

# OIL CONSERVATION

ARTESIA DISTRICT

MAY 22 2017

Form 3160-3  
(March 2012)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

RECEIVED

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

## APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM012121
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 LP		7. If Unit or CA Agreement, Name and No.
3a. Address 333 West Sheridan Avenue Oklahoma City OK	3b. Phone No. (include area code) (405)552-6571	8. Lease Name and Well No. COTTON DRAW UNIT 513H
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface SWSE / 230 FSL / 1815 FEL / LAT 32.1817205 / LONG -103.7288335 At proposed prod. zone NENE / 290 FNL / 660 FEL / LAT 32.1956038 / LONG -103.7315137		9. API Well No. <b>30-015-44199</b>
14. Distance in miles and direction from nearest town or post office*		10. Field and Pool, or Exploratory PADUCA / BONE SPRING <b>96641</b>
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 230 feet		11. Sec. T. R. M. or Blk. and Survey or Area SEC 25 / T24S / R31E / NMP
16. No. of acres in lease 1280		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, 750 feet applied for, on this lease, ft.		20. BLM/BIA Bond No. on file FED: CO1104
19. Proposed Depth 10200 feet / 15440 feet		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3514 feet
22. Approximate date work will start* 11/26/2017		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.<br>2. A Drilling Plan.<br>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).<br>5. Operator certification<br>6. Such other site specific information and/or plans as may be required by the BLM. |
|---|---|

25. Signature (Electronic Submission)	Name (Printed Typed) Linda Good / Ph: (405)552-6558	Date 02/23/2017
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed Typed) Cody Layton / Ph: (575)234-5959	Date 05/15/2017
Title Supervisor Multiple Resources		
Office CARLSBAD		

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.

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

(Continued on page 2)

\*(Instructions on page 2)

APPROVED WITH CONDITIONS

*RWP 5-23-17*

**APD ID:** 10400011715

**Submission Date:** 02/23/2017

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - General

**APD ID:** 10400011715

**Tie to previous NOS?**
**Submission Date:** 02/23/2017

**BLM Office:** CARLSBAD

**User:** Linda Good

**Title:** Regulatory Compliance  
Professional

**Federal/Indian APD:** FED

**Is the first lease penetrated for production Federal or Indian?** FED

**Lease number:** NMNM012121

**Lease Acres:** 1280

**Surface access agreement in place?**
**Allotted?**
**Reservation:**
**Agreement in place?** NO

**Federal or Indian agreement:**
**Agreement number:**
**Agreement name:**
**Keep application confidential?** YES

**Permitting Agent?** NO

**APD Operator:** DEVON ENERGY PRODUCTION COMPANY LP

**Operator letter of designation:**
**Keep application confidential?** YES

## Operator Info

**Operator Organization Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Operator Address:** 333 West Sheridan Avenue

**Zip:** 73102

**Operator PO Box:**
**Operator City:** Oklahoma City **State:** OK

**Operator Phone:** (405)552-6571

**Operator Internet Address:** aletha.dewbre@dvn.com

## Section 2 - Well Information

**Well in Master Development Plan?** NO

**Mater Development Plan name:**
**Well in Master SUPO?** NO

**Master SUPO name:**
**Well in Master Drilling Plan?** NO

**Master Drilling Plan name:**
**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Well API Number:**
**Field/Pool or Exploratory?** Field and Pool

**Field Name:** PADUCA

**Pool Name:** BONE SPRING

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Is the proposed well in an area containing other mineral resources?** NATURAL GAS,OIL

