

OCD-ARTESIA

Form 3160-3
(February 2005)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. USA NMLC 063622
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 Co., LP		7. If Unit or CA Agreement, Name and No
3a. Address 20 North Broadway OKC, OK 73102	3b. Phone No. (include area code) (405)-552-7802	8. Lease Name and Well No Vega 29 Federal 1H [39050]
4. Location of Well (Report location clearly and in accordance with any State requirements *) At surface NENE 320' FNL & 900' FEL Lot A At proposed prod zone SESE 340' FSL & 900' FEL Lot P		9. API Well No. 30-015-39863
14. Distance in miles and direction from nearest town or post office* Approximately 14 miles southeast of Loco Hills, NM.		10. Field and Pool, or Exploratory Hackberry; Bone Spring [29345]
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 320'		11. Sec, T, R, M or Blk and Survey or Area Sec 29-T19S-R31E
16. No. of acres in lease 1081 acres		12. County or Parish Eddy
17. Spacing Unit dedicated to this well 160		13. State NM
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SL: 500' BHL: 700'	19. Proposed Depth MTVD 9070' MD 13419'	20. BLM/BIA Bond No. on file PH: 9420' CO-1104
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3486.9' GL	22. Approximate date work will start* 01/15/2012	23. Estimated duration 45 days

24. Attachments

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

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

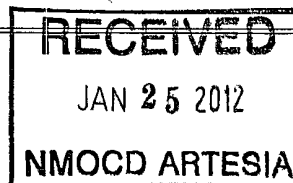
25. Signature		Name (Printed/Typed) Stephanie A. Ysasaga	Date 11/15/2011
Title Sr. Staff Engineering Technician			
Approved by (Signature)		Name (Printed/Typed) JAN 23 2012	Date JAN 23 2012
Title FIELD MANAGER		Office CARLSBAD FIELD OFFICE	

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

APPROVAL FOR TWO YEARS

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

*(Instructions on page 2)



Capitan Controlled Water Basin

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

**Approval Subject to General Requirements
& Special Stipulations Attached**

Operators Representative:

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

Steven Jones
Operations Engineer Advisor

Don Mayberry
Superintendent

Devon Energy Production Company, L.P.
20 North Broadway, Suite 1500
Oklahoma City, OK 73102-8260

Devon Energy Production Company, L.P.
Post Office Box 250
Artesia, NM 88211-0250

(405) 552-7994 (office)
(405) 596-8041 (cell)

(505) 748-0164 (office)
(505) 748-5235 (cell)

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 15th day of November, 2011.

Printed Name: Stephanie A. Ysasaga

Signed Name: [Signature]

Position Title: Sr. Staff Engineering Technician

Address: 20 North Broadway, OKC OK 73102

Telephone: (405) 552-7802

Field Representative (if not above signatory): Don Mayberry (see above)

Address (if different from above):

Telephone (if different from above):

E-mail (optional):

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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 October 15, 2009
Submit one copy to appropriate
District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-15-39863		Pool Code 29345		Pool Name HACKBERRY; BONE SPRING	
Property Code 39050		Property Name VEGA "29" FEDERAL			Well Number 1H
OGRID No 6137		Operator Name DEVON ENERGY PRODUCTION COMPANY, L.P.			Elevation 3486.9

" Surface Location

U/I or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	29	19 S	31 E		320	NORTH	900	EAST	EDDY

" Bottom Hole Location If Different From Surface

U/I or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	29	19 S	31 E		340	SOUTH	900	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No
160			

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>NW CORNER SEC. 29 LAT. = 32.6386302°N LONG. = 103.8999686°W NMSP EAST (FT) N = 596336.65 E = 674736.47</p>		<p>VEGA "29" FEDERAL #1H ELEV. = 3486.9' LAT. = 32.6377726°N (NAD83) LONG. = 103.8857377°W NMSP EAST (FT) N = 596042.83 E = 679118.40</p>		<p>SURFACE LOCATION 320' 900'</p>		<p>NE CORNER SEC. 29 LAT. = 32.6386302°N LONG. = 103.8828175°W NMSP EAST (FT) N = 596336.47 E = 680033.94</p>	
<p>SW CORNER SEC. 29 LAT. = 32.6241144°N LONG. = 103.8999168°W NMSP EAST (FT) N = 591055.73 E = 674773.95</p>		<p>BOTTOM OF HOLE LAT. = 32.6250741°N LONG. = 103.8856931°W NMSP EAST (FT) N = 591423.05 E = 679151.59</p>		<p>SE CORNER SEC. 29 LAT. = 32.6241144°N LONG. = 103.8877673°W NMSP EAST (FT) N = 591088.77 E = 680055.80</p>		<p>BOTTOM OF HOLE 340' 900'</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 or other persons having an interest in or mineral interest in the land on which 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 hereby are entered by the division.

Signature: *[Signature]* Date: 11/17/2011
Printed Name: **STEPHANIE A. YSASAGA**

" 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.

Signature and Seal of Professional Surveyor: *[Signature]*
Certificate Number: 12797
Date of Survey: OCTOBER 17, 2011
SURVEY NO. 599

PENETRATION POINT: 520' FNL & 900' FEL



PRODUCING AREA



PROJECT AREA

DRILLING PROGRAM

Devon Energy Production Company, LP

Vega 29 Federal 1H

Surface Location: 320' FNL & 900' FEL, Unit A, Sec 29 T19S R31E, Eddy, NM

Bottom hole Location: 340' FSL & 900' FEL, Unit P, Sec 29 T19S R31E, Eddy, NM

1. Geologic Name of Surface Formation

- a. Quaternary

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

a. Quaternary Alluvium	95'	Fresh Water
b. Rustler	410'	Barren
c. Salado	545'	Barren
d. Base Salado	1990'	Barren
e. Tansil Dolomite	2045'	Barren
f. Yates	2140'	Barren
g. Seven Rivers	2380'	Barren
h. Capitan	2505'	Barren
i. Base Capitan	3995'	Barren
j. Delaware	4400'	Oil
k. Bone Springs	6690'	Oil
l. 1 st Bone Spring Ss	7960'	Oil
m. 2 nd Bone Spring Lime	8290'	Oil
n. 2 nd Bone Spring Ss	8830'	Oil
o. 2 nd Bone Spring Middle Ss	8970'	Oil
p. 2 nd Bone Spring Middle Ss Base	9070'	Oil
q. 3 rd Bone Spring Lm	9270'	Oil
r. Pilot Hole	9420'	
s. Total Depth	TVD 9070' MD 13419'	

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 13 3/8" casing at 450' and circulating cement back to surface. The fresh water sands will be protected by setting 9 5/8" casing at 4390' and circulating cement to surface. The fresh water intervals will be isolated by setting 5 1/2" casing to total depth and circulating cement above the base of the 9 5/8" casing. All casing is new and API approved.

