMPANY, L.P.</b>	<sup>9</sup> Elevation <b>3421.9</b>

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
<b>M</b>	<b>17</b>	<b>19 S</b>	<b>31 E</b>		<b>962</b>	<b>SOUTH</b>	<b>200</b>	<b>WEST</b>	<b>EDDY</b>

<sup>11</sup> 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
<b>P</b>	<b>17</b>	<b>19 S</b>	<b>31 E</b>		<b>550</b>	<b>SOUTH</b>	<b>340</b>	<b>EAST</b>	<b>EDDY</b>

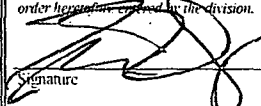
<sup>12</sup> Dedicated Acres	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
<b>160</b>			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

<p>N89°40'09"E 2640.39 FT</p> <p>NW CORNER SEC. 17 LAT. = 32.6676579°N LONG. = 103.9000749°W NMSP EAST (FT) N = 606897.08 E = 674660.66</p>		<p>N89°38'35"E 2641.21 FT</p> <p>N Q CORNER SEC. 17 LAT. = 32.6676699°N LONG. = 103.8914966°W NMSP EAST (FT) N = 606912.33 E = 677300.38</p>		<p>N89°38'35"E 2641.21 FT</p> <p>NE CORNER SEC. 17 LAT. = 32.6676846°N LONG. = 103.8829157°W NMSP EAST (FT) N = 606928.78 E = 679940.92</p>	
<p>N00°24'31"W 2639.83 FT</p> <p>W Q CORNER SEC. 17 LAT. = 32.6604036°N LONG. = 103.9000487°W NMSP EAST (FT) N = 604257.94 E = 674679.48</p>		<p>NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE.</p> <p>SIRIUS "17" FED COM #BH ELEV. = 3421.9' LAT. = 32.6557910°N (NAD83) LONG. = 103.8993810°W NMSP EAST (FT) N = 602580.64 E = 674891.83</p>		<p>S00°22'12"E 2641.55 FT</p> <p>E Q CORNER SEC. 17 LAT. = 32.6604256°N LONG. = 103.8828967°W NMSP EAST (FT) N = 604287.91 E = 679957.97</p>	
<p>N00°25'10"W 2640.86 FT</p> <p>SURFACE LOCATION</p> <p>200'</p>		<p>340'</p> <p>BOTTOM OF HOLE</p> <p>0.05'</p>		<p>S00°22'11"E 2641.38 FT</p> <p>BOTTOM OF HOLE</p> <p>0.05'</p>	
<p>S09°40'31"W 2639.37 FT</p> <p>SW CORNER SEC. 17 LAT. = 32.6531465°N LONG. = 103.9000209°W NMSP EAST (FT) N = 601617.77 E = 674698.81</p>		<p>S Q CORNER SEC. 17 LAT. = 32.6531577°N LONG. = 103.8914473°W NMSP EAST (FT) N = 601632.72 E = 677337.52</p>		<p>S09°41'07"W 2638.15 FT</p> <p>SE CORNER SEC. 17 LAT. = 32.6531671°N LONG. = 103.8828777°W NMSP EAST (FT) N = 601647.20 E = 679975.01</p>	

**" OPERATOR CERTIFICATION**

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature:  Date: **10/24/2013**

Printed Name: **Ryan DeLong; Regulatory Coordinator**

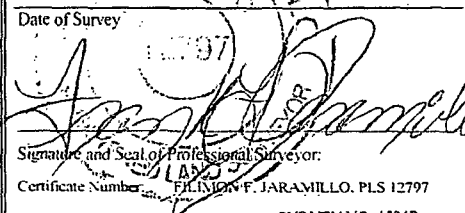
E-mail Address: **ryan.delong@dmn.com**

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**"SURVEYOR CERTIFICATION**

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date of Survey: **SEPTEMBER 30, 2013**

Signature and Seal of Professional Surveyor: 

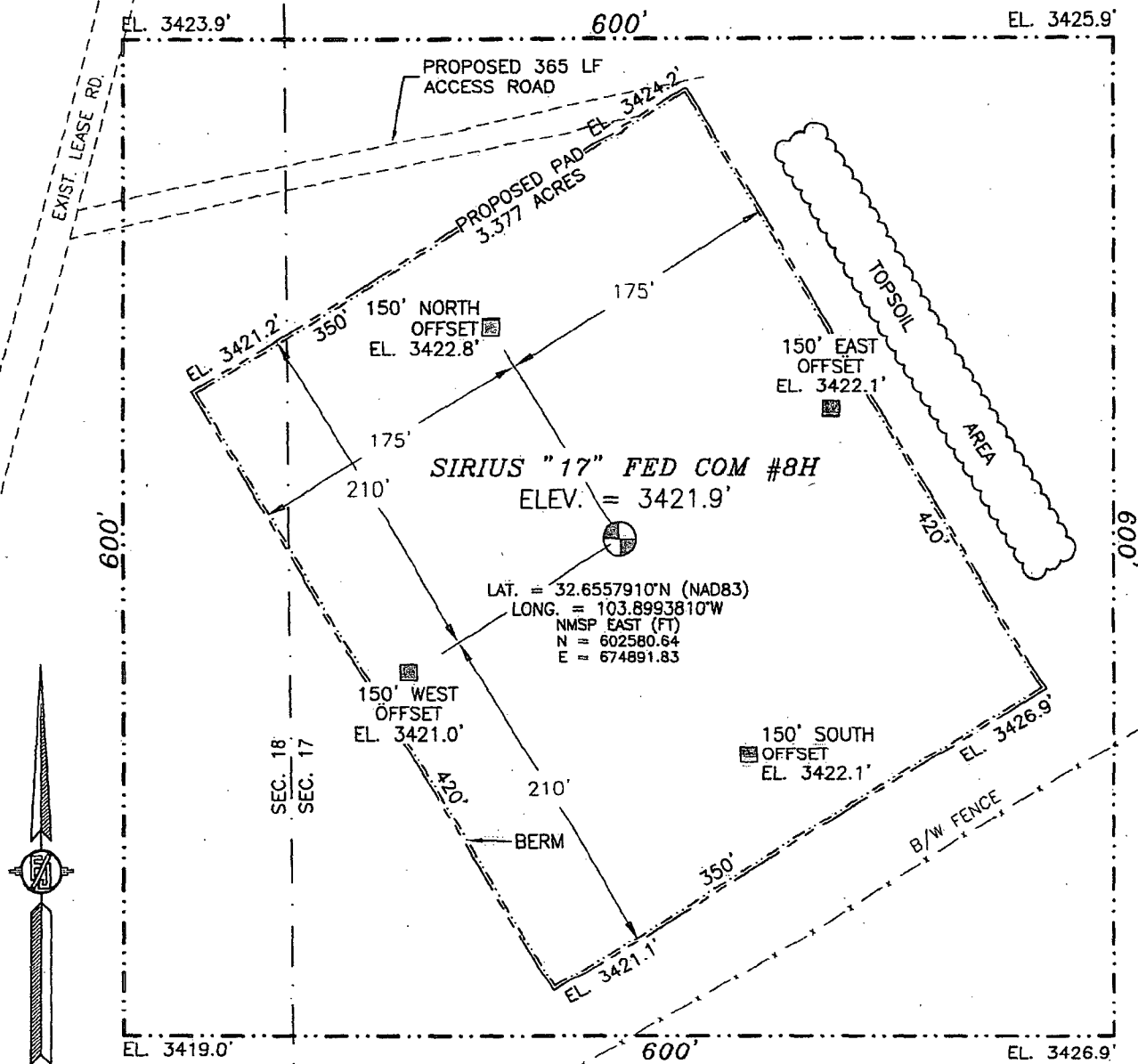
Certificate Number: **FILIMON F. JARAMILLO, PLS 12797**

SURVEY NO. 1596B

SECTION 17, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF HIGHWAY 360 AND CR 222 (SHUGART ROAD) GO EAST ON CR 222 APPROX. 5.0 MILES TO LEASE ROAD ON LEFT (NORTH), TURN NORTH GO APPROX. 2.0 MILES TO A LEASE ROAD AND CATTLE GUARD ON LEFT (NORTHWEST), TURN NORTHWEST CROSS CATTLE GUARD GO APPROX. 0.12 MILES TO A LEASE ROAD ON RIGHT (NORTH), TURN NORTH AT LEASE ROAD, CROSS CATTLE GUARD GO APPROX. 0.23 MILES TO A ROAD LATH ON RIGHT (EAST) OF LEASE ROAD WITH RED AND WHITE FLAGGING, FOLLOW LATHS APPROX. 365' TO LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.

SIRIUS "17" FED COM #8H

LOCATED 962 FT. FROM THE SOUTH LINE  
AND 200 FT. FROM THE WEST LINE OF  
SECTION 17, TOWNSHIP 19 SOUTH,  
RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 30, 2013

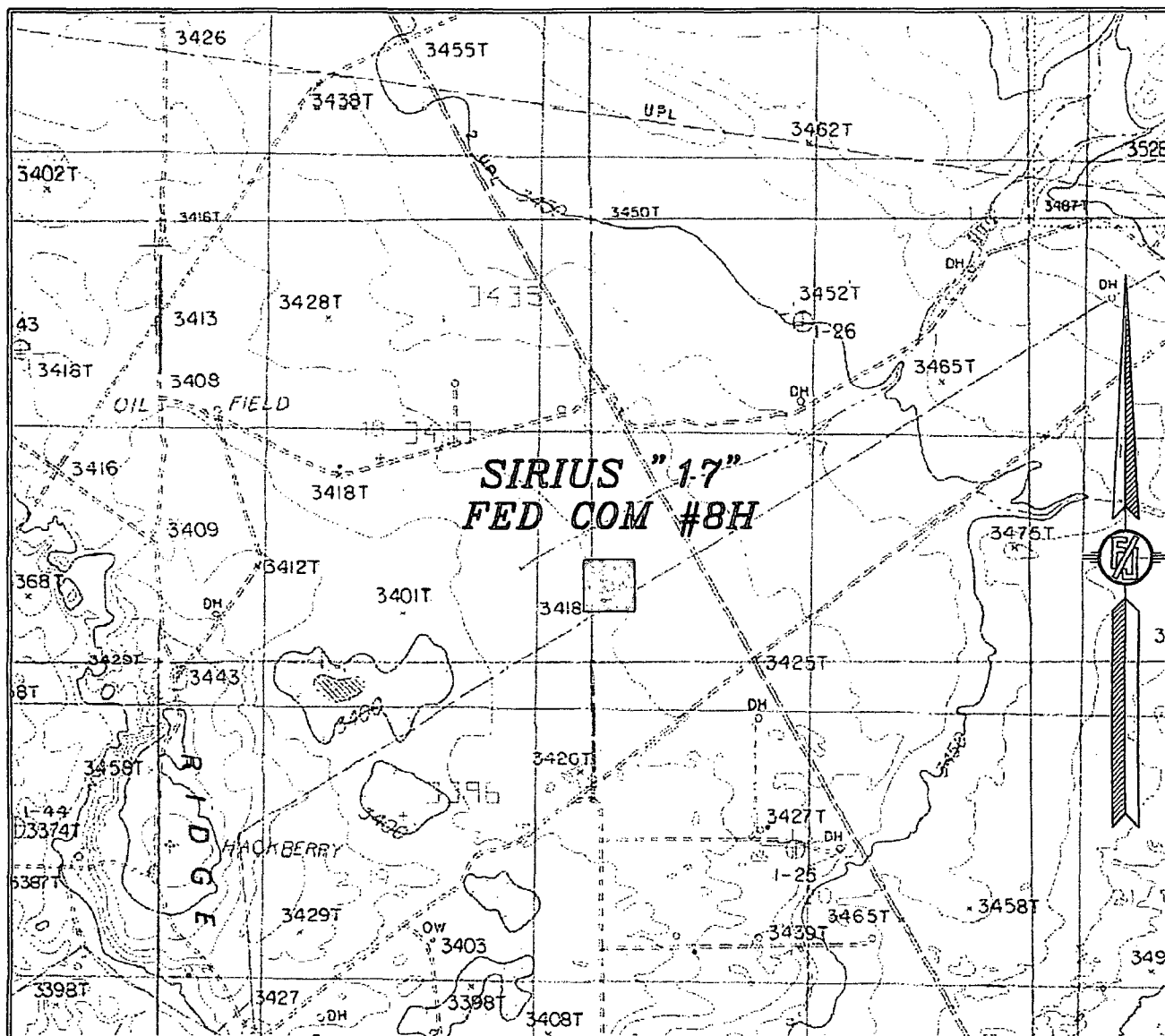
SURVEY NO. 1596B

MADRON SURVEYING, INC.

301 SOUTH CANAL  
(575) 234-3341

CARLSBAD, NEW MEXICO

SECTION 17, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.  
 EDDY COUNTY, STATE OF NEW MEXICO  
 LOCATION VERIFICATION MAP



USGS QUAD MAP:  
 HACKBERRY LAKE

NOT TO SCALE

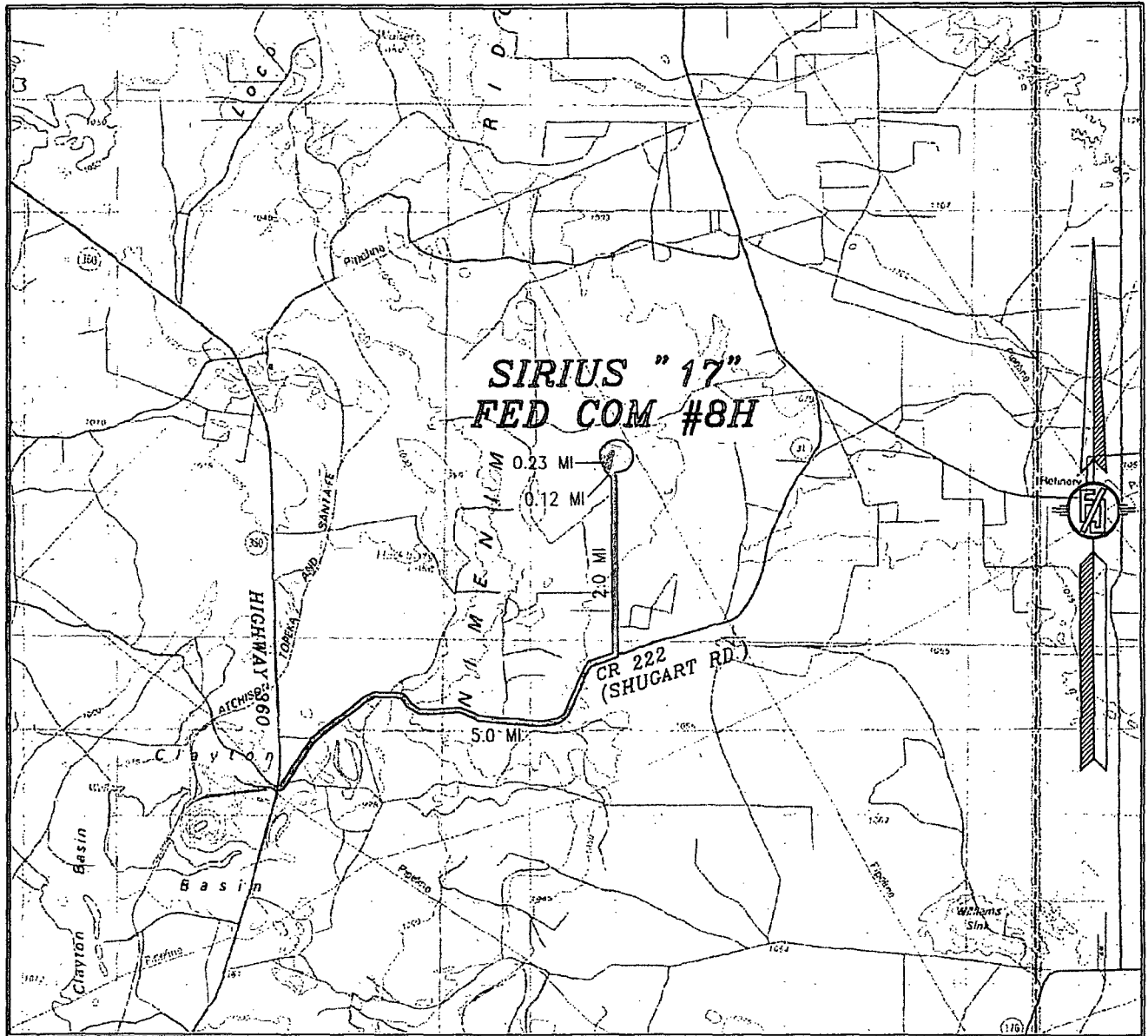
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 EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 30, 2013

SURVEY NO. 1596B

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 17, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
VICINITY MAP



NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

**SIRIUS "17" FED COM #8H**  
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EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 30, 2013

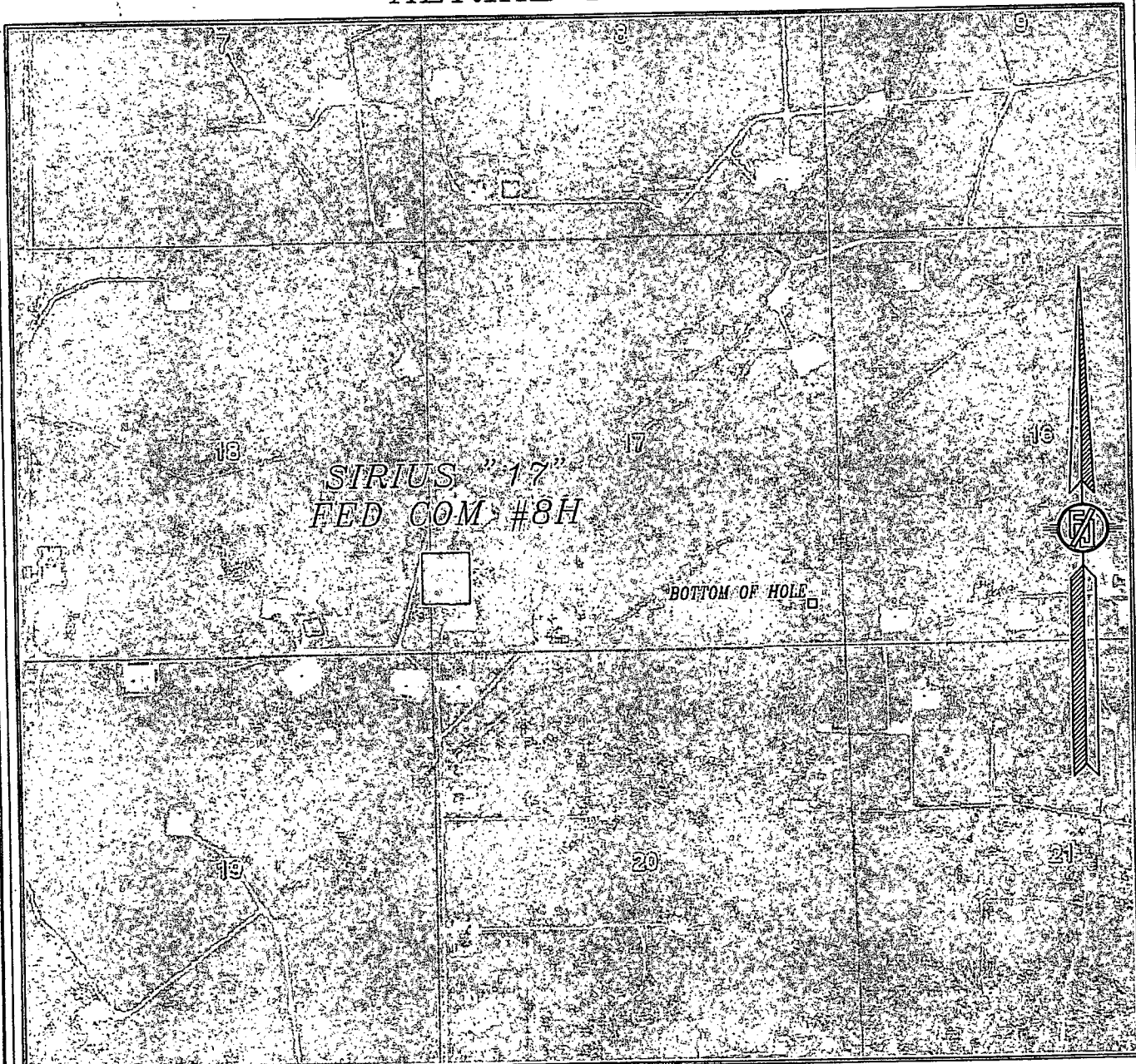
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MADRON SURVEYING, INC. 301 SOUTH CANAL  
(575) 234-3341

SURVEY NO. 1596B  
CARLSBAD, NEW MEXICO

SECTION 17, TOWNSHIP 19 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
AERIAL PHOTO



NOT TO SCALE  
AERIAL PHOTO:  
GOOGLE EARTH  
MARCH 2012

DEVON ENERGY PRODUCTION COMPANY, L.P.