**Describe other minerals:**

**Is the proposed well in a Helium production area?** N **Use Existing Well Pad?** YES **New surface disturbance?** N

**Type of Well Pad:** MULTIPLE WELL

**Multiple Well Pad Name:**

**Number:** 191H/193H/194H

**Well Class:** HORIZONTAL

COTTON DRAW UNIT

**Number of Legs:** 1

**Well Work Type:** Drill

**Well Type:** OIL WELL

**Describe Well Type:**

**Well sub-Type:** OTHER

**Describe sub-type:** DEVELOPMENT

**Distance to town:**

**Distance to nearest well:** 750 FT

**Distance to lease line:** 230 FT

**Reservoir well spacing assigned acres Measurement:** 160 Acres

**Well plat:** CDU 513H\_C-102\_Plats\_signed\_02-22-2017.pdf

**Well work start Date:** 11/26/2017

**Duration:** 45 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:** 5155

**STATE:** NEW MEXICO

**Meridian:** NEW MEXICO PRINCIPAL **County:** EDDY

**Latitude:** 32.1817205

**Longitude:** -103.7288335

SHL

**Elevation:** 3514

**MD:** 0

**TVD:** 0

**Leg #:** 1

**Lease Type:** FEDERAL

**Lease #:** NMNM012121

**NS-Foot:** 230

**NS Indicator:** FSL

**EW-Foot:** 1815

**EW Indicator:** FEL

**Twsp:** 24S

**Range:** 31E

**Section:** 25

**Aliquot:** SWSE

**Lot:**

**Tract:**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

	<b>STATE:</b> NEW MEXICO	<b>Meridian:</b> NEW MEXICO PRINCIPAL	<b>County:</b> EDDY
	<b>Latitude:</b> 32.1817205	<b>Longitude:</b> -103.7288335	
KOP	<b>Elevation:</b> -6215	<b>MD:</b> 9763	<b>TVD:</b> 9729
<b>Leg #: 1</b>	<b>Lease Type:</b> FEDERAL	<b>Lease #:</b> NMNM012121	
	<b>NS-Foot:</b> 0	<b>NS Indicator:</b> FSL	
	<b>EW-Foot:</b> 660	<b>EW Indicator:</b> FEL	
	<b>Twsp:</b> 24S	<b>Range:</b> 31E	<b>Section:</b> 25
	<b>Aliquot:</b> SESE	<b>Lot:</b>	<b>Tract:</b>
	<b>STATE:</b> NEW MEXICO	<b>Meridian:</b> NEW MEXICO PRINCIPAL	<b>County:</b> EDDY
	<b>Latitude:</b> 32.1817205	<b>Longitude:</b> -103.7288335	
PPP	<b>Elevation:</b> -6693	<b>MD:</b> 10513	<b>TVD:</b> 10207
<b>Leg #: 1</b>	<b>Lease Type:</b> FEDERAL	<b>Lease #:</b> NMNM012121	
	<b>NS-Foot:</b> 330	<b>NS Indicator:</b> FSL	
	<b>EW-Foot:</b> 660	<b>EW Indicator:</b> FEL	
	<b>Twsp:</b> 24S	<b>Range:</b> 31E	<b>Section:</b> 25
	<b>Aliquot:</b> SESE	<b>Lot:</b>	<b>Tract:</b>
	<b>STATE:</b> NEW MEXICO	<b>Meridian:</b> NEW MEXICO PRINCIPAL	<b>County:</b> EDDY
	<b>Latitude:</b> 32.1956038	<b>Longitude:</b> -103.7315137	
EXIT	<b>Elevation:</b> -6686	<b>MD:</b> 15440	<b>TVD:</b> 10200
<b>Leg #: 1</b>	<b>Lease Type:</b> FEDERAL	<b>Lease #:</b> NMNM89055	
	<b>NS-Foot:</b> 290	<b>NS Indicator:</b> FNL	
	<b>EW-Foot:</b> 660	<b>EW Indicator:</b> FEL	
	<b>Twsp:</b> 24S	<b>Range:</b> 31E	<b>Section:</b> 25
	<b>Aliquot:</b> NENE	<b>Lot:</b>	<b>Tract:</b>
	<b>STATE:</b> NEW MEXICO	<b>Meridian:</b> NEW MEXICO PRINCIPAL	<b>County:</b> EDDY
	<b>Latitude:</b> 32.1956038	<b>Longitude:</b> -103.7315137	
BHL	<b>Elevation:</b> -6686	<b>MD:</b> 15440	<b>TVD:</b> 10200
<b>Leg #: 1</b>	<b>Lease Type:</b> FEDERAL	<b>Lease #:</b> NMNM89055	
	<b>NS-Foot:</b> 290	<b>NS Indicator:</b> FNL	
	<b>EW-Foot:</b> 660	<b>EW Indicator:</b> FEL	

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Twsp:** 24S

**Range:** 31E

**Section:** 25

**Aliquot:** NENE

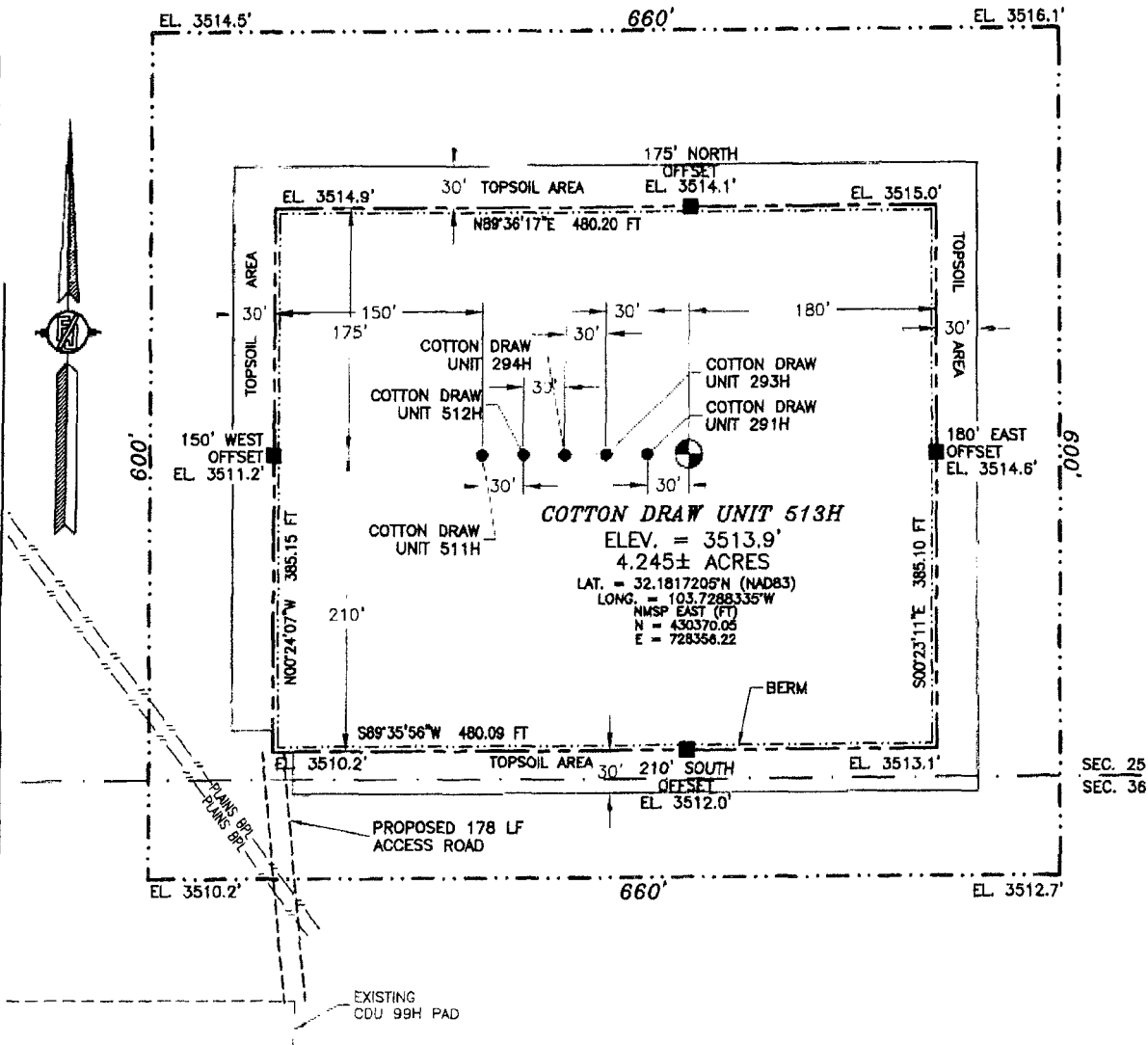
**Lot:**

**Tract:**

SECTION 25, TOWNSHIP 24 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. VERTICAL DATUM NAVD88.



012 60 120 240

SCALE 1" = 120'  
DIRECTIONS TO LOCATION

FROM STATE HIGHWAY 128 AND CR 1 (ORLA ROAD) GO SOUTH ON CR 1 8.1 MILES, TURN RIGHT ON CALICHE ROAD (MONSANTO ROAD) AND GO WEST 2.1 MILES, TURN RIGHT AND GO NORTH 0.75 OF A MILE, TURN LEFT AND GO WEST 2.0 MILES, TURN RIGHT AND GO NORTH 1.8 MILES, TURN LEFT AND GO WEST 0.3 OF A MILE, TURN RIGHT AND GO NORTH 0.5 OF A MILE, TURN RIGHT AND GO EAST 0.7 OF A MILE, TURN LEFT AND GO NORTH 0.83 OF A MILE, TURN RIGHT AND GO NORTHEAST 0.15 OF A MILE TO EXISTING CDU 99H PAD, FROM NORTHEAST PAD CORNER FOLLOW ROAD SURVEY FLAGS NORTH 178' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.