NOTE: THIS WELL WILL BE DRILLED WITH A PILOT HOLE (PH)

3. Casing Program:

<u>Hole Size</u>	<u>Hole Interval</u>	<u>OD Csg</u>	<u>Casing Interval</u>	<u>Weight</u>	<u>Collar</u>	<u>Grade</u>
17 1/2"	0'-450'	13 3/8"	0'-450' 505	48#	STC	H-40
12 1/4"	450'-4390'	9 5/8"	0'-4390' 4175	40#	LTC	J-55
8 3/4"	4390'-8300'	5 1/2"	0'-8300'	17#	LTC	HCP-110
8 3/4"	8300'-13419'	5 1/2"	8300-13419'	17#	BTC	HCP-110

Max TVD: 9,070 ft

If lost circulation is encountered while drilling thru the reef, we will immediately notify the BLM and switch to fresh water and drill to the 9-5/8" casing point (approx 4,390 ft).

An 8-3/4" pilot hole will be drilled to 9,420' MD, and plugged back to KOP with 500 sxs, Class H, 15.6 ppg, 1.16 cf/sk cement.

Design Parameter Factors:

<u>Casing Size</u>	<u>Collapse Design Factor</u>	<u>Burst Design Factor</u>	<u>Tension Design Factor</u>
13 3/8"	3.65	8.21	14.91
9 5/8" 40# J-55 LTC	1.13	1.73	2.95
5 1/2" 17# HCP-110 LTC	1.64	2.02	1.55
5 1/2" 17# HCP-110 BTC	1.84	2.27	5.22

4. Cement Program: (Note: All cement volumes are calculated with 25% excesses)

- a. 13 3/8" Surface **Lead:** 250 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.125 lbs/sack Cello Flake + 4% bwoc Bentonite + 81.4% Fresh Water, 13.5 ppg. **Yield:** 1.75 cf/sk
- Tail:** 250 sacks Class C Cement + 2% bwoc Calcium Chloride + 0.125 lbs/sack Cello Flake + 56.3% Fresh Water, 14.8 ppg. **Yield:** 1.35 cf/sk.. **TOC @ surface.**
- b. 9 5/8" Intermediate **Lead:** 1000 sacks (60:40) Poz (Fly Ash):Class C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 6% bwoc Bentonite + 107.8% Fresh Water, 12.5 ppg. **Yield:** 1.73 cf/sk
- Tail:** 300 sacks (60:40) Poz Class C Cement + 4% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.4% bwoc Sodium Metasilicate + 4% bwoc MPA-5 + 52.7% Water, 14.8 ppg. **Yield:** 1.38 cf/sk. **TOC @ surface.**

~~DV tool and ECP at 2400' (approx 100' above the reef top)~~

c. 5 1/2" Production

1st Stage

Lead: 755 sacks (35:65) Poz (Fly Ash):Class H Cement + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 2% bwoc Bentonite + 0.6% bwoc Sodium Metasilicate + 0.5% bwoc FL-52A + 102.5% Fresh Water, 12.5 ppg. **Yield:** 2.00 cf/sk

Tail: 1,510 sacks (50:50) Poz (Fly Ash):Class H Cement + 1% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 58.3% Fresh Water, 14.2 ppg. **Yield:** 1.28 cf/sk

DV TOOL at ~5,500 ft

2nd Stage

Lead: 800 sacks Class C Cement + 1% bwow Calcium Chloride + 0.125 lbs/sack Cello Flake + 157.8% Fresh Water, 11.4 ppg. **Yield:** 2.88 cf/sk

Tail: 150 sacks (60:40) Poz (Fly Ash):Class C Cement + 1% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 63.2% Fresh Water, 13.8 ppg. **Yield:** 1.38 cf/sk. **TOC @ 2,300'**

TOC for All Strings:

Surface:	0'
Intermediate:	0'
Production:	2,300'

The above cement volumes could be revised pending the caliper measurement from the open hole logs. Actual cement volumes will be adjusted bases on fluid caliper and caliper log data.

5. Pressure Control Equipment:

BOP DESIGN: The BOP system used to drill the **12-1/4"** and **8-3/4"** hole will consist of a **13-5/8" 3M Triple 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). The line will be kept as straight as possible with minimal turns.

6. **Proposed Mud Circulation System**

<u>Depth</u>	<u>Mud Wt.</u>	<u>Visc</u>	<u>Fluid Loss</u>	<u>Type System</u>
0' - 450' ⁵⁰⁵	8.4-9.0	30-34	NC	Fresh Water
450' - 4390' ⁴¹⁵	9.8-10.0	28-32	NC	Brine
4390' - 13419'	8.6-9.0	28-32	NC-12	Fresh Water

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

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

- A 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.

8. **Logging, Coring, and Testing Program:** *See 101A*

- 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.

9. **Potential Hazards:**

- No abnormal pressures or temperatures are expected. There is no known presence of H₂S in this area. If H₂S 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 3800 psi and Estimated BHT 140°. No H₂S is anticipated to be encountered.

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

- 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.



Devon Energy, Inc.

Eddy County

Vega "29" Federal

#1H

OH

Plan: Plan #1

Pathfinder X & Y Report

08 November, 2011



PATHFINDER[®]

A Schlumberger Company



Smith International, Inc.
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	Devon Energy, Inc.	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Site:	Vega "29" Federal	MD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Project:	Eddy County		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	Vega "29" Federal		
Site Position:		Northing:	596,042.830 usft
From:	Map	Easting:	679,118.400 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 38' 15.982 N
		Longitude:	103° 53' 8.656 W
		Grid Convergence:	0.24 °

Well		#1H				
Well Position	+N/-S	0.0 usft	Northing:	596,042.830 usft	Latitude:	32° 38' 15.982 N
	+E/-W	0.0 usft	Easting:	679,118.400 usft	Longitude:	103° 53' 8.656 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,486.9 usft	

Wellbore:		OH			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/8/2011	7.70	60.53	48,828

Design:	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.59

Survey Tool Program:	Date:	11/8/2011		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
0.0	13,419.0	Plan #1 (OH)	Pathfinder	Pathfinder MWD