**SIRIUS "17" FED COM #8H**

LOCATED 962 FT. FROM THE SOUTH LINE  
AND 200 FT. FROM THE WEST LINE OF  
SECTION 17, TOWNSHIP 19 SOUTH,  
RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 30, 2013

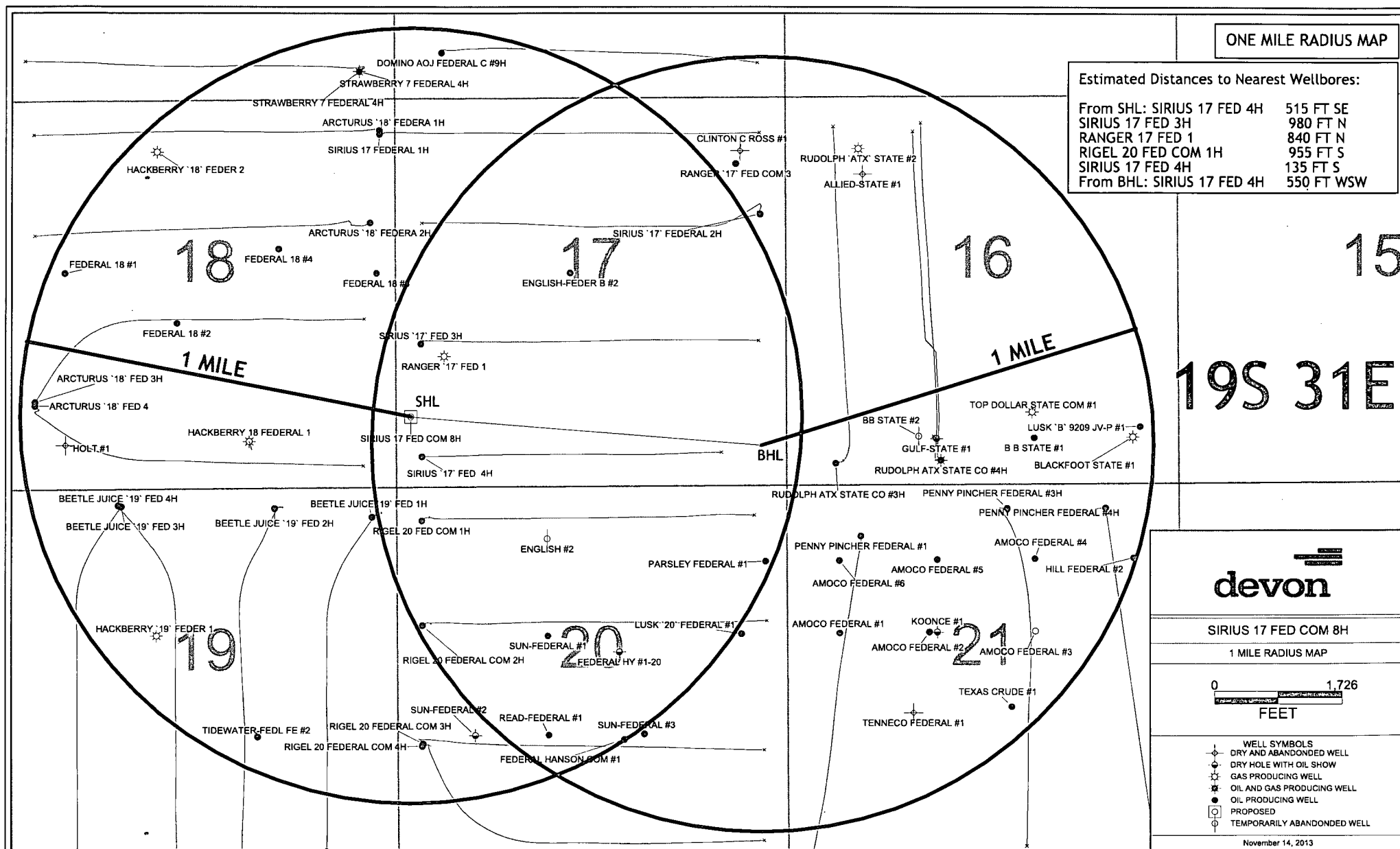
SURVEY NO. 1596B

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(575) 234-3341

# ONE MILE RADIUS MAP

## Estimated Distances to Nearest Wellbores:

From SHL: SIRIUS 17 FED 4H	515 FT SE
SIRIUS 17 FED 3H	980 FT N
RANGER 17 FED 1	840 FT N
RIGEL 20 FED COM 1H	955 FT S
SIRIUS 17 FED 4H	135 FT S
From BHL: SIRIUS 17 FED 4H	550 FT WSW





## DRILLING PROGRAM

Devon Energy Production Company, LP  
Sirius 17 Fed Com 8H

Surface Location: 962' FSL & 200' FWL, Unit M, Sec 17 T19S R31E, Eddy, NM

Bottom Hole Location: 550' FSL & 340' FEL, Unit P, Sec 17 T19S R31E, Eddy, NM

1. **Geologic Name of Surface Formation**

a. Quat Alluvium

2. **Estimated Tops of Geological Markers & Depths of Anticipated Fresh Water, Oil or Gas:**

a. Fresh Water	120'	
b. Rustler	435'	Barren
c. Salado	550'	Barren
d. Tansil Dolomite	1990'	Barren
e. Yates	2095'	Barren
f. Seven Rivers	2395'	Barren
g. Capitan	2490'	Barren
h. Queen	2870'	Barren
i. Delaware	4750'	Oil
j. Bone Spring	6525'	Oil
k. 1 <sup>st</sup> Bone Spring Ss	7850'	Oil
Total Depth	12,542'	

3. **Casing Program:**

<u>Hole</u>	<u>Hole</u>	<u>OD Csg</u>	<u>Casing</u>	<u>Weight</u>	<u>Collar</u>	<u>Grade</u>
<u>Size</u>	<u>Interval</u>		<u>Interval</u>			
26"	0-510'	20"	0-510'	94#	STC	H-40
17-1/2"	510-2450'	13-3/8"	0-2450'	61#	STC	J-55
12-1/4"	2450-4710'	9-5/8"	0-4710'	40#	BTC	J-55
8-3/4"	4710-12542'	5-1/2"	0-12542'	17#	BTC	HCP-110

All casing is new and API approved.

While running the intermediate casing, the casing will never be completely evacuated. There is no potential for the intermediate casing to be used as a production string.

**Design Parameter Factors:**

<u>Casing Size</u>	<u>Collapse Design</u>	<u>Burst Design</u>	<u>Tension Design</u>
	<u>Factor</u>	<u>Factor</u>	<u>Factor</u>
20"	2.18	8.84	12.12
17-3/8"	1.21	2.43	3.98
9-5/8"	1.17	1.79	3.34
5-1/2"	2.29	2.84	2.56

4. **Cement Program: (all cement volumes based on at least 25% excess)**

a. 20"	Surface	<p><b>Lead:</b> 590 sacks Class C Cement + 0.125 lbs/sack Cello Flake + 4% bwoc Bentonite + 1% bwoc Calcium Chloride; Water Requirement = 9.14 gps, 81.1% Fresh Water, 13.5 ppg <b>Yield:</b> 1.73 cf/sk.</p> <p><b>Tail:</b> 300 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.125 lbs/sack Cello Flake; Water Requirement = 6.35 gps, 56.3% Fresh Water, 14.8 ppg. <b>Yield:</b> 1.35 cf/sk. <b>TOC @ surface;</b></p>
b. 13-3/8"	Intermediate	<p><b>Lead:</b> 1385 sacks (60:40) Poz (Fly Ash):Class C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.25% bwoc FL- 52 + 1.5% bwoc Sodium Metasilicate; Water Requirement = 8.23 gps, 83.7% Fresh Water, 12.8 ppg. <b>Yield:</b> 1.66 cf/sk.</p> <p><b>Tail:</b> 450 sacks (60:40) Poz (Fly Ash):Class C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5; Water Requirement = 6.42 gps, 65.3% Fresh Water, 13.8 ppg. <b>Yield:</b> 1.38 cf/sk. <b>TOC @ surface;</b></p>
c. 9-5/8"	Intermediate	<p><b>1<sup>st</sup> Stage</b></p> <p><b>Lead:</b> 690 sacks (60:40) Poz (Fly Ash):Class C Cement +5% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 +0.25% bwoc FL-52 + 1% bwoc Sodium Metasilicate; Water Requirement = 8.81 gps, 89.6% Fresh Water, 12.6 ppg. <b>Yield:</b> 1.73 cf/sk.</p> <p><b>Tail:</b> 300 sacks (60:40) Poz (Fly Ash):Class C Cement +5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.1% bwoc Sodium Metasilicate + 0.5%bwoc BA-10A + 4% bwoc MPA-5; Water Requirement = 6.41 gps, 65.2% Fresh Water, 13.8 ppg. <b>Yield:</b> 1.38 cf/sk.</p>

**DV tool and ECP at 2500ft**

**2<sup>nd</sup> Stage**

**Lead:** 460 sacks (60:40) Poz (Fly Ash):Class C Cement +5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.25% bwoc FL-52 +1.5% bwoc Sodium Metasilicate; Water Requirement = 8.23 gps, 83.7% Fresh Water, 12.8 ppg. **Yield:** 1.66 cf/sk.

**Tail:** 150 sacks (60:40) Poz (Fly Ash):Class C Cement +5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5%bwoc BA-10A + 4% bwoc MPA-5; Water Requirement = 6.42 gps, 65.3% Fresh Water, 13.8 ppg. **Yield:** 1.38 cf/sk. **TOC @ surface;**

d. 5-1/2"	Production	<b>1st Lead:</b> 610 sacks (35:65) Poz (Fly Ash):Class H Cement + 3% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.7% bwoc FL-52 + 0.3% bwoc ASA-301 + 6% bwoc Bentonite ; Water Requirement = 11.02 gps, 105.6% Fresh Water, 12.5 ppg.. <b>Yield:</b> 2.01 cf/sk. <b>2nd Lead:</b> 1200 sacks (50:50) Poz (Fly Ash):Class H Cement + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 0.5% bwoc FL-52 + 0.3% bwoc Sodium Metasilicate; Water Requirement = 5.76 gps, 57.2% Fresh Water, 14.2 ppg. <b>Yield:</b> 1.28 cf/sk.
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#### **DV tool and ECP at 4760ft**

#### **2<sup>nd</sup> Stage**

**Lead:** 160 sacks Class C Cement + 1% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.3% bwoc FL-52 + 3% bwoc Sodium Metasilicate; Water Requirement = 17.69 gps, 157% Fresh Water, 11.4 ppg. **Yield:** 2.88 cf/sk.

**Tail:** 150 sacks (60:40) Poz (Fly Ash):Class C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc BA-10A + 4% bwoc MPA-5; Water Requirement = 6.40 gps, 65.1% Fresh Water, 13.8 ppg. **Yield:** 1.37 cf/sk. **TOC @ 2290ft (approx. 200ft above reef top)**

ACTUAL CEMENT VOLUMES WILL BE ADJUSTED BASED ON FLUID CALIPER AND CALIPER LOG DATA.

The above cement volumes could be revised pending the caliper measurement from the open hole logs. The top of cement is designed to reach approximately 200' above the reef top.

### **5. Pressure Control Equipment**

The BOP system used to drill the 17-1/2" hole will consist of a **20" 2M Annular preventer**. The BOP system will be tested as per BLM Onshore Oil and Gas Order No. 2 as a **2M system** prior to drilling out the casing shoe.

The BOP system used to drill the 12-1/4" and 8-3/4" holes will consist of a **13-5/8" 3M Double Ram and Annular preventer**. The BOP system will be tested as per BLM Onshore Oil and Gas Order No. 2 as a **3M system** prior to drilling out the casing shoe.

The pipe rams will be operated and checked as per Onshore Order No 2. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at **3,000 psi WP**.

Devon requests a variance to use a flexible line with flanged ends between the BOP and the choke manifold (choke line); **if an H&P rig or Scan Texas rig drills this well. Otherwise no flex line is needed.** The line will be kept as straight as possible with minimal turns.

See  
COA

### Proposed Mud Circulation System

See  
COA

<u>Depth</u>	<u>Mud Wt.</u>	<u>Visc</u>	<u>Fluid Loss</u>	<u>Type System</u>
0-510' 400'	8.4-9.0	30-34	NC	FW
0-2450'	9.8-10.0	28-32	NC	Brine
2450-4710' 400'	8.4-9.0	28-30	NC	FW
4710-12542'	8.4-9.0	28-32	NC	FW

The necessary mud products for weight addition and fluid loss control will be on location at all times. Visual mud monitoring equipment will be in place to detect volume changes indicating loss or gain of circulating fluid volume. If abnormal pressures are encountered, electronic/mechanical mud monitoring equipment will be installed.

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

- A Kelly cock will be in the drill string at all times.
- A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

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

- Drill stem tests will be based on geological sample shows.
- If a drill stem test is anticipated; a procedure, equipment to be used and safety measures will be provided via sundry notice to the BLM.
- The open hole electrical logging program will be:
  - Total Depth to Intermediate Casing      Dual Laterolog-Micro Laterolog with SP and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
  - Total Depth to Surface      Compensated Neutron with Gamma Ray
  - No coring program is planned
  - Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

8. **Potential Hazards:**

- No abnormal pressures or temperatures are expected. There is no known presence of H<sub>2</sub>S in this area. If H<sub>2</sub>S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6 No lost circulation is expected to occur. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Estimated BHP 3450 psi and Estimated BHT 125°. No H<sub>2</sub>S is anticipated to be encountered.

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

- a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 32 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.



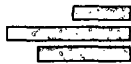
**Weatherford®**

## **Drilling Services**

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## **Proposal**

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**devon**

**SIRIUS 17 FED COM 8H**

**EDDY COUNTY, NM**

**WELL FILE: PLAN 3**

**OCTOBER 28, 2013**

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**Weatherford International, Ltd.**

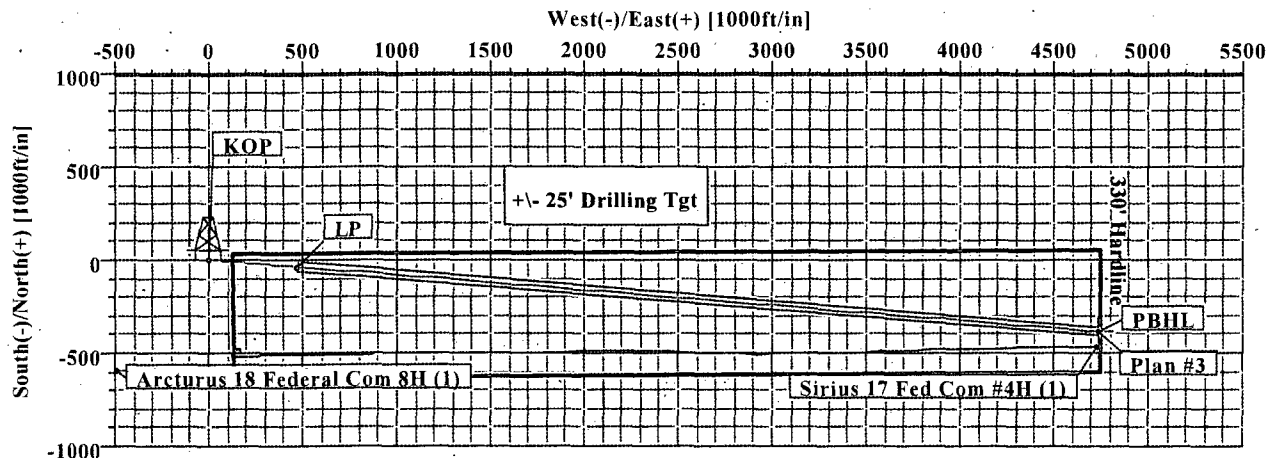
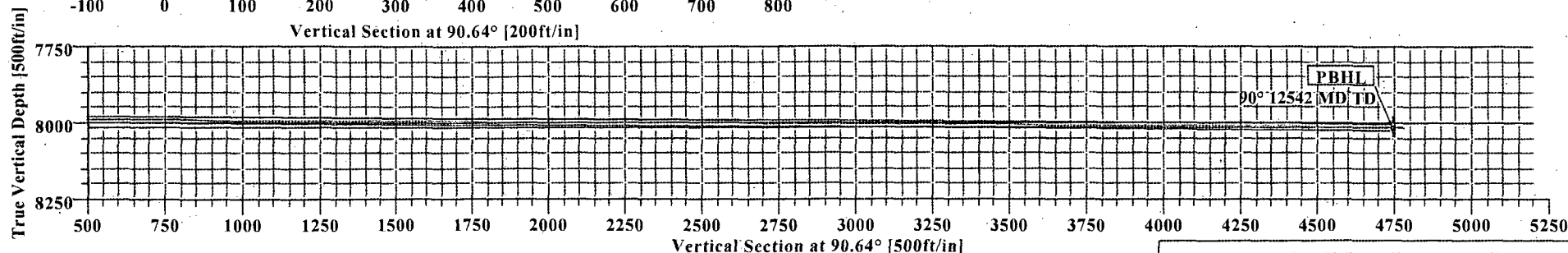
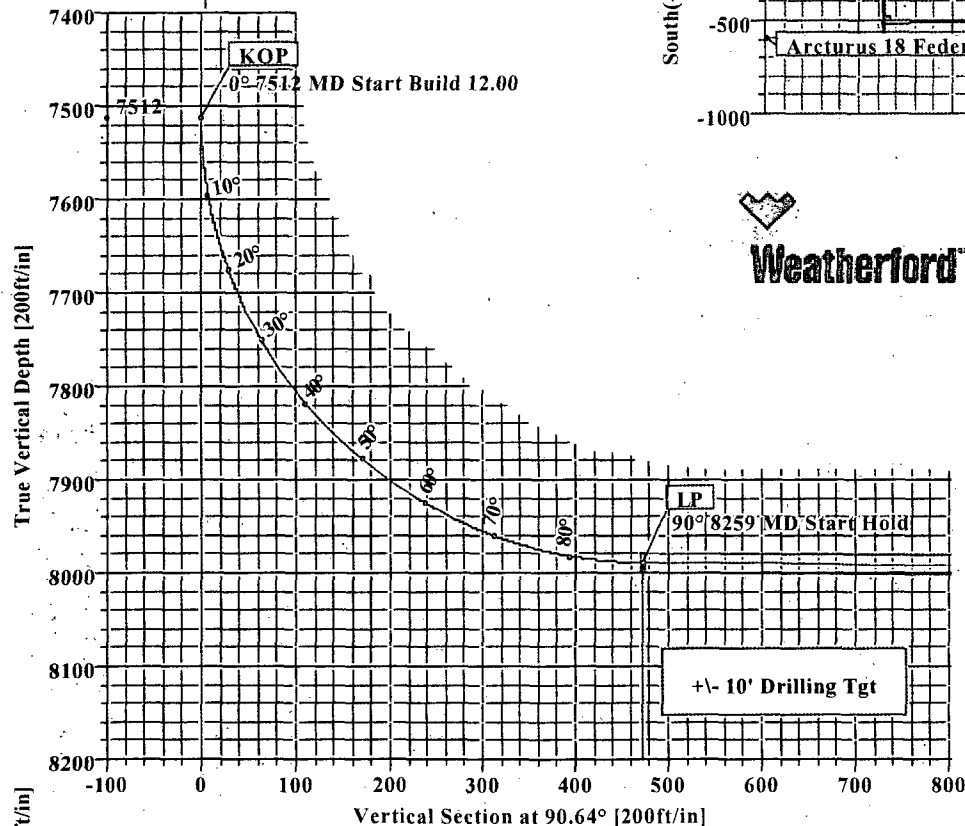
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# devon