COTTON DRAW UNIT 513H

LOCATED 230 FT. FROM THE SOUTH LINE  
AND 1815 FT. FROM THE EAST LINE OF  
SECTION 25, TOWNSHIP 24 SOUTH,  
RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

FEBRUARY 7, 2017

SURVEY NO. 5156

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

CARLSBAD, NEW MEXICO

3550

TRAIL

JEEP

Drill Hole

3535

3521

Gravel Pit

3500

3477

36

31

30

26

25

24

23

22

21

20

19

18

17

16

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14

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12

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6

5

4

3

2

1

0

COTTON DRAW  
UNIT 513H

COTTON DRAW  
UNIT 294H

COTTON DRAW  
UNIT 511H

COTTON DRAW  
UNIT 512H

COTTON DRAW  
UNIT 291H

COTTON DRAW  
UNIT 293H

Gravel Pit

3500

3477

36

31

30

26

25

24

23

22

21

20

19

18

17

16

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

0

NOT TO SCALE

COTTON DRAW UNIT 513H

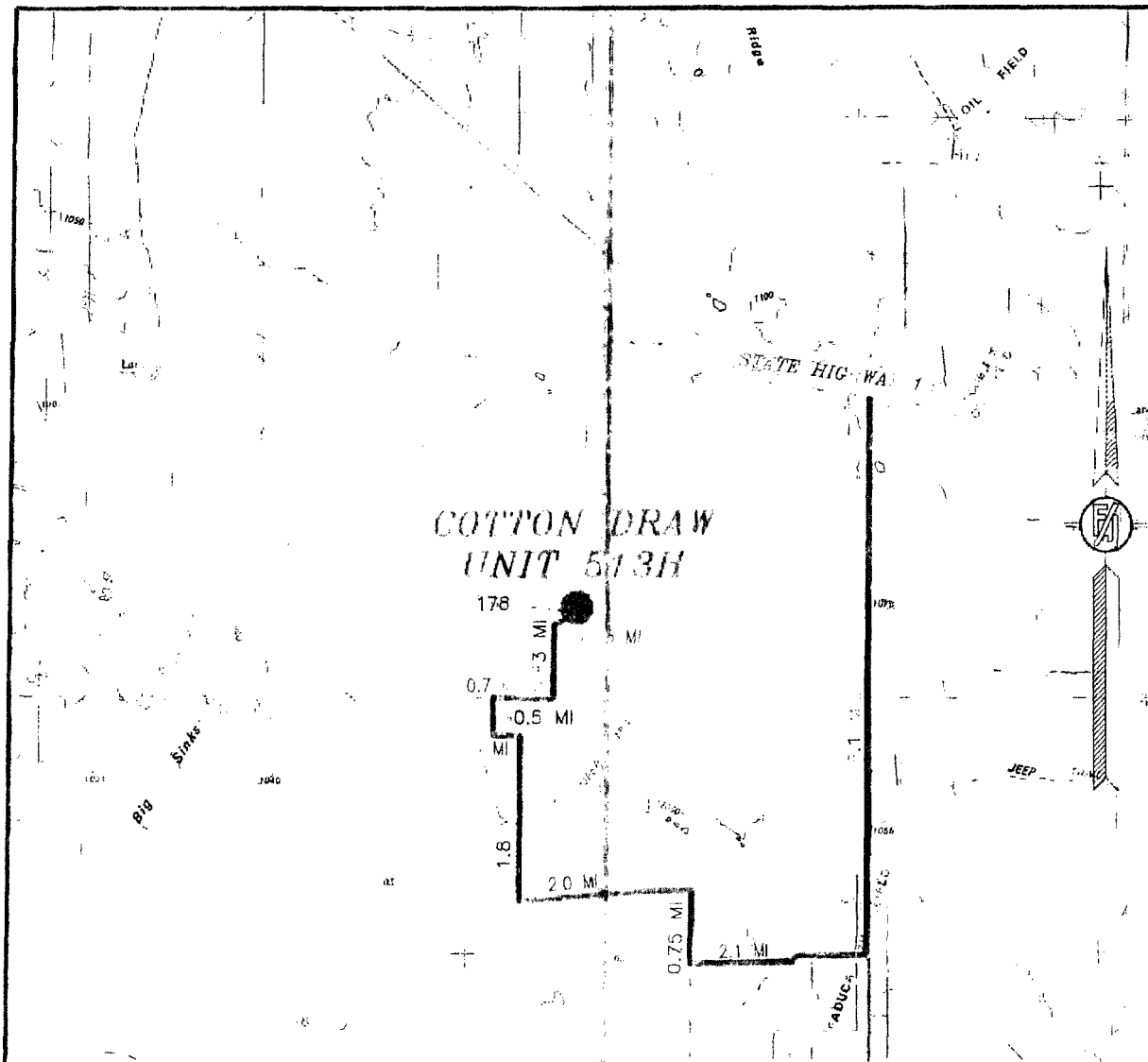
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EDDY COUNTY, STATE OF NEW MEXICO

FEBRUARY 7, 2017

*SURVEY NO. 5156.*

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

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.  
COTTON DRAW UNIT 513H

LOCATED 230 FT. FROM THE SOUTH LINE  
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RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

DIRECTIONS TO LOCATION

FROM STATE HIGHWAY 128 AND CR 1 (ORLA ROAD) GO SOUTH ON  
CR 1 6.1 MILES, TURN RIGHT ON CALICHE ROAD (MONSANTO ROAD)  
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MILE, TURN LEFT AND GO WEST 2.0 MILES, TURN RIGHT AND GO  
NORTH 1.8 MILES, TURN LEFT AND GO WEST 0.3 OF A MILE, TURN  
RIGHT AND GO NORTH 0.5 OF A MILE, TURN RIGHT AND GO EAST 0.7  
OF A MILE, TURN LEFT AND GO NORTH 0.83 OF A MILE, TURN RIGHT  
AND GO NORTHEAST 0.15 OF A MILE TO EXISTING CDU 99H PAD.  
FROM NORTHEAST PAD CORNER FOLLOW ROAD SURVEY FLAGS NORTH  
178' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