Smith International, Inc.
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	Devon Energy Inc.	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Site:	Vega "29" Federal	MD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey:												
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)		
0.0	0.00	0.00	0.0	-3,512.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
100.0	0.00	0.00	100.0	-3,412.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
200.0	0.00	0.00	200.0	-3,312.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
300.0	0.00	0.00	300.0	-3,212.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
400.0	0.00	0.00	400.0	-3,112.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
500.0	0.00	0.00	500.0	-3,012.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
600.0	0.00	0.00	600.0	-2,912.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
700.0	0.00	0.00	700.0	-2,812.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
800.0	0.00	0.00	800.0	-2,712.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
900.0	0.00	0.00	900.0	-2,612.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,000.0	0.00	0.00	1,000.0	-2,512.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,100.0	0.00	0.00	1,100.0	-2,412.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,200.0	0.00	0.00	1,200.0	-2,312.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,300.0	0.00	0.00	1,300.0	-2,212.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,400.0	0.00	0.00	1,400.0	-2,112.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,500.0	0.00	0.00	1,500.0	-2,012.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,600.0	0.00	0.00	1,600.0	-1,912.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,700.0	0.00	0.00	1,700.0	-1,812.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,800.0	0.00	0.00	1,800.0	-1,712.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
1,900.0	0.00	0.00	1,900.0	-1,612.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,000.0	0.00	0.00	2,000.0	-1,512.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,100.0	0.00	0.00	2,100.0	-1,412.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,200.0	0.00	0.00	2,200.0	-1,312.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,300.0	0.00	0.00	2,300.0	-1,212.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,400.0	0.00	0.00	2,400.0	-1,112.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,500.0	0.00	0.00	2,500.0	-1,012.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		
2,600.0	0.00	0.00	2,600.0	-912.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40		



Smith International, Inc.
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company:	Devon Energy, Inc.	Local Co-ordinate Reference:	Well #1H
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Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,700.0	0.00	0.00	2,700.0	-812.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
2,800.0	0.00	0.00	2,800.0	-712.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
2,900.0	0.00	0.00	2,900.0	-612.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,000.0	0.00	0.00	3,000.0	-512.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,100.0	0.00	0.00	3,100.0	-412.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,200.0	0.00	0.00	3,200.0	-312.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,300.0	0.00	0.00	3,300.0	-212.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,400.0	0.00	0.00	3,400.0	-112.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,500.0	0.00	0.00	3,500.0	-12.9	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,600.0	0.00	0.00	3,600.0	87.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,700.0	0.00	0.00	3,700.0	187.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,800.0	0.00	0.00	3,800.0	287.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
3,900.0	0.00	0.00	3,900.0	387.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,000.0	0.00	0.00	4,000.0	487.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,100.0	0.00	0.00	4,100.0	587.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,200.0	0.00	0.00	4,200.0	687.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,300.0	0.00	0.00	4,300.0	787.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,400.0	0.00	0.00	4,400.0	887.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,500.0	0.00	0.00	4,500.0	987.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,600.0	0.00	0.00	4,600.0	1,087.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,700.0	0.00	0.00	4,700.0	1,187.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,800.0	0.00	0.00	4,800.0	1,287.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
4,900.0	0.00	0.00	4,900.0	1,387.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,000.0	0.00	0.00	5,000.0	1,487.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,100.0	0.00	0.00	5,100.0	1,587.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,200.0	0.00	0.00	5,200.0	1,687.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,300.0	0.00	0.00	5,300.0	1,787.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	



Smith International, Inc.
Pathfinder X & Y Report



Company:	Devon Energy, Inc.	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Site:	Vega 29 Federal	MD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
5,400.0	0.00	0.00	5,400.0	1,887.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,500.0	0.00	0.00	5,500.0	1,987.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,600.0	0.00	0.00	5,600.0	2,087.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,700.0	0.00	0.00	5,700.0	2,187.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,800.0	0.00	0.00	5,800.0	2,287.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
5,900.0	0.00	0.00	5,900.0	2,387.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,000.0	0.00	0.00	6,000.0	2,487.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,100.0	0.00	0.00	6,100.0	2,587.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,200.0	0.00	0.00	6,200.0	2,687.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,300.0	0.00	0.00	6,300.0	2,787.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,400.0	0.00	0.00	6,400.0	2,887.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,500.0	0.00	0.00	6,500.0	2,987.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,600.0	0.00	0.00	6,600.0	3,087.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,700.0	0.00	0.00	6,700.0	3,187.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,800.0	0.00	0.00	6,800.0	3,287.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
6,900.0	0.00	0.00	6,900.0	3,387.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,000.0	0.00	0.00	7,000.0	3,487.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,100.0	0.00	0.00	7,100.0	3,587.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,200.0	0.00	0.00	7,200.0	3,687.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,300.0	0.00	0.00	7,300.0	3,787.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,400.0	0.00	0.00	7,400.0	3,887.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,500.0	0.00	0.00	7,500.0	3,987.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,600.0	0.00	0.00	7,600.0	4,087.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,700.0	0.00	0.00	7,700.0	4,187.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,800.0	0.00	0.00	7,800.0	4,287.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
7,900.0	0.00	0.00	7,900.0	4,387.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
8,000.0	0.00	0.00	8,000.0	4,487.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	



Smith International, Inc.
Pathfinder X & Y Report



Company:	Devon Energy, Inc.	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Site:	Vega "29" Federal	MD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
8,100.0	0.00	0.00	8,100.0	4,587.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
8,200.0	0.00	0.00	8,200.0	4,687.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
8,300.0	0.00	0.00	8,300.0	4,787.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
8,400.0	0.00	0.00	8,400.0	4,887.1	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
8,472.1	0.00	0.00	8,472.1	4,959.2	0.0	0.0	0.0	0.00	596,042.83	679,118.40	
8,500.0	2.79	179.59	8,500.0	4,987.1	-0.7	0.0	0.7	10.00	596,042.15	679,118.40	
8,550.0	7.79	179.59	8,549.8	5,036.9	-5.3	0.0	5.3	10.00	596,037.54	679,118.44	
8,600.0	12.79	179.59	8,598.9	5,086.0	-14.2	0.1	14.2	10.00	596,028.61	679,118.50	
8,650.0	17.79	179.59	8,647.2	5,134.3	-27.4	0.2	27.4	10.00	596,015.43	679,118.60	
8,700.0	22.79	179.59	8,694.0	5,181.1	-44.7	0.3	44.7	10.00	595,998.10	679,118.72	
8,750.0	27.79	179.59	8,739.2	5,226.3	-66.1	0.5	66.1	10.00	595,976.75	679,118.87	
8,800.0	32.79	179.59	8,782.4	5,269.5	-91.3	0.7	91.3	10.00	595,951.54	679,119.06	
8,850.0	37.79	179.59	8,823.2	5,310.3	-120.2	0.9	120.2	10.00	595,922.66	679,119.26	
8,900.0	42.79	179.59	8,861.3	5,348.4	-152.5	1.1	152.5	10.00	595,890.34	679,119.50	
8,950.0	47.79	179.59	8,896.5	5,383.6	-188.0	1.4	188.0	10.00	595,854.82	679,119.75	
9,000.0	52.79	179.59	8,928.4	5,415.5	-226.5	1.6	226.5	10.00	595,816.37	679,120.03	
9,050.0	57.79	179.59	8,956.9	5,444.0	-267.6	1.9	267.6	10.00	595,775.28	679,120.32	
9,100.0	62.79	179.59	8,981.7	5,468.8	-311.0	2.2	311.0	10.00	595,731.87	679,120.63	
9,150.0	67.79	179.59	9,002.5	5,489.6	-356.4	2.6	356.4	10.00	595,686.46	679,120.96	
9,200.0	72.79	179.59	9,019.4	5,506.5	-403.4	2.9	403.4	10.00	595,639.41	679,121.30	
9,250.0	77.79	179.59	9,032.1	5,519.2	-451.8	3.2	451.8	10.00	595,591.06	679,121.65	
9,300.0	82.79	179.59	9,040.5	5,527.6	-501.0	3.6	501.0	10.00	595,541.79	679,122.00	
9,350.0	87.79	179.59	9,044.6	5,531.7	-550.8	4.0	550.9	10.00	595,491.98	679,122.36	
9,368.6	89.65	179.59	9,045.0	5,532.1	-569.4	4.1	569.4	10.00	595,473.42	679,122.49	
9,400.0	89.65	179.59	9,045.2	5,532.3	-600.8	4.3	600.9	0.00	595,441.99	679,122.72	
9,500.0	89.65	179.59	9,045.9	5,533.0	-700.8	5.0	700.9	0.00	595,341.99	679,123.44	
9,600.0	89.65	179.59	9,046.5	5,533.6	-800.8	5.8	800.9	0.00	595,242.00	679,124.15	