Sirius 17 Fed Com 8H  
Eddy Co, NM



KB ELEV: 3442  
GL ELEV: 3422



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	94.64	0.00	0.00	0.00	0.00	0.00	0.00	
2	7512.13	0.00	94.64	7512.13	0.00	0.00	0.00	0.00	0.00	
3	8259.29	89.66	94.64	7989.58	-38.39	473.08	12.00	94.64	473.48	
4	12542.39	89.66	94.64	8015.00	-384.79	4742.07	0.00	0.00	4746.07	PBHL

## WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Sirius 17 Fed Com 8H	0.00	0.00	602580.64	674891.83	32°39'20.836N	103°53'57.787W	N/A

## TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL	8015.00	-384.79	4742.07	602195.85	679633.90	Rectangle (4284x50)

## LEGEND

- Arcturus 18 Federal Com 8H (1)
- Sirius 17 Fed Com #4H (1)
- 1
- Plan #3

## SITE DETAILS

Sirius 17 Fed Com 8H  
Site Centre Northing: 602580.64  
Easting: 674891.83  
Ground Level: 3422.00  
Positional Uncertainty: 0.00  
Convergence: 0.23

Plan: Plan #3 (Sirius 17 Fed Com 8H/1)

Created By: Russell W. Joyner

Date: 10/28/2013



# Weatherford

## Wft Plan Report X Y's.

**Weatherford**

Company: Devon Energy Date: 10/25/2013 Time: 19:27:18 Page: 1  
Field: Eddy Co., NM (NAD 83) Co-ordinate(NE) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Site: Sirius 17 Fed Com 8H Vertical (TVD) Reference: SITE 3442.0  
Well: Sirius 17 Fed Com 8H Section (VS) Reference: Well (0.00N;0.00E,90.64Azi)  
Wellpath: 1 Survey Calculation Method: Minimum Curvature Db: Sybase

Plan: Plan #3 Date Composed: 3/8/2013  
Principal: Yes Version: 1  
Tied-to: From Surface

Site: Sirius 17 Fed Com 8H

Site Position: Northing: 602580.64 ft Latitude: 32 39 20.836 N  
From: Map Easting: 674891.83 ft Longitude: 103 53 57.787 W  
Position Uncertainty: 0.00 ft North Reference: Grid  
Ground Level: 3422.00 ft Grid Convergence: 0.23 deg

Well: Sirius 17 Fed Com 8H Slot Name:  
Well Position: +N/-S 0.00 ft Northing: 602580.64 ft Latitude: 32 39 20.836 N  
+E/-W 0.00 ft Easting: 674891.83 ft Longitude: 103 53 57.787 W  
Position Uncertainty: 0.00 ft

Wellpath: 1 Drilled From: Surface  
Current Datum: SITE Height 3442.00 ft Tie-on Depth: 0.00 ft  
Magnetic Data: 11/25/2013 Above System Datum: Mean Sea Level  
Field Strength: 48621 nT Declination: 7.47 deg  
Vertical Section: Depth From (TVD) +N/-S Mag Dip Angle: 60.47 deg  
ft ft ft Direction deg  
0.00 0.00 0.00 90.64

### Plan Section Information

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	TFO deg	Target
0.00	0.00	94.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7512.13	0.00	94.64	7512.13	0.00	0.00	0.00	0.00	0.00	0.00	
8259.29	89.66	94.64	7989.58	-38.39	473.08	12.00	12.00	0.00	94.64	
12542.39	89.66	94.64	8015.00	-384.79	4742.07	0.00	0.00	0.00	0.00	PBHL

### Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comment
7500.00	0.00	94.64	7500.00	0.00	0.00	0.00	0.00	602580.64	674891.83	
7512.13	0.00	94.64	7512.13	0.00	0.00	0.00	0.00	602580.64	674891.83	KOP
7600.00	10.54	94.64	7599.50	-0.65	8.04	8.04	12.00	602579.99	674899.87	
7700.00	22.54	94.64	7695.19	-2.95	36.37	36.40	12.00	602577.69	674928.20	
7800.00	34.54	94.64	7782.87	-6.81	83.91	83.98	12.00	602573.83	674975.74	
7900.00	46.54	94.64	7858.72	-12.06	148.58	148.71	12.00	602568.58	675040.41	
8000.00	58.54	94.64	7919.43	-18.47	227.56	227.75	12.00	602562.17	675119.39	
8100.00	70.54	94.64	7962.33	-25.75	317.39	317.66	12.00	602554.89	675209.22	
8200.00	82.54	94.64	7985.56	-33.61	414.15	414.50	12.00	602547.03	675305.98	
8259.29	89.66	94.64	7989.58	-38.39	473.08	473.48	12.00	602542.25	675364.91	LP
8300.00	89.66	94.64	7989.83	-41.68	513.65	514.08	0.00	602538.96	675405.48	
8400.00	89.66	94.64	7990.42	-49.77	613.32	613.84	0.00	602530.87	675505.15	
8500.00	89.66	94.64	7991.01	-57.85	712.99	713.59	0.00	602522.79	675604.82	
8600.00	89.66	94.64	7991.61	-65.94	812.66	813.35	0.00	602514.70	675704.49	
8700.00	89.66	94.64	7992.20	-74.03	912.33	913.10	0.00	602506.61	675804.16	
8800.00	89.66	94.64	7992.79	-82.12	1012.00	1012.86	0.00	602498.52	675903.83	
8900.00	89.66	94.64	7993.39	-90.21	1111.67	1112.61	0.00	602490.43	676003.50	
9000.00	89.66	94.64	7993.98	-98.29	1211.34	1212.37	0.00	602482.35	676103.17	
9100.00	89.66	94.64	7994.57	-106.38	1311.01	1312.12	0.00	602474.26	676202.84	
9200.00	89.66	94.64	7995.17	-114.47	1410.68	1411.88	0.00	602466.17	676302.51	
9300.00	89.66	94.64	7995.76	-122.56	1510.36	1511.63	0.00	602458.08	676402.19	
9400.00	89.66	94.64	7996.35	-130.64	1610.03	1611.38	0.00	602450.00	676501.86	
9500.00	89.66	94.64	7996.95	-138.73	1709.70	1711.14	0.00	602441.91	676601.53	





# Weatherford

## Wft Plan Report X Y's.

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Site: Sirius 17 Fed Com 8H  
Well: Sirius 17 Fed Com 8H  
Wellpath: 1

Date: 10/25/2013 Time: 19:27:18 Page: 2  
Co-ordinate(NE) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0  
Section (VS) Reference: Well (0.00N,0.00E,90.64Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

### Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	MapN ft	MapE ft	Comments
9600.00	89.66	94.64	7997.54	-146.82	1809.37	1810.89	0.00	602433.82	676701.20	
9700.00	89.66	94.64	7998.13	-154.91	1909.04	1910.65	0.00	602425.73	676800.87	
9800.00	89.66	94.64	7998.73	-162.99	2008.71	2010.40	0.00	602417.65	676900.54	
9900.00	89.66	94.64	7999.32	-171.08	2108.38	2110.16	0.00	602409.56	677000.21	
10000.00	89.66	94.64	7999.91	-179.17	2208.05	2209.91	0.00	602401.47	677099.88	
10100.00	89.66	94.64	8000.51	-187.26	2307.72	2309.67	0.00	602393.38	677199.55	
10200.00	89.66	94.64	8001.10	-195.35	2407.39	2409.42	0.00	602385.29	677299.22	
10300.00	89.66	94.64	8001.69	-203.43	2507.06	2509.18	0.00	602377.21	677398.89	
10400.00	89.66	94.64	8002.29	-211.52	2606.73	2608.93	0.00	602369.12	677498.56	
10500.00	89.66	94.64	8002.88	-219.61	2706.40	2708.69	0.00	602361.03	677598.23	
10600.00	89.66	94.64	8003.47	-227.70	2806.07	2808.44	0.00	602352.94	677697.90	
10700.00	89.66	94.64	8004.07	-235.78	2905.74	2908.20	0.00	602344.86	677797.57	
10800.00	89.66	94.64	8004.66	-243.87	3005.41	3007.95	0.00	602336.77	677897.24	
10900.00	89.66	94.64	8005.25	-251.96	3105.09	3107.71	0.00	602328.68	677996.92	
11000.00	89.66	94.64	8005.85	-260.05	3204.76	3207.46	0.00	602320.59	678096.59	
11100.00	89.66	94.64	8006.44	-268.13	3304.43	3307.22	0.00	602312.51	678196.26	
11200.00	89.66	94.64	8007.03	-276.22	3404.10	3406.97	0.00	602304.42	678295.93	
11300.00	89.66	94.64	8007.63	-284.31	3503.77	3506.73	0.00	602296.33	678395.60	
11400.00	89.66	94.64	8008.22	-292.40	3603.44	3606.48	0.00	602288.24	678495.27	
11500.00	89.66	94.64	8008.81	-300.48	3703.11	3706.23	0.00	602280.16	678594.94	
11600.00	89.66	94.64	8009.41	-308.57	3802.78	3805.99	0.00	602272.07	678694.61	
11700.00	89.66	94.64	8010.00	-316.66	3902.45	3905.74	0.00	602263.98	678794.28	
11800.00	89.66	94.64	8010.59	-324.75	4002.12	4005.50	0.00	602255.89	678893.95	
11900.00	89.66	94.64	8011.19	-332.84	4101.79	4105.25	0.00	602247.80	678993.62	
12000.00	89.66	94.64	8011.78	-340.92	4201.46	4205.01	0.00	602239.72	679093.29	
12100.00	89.66	94.64	8012.37	-349.01	4301.13	4304.76	0.00	602231.63	679192.96	
12200.00	89.66	94.64	8012.97	-357.10	4400.80	4404.52	0.00	602223.54	679292.63	
12300.00	89.66	94.64	8013.56	-365.19	4500.47	4504.27	0.00	602215.45	679392.30	
12400.00	89.66	94.64	8014.16	-373.27	4600.15	4604.03	0.00	602207.37	679491.98	
12500.00	89.66	94.64	8014.75	-381.36	4699.82	4703.78	0.00	602199.28	679591.65	
12542.39	89.66	94.64	8015.00	-384.79	4742.07	4746.07	0.00	602195.85	679633.90	PBHL

### Targets

Name	Description Dip.	Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	<--- Latitude --->			<--- Longitude --->		
								Deg	Min	Sec	Deg	Min	Sec
PBHL	0.34	94.64	8015.00	-384.79	4742.07	602195.85	679633.90	32	39	16.833 N	103	53	2.338 W
-Rectangle (4284x50)													

### Casing Points

MD	TVD	Diameter	Hole Size	Name

### Formations

MD	TVD	Formations	Lithology	Dip Angle	Dip Direction



# Weatherford

## Wft Plan Report X Y's.



Weatherford

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Site: Sirius 17 Fed Com 8H  
Well: Sirius 17 Fed Com 8H  
Wellpath: 1

Date: 10/25/2013 Time: 19:27:18 Page: 3  
Co-ordinate(NE) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0  
Section (VS) Reference: Well (0.00N,0.00E,90.64Azi)  
Survey Calculation Method: Minimum Curvature Db: Sybase

### Annotation

MD ft	TVD ft	
7512.13	7512.13	KOP
8259.29	7989.58	LP
12542.39	8015.00	PBHL



# Weatherford Anticollision Report

**Weatherford**

Company:	Devon Energy	Date:	10/25/2013	Time:	19:28:29	Page:	1
Field:	Eddy Co., NM (NAD 83)						
Reference Site:	Sirius 17 Fed Com 8H	Co-ordinate(NE) Reference:	Well: Sirius 17 Fed Com 8H, Grid North				
Reference Well:	Sirius 17 Fed Com 8H	Vertical (TVD) Reference:	SITE 3442.0				
Reference Wellpath:						Db:	Sybase

NO GLOBAL SCAN: Using user defined selection &amp; scan criteria

Interpolation Method: MD + Stations Interval: 100.00 ft

Depth Range: 0.00 to 16213.19 ft

Maximum Radius: 40000.00 ft

Reference: Plan: Plan #3

Error Model: ISCWSA Ellipse

Scan Method: Closest Approach 3D

Error Surface: Ellipse

Plan: Plan #3

Date Composed: 3/8/2013

Principal: Yes

Version: 1

Tied-to: From Surface

**Summary**

Site	Offset Wellpath Well	Wellpath	Reference MD ft	Offset MD ft	Ctr-Ctr Edge Distance ft	Separation Distance ft	Factor	Warning
Arcturus 18 Federal	Arcturus 18 Federal	1 V0 Plan: Test V1	7850.00	7883.52	627.43	592.07	17.74	
Sirius 17 Fed Com #4	Sirius 17 Fed Com #4	1 V0	0.00	138458.54	539.79	415.20	4.33	

Site: Arcturus 18 Federal Com 8H

Well: Arcturus 18 Federal Com 8H

Wellpath: 1 V0 Plan: Test V1

Inter-Site Error: 0.00 ft

Reference MD ft	TVD ft	Offset MD ft	TVD ft	Semi-Major Axis Ref ft	Offset ft	TFO-HS deg	North ft	East ft	Ctr-Ctr Edge Distance ft	Separation Distance ft	Factor	Warning
0.00	0.00	3.00	-3.00	0.00	0.00	169.99	-661.18	116.73	671.41			No Data
100.00	100.00	97.00	97.00	0.09	0.09	169.99	-661.18	116.73	671.41	671.23	3790.77	
200.00	200.00	197.00	197.00	0.31	0.31	169.99	-661.18	116.73	671.41	670.78	1078.39	
300.00	300.00	297.00	297.00	0.54	0.53	169.99	-661.18	116.73	671.41	670.33	626.23	
400.00	400.00	397.00	397.00	0.76	0.76	169.99	-661.18	116.73	671.41	669.88	441.23	
500.00	500.00	497.00	497.00	0.99	0.98	169.99	-661.18	116.73	671.41	669.43	340.61	
600.00	600.00	597.00	597.00	1.21	1.21	169.99	-661.18	116.73	671.41	668.98	277.36	
700.00	700.00	697.00	697.00	1.44	1.43	169.99	-661.18	116.73	671.41	668.53	233.92	
800.00	800.00	797.00	797.00	1.66	1.66	169.99	-661.18	116.73	671.41	668.09	202.24	
900.00	900.00	897.00	897.00	1.89	1.88	169.99	-661.18	116.73	671.41	667.64	178.12	
1000.00	1000.00	997.00	997.00	2.11	2.11	169.99	-661.18	116.73	671.41	667.19	159.14	
1100.00	1100.00	1097.00	1097.00	2.34	2.33	169.99	-661.18	116.73	671.41	666.74	143.82	
1200.00	1200.00	1197.00	1197.00	2.56	2.56	169.99	-661.18	116.73	671.41	666.29	131.19	
1300.00	1300.00	1297.00	1297.00	2.79	2.78	169.99	-661.18	116.73	671.41	665.84	120.59	
1400.00	1400.00	1397.00	1397.00	3.01	3.01	169.99	-661.18	116.73	671.41	665.39	111.58	
1500.00	1500.00	1497.00	1497.00	3.24	3.23	169.99	-661.18	116.73	671.41	664.94	103.83	
1600.00	1600.00	1597.00	1597.00	3.46	3.45	169.99	-661.18	116.73	671.41	664.49	97.08	
1700.00	1700.00	1697.00	1697.00	3.69	3.68	169.99	-661.18	116.73	671.41	664.04	91.15	
1800.00	1800.00	1797.00	1797.00	3.91	3.90	169.99	-661.18	116.73	671.41	663.59	85.91	
1900.00	1900.00	1897.00	1897.00	4.14	4.13	169.99	-661.18	116.73	671.41	663.14	81.24	
2000.00	2000.00	1997.00	1997.00	4.36	4.35	169.99	-661.18	116.73	671.41	662.69	77.05	
2100.00	2100.00	2097.00	2097.00	4.59	4.58	169.99	-661.18	116.73	671.41	662.24	73.27	
2200.00	2200.00	2197.00	2197.00	4.81	4.80	169.99	-661.18	116.73	671.41	661.79	69.84	
2300.00	2300.00	2297.00	2297.00	5.03	5.03	169.99	-661.18	116.73	671.41	661.34	66.72	
2400.00	2400.00	2397.00	2397.00	5.26	5.25	169.99	-661.18	116.73	671.41	660.89	63.87	
2500.00	2500.00	2497.00	2497.00	5.48	5.48	169.99	-661.18	116.73	671.41	660.44	61.25	
2600.00	2600.00	2597.00	2597.00	5.71	5.70	169.99	-661.18	116.73	671.41	659.99	58.84	
2700.00	2700.00	2697.00	2697.00	5.93	5.93	169.99	-661.18	116.73	671.41	659.54	56.61	
2800.00	2800.00	2797.00	2797.00	6.16	6.15	169.99	-661.18	116.73	671.41	659.09	54.54	
2900.00	2900.00	2897.00	2897.00	6.38	6.38	169.99	-661.18	116.73	671.41	658.65	52.62	
3000.00	3000.00	2997.00	2997.00	6.61	6.60	169.99	-661.18	116.73	671.41	658.20	50.83	
3100.00	3100.00	3097.00	3097.00	6.83	6.83	169.99	-661.18	116.73	671.41	657.75	49.15	
3200.00	3200.00	3197.00	3197.00	7.06	7.05	169.99	-661.18	116.73	671.41	657.30	47.59	
3300.00	3300.00	3297.00	3297.00	7.28	7.28	169.99	-661.18	116.73	671.41	656.85	46.12	
3400.00	3400.00	3397.00	3397.00	7.51	7.50	169.99	-661.18	116.73	671.41	656.40	44.74	
3500.00	3500.00	3497.00	3497.00	7.73	7.73	169.99	-661.18	116.73	671.41	655.95	43.44	



# Weatherford

## Anticollision Report

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Reference Site: Sirius 17 Fed Com 8H  
Reference Well: Sirius 17 Fed Com 8H  
Reference Wellpath:

Date: 10/25/2013

Time: 19:28:29

Page: 2

Co-ordinate(NE) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0

Db: Sybase

Site: Arcturus 18 Federal Com 8H  
Well: Arcturus 18 Federal Com 8H  
Wellpath: 1 V0 Plan: Test V1