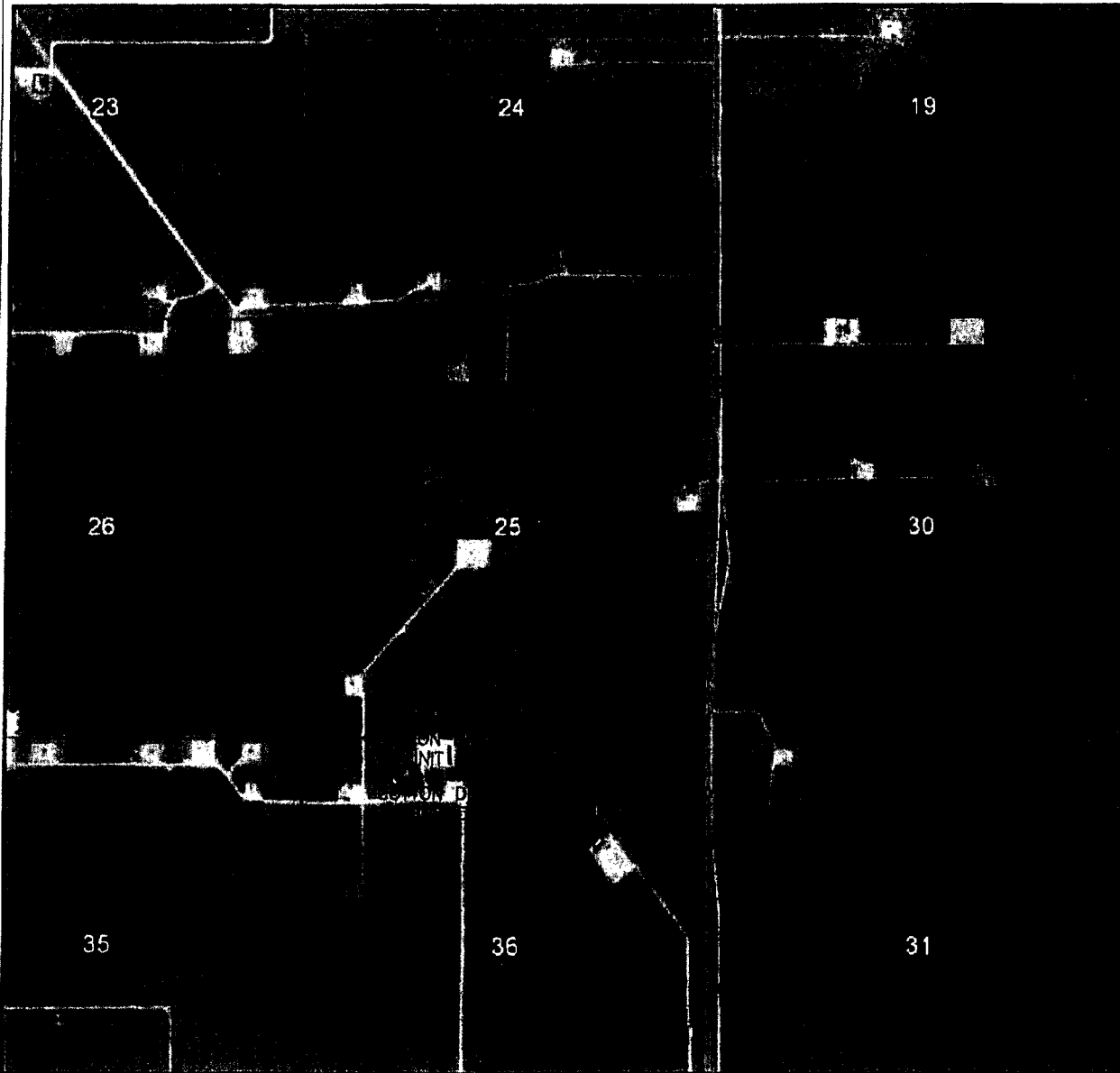
FEBRUARY 7, 2017

SURVEY NO. 5156

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



SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
AERIAL PHOTO



NOT TO SCALE  
AERIAL PHOTO:  
GOOGLE EARTH  
NOVEMBER 2015

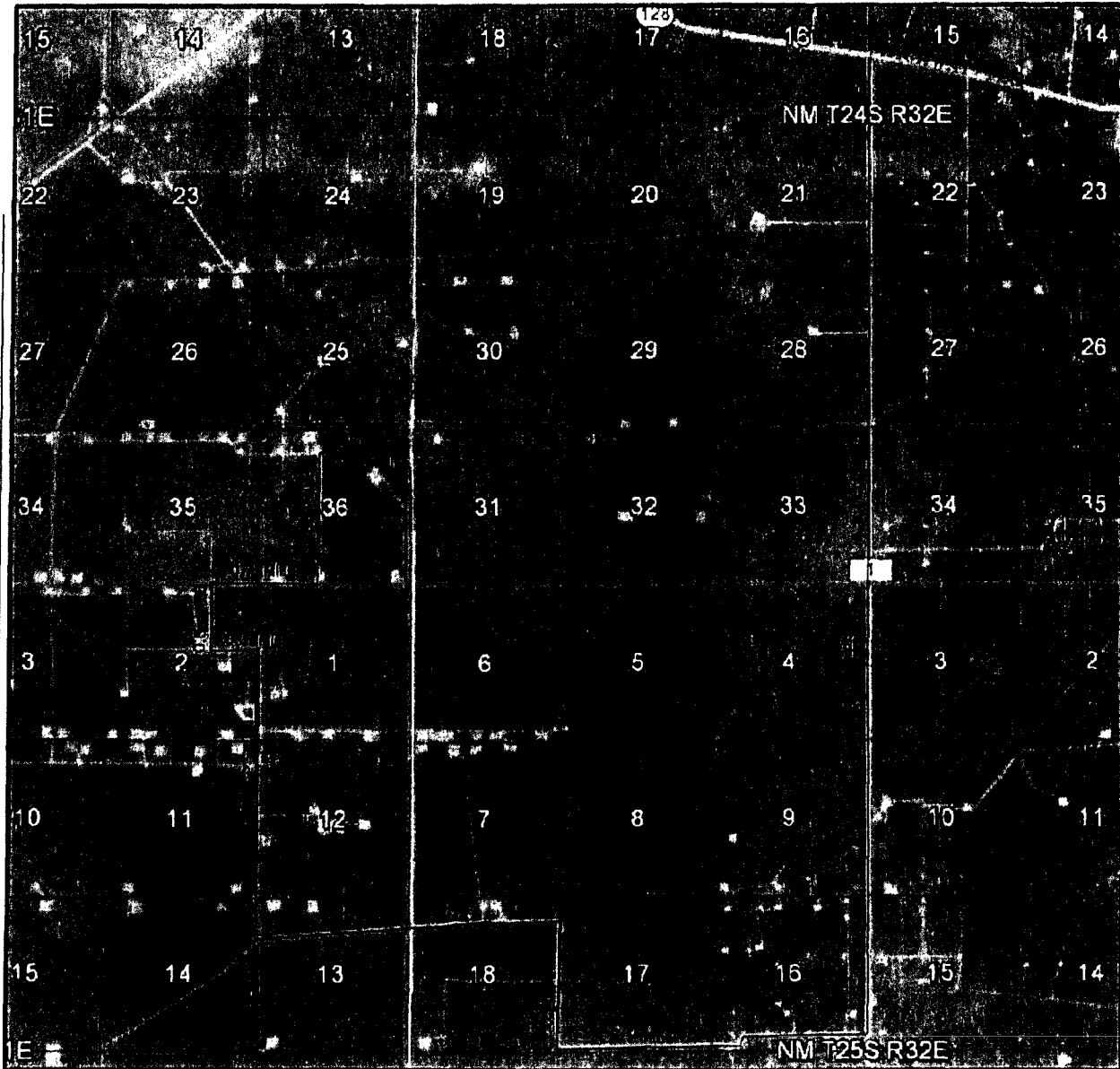
DEVON ENERGY PRODUCTION COMPANY, L.P.  
COTTON DRAW UNIT 513H  
LOCATED 230 FT. FROM THE SOUTH LINE  
AND 1815 FT. FROM THE EAST LINE OF  
SECTION 25, TOWNSHIP 24 SOUTH,  
RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