Smith International, Inc.
Pathfinder X & Y Report



Company:	Devon Energy Inc	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Site:	Vega 29 Federal	MD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000:1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
9,700.0	89.65	179.59	9,047.1	5,534.2	-900.8	6.5	900.9	0.00	595,142.00	679,124.87	
9,800.0	89.65	179.59	9,047.7	5,534.8	-1,000.8	7.2	1,000.8	0.00	595,042.01	679,125.59	
9,900.0	89.65	179.59	9,048.3	5,535.4	-1,100.8	7.9	1,100.8	0.00	594,942.01	679,126.31	
10,000.0	89.65	179.59	9,048.9	5,536.0	-1,200.8	8.6	1,200.8	0.00	594,842.02	679,127.03	
10,100.0	89.65	179.59	9,049.6	5,536.7	-1,300.8	9.3	1,300.8	0.00	594,742.02	679,127.75	
10,200.0	89.65	179.59	9,050.2	5,537.3	-1,400.8	10.1	1,400.8	0.00	594,642.02	679,128.46	
10,300.0	89.65	179.59	9,050.8	5,537.9	-1,500.8	10.8	1,500.8	0.00	594,542.03	679,129.18	
10,400.0	89.65	179.59	9,051.4	5,538.5	-1,600.8	11.5	1,600.8	0.00	594,442.03	679,129.90	
10,500.0	89.65	179.59	9,052.0	5,539.1	-1,700.8	12.2	1,700.8	0.00	594,342.04	679,130.62	
10,600.0	89.65	179.59	9,052.6	5,539.7	-1,800.8	12.9	1,800.8	0.00	594,242.04	679,131.34	
10,700.0	89.65	179.59	9,053.2	5,540.3	-1,900.8	13.7	1,900.8	0.00	594,142.05	679,132.06	
10,800.0	89.65	179.59	9,053.9	5,541.0	-2,000.8	14.4	2,000.8	0.00	594,042.05	679,132.77	
10,900.0	89.65	179.59	9,054.5	5,541.6	-2,100.8	15.1	2,100.8	0.00	593,942.06	679,133.49	
11,000.0	89.65	179.59	9,055.1	5,542.2	-2,200.8	15.8	2,200.8	0.00	593,842.06	679,134.21	
11,100.0	89.65	179.59	9,055.7	5,542.8	-2,300.8	16.5	2,300.8	0.00	593,742.06	679,134.93	
11,200.0	89.65	179.59	9,056.3	5,543.4	-2,400.8	17.2	2,400.8	0.00	593,642.07	679,135.65	
11,300.0	89.65	179.59	9,056.9	5,544.0	-2,500.8	18.0	2,500.8	0.00	593,542.07	679,136.37	
11,400.0	89.65	179.59	9,057.6	5,544.7	-2,600.8	18.7	2,600.8	0.00	593,442.08	679,137.08	
11,500.0	89.65	179.59	9,058.2	5,545.3	-2,700.7	19.4	2,700.8	0.00	593,342.08	679,137.80	
11,600.0	89.65	179.59	9,058.8	5,545.9	-2,800.7	20.1	2,800.8	0.00	593,242.09	679,138.52	
11,700.0	89.65	179.59	9,059.4	5,546.5	-2,900.7	20.8	2,900.8	0.00	593,142.09	679,139.24	
11,800.0	89.65	179.59	9,060.0	5,547.1	-3,000.7	21.6	3,000.8	0.00	593,042.10	679,139.96	
11,900.0	89.65	179.59	9,060.6	5,547.7	-3,100.7	22.3	3,100.8	0.00	592,942.10	679,140.68	
12,000.0	89.65	179.59	9,061.3	5,548.4	-3,200.7	23.0	3,200.8	0.00	592,842.10	679,141.40	
12,100.0	89.65	179.59	9,061.9	5,549.0	-3,300.7	23.7	3,300.8	0.00	592,742.11	679,142.11	
12,200.0	89.65	179.59	9,062.5	5,549.6	-3,400.7	24.4	3,400.8	0.00	592,642.11	679,142.83	
12,300.0	89.65	179.59	9,063.1	5,550.2	-3,500.7	25.2	3,500.8	0.00	592,542.12	679,143.55	