Inter-Site Error: 0.00 ft

Reference		Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation	Warning
MD	TVD	MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance	Factor	
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
3600.00	3600.00	3597.00	3597.00	7.96	7.95	169.99	-661.18	116.73	671.41	655.50	42.21	
3700.00	3700.00	3697.00	3697.00	8.18	8.17	169.99	-661.18	116.73	671.41	655.05	41.05	
3800.00	3800.00	3797.00	3797.00	8.41	8.40	169.99	-661.18	116.73	671.41	654.60	39.95	
3900.00	3900.00	3897.00	3897.00	8.63	8.62	169.99	-661.18	116.73	671.41	654.15	38.91	
4000.00	4000.00	3997.00	3997.00	8.86	8.85	169.99	-661.18	116.73	671.41	653.70	37.92	
4100.00	4100.00	4097.00	4097.00	9.08	9.07	169.99	-661.18	116.73	671.41	653.25	36.98	
4200.00	4200.00	4197.00	4197.00	9.31	9.30	169.99	-661.18	116.73	671.41	652.80	36.09	
4300.00	4300.00	4297.00	4297.00	9.53	9.52	169.99	-661.18	116.73	671.41	652.35	35.24	
4400.00	4400.00	4397.00	4397.00	9.75	9.75	169.99	-661.18	116.73	671.41	651.90	34.43	
4500.00	4500.00	4497.00	4497.00	9.98	9.97	169.99	-661.18	116.73	671.41	651.45	33.65	
4600.00	4600.00	4597.00	4597.00	10.20	10.20	169.99	-661.18	116.73	671.41	651.00	32.91	
4700.00	4700.00	4697.00	4697.00	10.43	10.42	169.99	-661.18	116.73	671.41	650.55	32.20	
4800.00	4800.00	4797.00	4797.00	10.65	10.65	169.99	-661.18	116.73	671.41	650.10	31.52	
4900.00	4900.00	4897.00	4897.00	10.88	10.87	169.99	-661.18	116.73	671.41	649.65	30.87	
5000.00	5000.00	4997.00	4997.00	11.10	11.10	169.99	-661.18	116.73	671.41	649.21	30.24	
5100.00	5100.00	5097.00	5097.00	11.33	11.32	169.99	-661.18	116.73	671.41	648.76	29.64	
5200.00	5200.00	5197.00	5197.00	11.55	11.55	169.99	-661.18	116.73	671.41	648.31	29.07	
5300.00	5300.00	5297.00	5297.00	11.78	11.77	169.99	-661.18	116.73	671.41	647.86	28.51	
5400.00	5400.00	5397.00	5397.00	12.00	12.00	169.99	-661.18	116.73	671.41	647.41	27.98	
5500.00	5500.00	5497.00	5497.00	12.23	12.22	169.99	-661.18	116.73	671.41	646.96	27.46	
5600.00	5600.00	5597.00	5597.00	12.45	12.45	169.99	-661.18	116.73	671.41	646.51	26.97	
5700.00	5700.00	5697.00	5697.00	12.68	12.67	169.99	-661.18	116.73	671.41	646.06	26.49	
5800.00	5800.00	5797.00	5797.00	12.90	12.89	169.99	-661.18	116.73	671.41	645.61	26.03	
5900.00	5900.00	5897.00	5897.00	13.13	13.12	169.99	-661.18	116.73	671.41	645.16	25.58	
6000.00	6000.00	5997.00	5997.00	13.35	13.34	169.99	-661.18	116.73	671.41	644.71	25.15	
6100.00	6100.00	6097.00	6097.00	13.58	13.57	169.99	-661.18	116.73	671.41	644.26	24.73	
6200.00	6200.00	6197.00	6197.00	13.80	13.79	169.99	-661.18	116.73	671.41	643.81	24.33	
6300.00	6300.00	6297.00	6297.00	14.03	14.02	169.99	-661.18	116.73	671.41	643.36	23.94	
6400.00	6400.00	6397.00	6397.00	14.25	14.24	169.99	-661.18	116.73	671.41	642.91	23.56	
6500.00	6500.00	6497.00	6497.00	14.47	14.47	169.99	-661.18	116.73	671.41	642.46	23.20	
6600.00	6600.00	6597.00	6597.00	14.70	14.69	169.99	-661.18	116.73	671.41	642.01	22.84	
6700.00	6700.00	6697.00	6697.00	14.92	14.92	169.99	-661.18	116.73	671.41	641.56	22.50	
6800.00	6800.00	6797.00	6797.00	15.15	15.14	169.99	-661.18	116.73	671.41	641.11	22.16	
6900.00	6900.00	6897.00	6897.00	15.37	15.37	169.99	-661.18	116.73	671.41	640.66	21.84	
7000.00	7000.00	6997.00	6997.00	15.60	15.59	169.99	-661.18	116.73	671.41	640.21	21.53	
7100.00	7100.00	7097.00	7097.00	15.82	15.82	169.99	-661.18	116.73	671.41	639.76	21.22	
7200.00	7200.00	7197.00	7197.00	16.05	16.04	169.99	-661.18	116.73	671.41	639.32	20.92	
7300.00	7300.00	7297.00	7297.00	16.27	16.27	169.99	-661.18	116.73	671.41	638.87	20.63	
7400.00	7400.00	7397.00	7397.00	16.50	16.49	169.99	-661.18	116.73	671.41	638.42	20.35	
7500.00	7500.00	7531.00	7530.88	16.72	16.78	170.24	-660.30	113.57	670.85	637.36	20.03	
7512.13	7512.13	7561.32	7560.85	16.75	16.85	170.59	-659.08	109.24	670.07	636.51	19.97	
7525.00	7525.00	7592.64	7591.46	16.78	16.91	76.64	-657.29	102.84	668.86	635.24	19.89	
7550.00	7549.96	7649.39	7645.54	16.83	17.04	78.65	-652.68	86.40	665.41	631.67	19.72	
7575.00	7574.82	7699.25	7691.09	16.89	17.16	81.27	-647.23	66.95	660.80	626.96	19.53	
7600.00	7599.50	7741.48	7727.86	16.95	17.27	84.16	-641.64	46.96	655.46	621.50	19.30	
7625.00	7623.95	7776.30	7756.70	17.00	17.38	87.04	-636.37	28.18	649.81	615.71	19.06	
7650.00	7648.09	7804.43	7778.91	17.06	17.48	89.73	-631.72	11.57	644.22	609.97	18.81	
7675.00	7671.86	7826.77	7795.80	17.12	17.56	92.09	-627.78	-2.50	639.00	604.58	18.57	
7700.00	7695.19	7844.21	7808.50	17.17	17.63	94.09	-624.55	-14.02	634.39	599.81	18.34	
7725.00	7718.02	7857.58	7817.94	17.23	17.69	95.69	-622.00	-23.13	630.59	595.85	18.15	
7750.00	7740.28	7867.55	7824.80	17.30	17.74	96.90	-620.05	-30.10	627.74	592.84	17.99	



# Weatherford

## Anticollision Report

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Reference Site: Sirius 17 Fed Com 8H  
Reference Well: Sirius 17 Fed Com 8H  
Reference Wellpath:

Date: 10/25/2013

Time: 19:28:29

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Co-ordinate(N/E) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0

Db: Sybase

Site: Arcturus 18 Federal Com 8H  
Well: Arcturus 18 Federal Com 8H  
Wellpath: 1 V0 Plan: Test V1

Inter-Site Error: 0.00 ft

Reference MD	TVD	Offset MD	TVD	Semi-Major Axis Ref	Offset	TFO-HS	Offset Location North	East	Ctr-Ctr Edge Distance	Separation Distance	Factor	Warning
7775.00	7761.92	7874.71	7829.63	17.37	17.77	97.76	-618.62	-35.18	625.94	590.91	17.87	
7800.00	7782.87	7879.51	7832.83	17.44	17.80	98.27	-617.66	-38.63	625.26	590.11	17.79	
7825.00	7803.09	7882.35	7834.70	17.52	17.81	98.47	-617.08	-40.68	625.76	590.50	17.75	
7850.00	7822.50	7883.52	7835.47	17.60	17.82	98.38	-616.84	-41.54	627.43	592.07	17.74	
7875.00	7841.06	7883.29	7835.32	17.70	17.81	98.02	-616.89	-41.37	630.28	594.82	17.78	
7900.00	7858.72	7881.86	7834.38	17.81	17.81	97.40	-617.18	-40.33	634.29	598.73	17.84	
7925.00	7875.44	7879.40	7832.75	17.93	17.79	96.56	-617.68	-38.55	639.40	603.75	17.94	
7950.00	7891.15	7876.05	7830.53	18.06	17.78	95.49	-618.35	-36.15	645.57	609.83	18.06	
7975.00	7905.83	7871.94	7827.77	18.21	17.76	94.23	-619.18	-33.21	652.73	616.88	18.21	
8000.00	7919.43	7867.15	7824.52	18.38	17.74	92.77	-620.13	-29.81	660.82	624.85	18.37	
8025.00	7931.91	7861.77	7820.84	18.57	17.71	91.15	-621.18	-26.04	669.75	633.66	18.56	
8050.00	7943.24	7855.87	7816.74	18.77	17.68	89.38	-622.33	-21.95	679.45	643.23	18.76	
8075.00	7953.39	7849.51	7812.27	19.00	17.65	87.47	-623.55	-17.60	689.83	653.48	18.98	
8100.00	7962.33	7842.75	7807.45	19.24	17.63	85.45	-624.83	-13.03	700.81	664.32	19.20	
8125.00	7970.04	7835.61	7802.29	19.51	17.60	83.33	-626.16	-8.29	712.31	675.67	19.44	
8150.00	7976.49	7828.15	7796.82	19.80	17.57	81.14	-627.53	-3.40	724.24	687.47	19.70	
8175.00	7981.66	7820.40	7791.05	20.11	17.54	78.89	-628.92	1.58	736.54	699.64	19.96	
8200.00	7985.56	7812.38	7785.00	20.43	17.51	76.61	-630.34	6.65	749.12	712.10	20.23	
8225.00	7988.15	7804.13	7778.67	20.78	17.48	74.32	-631.77	11.76	761.91	724.78	20.52	
8250.00	7989.44	7795.65	7772.08	21.13	17.45	72.04	-633.21	16.89	774.85	737.62	20.81	
8259.29	7989.58	7792.45	7769.57	21.27	17.43	71.19	-633.75	18.80	779.69	742.42	20.92	
8300.00	7989.83	7778.88	7758.78	21.89	17.39	70.36	-635.96	26.71	801.43	763.72	21.25	
8400.00	7990.42	7750.00	7735.05	23.58	17.30	68.56	-640.40	42.56	859.25	820.29	22.06	
8500.00	7991.01	7725.00	7713.73	25.46	17.23	66.99	-643.92	55.13	922.76	882.36	22.84	
8600.00	7991.61	7704.09	7695.40	27.49	17.17	65.67	-646.64	64.82	991.18	949.18	23.60	
8700.00	7992.20	7686.28	7679.45	29.64	17.13	64.54	-648.77	72.45	1063.80	1020.08	24.33	
8800.00	7992.79	7675.00	7669.20	31.88	17.10	63.83	-650.04	76.98	1139.99	1094.41	25.01	
8900.00	7993.39	7657.57	7653.16	34.21	17.06	62.73	-651.88	83.53	1219.13	1171.71	25.71	
9000.00	7993.98	7650.00	7646.11	36.59	17.04	62.26	-652.63	86.19	1300.84	1251.43	26.33	
9100.00	7994.57	7635.56	7632.55	39.02	17.01	61.35	-653.97	90.98	1384.64	1333.30	26.97	
9200.00	7995.17	7625.00	7622.54	41.50	16.99	60.70	-654.88	94.23	1470.28	1416.95	27.57	
9300.00	7995.76	7618.21	7616.07	44.01	16.97	60.27	-655.43	96.20	1557.46	1502.06	28.12	
9400.00	7996.35	7610.86	7609.03	46.55	16.95	59.82	-656.00	98.24	1645.96	1588.51	28.65	
9500.00	7996.95	7600.00	7598.58	49.11	16.93	59.15	-656.79	101.06	1735.63	1676.18	29.19	
9600.00	7997.54	7600.00	7598.58	51.70	16.93	59.15	-656.79	101.06	1826.24	1764.56	29.61	
9700.00	7998.13	7600.00	7598.58	54.30	16.93	59.15	-656.79	101.06	1917.79	1853.87	30.00	
9800.00	7998.73	7587.70	7586.66	56.92	16.90	58.40	-657.61	103.98	2009.97	1944.10	30.52	
9900.00	7999.32	7583.10	7582.18	59.55	16.89	58.12	-657.89	105.00	2102.86	2034.87	30.93	
10000.00	7999.91	7575.00	7574.27	62.19	16.88	57.63	-658.37	106.68	2196.36	2126.34	31.37	
10100.00	8000.51	7575.00	7574.27	64.84	16.88	57.63	-658.37	106.68	2290.34	2218.05	31.68	
10200.00	8001.10	7575.00	7574.27	67.51	16.88	57.63	-658.37	106.68	2384.80	2310.25	31.99	
10300.00	8001.69	7575.00	7574.27	70.18	16.88	57.63	-658.37	106.68	2479.70	2402.87	32.27	
10400.00	8002.29	7564.83	7564.30	72.86	16.86	57.02	-658.91	108.62	2574.87	2496.11	32.70	
10500.00	8002.88	7561.90	7561.42	75.54	16.85	56.85	-659.05	109.14	2670.42	2589.50	33.00	
10600.00	8003.47	7559.16	7558.73	78.23	16.84	56.69	-659.18	109.61	2766.27	2683.18	33.29	
10700.00	8004.07	7550.00	7549.69	80.93	16.82	56.14	-659.59	111.07	2862.44	2777.44	33.67	
10800.00	8004.66	7550.00	7549.69	83.63	16.82	56.14	-659.59	111.07	2958.77	2871.50	33.90	
10900.00	8005.25	7550.00	7549.69	86.33	16.82	56.14	-659.59	111.07	3055.34	2965.80	34.12	
11000.00	8005.85	7550.00	7549.69	89.04	16.82	56.14	-659.59	111.07	3152.12	3060.30	34.33	
11100.00	8006.44	7550.00	7549.69	91.75	16.82	56.14	-659.59	111.07	3249.10	3155.00	34.53	
11200.00	8007.03	7550.00	7549.69	94.46	16.82	56.14	-659.59	111.07	3346.26	3249.87	34.72	



# Weatherford Anticollision Report

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Reference Site: Sirius 17 Fed Com 8H  
Reference Well: Sirius 17 Fed Com 8H  
Reference Wellpath:

Date: 10/25/2013 Time: 19:28:29 Page: 4  
Co-ordinate(N/E) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0

Db: Sybase

Site: Arcturus 18 Federal Com 8H  
Well: Arcturus 18 Federal Com 8H  
Wellpath: 1 V0 Plan: Test V1

Inter-Site Error: 0.00 ft

Reference		Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation	Warning
MD	TVD	MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance	Factor	
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
11300.00	8007.63	7550.00	7549.69	97.18	16.82	56.14	-659.59	111.07	3443.57	3344.90	34.90	
11400.00	8008.22	7550.00	7549.69	99.90	16.82	56.14	-659.59	111.07	3541.04	3440.08	35.07	
11500.00	8008.81	7550.00	7549.69	102.62	16.82	56.14	-659.59	111.07	3638.65	3535.40	35.24	
11600.00	8009.41	7539.14	7538.95	105.35	16.80	55.51	-660.02	112.59	3736.25	3631.30	35.60	
11700.00	8010.00	7537.67	7537.49	108.08	16.80	55.42	-660.07	112.78	3834.06	3726.91	35.78	
11800.00	8010.59	7536.26	7536.10	110.81	16.80	55.34	-660.12	112.95	3931.98	3822.63	35.96	
11900.00	8011.19	7525.00	7524.91	113.54	16.77	54.68	-660.47	114.21	4030.10	3919.14	36.32	
12000.00	8011.78	7525.00	7524.91	116.27	16.77	54.68	-660.47	114.21	4128.18	4014.96	36.46	
12100.00	8012.37	7525.00	7524.91	119.00	16.77	54.68	-660.47	114.21	4226.35	4110.86	36.60	
12200.00	8012.97	7525.00	7524.91	121.74	16.77	54.68	-660.47	114.21	4324.60	4206.85	36.73	
12300.00	8013.56	7525.00	7524.91	124.48	16.77	54.68	-660.47	114.21	4422.94	4302.91	36.85	
12400.00	8014.16	7525.00	7524.91	127.21	16.77	54.68	-660.47	114.21	4521.34	4399.05	36.97	
12500.00	8014.75	7525.00	7524.91	129.95	16.77	54.68	-660.47	114.21	4619.81	4495.25	37.09	
12542.39	8015.00	7525.00	7524.91	131.12	16.77	54.68	-660.47	114.21	4661.58	4536.06	37.14	

Site: Sirius 17 Fed Com #4H  
Well: Sirius 17 Fed Com #4H  
Wellpath: 1 V0

Inter-Site Error: 0.00 ft

Reference		Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation	Warning
MD	TVD	MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance	Factor	
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
0.00	0.00	138458.54	-3.00	0.00	124.61	165.00	-521.40	139.71	539.79	415.20	4.33	
100.00	100.00	97.15	97.15	0.09	0.09	165.02	-521.44	139.50	539.78	539.60	3044.41	
200.00	200.00	197.50	197.50	0.31	0.31	165.12	-521.62	138.61	539.72	539.10	864.38	
300.00	300.00	298.29	298.27	0.54	0.54	165.29	-521.86	137.03	539.56	538.48	501.40	
400.00	400.00	398.56	398.52	0.76	0.76	165.48	-522.08	135.18	539.30	537.77	352.72	
500.00	500.00	499.58	499.52	0.99	0.97	165.67	-522.16	133.36	538.92	536.96	275.01	
600.00	600.00	602.55	602.48	1.21	1.17	165.83	-521.77	131.75	538.18	535.79	225.48	
700.00	700.00	704.25	704.17	1.44	1.39	165.96	-520.90	130.30	537.00	534.18	190.14	
800.00	800.00	805.78	805.69	1.66	1.60	166.05	-519.68	129.05	535.53	532.27	164.13	
900.00	900.00	909.28	909.17	1.89	1.82	166.12	-517.86	127.96	533.57	529.86	143.82	
1000.00	1000.00	1011.77	1011.62	2.11	2.05	166.15	-515.42	127.07	531.06	526.90	127.73	
1100.00	1100.00	1113.96	1113.76	2.34	2.27	166.13	-512.43	126.49	528.08	523.48	114.71	
1200.00	1200.00	1215.19	1214.94	2.56	2.49	166.05	-509.00	126.48	524.79	519.74	104.03	
1300.00	1300.00	1316.43	1316.08	2.79	2.71	165.76	-504.87	128.09	521.22	515.74	95.06	
1400.00	1400.00	1415.56	1415.05	3.01	2.92	165.31	-500.40	131.18	517.63	511.71	87.48	
1500.00	1500.00	1513.48	1512.80	3.24	3.12	164.78	-496.05	135.01	514.34	507.99	81.04	
1600.00	1600.00	1611.04	1610.19	3.46	3.33	164.20	-492.04	139.20	511.52	504.74	75.53	
1700.00	1700.00	1708.66	1707.64	3.69	3.53	163.61	-488.36	143.64	509.16	501.96	70.72	
1800.00	1800.00	1805.97	1804.80	3.91	3.74	163.04	-485.26	148.03	507.39	499.77	66.54	
1900.00	1900.00	1904.40	1903.10	4.14	3.95	162.46	-482.46	152.53	506.03	497.97	62.81	
2000.00	2000.00	1998.87	1997.45	4.36	4.14	161.95	-480.47	156.55	505.33	496.85	59.60	
2100.00	2100.00	2093.63	2092.16	4.59	4.34	161.59	-479.87	159.73	505.78	496.88	56.84	
2200.00	2200.00	2190.91	2189.41	4.81	4.54	161.34	-480.33	162.22	507.04	497.72	54.38	
2300.00	2300.00	2290.41	2288.88	5.03	4.74	161.16	-481.29	164.25	508.61	498.86	52.14	
2400.00	2400.00	2390.32	2388.76	5.26	4.95	161.01	-482.40	165.98	510.22	500.03	50.09	
2500.00	2500.00	2492.02	2490.46	5.48	5.16	160.90	-483.46	167.42	511.68	501.05	48.16	
2600.00	2600.00	2593.84	2592.26	5.71	5.37	160.81	-484.25	168.55	512.77	501.71	46.35	
2700.00	2700.00	2694.65	2693.07	5.93	5.58	160.73	-484.81	169.54	513.62	502.12	44.66	
2800.00	2800.00	2795.83	2794.25	6.16	5.79	160.65	-485.21	170.39	514.27	502.33	43.07	
2900.00	2900.00	2897.23	2895.64	6.38	6.01	160.58	-485.39	171.14	514.68	502.30	41.57	



# Weatherford Anticollision Report

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Reference Site: Sirius 17 Fed Com 8H  
Reference Well: Sirius 17 Fed Com 8H  
Reference Wellpath:

Date: 10/25/2013 Time: 19:28:29 Page: 5  
Co-ordinate(NE) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0

Db: Sybase

Site: Sirius 17 Fed Com #4H  
Well: Sirius 17 Fed Com #4H  
Wellpath: 1 VO

Inter-Site Error: 0.00 ft

Reference MD	Reference TVD	Offset MD	Offset TVD	Semi-Major Axis Ref	Semi-Major Axis Offset	Semi-Major Axis TFO-HS	Offset Location North	Offset Location East	Ctr-Ctr Edge Distance	Ctr-Ctr Edge Distance	Separation Factor	Warning
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
3000.00	3000.00	2998.20	2996.61	6.61	6.22	160.53	-485.37	171.57	514.80	501.99	40.18	
3100.00	3100.00	3098.56	3096.96	6.83	6.43	160.52	-485.42	171.71	514.89	501.68	38.96	
3200.00	3200.00	3199.99	3198.40	7.06	6.65	160.54	-485.33	171.52	514.75	501.05	37.59	
3300.00	3300.00	3300.75	3299.16	7.28	6.86	160.56	-485.07	171.17	514.38	500.25	36.40	
3400.00	3400.00	3400.45	3398.85	7.51	7.07	160.59	-484.76	170.77	513.96	499.39	35.28	
3500.00	3500.00	3499.07	3497.47	7.73	7.28	160.64	-484.67	170.30	513.72	498.72	34.26	
3600.00	3600.00	3597.60	3596.00	7.96	7.48	160.71	-484.93	169.74	513.78	498.36	33.32	
3700.00	3700.00	3695.52	3693.92	8.18	7.68	160.81	-485.56	169.03	514.15	498.30	32.45	
3800.00	3800.00	3795.69	3794.08	8.41	7.88	160.92	-486.51	168.30	514.81	498.53	31.63	
3900.00	3900.00	3895.98	3894.37	8.63	8.09	161.04	-487.36	167.43	515.32	498.61	30.84	
4000.00	4000.00	3996.32	3994.70	8.86	8.30	161.16	-488.17	166.57	515.81	498.67	30.09	
4100.00	4100.00	4097.56	4095.93	9.08	8.51	161.27	-488.81	165.76	516.15	498.57	29.36	
4200.00	4200.00	4197.93	4196.30	9.31	8.72	161.36	-489.23	165.03	516.31	498.30	28.66	
4300.00	4300.00	4299.17	4297.53	9.53	8.93	161.43	-489.45	164.41	516.33	497.88	27.99	
4400.00	4400.00	4399.39	4397.75	9.75	9.14	161.49	-489.49	163.90	516.20	497.32	27.34	
4500.00	4500.00	4498.87	4497.24	9.98	9.34	161.52	-489.49	163.55	516.09	496.78	26.73	
4600.00	4600.00	4597.17	4595.53	10.20	9.54	161.56	-489.74	163.26	516.24	496.50	26.15	
4700.00	4700.00	4697.99	4696.35	10.43	9.75	161.60	-490.06	162.98	516.45	496.28	25.60	
4800.00	4800.00	4798.89	4797.25	10.65	9.97	161.64	-490.17	162.72	516.47	495.86	25.06	
4900.00	4900.00	4899.39	4897.75	10.88	10.18	161.67	-490.20	162.40	516.40	495.35	24.53	
5000.00	5000.00	5000.65	4999.01	11.10	10.39	161.71	-490.04	161.99	516.13	494.64	24.02	
5100.00	5100.00	5101.53	5099.88	11.33	10.61	161.74	-489.68	161.53	515.65	493.71	23.51	
5200.00	5200.00	5202.41	5200.76	11.55	10.83	161.78	-489.16	161.05	515.01	492.64	23.02	
5300.00	5300.00	5303.06	5301.41	11.78	11.04	161.75	-488.30	161.06	514.20	491.39	22.55	
5400.00	5400.00	5402.60	5400.94	12.00	11.25	161.69	-487.36	161.25	513.36	490.11	22.09	
5500.00	5500.00	5502.02	5500.36	12.23	11.45	161.68	-486.67	161.11	512.66	488.99	21.66	
5600.00	5600.00	5602.04	5600.38	12.45	11.66	161.72	-486.16	160.59	512.01	487.91	21.24	
5700.00	5700.00	5702.18	5700.52	12.68	11.87	161.80	-485.75	159.68	511.34	486.80	20.84	
5800.00	5800.00	5802.55	5800.88	12.90	12.09	161.92	-485.38	158.49	510.62	485.64	20.44	
5900.00	5900.00	5903.21	5901.53	13.13	12.30	162.04	-484.95	157.16	509.80	484.38	20.06	
6000.00	6000.00	6004.32	6002.63	13.35	12.52	162.16	-484.32	155.84	508.80	482.95	19.68	
6100.00	6100.00	6103.39	6101.69	13.58	12.72	162.27	-483.64	154.64	507.78	481.49	19.32	
6200.00	6200.00	6202.63	6200.92	13.80	12.92	162.36	-483.08	153.59	506.92	480.21	18.98	
6300.00	6300.00	6300.01	6298.30	14.03	13.12	162.44	-482.83	152.81	506.43	479.30	18.66	
6400.00	6400.00	6401.49	6399.77	14.25	13.33	162.54	-482.69	151.84	506.01	478.44	18.35	
6500.00	6500.00	6501.53	6499.80	14.47	13.54	162.64	-482.45	150.78	505.47	477.46	18.05	
6600.00	6600.00	6601.89	6600.17	14.70	13.75	162.68	-482.00	150.27	504.89	476.45	17.75	
6700.00	6700.00	6702.22	6700.49	14.92	13.96	162.70	-481.37	149.92	504.19	475.31	17.46	
6800.00	6800.00	6800.56	6798.83	15.15	14.17	162.75	-480.96	149.37	503.62	474.32	17.19	
6900.00	6900.00	6897.96	6896.22	15.37	14.37	162.87	-481.19	148.33	503.53	473.80	16.94	
7000.00	7000.00	6995.61	6993.87	15.60	14.57	163.01	-481.91	147.23	503.91	473.75	16.71	
7100.00	7100.00	7093.55	7091.80	15.82	14.77	163.16	-483.09	146.26	504.77	474.19	16.51	
7200.00	7200.00	7190.70	7188.92	16.05	14.97	163.33	-484.67	145.09	505.98	474.98	16.32	
7300.00	7300.00	7285.71	7283.89	16.27	15.16	163.51	-487.03	144.16	508.09	476.67	16.17	
7400.00	7400.00	7383.05	7381.19	16.50	15.36	163.69	-490.22	143.49	511.04	479.19	16.05	
7500.00	7500.00	7484.10	7482.18	16.72	15.57	163.86	-493.62	142.85	514.08	481.80	15.93	
7512.13	7512.13	7496.52	7494.58	16.75	15.60	163.88	-494.01	142.77	514.43	482.10	15.91	
7525.00	7525.00	7509.69	7507.75	16.78	15.62	69.25	-494.42	142.67	514.73	482.34	15.89	
7550.00	7549.96	7535.11	7533.16	16.83	15.68	69.41	-495.20	142.47	514.94	482.45	15.85	
7575.00	7574.82	7559.95	7557.99	16.89	15.73	69.76	-495.95	142.26	514.69	482.10	15.79	
7600.00	7599.50	7584.61	7582.63	16.95	15.78	70.28	-496.69	142.06	514.01	481.32	15.72	



# Weatherford Anticollision Report

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Reference Site: Sirius 17 Fed Com 8H  
Reference Well: Sirius 17 Fed Com 8H  
Reference Wellpath:

Date: 10/25/2013 Time: 19:28:29 Page: 6  
Co-ordinate(NE) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0

Db: Sybase

Site: Sirius 17 Fed Com #4H  
Well: Sirius 17 Fed Com #4H  
Wellpath: 1 VO

Inter-Site Error: 0.00 ft

Reference MD	Reference TVD	Offset MD	Offset TVD	Semi-Major Axis Ref	Offset	TFO-HS	Offset Location North	Offset Location East	Ctr-Ctr Edge Distance	Edge Distance	Separation Factor	Warning
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
7625.00	7623.95	7609.02	7607.03	17.00	15.83	70.98	-497.43	141.86	512.94	480.15	15.65	
7650.00	7648.09	7632.81	7630.81	17.06	15.88	71.84	-498.15	141.67	511.51	478.63	15.56	
7675.00	7671.86	7655.62	7653.60	17.12	15.93	72.83	-498.86	141.50	509.80	476.83	15.46	
7700.00	7695.19	7678.01	7675.99	17.17	15.98	73.95	-499.61	141.35	507.89	474.83	15.36	
7725.00	7718.02	7699.94	7697.90	17.23	16.02	75.20	-500.37	141.23	505.83	472.67	15.25	
7750.00	7740.28	7721.35	7719.29	17.30	16.07	76.54	-501.14	141.13	503.70	470.44	15.14	
7775.00	7761.92	7742.35	7740.28	17.37	16.11	77.99	-501.93	141.04	501.58	468.21	15.03	
7800.00	7782.87	7762.70	7760.62	17.44	16.15	79.50	-502.72	140.96	499.55	466.05	14.91	
7825.00	7803.09	7782.35	7780.25	17.52	16.19	81.04	-503.50	140.90	497.70	464.07	14.80	
7850.00	7822.50	7801.24	7799.12	17.60	16.23	82.60	-504.26	140.86	496.13	462.36	14.69	
7875.00	7841.06	7819.53	7817.40	17.70	16.27	84.16	-505.03	140.82	494.93	461.02	14.59	
7900.00	7858.72	7837.66	7835.51	17.81	16.30	85.73	-505.78	140.78	494.20	460.12	14.50	
7925.00	7875.44	7854.80	7852.64	17.93	16.34	87.23	-506.47	140.74	494.01	459.77	14.43	
7950.00	7891.15	7870.90	7868.73	18.06	16.37	88.63	-507.11	140.69	494.48	460.07	14.37	
7975.00	7905.83	7885.93	7883.75	18.21	16.40	89.89	-507.69	140.65	495.71	461.11	14.33	
8000.00	7919.43	7899.85	7897.65	18.38	16.43	90.99	-508.22	140.60	497.77	462.97	14.30	
8025.00	7931.91	7912.60	7910.40	18.57	16.46	91.90	-508.70	140.56	500.75	465.74	14.30	
8050.00	7943.24	7924.13	7921.92	18.77	16.48	92.61	-509.12	140.51	504.70	469.47	14.33	
8075.00	7953.39	7934.44	7932.22	19.00	16.51	93.08	-509.50	140.47	509.68	474.21	14.37	
8100.00	7962.33	7943.50	7941.28	19.24	16.53	93.30	-509.82	140.43	515.71	479.98	14.43	
8125.00	7970.04	7951.29	7949.06	19.51	16.54	93.27	-510.10	140.40	522.81	486.79	14.51	
8150.00	7976.49	7957.80	7955.57	19.80	16.56	92.95	-510.32	140.37	530.96	494.64	14.62	
8175.00	7981.66	7963.00	7960.77	20.11	16.57	92.35	-510.51	140.34	540.15	503.50	14.74	
8200.00	7985.56	7966.89	7964.65	20.43	16.57	91.46	-510.64	140.32	550.33	513.34	14.88	
8225.00	7988.15	7969.46	7967.22	20.78	16.58	90.26	-510.73	140.31	561.45	524.11	15.04	
8250.00	7989.44	7970.70	7968.46	21.13	16.58	88.76	-510.77	140.30	573.45	535.75	15.21	
8259.29	7989.58	7970.83	7968.59	21.27	16.58	88.13	-510.78	140.30	578.11	540.28	15.28	
8300.00	7989.83	7970.97	7968.73	21.89	16.58	88.15	-510.78	140.30	599.81	561.36	15.60	
8400.00	7990.42	7971.31	7969.07	23.58	16.58	88.19	-510.79	140.30	660.78	620.64	16.46	
8500.00	7991.01	7971.66	7969.42	25.46	16.58	88.23	-510.80	140.29	730.40	688.38	17.38	
8600.00	7991.61	7972.00	7969.76	27.49	16.59	88.26	-510.82	140.29	806.44	762.38	18.30	
8700.00	7992.20	7972.34	7970.10	29.64	16.59	88.30	-510.83	140.29	887.24	841.04	19.20	
8800.00	7992.79	7972.68	7970.43	31.88	16.59	88.34	-510.84	140.29	971.63	923.18	20.05	
8900.00	7993.39	9585.43	8883.94	34.21	30.79	155.46	-498.94	1105.24	982.62	947.37	27.87	
9000.00	7993.98	9673.57	8885.44	36.59	32.74	155.91	-498.07	1193.37	979.90	943.13	26.65	
9100.00	7994.57	9775.06	8887.66	39.02	35.07	156.40	-497.85	1294.84	978.00	939.60	25.47	
9200.00	7995.17	9868.89	8889.84	41.50	37.30	156.88	-497.24	1388.64	976.12	936.14	24.42	
9300.00	7995.76	9960.97	8892.51	44.01	39.49	157.33	-497.19	1480.68	975.08	933.55	23.48	
9400.00	7996.35	10042.48	8895.79	46.55	41.47	157.74	-497.46	1562.12	975.31	932.32	22.68	
9500.00	7996.95	10145.16	8901.54	49.11	44.01	158.29	-497.59	1664.63	977.01	932.46	21.93	
9600.00	7997.54	10271.55	8906.22	51.70	47.18	158.98	-496.77	1790.94	976.72	930.51	21.14	
9700.00	7998.13	10360.00	8908.89	54.30	49.42	159.47	-495.83	1879.34	975.74	928.17	20.51	
9800.00	7998.73	10438.98	8912.80	56.92	51.43	159.96	-494.53	1958.21	976.47	927.69	20.02	
9900.00	7999.32	10528.76	8919.01	59.55	53.73	160.58	-492.66	2047.75	979.00	929.08	19.61	
10000.00	7999.91	10618.78	8925.63	62.19	56.04	161.14	-491.79	2137.52	982.46	931.38	19.23	
10100.00	8000.51	10723.04	8933.17	64.84	58.75	161.68	-492.79	2241.50	986.51	934.09	18.82	
10200.00	8001.10	10850.99	8940.05	67.51	62.10	162.32	-493.60	2369.26	988.77	934.89	18.35	
10300.00	8001.69	10964.37	8943.36	70.18	65.06	162.76	-495.48	2482.57	989.09	933.72	17.86	
10400.00	8002.29	11101.40	8943.42	72.86	68.68	163.16	-499.17	2619.55	987.07	929.87	17.26	
10500.00	8002.88	11244.21	8936.78	75.54	72.47	163.46	-503.14	2762.14	980.45	921.25	16.56	
10600.00	8003.47	11361.30	8927.82	78.23	75.59	163.70	-505.49	2878.85	970.79	909.85	15.93	





# Weatherford Anticollision Report

**Weatherford**

Company: Devon Energy  
Field: Eddy Co., NM (NAD 83)  
Reference Site: Sirius 17 Fed Com 8H  
Reference Well: Sirius 17 Fed Com 8H  
Reference Wellpath:

Date: 10/25/2013

Time: 19:28:29

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Co-ordinate(N/E) Reference: Well: Sirius 17 Fed Com 8H, Grid North  
Vertical (TVD) Reference: SITE 3442.0

Db: Sybase

Site: Sirius 17 Fed Com #4H  
Well: Sirius 17 Fed Com #4H  
Wellpath: 1 V0

Inter-Site Error: 0.00 ft

Reference		Offset		Semi-Major Axis			Offset Location		Ctr-Ctr Edge		Separation	Warning
MD	TVD	MD	TVD	Ref	Offset	TFO-HS	North	East	Distance	Distance	Factor	
ft	ft	ft	ft	ft	ft	deg	ft	ft	ft	ft		
10700.00	8004.07	11456.10	8920.50	80.93	78.12	164.04	-504.98	2973.36	960.42	898.17	15.43	
10800.00	8004.66	11539.88	8914.89	83.63	80.35	164.31	-505.35	3056.95	951.32	887.79	14.97	
10900.00	8005.25	11628.86	8910.82	86.33	82.73	164.69	-504.71	3145.83	943.95	879.33	14.61	
11000.00	8005.85	11743.87	8905.70	89.04	85.79	165.28	-502.51	3260.71	936.51	870.89	14.27	
11100.00	8006.44	11858.64	8898.33	91.75	88.83	165.91	-499.07	3375.19	926.91	860.44	13.94	
11200.00	8007.03	11934.38	8893.92	94.46	90.87	166.37	-496.35	3450.75	917.90	850.75	13.67	
11300.00	8007.63	12022.56	8890.88	97.18	93.21	166.94	-493.29	3538.82	911.24	843.50	13.45	
11400.00	8008.22	12119.46	8888.19	99.90	95.80	167.64	-489.13	3635.60	905.19	837.04	13.28	
11500.00	8008.81	12209.08	8886.07	102.62	98.25	168.26	-485.68	3725.12	899.80	831.23	13.12	
11600.00	8009.41	12300.96	8884.70	105.35	100.74	168.84	-483.59	3816.97	895.67	826.57	12.96	
11700.00	8010.00	12419.00	8882.48	108.08	103.92	169.57	-480.94	3934.96	891.35	821.73	12.80	
11800.00	8010.59	12520.85	8878.93	110.81	106.67	170.21	-478.28	4036.71	885.44	815.34	12.63	
11900.00	8011.19	12601.75	8876.85	113.54	108.87	170.70	-476.78	4117.57	880.65	810.04	12.47	
12000.00	8011.78	12701.32	8875.38	116.27	111.56	171.29	-475.40	4217.11	877.11	805.95	12.33	
12100.00	8012.37	12798.55	8874.01	119.00	114.19	171.89	-473.63	4314.32	873.67	802.02	12.19	
12200.00	8012.97	12897.79	8872.80	121.74	116.89	172.53	-471.65	4413.53	870.50	798.37	12.07	
12300.00	8013.56	12998.35	8871.46	124.48	119.62	173.11	-470.65	4514.07	867.44	794.72	11.93	
12400.00	8014.16	13106.77	8869.16	127.21	122.56	173.69	-470.26	4622.47	863.75	790.33	11.76	
12500.00	8014.75	13209.96	8866.32	129.95	125.37	174.26	-469.69	4725.62	859.51	785.39	11.60	
12542.39	8015.00	13215.00	8866.17	131.12	125.51	174.28	-469.65	4730.66	858.45	784.16	11.56	

**Weatherford®****Weatherford Drilling Services**

GeoDec v5.03

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Report Date: October 25, 2013  
Job Number: \_\_\_\_\_  
Customer: Devon  
Well Name: Sirius 17 Fed Com 8H  
API Number: \_\_\_\_\_  
Rig Name: \_\_\_\_\_  
Location: Eddy Co., NM  
Block: \_\_\_\_\_  
Engineer: RWJ

---

US State Plane 1983	Geodetic Latitude / Longitude
System: New Mexico Eastern Zone	System: Latitude / Longitude
Projection: Transverse Mercator/Gauss Kruger	Projection: Geodetic Latitude and Longitude
Datum: North American Datum 1983	Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: GRS 1980	Ellipsoid: Clarke 1866
North/South 602580.640 USFT	Latitude 32.6556714 DEG
East/West 674891.830 USFT	Longitude -103.8988782 DEG
Grid Convergence: .23°	
Total Correction: +7.36°	

---

Geodetic Location WGS84	Elevation =	0.0 Meters
Latitude =	32.65567° N	32° 39 min 20.417 sec
Longitude =	103.89888° W	103° 53 min 55.961 sec