FEBRUARY 7, 2017

SURVEY NO. 5156

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

SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
 EDDY COUNTY, STATE OF NEW MEXICO  
 ACCESS AERIAL ROUTE MAP



NOT TO SCALE  
 AERIAL PHOTO:  
 GOOGLE EARTH  
 NOVEMBER 2015

DEVON ENERGY PRODUCTION COMPANY, L.P.  
 COTTON DRAW UNIT 513H  
 LOCATED 230 FT. FROM THE SOUTH LINE  
 AND 1815 FT. FROM THE EAST LINE OF  
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 RANGE 31 EAST, N.M.P.M.  
 EDDY COUNTY, STATE OF NEW MEXICO

FEBRUARY 7, 2017

SURVEY NO. 5156

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

**APD ID:** 10400011715

**Submission Date:** 02/23/2017

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - Geologic Formations

**ID:** Surface formation

**Name:** UNKNOWN

**Lithology(ies):**

ALLUVIUM

**Elevation:** 3512

**True Vertical Depth:** 0

**Measured Depth:** 0

**Mineral Resource(s):**

NONE

**Is this a producing formation?** N

**ID:** Formation 1

**Name:** RUSTLER

**Lithology(ies):**

SALT

**Elevation:** 2837

**True Vertical Depth:** 675

**Measured Depth:** 675

**Mineral Resource(s):**

NONE

**Is this a producing formation?** N

**ID:** Formation 2

**Name:** BASE OF SALT

**Lithology(ies):**

SALT

**Elevation:** -738

**True Vertical Depth:** 4250

**Measured Depth:** 4250

**Mineral Resource(s):**

NONE

**Is this a producing formation?** N

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**ID:** Formation 3

**Name:** DELAWARE

**Lithology(ies):**

SANDSTONE

**Elevation:** -788

**True Vertical Depth:** 4300

**Measured Depth:** 4300

**Mineral Resource(s):**

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 4

**Name:** BONE SPRING

**Lithology(ies):**

SANDSTONE

**Elevation:** -4888

**True Vertical Depth:** 8400

**Measured Depth:** 8400

**Mineral Resource(s):**

NATURAL GAS

OIL

**Is this a producing formation?** Y

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## Section 2 - Blowout Prevention

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**Pressure Rating (PSI):** 3M

**Rating Depth:** 10200

**Equipment:** BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

**Requesting Variance?** YES

**Variance request:** A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

**Testing Procedure:** A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

**Choke Diagram Attachment:**

CDU 512H\_3M BOPE\_Ck\_02-23-2017.pdf

**BOP Diagram Attachment:**

CDU 512H\_3M BOPE\_Ck\_02-23-2017.pdf

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Pressure Rating (PSI):** 3M

**Rating Depth:** 4300

**Equipment:** BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

**Requesting Variance?** YES

**Variance request:** A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

**Testing Procedure:** A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

**Choke Diagram Attachment:**

CDU 512H\_3M BOPE\_Ck\_02-23-2017.pdf

**BOP Diagram Attachment:**

CDU 512H\_3M BOPE\_Ck\_02-23-2017.pdf

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### Section 3 - Casing

---

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**String Type:** PRODUCTION

**Other String Type:**

**Hole Size:** 8.75

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -6215

**Bottom setting depth MD:** 15440

**Bottom setting depth TVD:** 10200

**Bottom setting depth MSL:** -16415

**Calculated casing length MD:** 15440

**Casing Size:** 5.5

**Other Size**

**Grade:** P-110

**Other Grade:**

**Weight:** 17

**Joint Type:** BUTT

**Other Joint Type:**

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### **Safety Factors**

**Collapse Design Safety Factor:** 1.7

**Burst Design Safety Factor:** 2.11

**Joint Tensile Design Safety Factor type:** BUOYANT

**Joint Tensile Design Safety Factor:** 2.51

**Body Tensile Design Safety Factor type:** BUOYANT

**Body Tensile Design Safety Factor:** 2.51

**Casing Design Assumptions and Worksheet(s):**

CDU 512H\_ProdCsg Ass\_02-23-2017.pdf

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**String Type:** INTERMEDIATE