Smith International, Inc.
Pathfinder X & Y Report



Company:	Devon Energy, Inc.	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County	TVD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Site:	Vega "29" Federal	MD Reference:	KB = 26 @ 3512.9usft (H&P 300)
Well:	#1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000:1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
12,400.0	89.65	179.59	9,063.7	5,550.8	-3,600.7	25.9	3,600.8	0.00	592,442.12	679,144.27	
12,500.0	89.65	179.59	9,064.3	5,551.4	-3,700.7	26.6	3,700.8	0.00	592,342.13	679,144.99	
12,600.0	89.65	179.59	9,065.0	5,552.1	-3,800.7	27.3	3,800.8	0.00	592,242.13	679,145.71	
12,700.0	89.65	179.59	9,065.6	5,552.7	-3,900.7	28.0	3,900.8	0.00	592,142.14	679,146.42	
12,800.0	89.65	179.59	9,066.2	5,553.3	-4,000.7	28.7	4,000.8	0.00	592,042.14	679,147.14	
12,900.0	89.65	179.59	9,066.8	5,553.9	-4,100.7	29.5	4,100.8	0.00	591,942.15	679,147.86	
13,000.0	89.65	179.59	9,067.4	5,554.5	-4,200.7	30.2	4,200.8	0.00	591,842.15	679,148.58	
13,100.0	89.65	179.59	9,068.0	5,555.1	-4,300.7	30.9	4,300.8	0.00	591,742.15	679,149.30	
13,200.0	89.65	179.59	9,068.7	5,555.8	-4,400.7	31.6	4,400.8	0.00	591,642.16	679,150.02	
13,300.0	89.65	179.59	9,069.3	5,556.4	-4,500.7	32.3	4,500.8	0.00	591,542.16	679,150.73	
13,400.0	89.65	179.59	9,069.9	5,557.0	-4,600.7	33.1	4,600.8	0.00	591,442.17	679,151.45	
13,419.1	89.65	179.59	9,070.0	5,557.1	-4,619.8	33.2	4,619.9	0.00	591,423.05	679,151.59	

Checked By: _____	Approved By: _____	Date: _____
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Project: Eddy County
Site: Vega "29" Federal
Well: #1H
Wellbore: OH
Plan: Plan #1 (#1H/OH)



A Schlumberger Company

West(-)/East(+) (200 usft/in)

PROJECT DETAILS: Eddy County
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid



Azimuths to Grid North
True North: -0.24°
Magnetic North: 7.46°

Magnetic Field
Strength: 48828.1snT
Dip Angle: 60.53°
Date: 11/8/2011
Model: IGRF200510

WELL DETAILS: #1H

Ground Elevation: 3486.9
RKB Elevation: KB = 26 @ 3512.9usft (H&P 300)
Rig Name: H&P 300

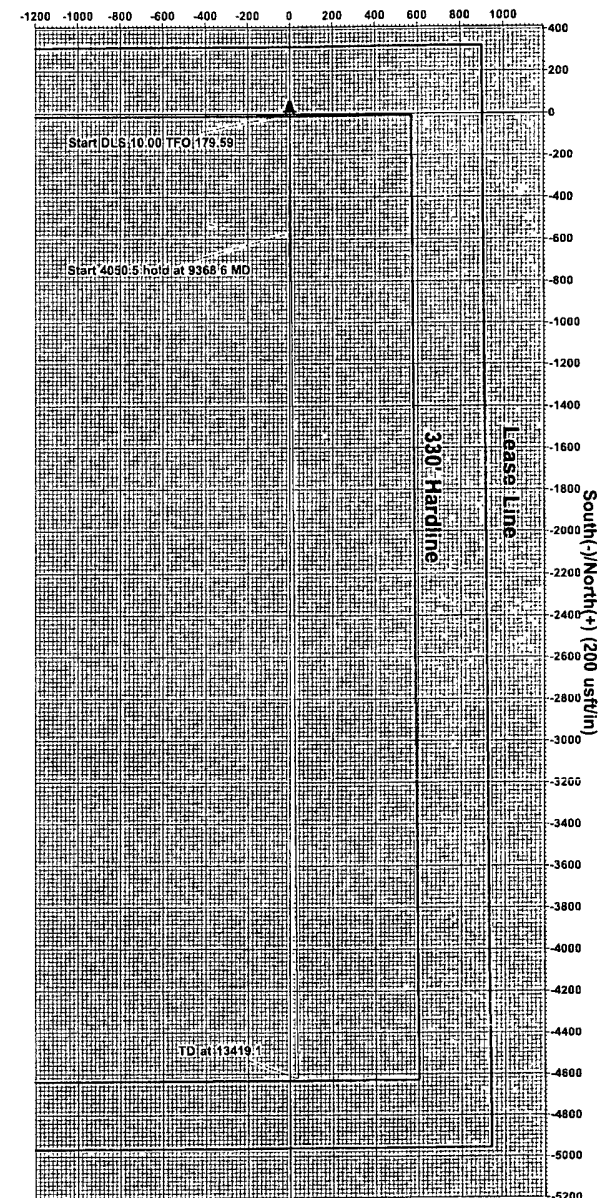
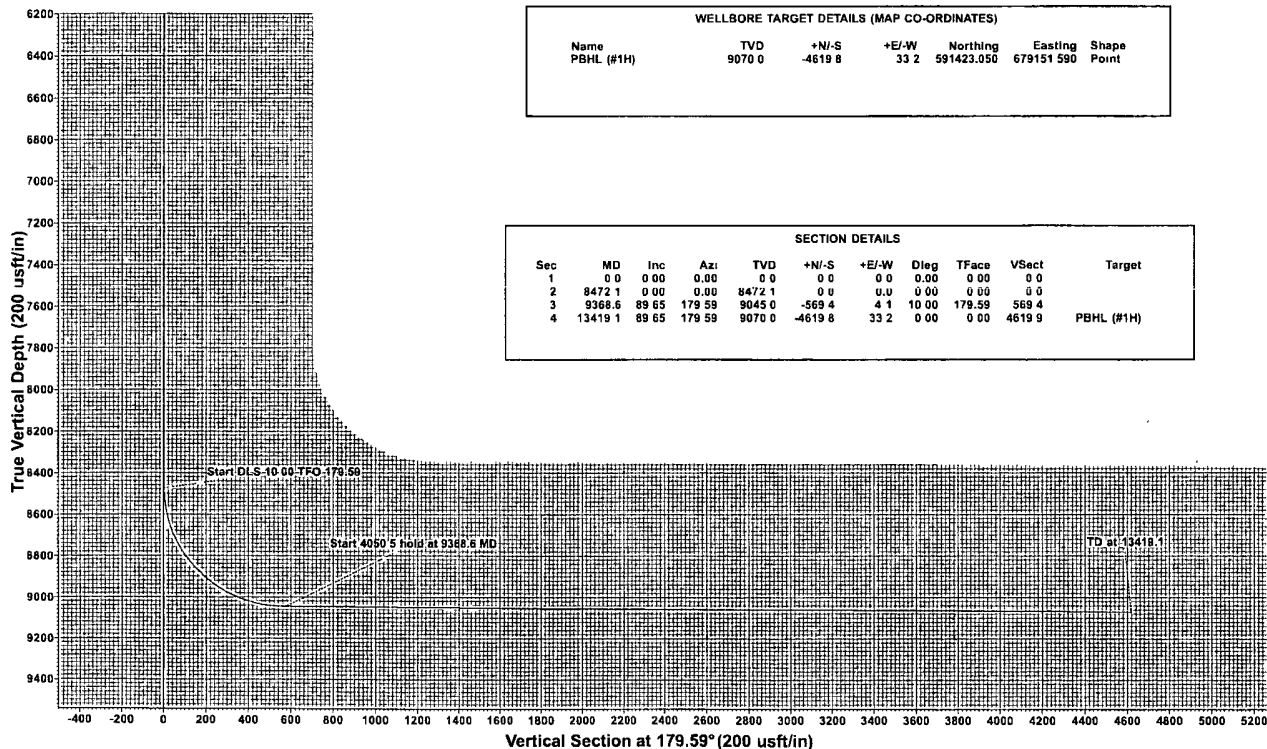
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Spot
0.0	0.0	596042.630	679118.400	32°38'15.982"N	103°53'06.656"W	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL (#1H)	9070.0	-4619.8	33.2	591423.050	679151.590	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFac	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	8472.1	0.00	0.00	8472.1	0.0	0.0	0.00	0.00	0.0	
3	9368.6	89.65	179.59	9045.0	-569.4	4.1	10.00	179.59	569.4	
4	13419.1	89.65	179.59	9070.0	-4619.8	33.2	0.00	0.00	4619.9	PBHL (#1H)