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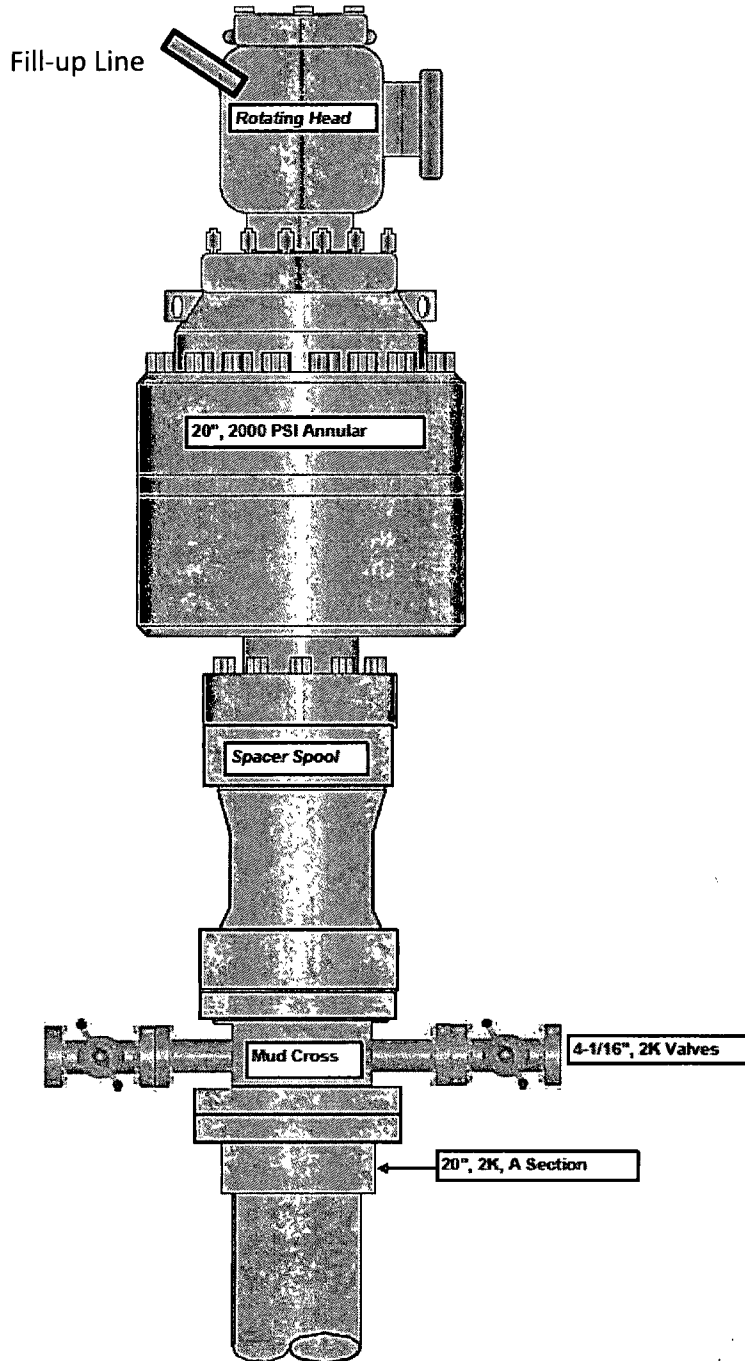
Magnetic Declination =	7.59°	[True North Offset]
Local Gravity =	.9988 g	Checksum = 6634
Local Field Strength =	48604 nT	Magnetic Vector X = 23755 nT
Magnetic Dip =	60.46°	Magnetic Vector Y = 3164 nT
Magnetic Model =	bggm2013	Magnetic Vector Z = 42285 nT
Spud Date =	Nov 25, 2013	Magnetic Vector H = 23965 nT

---

Signed: \_\_\_\_\_

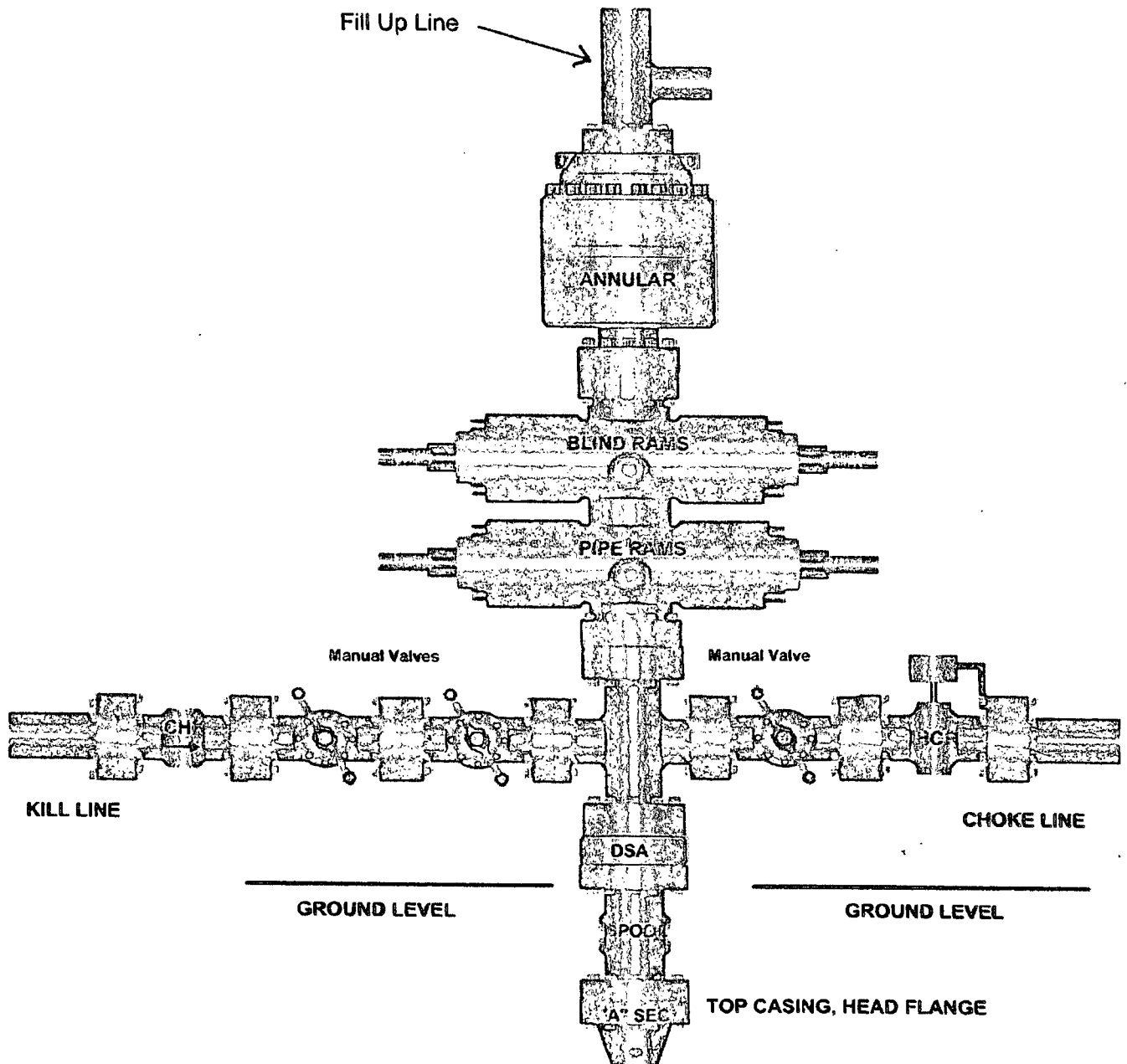
Date: \_\_\_\_\_

## 20" 2K Annular

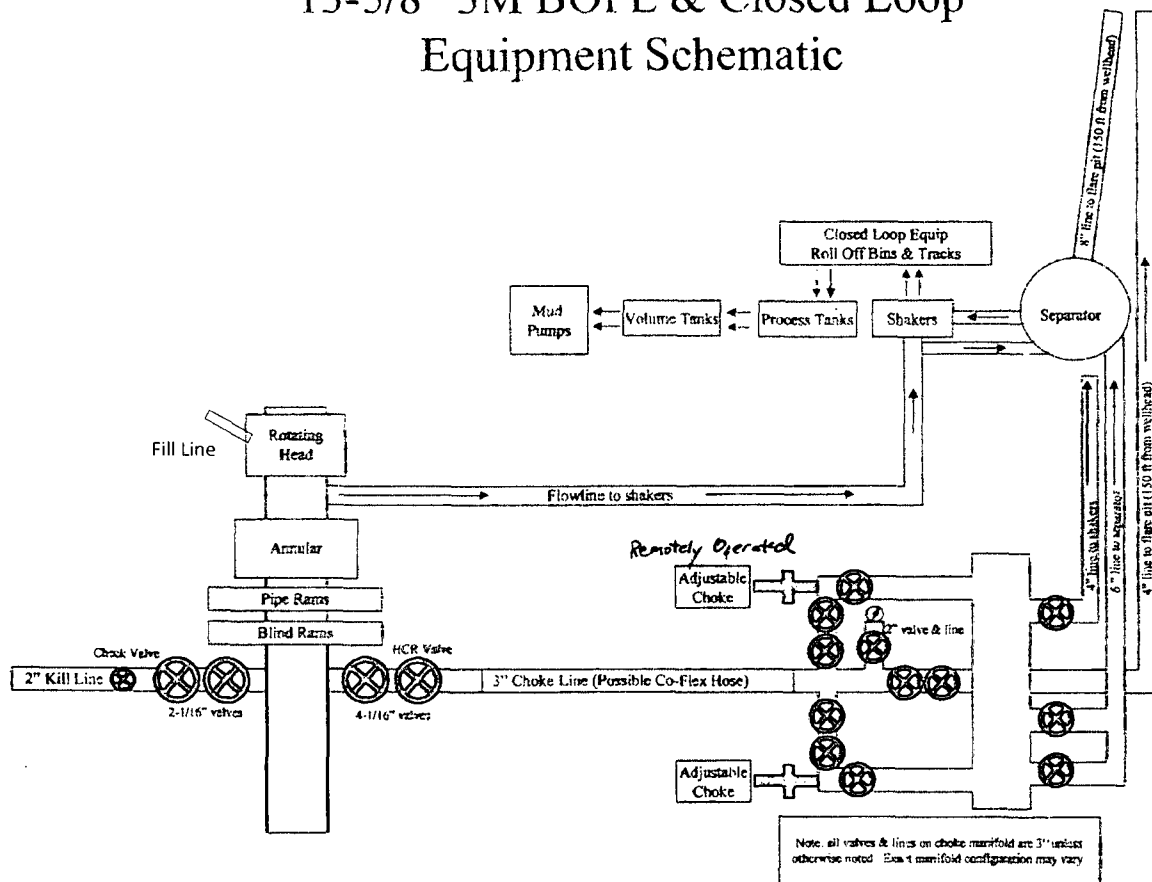


**\*The same choke manifold will be used with all BOP's**

# 13-5/8" x 3,000 psi BOP Stack



# 13-5/8" 3M BOPE & Closed Loop Equipment Schematic





Fluid Technology

ContiTech Beattie Corp.  
Website: [www.contitechbeattie.com](http://www.contitechbeattie.com)

Monday, June 14, 2010

RE: Drilling & Production Hoses  
Lifting & Safety Equipment

To Helmerich & Payne,

A Continental ContiTech hose assembly can perform as intended and suitable for the application regardless of whether the hose is secured or unsecured in its configuration. As a manufacturer of High Pressure Hose Assemblies for use in Drilling & Production, we do offer the corresponding lifting and safety equipment, this has the added benefit of easing the lifting and handling of each hose assembly whilst affording hose longevity by ensuring correct handling methods and procedures as well as securing the hose in the unlikely event of a failure; but in no way does the lifting and safety equipment affect the performance of the hoses providing the hoses have been handled and installed correctly. It is good practice to use lifting & safety equipment but not mandatory.

Should you have any questions or require any additional information/clarifications then please do not hesitate to contact us.

ContiTech Beattie is part of the Continental AG Corporation and can offer the full support resources associated with a global organization.

Best regards,

Robin Hodgson  
Sales Manager  
ContiTech Beattie Corp

ContiTech Beattie Corp,  
11535 Brittmoore Park Drive,  
Houston, TX 77041  
Phone: +1 (832) 327-0141  
Fax: +1 (832) 327-0148  
[www.contitechbeattie.com](http://www.contitechbeattie.com)



# Hydrostatic Test Certificate

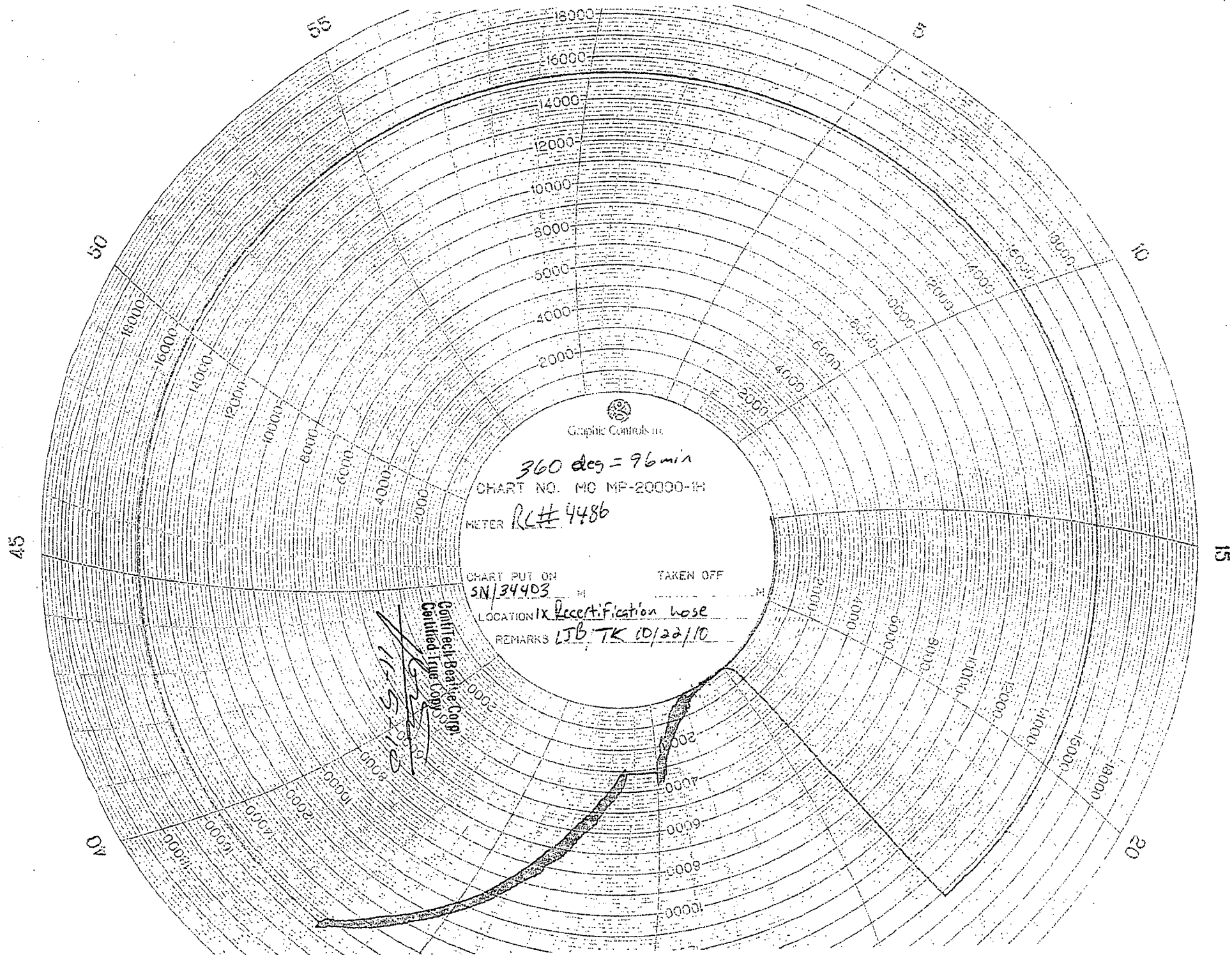


Certificate Number: 4520	PBC No: 10321	Customer Name & Address
Customer Purchase Order No: RIG 300		HELMERICH & PAYNE INT'L DRILLING CO 1437 SOUTH BOULDER TULSA, OK 74119
Project:		
Test Centre Address	Accepted by ContiTech Beattie Inspection	Accepted by Client Inspection
ContiTech Beattie Corp. 11535 Brittmoore Park Drive Houston, TX 77041 USA	Signed: Josh Sims Date: 10/27/10	

We certify that the goods detailed hereon have been inspected by our Quality Management System, and to the best of our knowledge are found to conform to relevant industrial standards within the requirements of the purchase order as issued to ContiTech Beattie Corporation.

These goods were made in the United States of America.

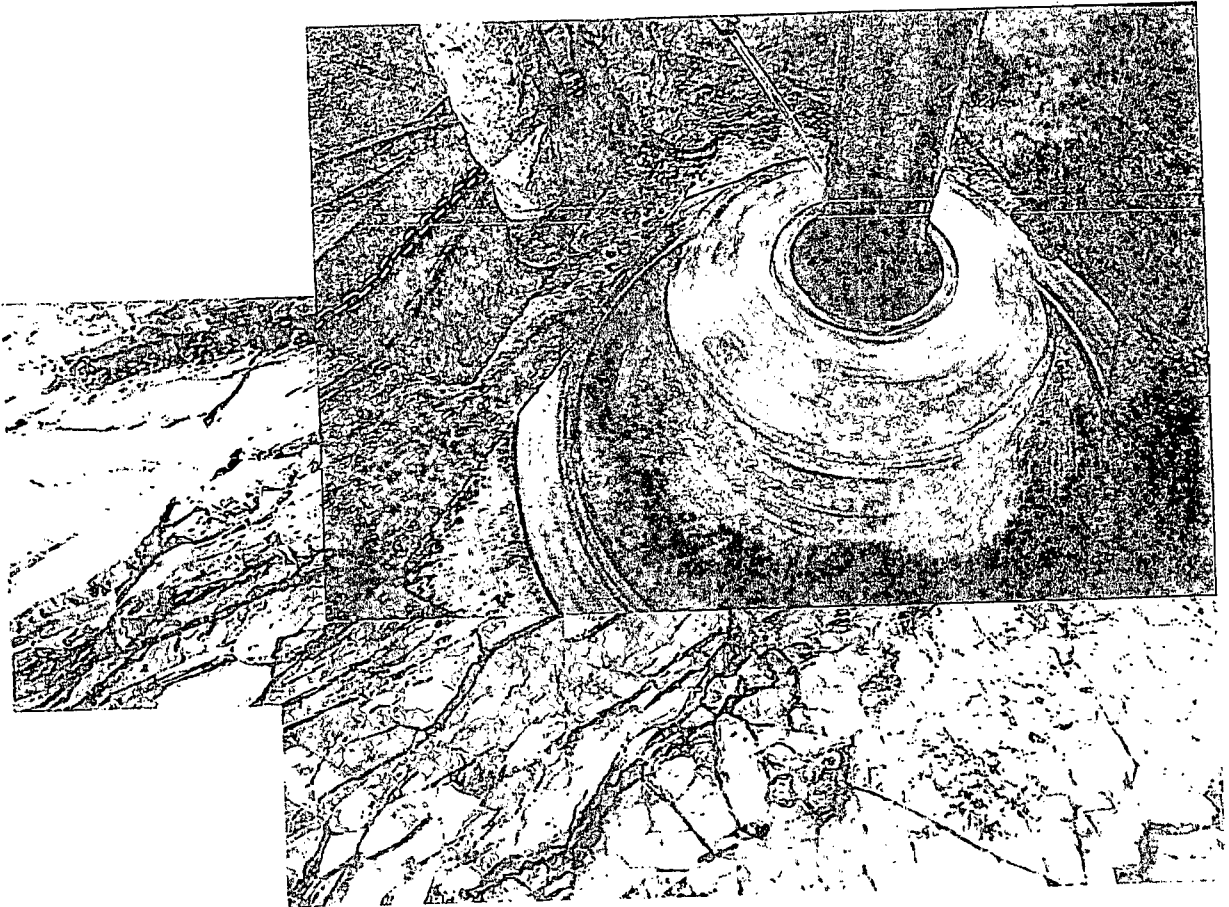
Item	Part No.	Description	Qty	Serial Number	As-Built Length (m)	Work. Press.	Test Press.	Test Time (minutes)
1		3" ID 10K Choke & Kill Hose x 35ft OAL End A: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange End B: 4.1/16" 10Kpsi API Spec 6A Type 6BX Flange Working Pressure: 10,000psi Test Pressure: 15,000psi Serial#: 49106	1	49106		10 kpsi	15 kpsi	60