**Other String Type:**

**Hole Size:** 12.25

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -6215

**Bottom setting depth MD:** 4300

**Bottom setting depth TVD:** 4300

**Bottom setting depth MSL:** -10515

**Calculated casing length MD:** 4300

**Casing Size:** 9.625

**Other Size**

**Grade:** J-55

**Other Grade:**

**Weight:** 40

**Joint Type:** BUTT

**Other Joint Type:**

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### **Safety Factors**

**Collapse Design Safety Factor:** 1.19

**Burst Design Safety Factor:** 1.42

**Joint Tensile Design Safety Factor type:** BUOYANT

**Joint Tensile Design Safety Factor:** 3.98

**Body Tensile Design Safety Factor type:** BUOYANT

**Body Tensile Design Safety Factor:** 3.98

**Casing Design Assumptions and Worksheet(s):**

CDU 512H\_Int Csg Ass\_02-23-2017.pdf

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**String Type:** SURFACE

**Other String Type:**

**Hole Size:** 17.5

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -6215

**Bottom setting depth MD:** 0

**Bottom setting depth TVD:** 0

**Bottom setting depth MSL:** -6215

**Calculated casing length MD:** 0

**Casing Size:** 13.375

**Other Size**

**Grade:** H-40

**Other Grade:**

**Weight:** 48

**Joint Type:** BUTT

**Other Joint Type:**

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### **Safety Factors**

**Collapse Design Safety Factor:** 1.74

**Burst Design Safety Factor:** 2.45

**Joint Tensile Design Safety Factor type:** BUOYANT

**Joint Tensile Design Safety Factor:** 4.13

**Body Tensile Design Safety Factor type:** BUOYANT

**Body Tensile Design Safety Factor:** 4.13

**Casing Design Assumptions and Worksheet(s):**

CDU 512H\_SurfCsg Ass\_02-23-2017.pdf

### **Section 4 - Cement**

**Casing String Type:** SURFACE



**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Stage Tool Depth:**

Lead

**Top MD of Segment:** 0

**Bottom MD Segment:** 700

**Cement Type:** CLASS C

**Additives:** 1% CaCl

**Quantity (sks):** 560

**Yield (cu.ff./sk):** 1.34

**Density:** 14.8

**Volume (cu.ft.):** 750

**Percent Excess:** 50

**Casing String Type:** INTERMEDIATE

**Stage Tool Depth:**

Lead

**Top MD of Segment:** 0

**Bottom MD Segment:** 3000

**Cement Type:** CLASS C

**Additives:** Poz (Fly Ash): 6% BWOC  
Bentonite + 5% BWOW Sodium  
Chloride + 0.125 lbs/sack Poly-E-Flake

**Quantity (sks):** 700

**Yield (cu.ff./sk):** 1.85

**Volume (cu.ft.):** 1295

**Percent Excess:** 30

**Density:** 12.9

Tail

**Top MD of Segment:** 3000

**Bottom MD Segment:** 4300

**Cement Type:** CLASS C

**Quantity (sks):** 320

**Yield (cu.ff./sk):** 1.33

**Additives:** 0.125 lbs/sack Poly-E-Flake

**Volume (cu.ft.):** 425

**Percent Excess:** 30

**Density:** 14.8

**Casing String Type:** PRODUCTION

**Stage Tool Depth:**

Lead

**Top MD of Segment:** 4100

**Bottom MD Segment:** 10000

**Cement Type:** TUNED

**Additives:** TUNED LIGHT

**Quantity (sks):** 560

**Yield (cu.ff./sk):** 3.27

**Density:** 9

**Volume (cu.ft.):** 1830

**Percent Excess:** 25

Tail

**Top MD of Segment:** 10000

**Bottom MD Segment:** 15440

**Cement Type:** CLASS C

**Additives:** 0.125 lbs/sack Poly-E-Flake

**Quantity (sks):** 1135

**Yield (cu.ff./sk):** 1.2

**Density:** 14.5

**Volume (cu.ft.):** 1362

**Percent Excess:** 25

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

## Section 5 - Circulating Medium

**Mud System Type:** Closed

**Will an air or gas system be Used?** NO

**Description of the equipment for the circulating system in accordance with Onshore Order #2:**

**Diagram of the equipment for the circulating system in accordance with Onshore Order #2:**

**Describe what will be on location to control well or mitigate other conditions:** Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

**Describe the mud monitoring system utilized:** PVT/Pason/Visual Monitoring

### Circulating Medium Table

<b>Top Depth:</b> 0	<b>Bottom Depth:</b> 700
<b>Mud Type:</b> OTHER	FRESH WATER GEL
<b>Min Weight (lbs./gal.):</b> 8.6	<b>Max Weight (lbs./gal.):</b> 8.8
<b>Density (lbs/cu.ft.):</b>	<b>Gel Strength (lbs/100 sq.ft.):</b>
<b>PH:</b>	<b>Viscosity (CP):</b>
<b>Filtration (cc):</b>	<b>Salinity (ppm):</b>
<b>Additional Characteristics:</b> SEE ATTACHED DRILLING PLAN FOR MORE DETAILS.	

<b>Top Depth:</b> 700	<b>Bottom Depth:</b> 4300
<b>Mud Type:</b> OTHER	SATURATED BRINE
<b>Min Weight (lbs./gal.):</b> 10	<b>Max Weight (lbs./gal.):</b> 10.2
<b>Density (lbs/cu.ft.):</b>	<b>Gel Strength (lbs/100 sq.ft.):</b>
<b>PH:</b>	<b>Viscosity (CP):</b>
<b>Filtration (cc):</b>	<b>Salinity (ppm):</b>
<b>Additional Characteristics:</b> SEE ATTACHED DRILLING PLAN FOR MORE DETAILS.	

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Top Depth:** 4300

**Bottom Depth:** 15440

**Mud Type:** OTHER

CUT BRINE

**Min Weight (lbs./gal.):** 8.5

**Max Weight (lbs./gal.):** 9.3

**Density (lbs/cu.ft.):**

**Gel Strength (lbs/100 sq.ft.):**

**PH:**

**Viscosity (CP):**

**Filtration (cc):**

**Salinity (ppm):**

**Additional Characteristics:** SEE ATTACHED DRILLING PLAN FOR MORE DETAILS.

---

## Section 6 - Test, Logging, Coring

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**List of production tests including testing procedures, equipment and safety measures:**

Will run GRMWD from KOP to TD. Stated logs run will be in the Completion Report and submitted to the BLM.

**List of open and cased hole logs run in the well:**

CBL,DS,GR,MWD,MUDLOG

**Coring operation description for the well:**

N/A

---

## Section 7 - Pressure

---

**Anticipated Bottom Hole Pressure:** 4548

**Anticipated Surface Pressure:** 2302.46

**Anticipated Bottom Hole Temperature(F):** 185

**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

CDU 513H\_H2S Plans\_02-22-2017.pdf

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

## **Section 8 - Other Information**

**Proposed horizontal/directional/multi-lateral plan submission:**

CDU 512H\_Dir Plan\_02-23-2017.pdf

**Other proposed operations facets description:**

Multi-Bowl Verbiage  
Multi-Bowl Wellhead  
Closed-Loop Design Plan  
Drilling Plan

**Other proposed operations facets attachment:**

CDU 513H\_MB Verb 3M\_02-22-2017.pdf  
CDU 513H\_MB Wellhd\_02-22-2017.pdf  
CDU 513H\_Clsd Loop\_02-22-2017.pdf  
CDU 512H\_Drilling Plan\_02-23-2017.pdf

**Other Variance attachment:**

CDU 513H\_Co-flex\_02-22-2017.pdf

## Devon Energy, Cotton Draw Unit 513H

### 1. Geologic Formations

TVD of target	10,200'	Pilot hole depth	N/A
MD at TD:	15,440'	Deepest expected fresh water:	

### Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	675	Water	
Top of Salt	1500	Salt	
Lamar	4250	Barren	
Delaware Group	4300	Oil/Gas	
Bone Spring	8400	Target	

\*H<sub>2</sub>S, water flows, loss of circulation, abnormal pressures, etc.