Plan: Plan #1 (#1H/OH)

Created By: Sam Biffle Date: 14.06, November 08 2011



**Devon Energy Corporation
20 North Broadway
Oklahoma City, Oklahoma 73102-8260**

Hydrogen Sulfide (H₂S) Contingency Plan

For

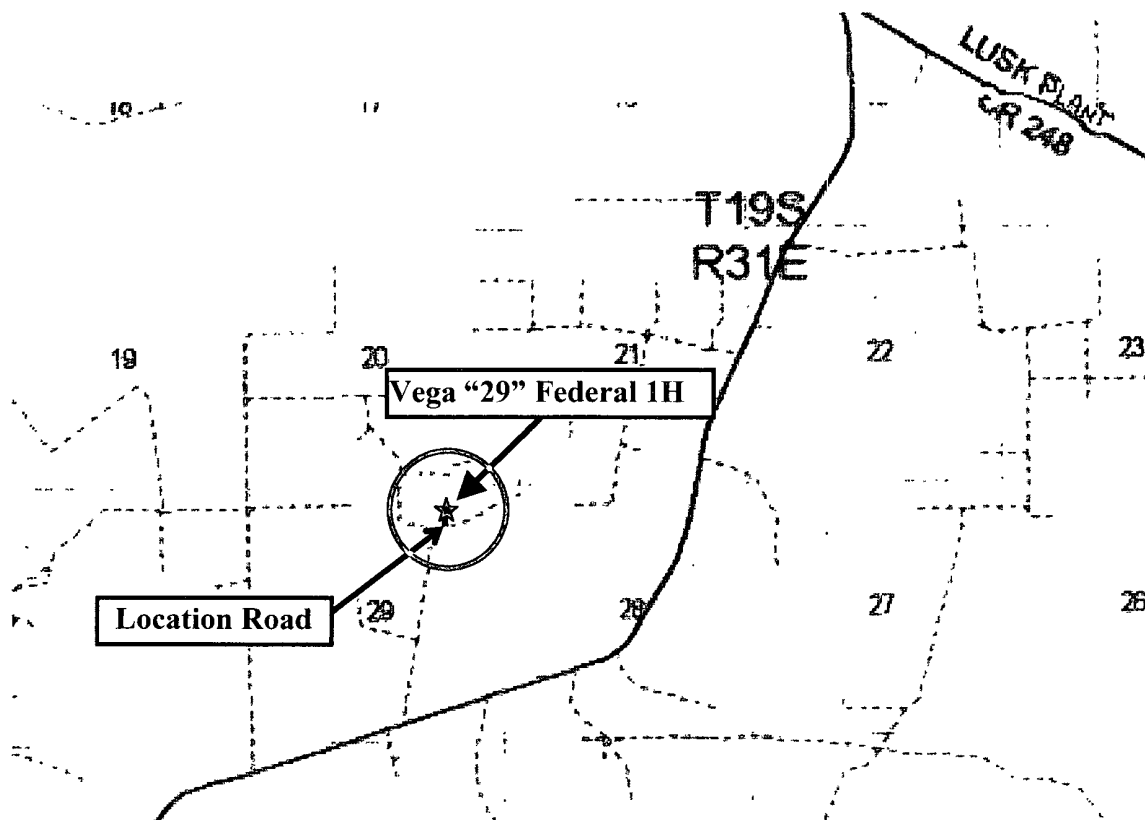
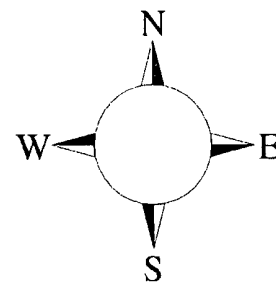
Vega "29" Federal 1H

**Sec-29, T-19S R-31E
320' FNL & 900' FEL,
LAT. = 32.6377726°N (NAD83)
LONG = 103.8857377°W**

Eddy County NM

Vega "29" Federal 1H

This is an open drilling site. H₂S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H₂S, including warning signs, wind indicators and H₂S monitor.



Assumed 100 ppm 3000' ()
100 ppm H₂S 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 South to caliche road and then jog Southward on 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 H₂S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H₂S, 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 H₂S 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 H₂S, 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 (SO₂). 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 H₂S and SO₂

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

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)

Devon Energy Corp. Company Call List

<u>Artesia (575)</u>	<u>Cellular</u>	<u>Office</u>	<u>Home</u>
Foreman – Roger Hernandez	748-0169	748-5238	
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 – Steven Jones(405) 552-7994(405) 596-8041	

Agency Call List

<u>Lea</u>	<u>Hobbs</u>
<u>County</u>	State Police 392-5588
<u>(575)</u>	City Police 397-9265
	Sheriff's Office 393-2515
	Ambulance 911
	Fire Department 397-9308
	LEPC (Local Emergency Planning Committee) 393-2870
	NMOCD 393-6161
	US Bureau of Land Management 393-3612

<u>Eddy</u>	<u>Carlsbad</u>
<u>County</u>	State Police 885-3137
<u>(575)</u>	City Police 885-2111
	Sheriff's Office 887-7551
	Ambulance 911
	Fire Department 885-2111
	LEPC (Local Emergency Planning Committee) 887-3798
	US Bureau of Land Management 887-6544
	New Mexico Emergency Response Commission (Santa Fe) ... (505)476-9600
	24 HR (505) 827-9126
	National Emergency Response Center (Washington, DC) .. (800) 424-8802