Commitment Runs Deep



Design Plan  
Operation and Maintenance Plan  
Closure Plan

SENM - Closed Loop Systems  
April 2010

## **I. Design Plan**

Devon uses various high efficient closed loop systems (CLS). The CLS shown is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

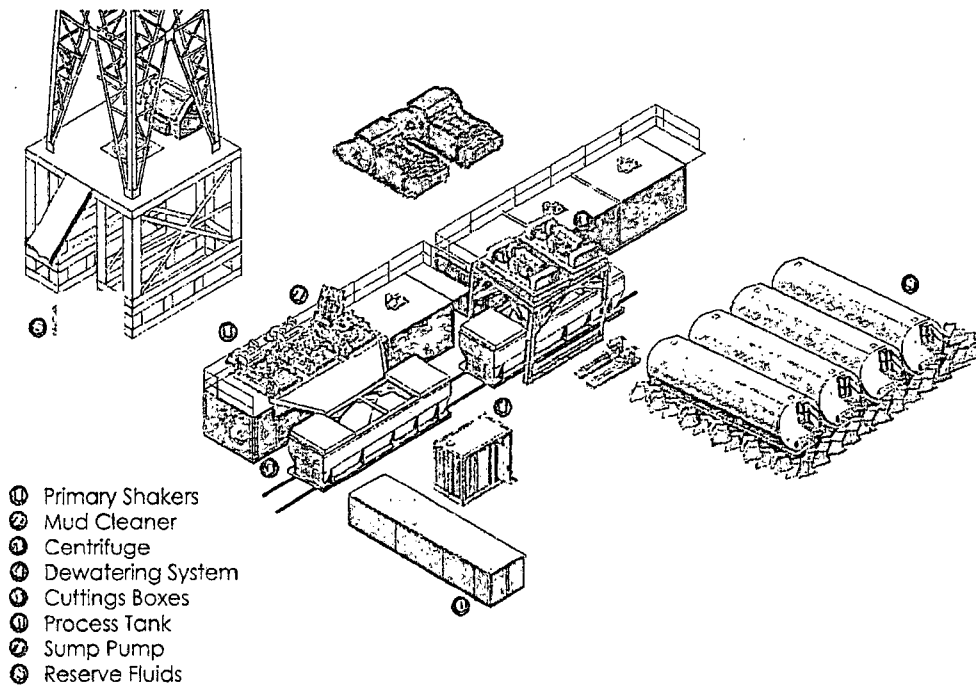
## **II. Operations and Maintenance Plan**

**Primary Shakers:** The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

**Mud Cleaner:** The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.

**devon**

## Closed Loop Schematic



**Centrifuges:** The centrifuges can be utilized depending on the well's anticipated solids volume. One or two centrifuges can be used depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

**Dewatering System:** The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds

ultra fine solids into a mass that is within the centrifuge operating design. The dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

*Cuttings Boxes:* Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

*Process Tank:* (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

*Sump and Sump Pump:* The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

*Reserve Fluids (Tank Farm):* A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

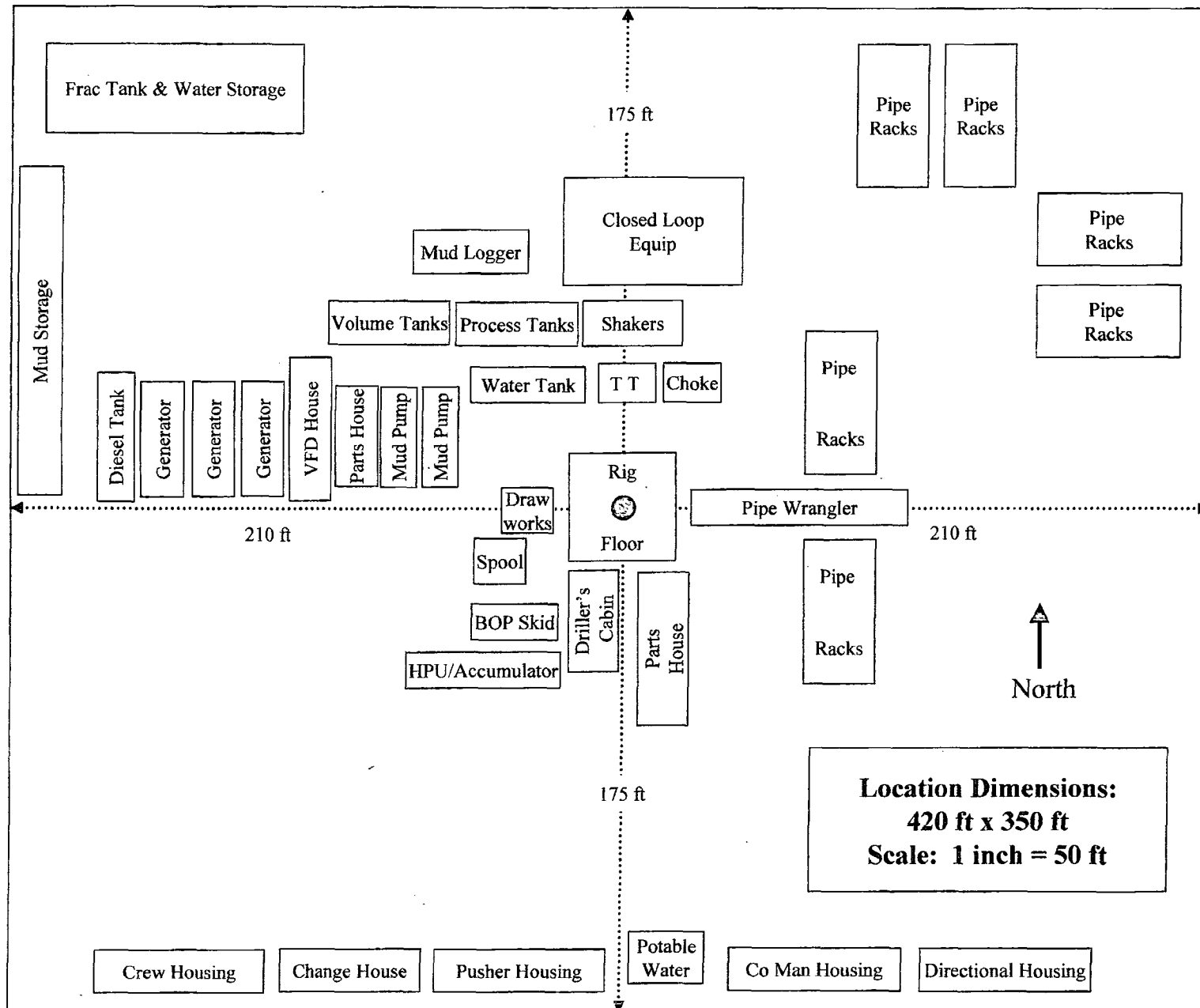
dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

These operations are monitored by Solids Control service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

### **III. Closure Plan**

A maximum 170' X 170' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.

# H&P Flex Rig Location Layout





**Devon Energy Center  
333 West Sheridan Avenue  
Oklahoma City, Oklahoma 73102-5015**

# **Hydrogen Sulfide (H<sub>2</sub>S) Contingency Plan**

**For**

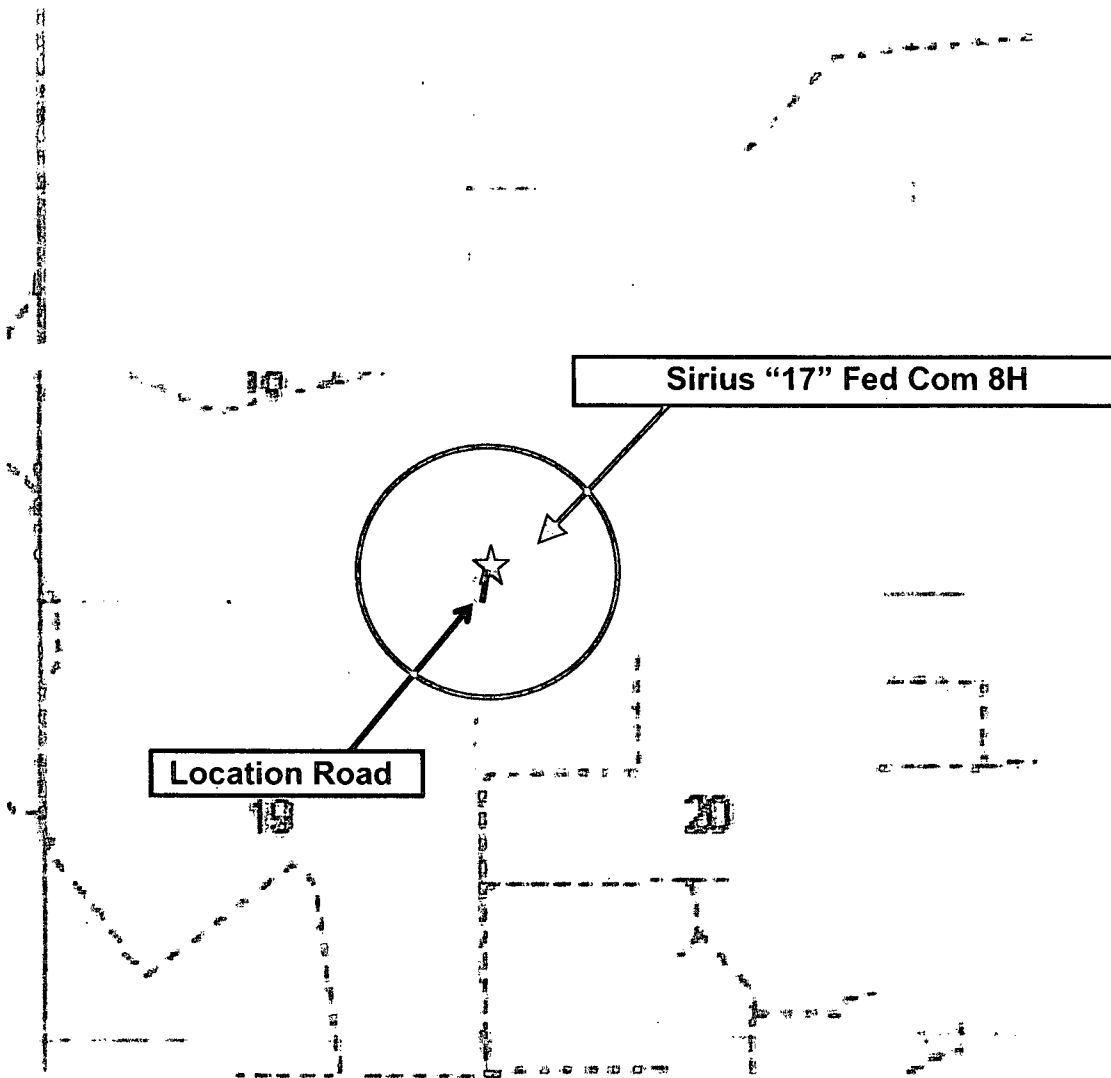
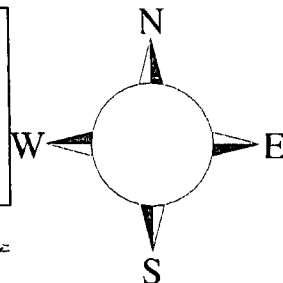
**Sirius "17" Fed Com 8H**

**Sec-17, T-19S R-31E  
560' FSL & 240' FWL,  
LAT. = 32.6546866°N (NAD83)  
LONG = 103.8992472°W**

**Eddy County NM**

## Sirius "17" Fed Com 8H

This is an open drilling site. H<sub>2</sub>S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H<sub>2</sub>S, including warning signs, wind indicators and H<sub>2</sub>S monitor.



Assumed 100 ppm ROE = 3000' (Radius of Exposure)  
100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.

### Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road, West then Northwest on lease road. Crews should then block entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.



**Assumed 100 ppm ROE = 3000'**  
**100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.**

### **Emergency Procedures**

**In the event of a release of gas containing H<sub>2</sub>S, the first responder(s) must**

- **Isolate the area and prevent entry by other persons into the 100 ppm ROE.**
- **Evacuate any public places encompassed by the 100 ppm ROE.**
- **Be equipped with H<sub>2</sub>S monitors and air packs in order to control the release.**
- **Use the "buddy system" to ensure no injuries occur during the response**
- **Take precautions to avoid personal injury during this operation.**
- **Contact operator and/or local officials to aid in operation. See list of phone numbers attached.**
- **Have received training in the**
  - **Detection of H<sub>2</sub>S, and**
  - **Measures for protection against the gas,**
  - **Equipment used for protection and emergency response.**

### **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<sub>2</sub>). 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 there is an ignition of the gas

### **Characteristics of H<sub>2</sub>S and SO<sub>2</sub>**

<b>Common Name</b>	<b>Chemical Formula</b>	<b>Specific Gravity</b>	<b>Threshold Limit</b>	<b>Hazardous Limit</b>	<b>Lethal Concentration</b>
<b>Hydrogen Sulfide</b>	<b>H<sub>2</sub>S</b>	<b>1.189 Air = 1</b>	<b>10 ppm</b>	<b>100 ppm/hr</b>	<b>600 ppm</b>
<b>Sulfur Dioxide</b>	<b>SO<sub>2</sub></b>	<b>2.21 Air = 1</b>	<b>2 ppm</b>	<b>N/A</b>	<b>1000 ppm</b>

## **Contacting Authorities**

Devon Energy Corp. 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. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER)

## **Hydrogen Sulfide Drilling Operation Plan**

### **I. HYDROGEN SULFIDE (H<sub>2</sub>S) TRAINING**

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

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

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

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

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan.

## **II. HYDROGEN SULFIDE TRAINING**

Note: All H<sub>2</sub>S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H<sub>2</sub>S.

### **1. Well Control Equipment**

- A. Flare line
- B. Choke manifold – (with remotely operated choke)
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

### **2. Protective equipment for essential personnel:**

- A. 30-minute SCBA units located in the doghouse and at briefing areas, as indicated on well site diagram. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

### **3. H<sub>2</sub>S detection and monitoring equipment:**

- A. Portable H<sub>2</sub>S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H<sub>2</sub>S levels of 20 PPM are reached. These units are usually capable of detecting SO<sub>2</sub>, which is a byproduct of burning H<sub>2</sub>S.

### **4. Visual warning systems:**

- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

**5. Mud program:**

- A. The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. Proper mud weight, safe drilling practices and the use of H<sub>2</sub>S scavengers will minimize hazards when penetrating H<sub>2</sub>S bearing zones.

**6. Metallurgy:**

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H<sub>2</sub>S trim.
- B. All elastomers used for packing and seals shall be H<sub>2</sub>S trim.

**7. Communication:**

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

**8. Well testing:**

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H<sub>2</sub>S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

## Devon Energy Corp. Company Call List

<u>Artesia (575)</u>	<u>Cellular</u>	<u>Office</u>	<u>Home</u>
Foreman – Robert Bell.....	748-7448 .....	748-0178 .....	746-2991
Asst. Foreman –Tommy Polly.....	748-5290.....	748-0165.....	748-2846
Don Mayberry.....	748-5235 .....	748-0164.....	746-4945
Montral Walker .....	390-5182 .....	748-0193 .....	(936) 414-6246
Engineer – Marcos Ortiz.....	(405) 317-0666.....	(405) 552-8152.....	(405) 381-4350

## Agency Call List

<u>Lea</u>	<u>Hobbs</u>
<u>County</u>	Lea County Communication Authority .....
<u>(575)</u>	State Police .....
	City Police .....
	Sheriff's Office .....
	Ambulance .....
	Fire Department .....
	LEPC (Local Emergency Planning Committee).....
	NMOCD.....
	US Bureau of Land Management .....

<u>Eddy</u>	<u>Carlsbad</u>
<u>County</u>	State Police .....
<u>(575)</u>	City Police .....
	Sheriff's Office .....
	Ambulance .....
	Fire Department .....
	LEPC (Local Emergency Planning Committee).....
	US Bureau of Land Management .....
	NM Emergency Response Commission (Santa Fe) .....
	24 HR .....
	National Emergency Response Center (Washington, DC) .....

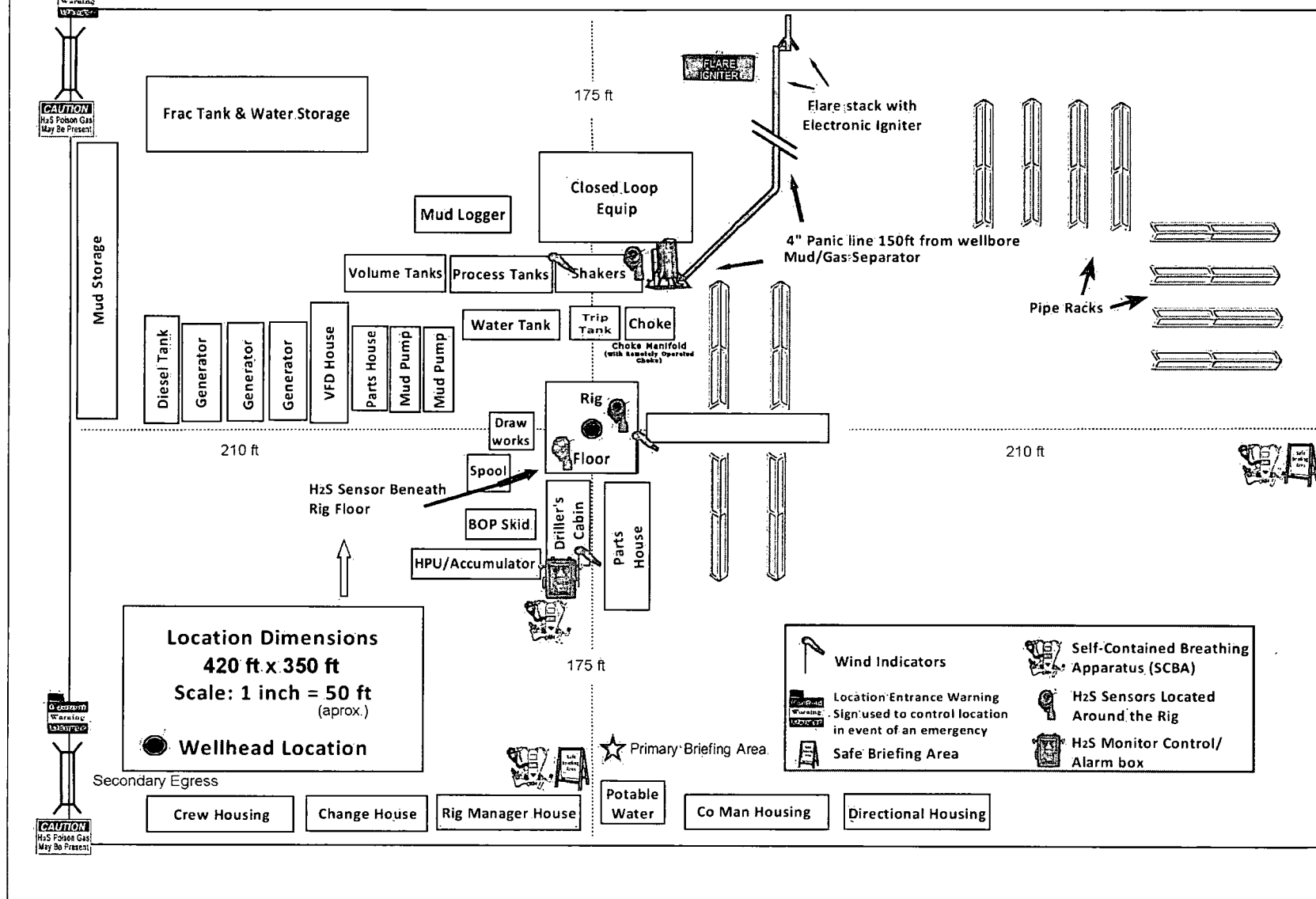
### **Emergency Services**

	Boots & Coots IWC .....
	Cudd Pressure Control.....
	Halliburton .....
	B. J. Services.....
<i>Give</i>	Native Air – Emergency Helicopter – Hobbs.....
<i>GPS</i>	Flight For Life - Lubbock, TX .....
<i>position:</i>	Aerocare - Lubbock, TX .....
	Med Flight Air Amb - Albuquerque, NM .....
	Lifeguard Air Med Svc. Albuquerque, NM .....