## Devon Energy, Cotton Draw Unit 513H

### 2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	700'	13.375"	48	H-40	STC	1.74	2.45	4.13
12.25"	0	4,300'	9.625"	40	J-55	LTC	1.19	1.42	3.98
8.75"	0	15,440'	5.5"	17	P-110	BTC	1.7	2.11	2.51
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 <sup>rd</sup> string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 <sup>nd</sup> string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

## Devon Energy, Cotton Draw Unit 513H

### 3. Cementing Program

Casing	# Sks	Wt. lb/ gal	H <sub>2</sub> O gal/sk	Yld ft <sup>3</sup> / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8" Surface	560	14.8	6.34	1.34	6	Tail: Class C Cement + 1% Calcium Chloride
9-5/8" Inter.	700	12.9	9.81	1.85	14	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	320	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod	560	9	13.5	3.27	21	Lead: Tuned Light® Cement
	1135	14.5	5.31	1.2	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite
5-1/2" Prod Two Stage	540	10.9	20.6	3.31	24	1 <sup>st</sup> Stage Lead: (50:40:10) Class C: Silicalite: Enhancer 923 + 10% BWOC Bentonite + 0.05% BWOC SA-1015 + 0.3% BWOC HR-800 + 0.2% BWOC FE-2 + 0.125 lb/sk Pol-E-Flake + 0.5 lb/sk D-Air 5000
	1135	14.5	5.31	1.2	25	1 <sup>st</sup> Stage Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite
	DV Tool = 4350ft					
	20	10.9	20.6	3.31	24	2 <sup>nd</sup> Stage Lead: (50:40:10) Class C: Silicalite: Enhancer 923 + 10% BWOC Bentonite + 0.05% BWOC SA-1015 + 0.3% BWOC HR-800 + 0.2% BWOC FE-2 + 0.125 lb/sk Pol-E-Flake + 0.5 lb/sk D-Air 5000
	30	14.8	6.32	1.33	6	2 <sup>nd</sup> Stage Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake

DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
13-3/8" Surface	0'	50%
9-5/8" Intermediate	0'	30%
5-1/2" Production Casing	4100'	25%
5-1/2" Production Casing Two Stage Option	1 <sup>st</sup> Stage = 4350' / 2 <sup>nd</sup> Stage = 4100'	25%

## Devon Energy, Cotton Draw Unit 513H

### 4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
---	--

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	50% of working pressure  3M
			Blind Ram		
			Pipe Ram		
			Double Ram	x	
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure  3M
			Blind Ram		
			Pipe Ram		
			Double Ram	x	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

\*Specify if additional ram is utilized.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
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## Devon Energy, Cotton Draw Unit 513H

Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
Y	Are anchors required by manufacturer?
Y	<p>A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.</p> <p>Devon proposes using a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. 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.</p> <ul style="list-style-type: none"> <li>Wellhead will be installed by wellhead representatives.</li> <li>If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.</li> <li>Wellhead representative will install the test plug for the initial BOP test.</li> <li>Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 3M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.</li> <li>If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.</li> <li>Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.</li> <li>Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.</li> </ul> <p>After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.</p> <p>After running the 9-5/8" intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the wellhead.</p> <p>The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. 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.</p>

## Devon Energy, Cotton Draw Unit 513H

	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
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### 5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	700'	FW Gel	8.6-8.8	28-34	N/C
700'	4,300'	Saturated Brine	10.0-10.2	28-34	N/C
4,300'	15,440'	Cut Brine	8.5-9.3	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
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### 6. Logging and Testing Procedures

Logging, Coring and Testing.	
x	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
X	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX	

### 7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4,548 psi
Abnormal Temperature	No

## Devon Energy, Cotton Draw Unit 513H

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H <sub>2</sub> S) monitors will be installed prior to drilling out the surface shoe. If H <sub>2</sub> S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H <sub>2</sub> S is present
Y	H <sub>2</sub> S Plan attached