Emergency Services

	Boots & Coots IWC1-800-256-9688 or (281) 931-8884
	Cudd Pressure Control(915) 699-0139 or (915) 563-3356
	Halliburton(575) 746-2757
	B. J. Services(575) 746-3569
<i>Give</i>	Flight For Life - Lubbock, TX(806) 743-9911
<i>GPS</i>	Aerocare - Lubbock, TX(806) 747-8923
<i>position:</i>	Med Flight Air Amb - Albuquerque, NM(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM(575) 272-3115

Prepared in conjunction with
Wade Rohloff





Proposed Interim Site Reclamation

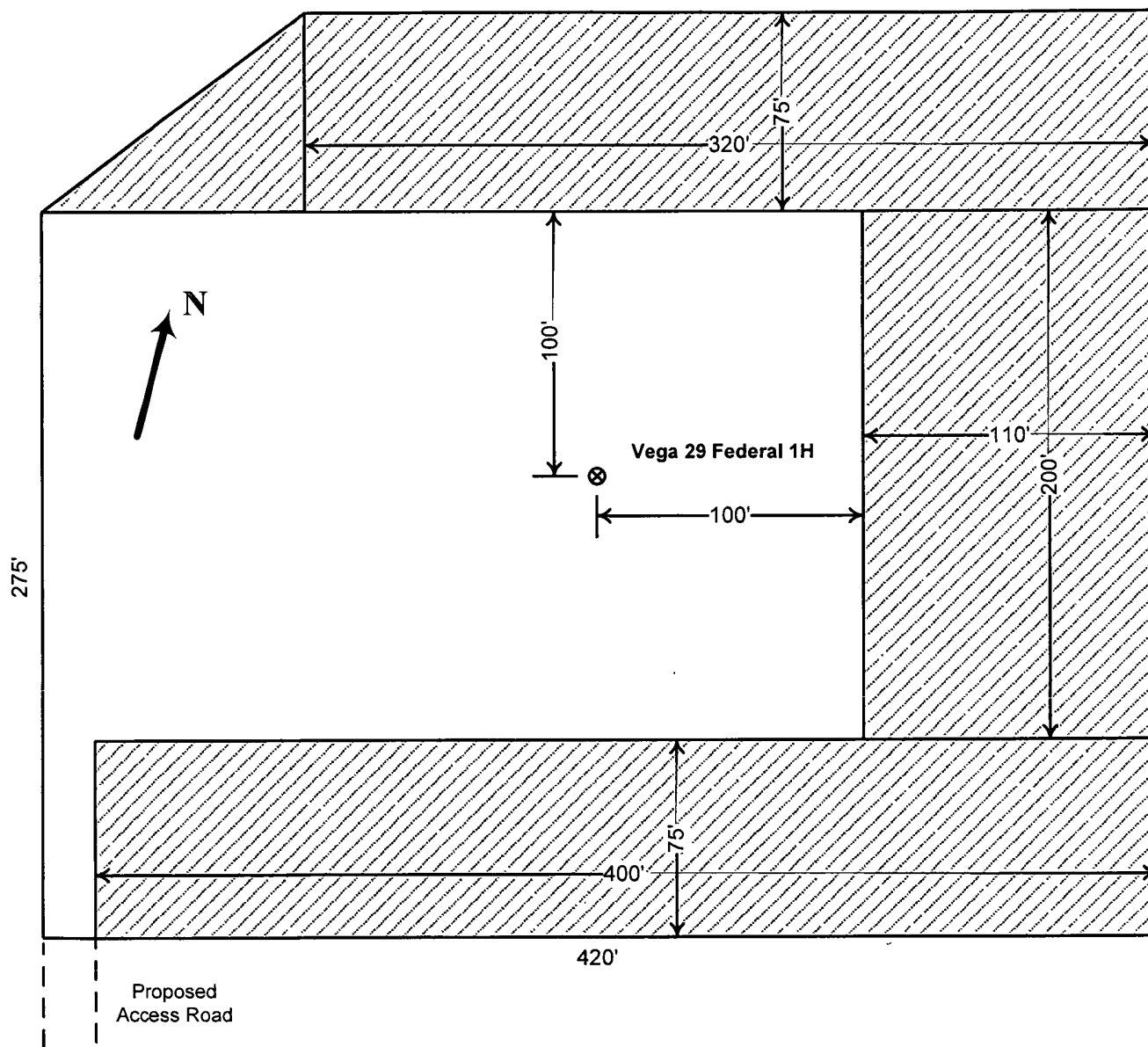
Devon Energy Production Co.
Vega 29 Federal 1H
320' FNL & 900' FEL
Sec. 29-T19S-R31E
Eddy County, NM



Proposed
Reclamation
Area



Scale: 1in = 60ft.



PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	DEVON ENERGY
LEASE NO.:	NMLC063622
WELL NAME & NO.:	1H VEGA 29 FEDERAL
SURFACE HOLE FOOTAGE:	320' FNL & 900' FEL
BOTTOM HOLE FOOTAGE:	340' FSL & 900' FEL
LOCATION:	Section 29, T.19 S., R.31 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - Hackberry Special Recreation Management Area
 - Pad Construction
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - H₂S – Onshore Order #6
 - Logging Requirements
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **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 Special Recreation Management Area: Pipelines 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. Surface lines shall not obstruct roads, "two-tracks" or trails. Surface lines shall be buried a minimum of 6 inches under all approved trails within the Hackberry SRMA to allow safe passage of motorcycles and ATV's. 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. Appropriate safety signage will be in place during all phases of the project. Upon completion of construction, the road shall be returned to pre-construction condition with no bumps or dips. All vehicle and equipment operators will observe speed limits and practice responsible defensive driving habits.

Pad Construction

Well-pad is to be constructed so as to avoid removing the northern/northwestern dunal hill. Care will be taken to avoid unneeded changes to the land-form at the north/northwestern pad edge.