Prepared in conjunction with  
Dave Small



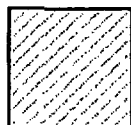
# Devon Energy - Well Pad Rig Location Layout Safety Equipment Location





## Proposed Interim Site Reclamation

Devon Energy Production Co.  
Sirius 17 Fed Com 8H  
560' FSL & 240' FWL  
Sec. 17-T19S-R31E  
Eddy County, NM

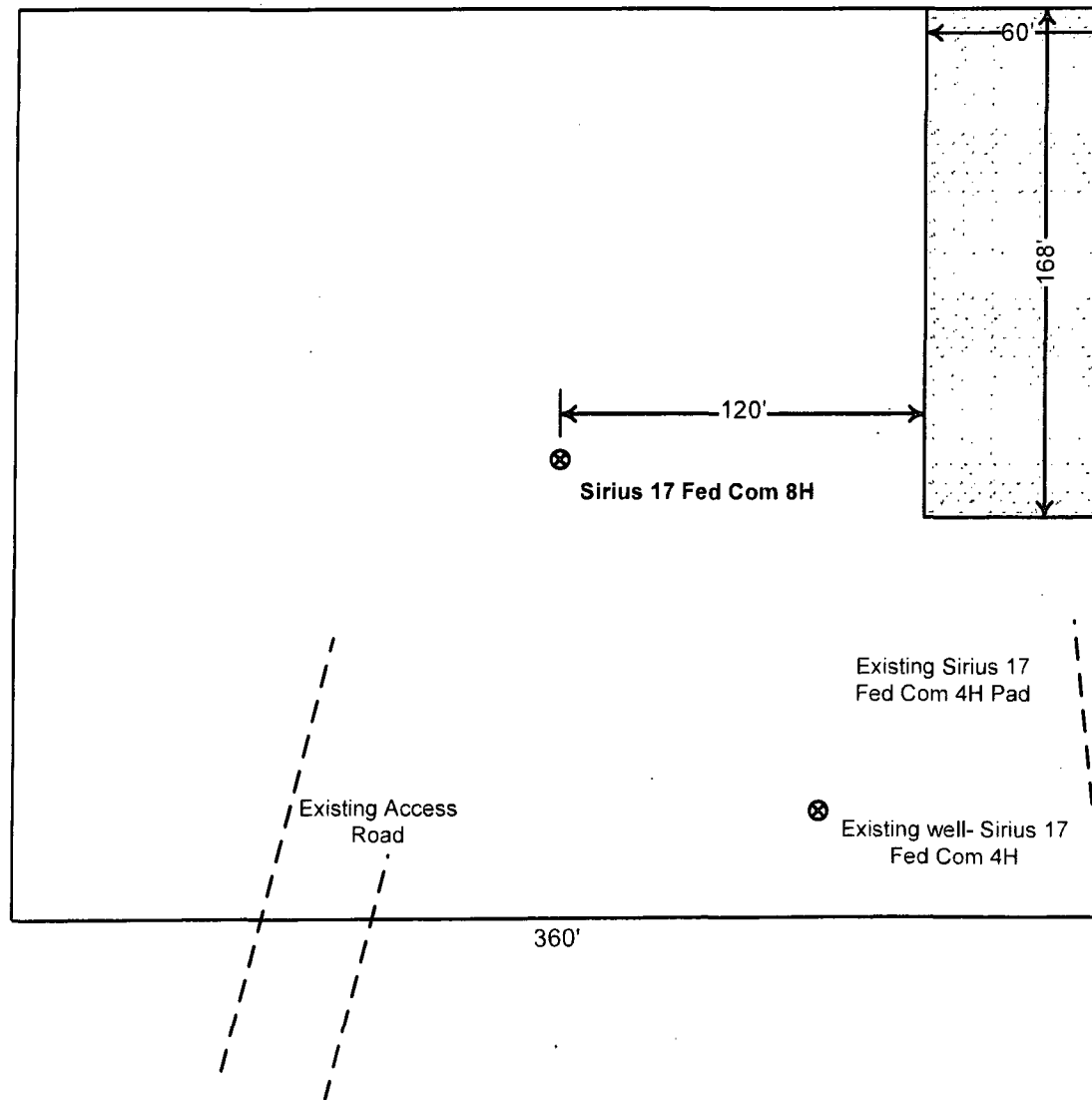


Proposed  
Reclamation  
Area



Scale: 1in = 60ft.

300'



Stockpile for Spoils Pile- East Side of Location

**SURFACE USE PLAN**  
Devon Energy Production Company, LP  
**Sirius 17 Fed Com 8H**

Surface Location: 962' FSL & 200' FWL, Unit M, Sec 17 T19S R31E, Eddy, NM  
Bottom Hole Location: 550' FSL & 340' FEL, Unit P, Sec 17 T19S R31E, Eddy, NM

**1. Existing Roads:**

- a. The well site and elevation plat for the proposed well are reflected on the Site Map. The well was staked by Madron Surveyors.
- b. All roads into the location are depicted on the Vicinity Map. Existing roads will be maintained and kept the same or better condition than before operations began.
- c. Directions to Location: From CR. 222 (Shugart) and CR. 248 (Lusk Plant) go south-southwest on CR. 222 4.7 miles turn right and go north 2.0 miles to road intersection and continue north 0.15 miles to the exist. Sirius "17" Fed. #4H well and from this well location is northwest 149'.

**2. New or Reconstructed Access Roads:**

- a. The Site Map shows the existing County road. No new access road will be constructed.
- b. No cattle guards, grates or fence cuts will be required. No turnouts are planned.

**3. Location of Existing Wells:**

One Mile Radius Plat shows all existing and proposed wells within a one-mile radius of the proposed location. See attached plat.

**4. Location of Existing and/or Proposed Production Facilities**

- a. In the event the well is found productive, the Sirius 17 Federal Com 3H tank battery Sec 17 T19S R31E will be utilized and the necessary production equipment will be installed at the well site (See Interim Site Reclamation Diagram).

If necessary, the well will be operated by means of an electric prime mover. Electric power poles will be set along side of the access road. If said power poles are needed, a plat and a sundry notice will be filed with your office.

- b. All flow lines will adhere to API standards.
- c. If the well is productive, rehabilitation plans are as follows:
  - i. The original topsoil from the well site will be returned to the location. The drill site will then be contoured as close as possible to the original state.

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

This location will be drilled using a combination of water mud systems (outlined in the Drilling Program). The water will be obtained from commercial water stations in the area and hauled to location by transport truck using the existing and proposed roads shown on the Vicinity Map. On occasion, water will be obtained from a pre-existing water well, running a pump directly to the drill rig. In these cases where a poly pipeline is used to transport water for drilling purposes, proper authorizations will be secured. If a poly pipeline is used, the size, distance, and map showing route will be provided to the BLM via sundry notice.

**6. Construction Materials:**



The caliche utilized for the drilling pad and proposed access road will be from minerals that are located onsite or will be used onsite. If minerals are not available onsite, then an established mineral pit will be used to build the location and stem road.

**7. Methods of Handling Waste Material:**

- a. Drill cuttings will be disposed.
- b. All trash, junk and other waste material will be contained in trash cages or trash bins to prevent scattering. When the job is completed all contents will be removed and disposed of in an approved sanitary landfill.
- c. The supplier, including broken sacks, will pick up salts remaining after completion of well.
- d. A Porto-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.
- e. Remaining drilling fluids will be sent to a closed loop system. Water produced during completion will be put into a closed loop system. Oil and condensate produced will be put into a storage tank and sold.
- f. Disposal of fluids to be transported by the following companies:
  - i. American Production Service Inc, Odessa TX
  - ii. Gandy Corporation, Lovington NM
  - iii. I & W Inc, Loco Hill NM
  - iv. Jims Water Service of Co Inc, Denver CO

**8. Ancillary Facilities:** No campsite or other facilities will be constructed as a result of this well.

**9. Well Site Layout**

- a. The Rig Location Layout Diagram shows the proposed well site layout with dimensions of the pad layout.
- b. This exhibit indicated proposed location of sump pits and living facilities.
- c. Mud pits in the active circulating system will be steel pits.
- d. A closed loop system will be utilized.
- e. If a pit or closed loop system is utilized, Devon will comply with the NMOCD requirements 19.15.17 and submit form C-144 to the appropriate NMOCD District Office. A copy to be provided to the BLM.

**10. Plans for Surface Reclamation**

- a. After concluding the drilling and/or completion operations, if the well is found non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations. The road will be reclaimed as directed by the BLM. The original top soil will again be returned to the pad and contoured, as close as possible, to the original topography.
- b. The location and road will be rehabilitated as recommended by the BLM.
- c. If the well is deemed commercially productive, caliche from areas of the pad site not required for operations will be reclaimed. The original top soil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography.

- d. All disturbed areas not needed for active support of production operations will undergo interim reclamation. The portions of the cleared well site not needed for operational and safety purposes will be recontoured to a final or intermediate contour that blends with the surrounding topography as much as possible. Topsoil will be spread over areas not needed for all-weather operations.

**11. Surface Ownership**

- a. The surface is owned by the US Government and is administered by the Bureau of Land Management. The surface is multiple use with the primary uses of the region for the grazing of livestock and the production of oil and gas.
- b. The proposed road routes and the surface location will be restored as directed by the BLM.

**12. Other Information:**

- a. The area surrounding the well site is grassland. The topsoil is very sandy in nature. The vegetation is moderately sparse with native prairie grass, sage bush, yucca and miscellaneous weeds. No wildlife was observed but it is likely that deer, rabbits, coyotes, and rodents traverse the area.
- b. There is no permanent or live water in the general proximity of the location.
- c. There are no dwellings within 2 miles of location.
- d. A Cultural Resources Examination will be completed by the Permian Basin Cultural Resource Fund in lieu of being required to conduct a Class III Survey for cultural resources associated with their project within the BLM office in Carlsbad, New Mexico.

**13. Bond Coverage:**

Bond Coverage is Nationwide; Bond # is CO-1104;NMB-001801

**Operators Representative:**

The Devon Energy Production Company, L.P. representatives responsible for ensuring compliance of the surface use plan are listed below.

Justin Lazzari - Operations Engineer Advisor  
Devon Energy Production Company, L.P.  
333 W. Sheridan  
Oklahoma City, OK 73102-8260  
(405) 228-8466 (office)  
(405) 464-9261 (Cellular)

Jerry Mathews - Superintendent  
Devon Energy Production Company, L.P.  
Post Office Box 250  
Artesia, NM 88211-0250  
(575) 748-0161 (office)  
(575) 748-5234 (home)

# PECOS DISTRICT

## CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>Devon Energy Production Company, LP.</b>
<b>LEASE NO.:</b>	<b>NMNM-06370</b>
<b>WELL NAME &amp; NO.:</b>	<b>Sirius 17 Fed Com 8H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>962' FSL &amp; 0200' FWL</b>
<b>BOTTOM HOLE FOOTAGE</b>	<b>0550' FSL &amp; 0340' FEL</b>
<b>LOCATION:</b>	<b>Section 17, T. 19 S., R 31 E., NMPM</b>
<b>COUNTY:</b>	<b>Eddy County, New Mexico</b>

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**

- Lesser Prairie-Chicken Timing Stipulations
- Ground-level Abandoned Well Marker
- Hackberry Lake OHV Area
- VRM
- Communitization Agreement

- ☐ **Construction**
  - Notification
  - Topsoil
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  - Federal Mineral Material Pits
  - Well Pads
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  - H2S Requirements
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- ☒ **Production (Post Drilling)**
  - Well Structures & Facilities
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- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

## **I. GENERAL PROVISIONS**

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

## **II. PERMIT EXPIRATION**

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

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

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

## **IV. NOXIOUS WEEDS**

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

## **V. SPECIAL REQUIREMENT(S)**

### **Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:**

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period.

Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted.

Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

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

### **Hackberry Lake Off-Highway Vehicle Special Recreation Management Area**

Pipelines (including temporary surface lines) shall be buried a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. Power poles and associated ground structures (poles, guy wires) will not be placed within 20 feet of recreation trails. Guy wires must be equipped with a sleeve, tape or other industry approved apparatus that is highly visible during the day and reflective at night. During ALL phases of construction, open ditches, holes, materials storage or other trail modifications must have proper signage notifying trail users of potential hazards. Upon completion of construction, roads/trails shall be returned to pre-construction condition with no bumps or dips. Power line poles will be spaced to avoid pole placement within 20-feet of trails and "two tracks." All vehicle and equipment operators will observe speed limits and practice responsible defensive driving habits. If trail route modifications are required due to development, proposed changes shall be approved by BLM. The developer will absorb all expenses incurred as the result of required modifications.

### **Communitization Agreement**

A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. If the Communitization Agreement number is known, it shall also be on the sign. If not, it shall be placed on the sign 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**

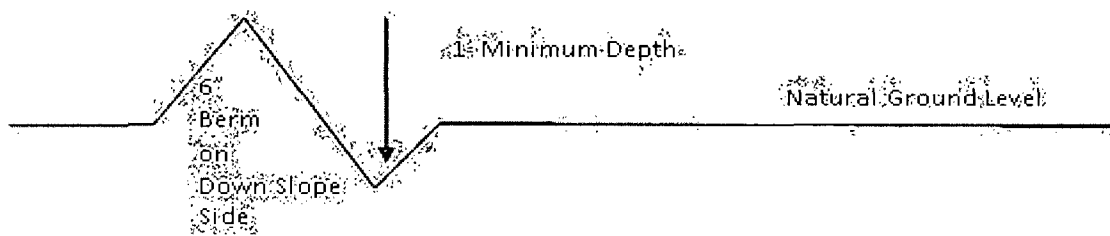
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**

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

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

#### **Cross Section of a Typical Lead-off Ditch**



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

#### **Formula for Spacing Interval of Lead-off Ditches**

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

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

#### **Cattleguards**

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

#### **Fence Requirement**

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

#### **Public Access**

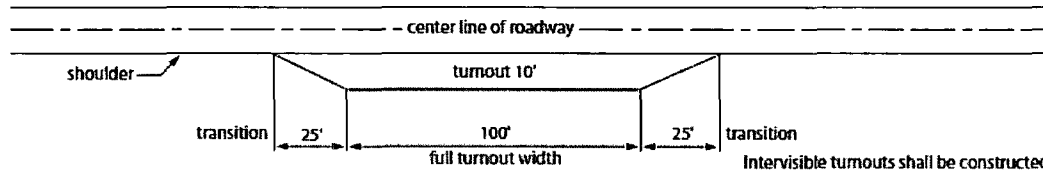
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.



### Construction Steps

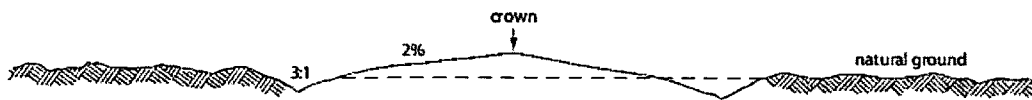
1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

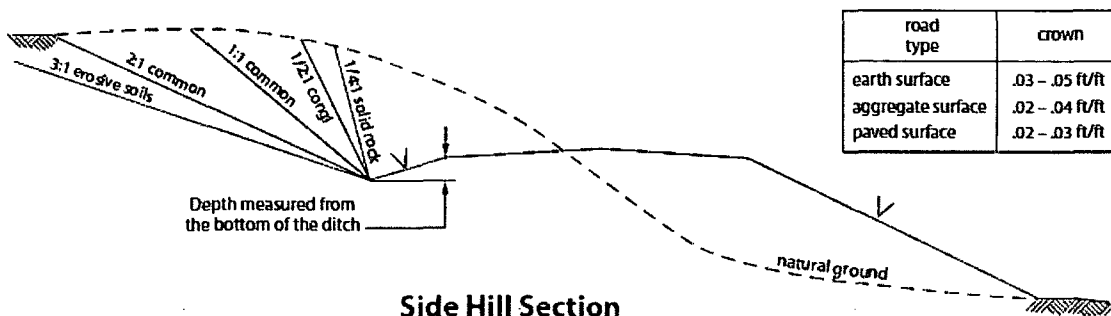


### Typical Turnout Plan

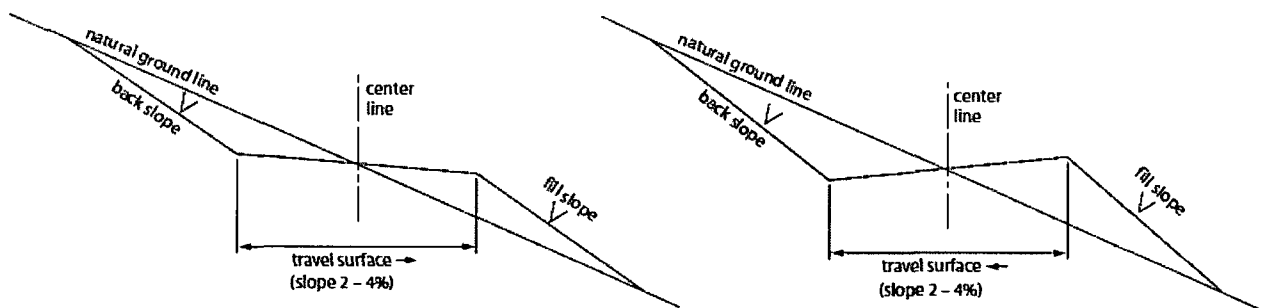
Intervisible turnouts shall be constructed on all single lane roads on all blind curves with additional turnouts as needed to keep spacing below 1000 feet.



### Level Ground Section



### Side Hill Section



### Typical Outsloped Section

### Typical Insloped Section

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. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM. Operator has stated that they will have monitoring equipment in place prior to drilling out of the surface shoe.**
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.**

#### **Capitan Reef**

**Possibility of water and brine flows in the Artesia and Salado Groups.**

**Possibility of lost circulation in the Artesia Group and Capitan Reef.**

1. The **20** inch surface casing shall be set at approximately **400** 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 **13-3/8** inch 1<sup>st</sup> intermediate casing is:
  - ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

3. The minimum required fill of cement behind the **9-5/8** inch 2<sup>nd</sup> intermediate casing, which shall be set at approximately **4000** feet, is:

**Operator has proposed DV tool at depth of 2500'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.**

- a. First stage to DV tool:

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

- b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef. Excess calculates to 11% - Additional cement may be required.**

**Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.**

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:

**Operator has proposed DV tool at depth of 4760'. Operator is to submit sundry if DV tool depth varies by more than 100' from approved depth.**

- a. First stage to DV tool:

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

- b. Second stage above DV tool:

☒ Cement should tie-back at least **50 feet above the Capitan Reef**. Operator shall provide method of verification.

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.

### 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. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** 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.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **13-3/8 1<sup>st</sup>** intermediate casing shoe shall be **3000 (3M)** psi.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, 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. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- 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 120513**

## **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).

#### **VRM Facility Requirement**

Low-profile tanks not greater than eight-feet-high shall be used.

### **B. PIPELINES**

#### **STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES**

**A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third



parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
  - (1) Land clearing.
  - (2) Earth-disturbing and earth-moving work.
  - (3) Blasting.
  - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing

by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder 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 will be made by the

authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. 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, powerline 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.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

## **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).

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

## Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

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

\*Pounds of pure live seed:

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