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) 234-6235 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 stockpile the topsoil in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 4 inches in depth. The topsoil will be used 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. 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 (20) 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

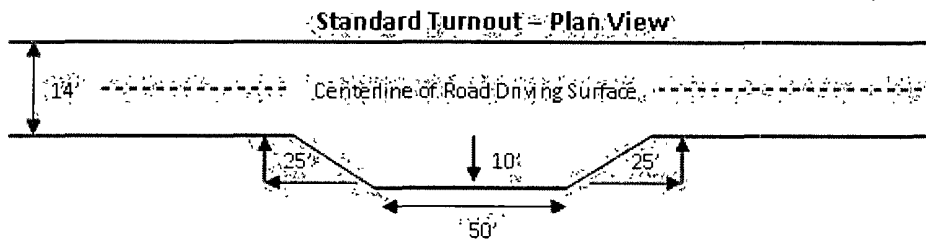
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

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 be constructed on all blind curves. Turnouts shall conform to the following diagram:

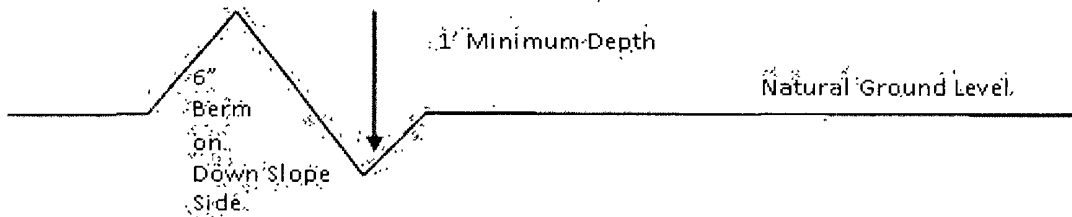


Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing 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:

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

Culvert Installations

Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road 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 cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

Fence Requirement

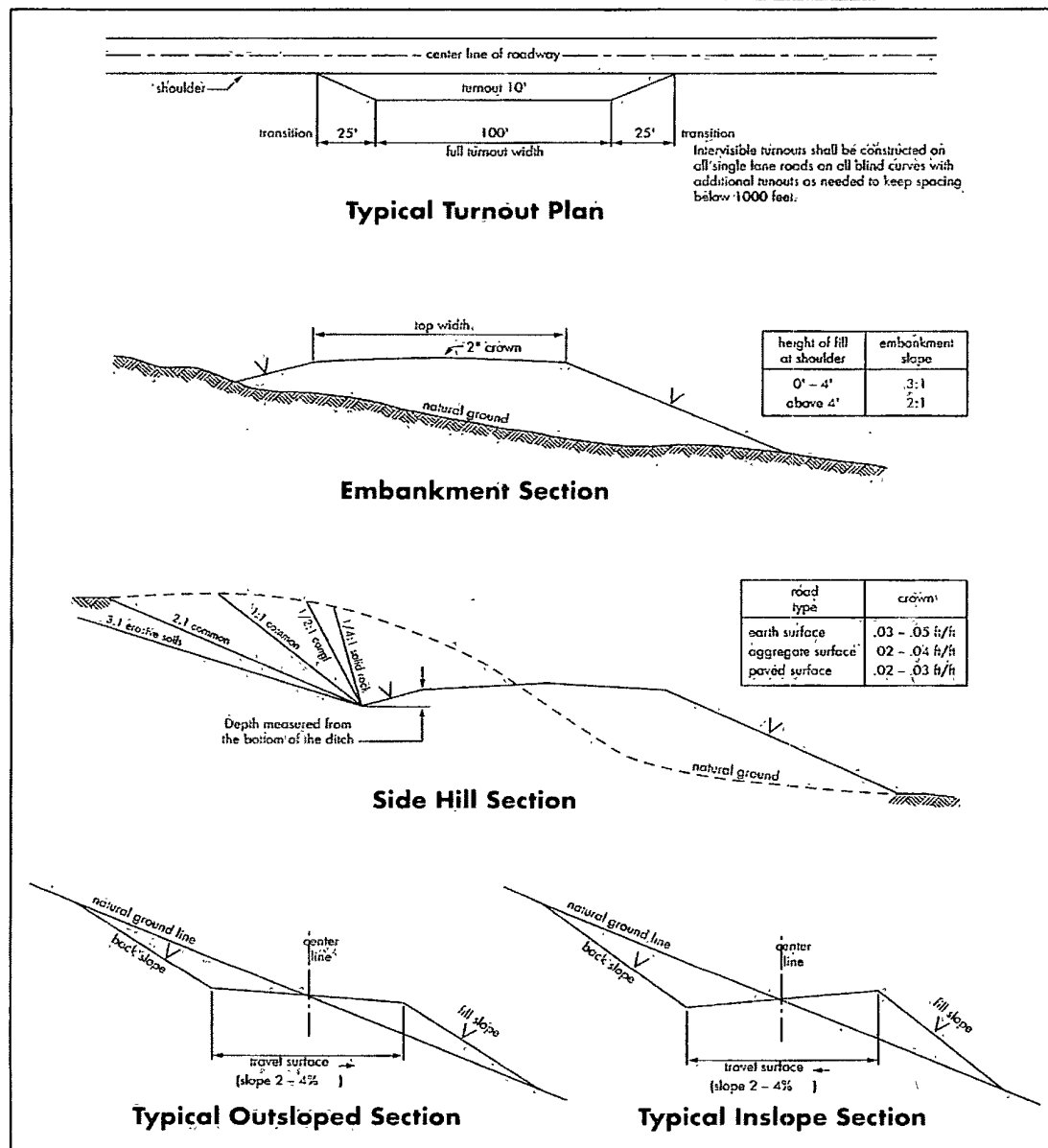
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access

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

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

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

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

☒ **Eddy County**

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

1. A Hydrogen Sulfide (H₂S) Drilling Plan should be activated 500 feet prior to drilling into the Yates formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**
2. 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 are located, this does not include the dog house or stairway area.
3. **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 and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.

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. 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.

**Possible water and brine flows in the Salado and Artesia groups.
Possible lost circulation in the Artesia group and Capitan Reef.**

1. The 13-3/8 inch surface casing shall be set at **approximately 505 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface.
 - 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.

Special Capitan Reef requirements:

If any lost circulation occurs below the Base of the Salt, the operator shall do the following:

- **Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.**

- **Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.**
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing (set casing in the base of the Capitan Reef at approximately **4175'**) is:
- ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef.**

Positive standoff centralizers shall be utilized for the production string every other joint of casing from 100' MD above KOP or at the legal footage setback, whichever is the deeper MD, up to TOC.

The pilot hole plugging procedure is approved as written.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
- a. First stage to DV tool, cement shall:
 - ☒ 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 shall:
 - ☒ Cement should tie-back a minimum of 50 feet above the Capitan Reef. Operator shall provide method of verification.
4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. **Variance approved to use flex line with Serial #49106 from BOP to choke manifold. Check condition of 3" 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. Anchor requirements to be onsite for review. 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 **3000 (3M)** psi.
 - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
4. 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 results of the test shall be reported to the appropriate BLM office.

- d. 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.**
- e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

D. DRILL STEM TEST

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

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.

CRW 012312

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

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

Containment Structures

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

Painting Requirement

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

IX. INTERIM RECLAMATION

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
Four-winged Saltbush	5lbs/A

*Pounds of pure live seed:

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