### 8. Other facets of operation

Is this a walking operation? Yes

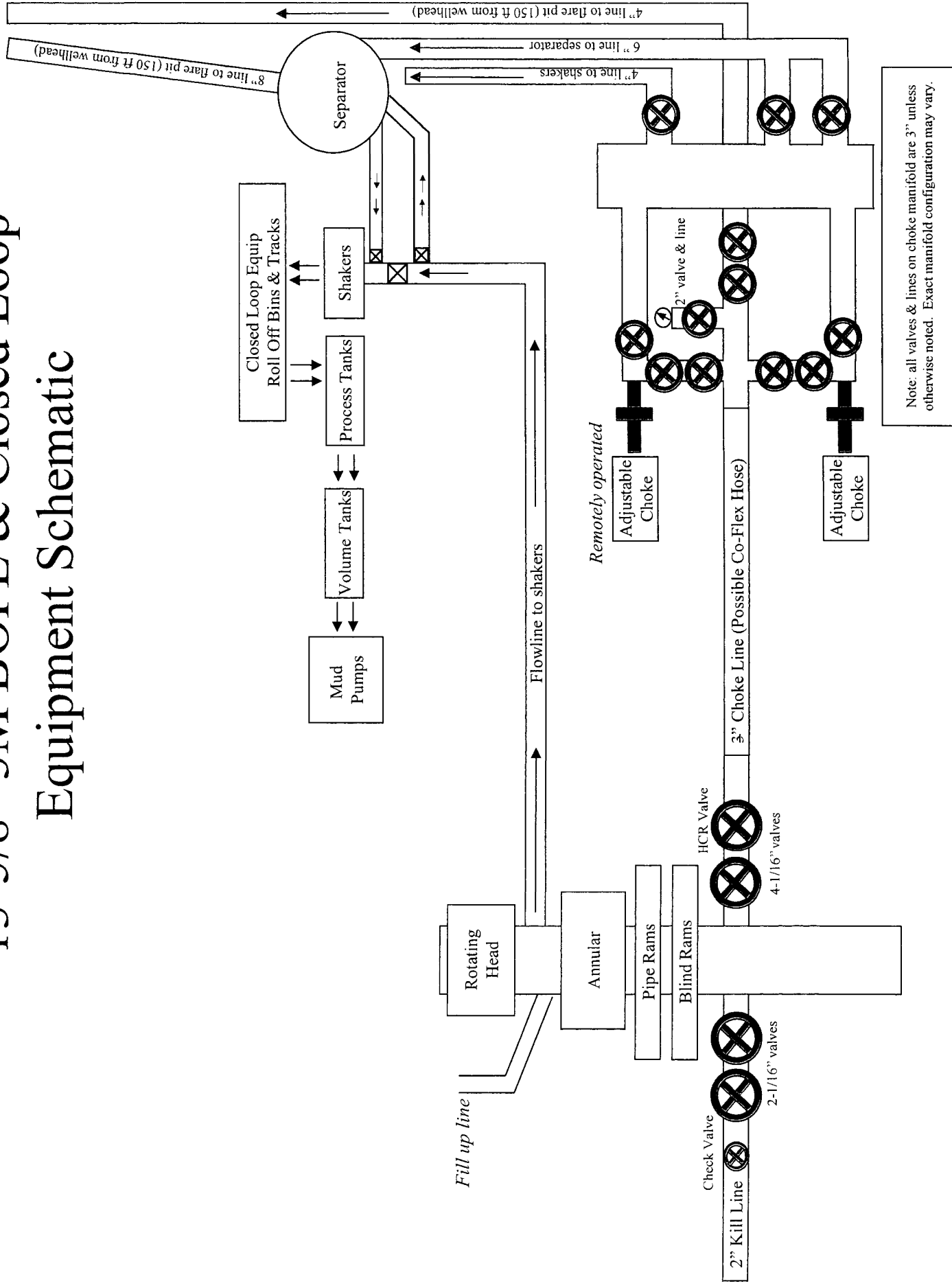
Will be pre-setting casing? No

Attachments

☒ Directional Plan

☐ Other, describe

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



## Casing Assumptions and Load Cases

### Surface

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Surface Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Displace to Gas	Formation Pore Pressure	Dry gas from next casing point

Surface Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Surface Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	3 ft/s
Service Loads	N/A

## Casing Assumptions and Load Cases

### Intermediate

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Intermediate Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Fracture @ Shoe	Formation Pore Pressure	Dry gas

Intermediate Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Intermediate Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

## Casing Assumptions and Load Cases

### Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Fluid in hole (water or produced water) + test psi
Tubing Leak	Formation Pore Pressure	Packer @ KOP, leak below surface 8.6 ppg packer fluid
Stimulation	Formation Pore Pressure	Max frac pressure with heaviest frac fluid

Production Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A



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

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

**For**

**Cotton Draw Unit 513H**

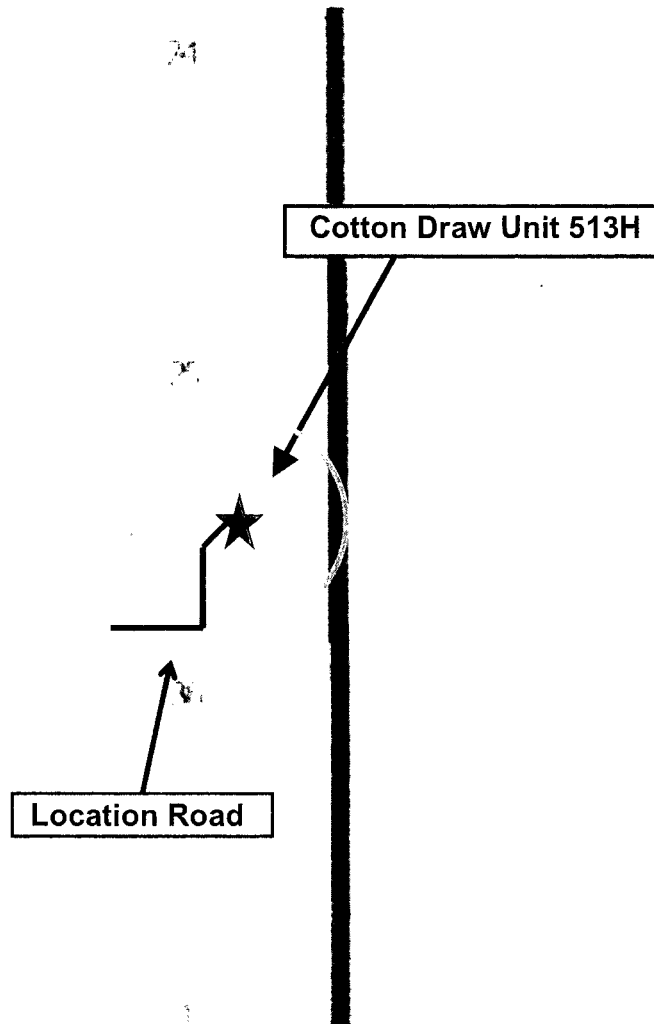
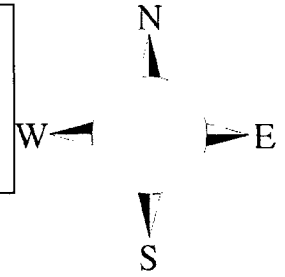
**Sec-25 T-24S R-31E  
230' FSL & 1815 FEL  
LAT. = 32.1817205' N (NAD83)  
LONG = 103.7288335 W**

**Eddy County NM**



**Cotton Draw Unit 513H**

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. Crews should then block the 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 tubulars 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 reasonably expected to contain H<sub>2</sub>S.

## **1. Well Control Equipment**

- A. Flare line
- B. Choke manifold – Remotely Operated
- 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:**

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with one escape unit available in the top doghouse. 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:**

Portable H<sub>2</sub>S monitors positioned on location for best coverage and response. These units have warning lights which activate when H<sub>2</sub>S levels reach 10 ppm and audible sirens which activate at 10 ppm. Sensor locations:

- Bell nipple
- Shale shaker
- Trip tank
- Suction pit
- Rig floor
- Cellar
- Choke manifold
- Living Quarters (usually the company man's trailer stairs.)

### **Visual warning systems:**

- A. Wind direction indicators as shown on well site diagram
- 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.

#### **4. Mud program:**

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.

#### **5. 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.

#### **6. Communication:**

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

#### **7. Well testing:**

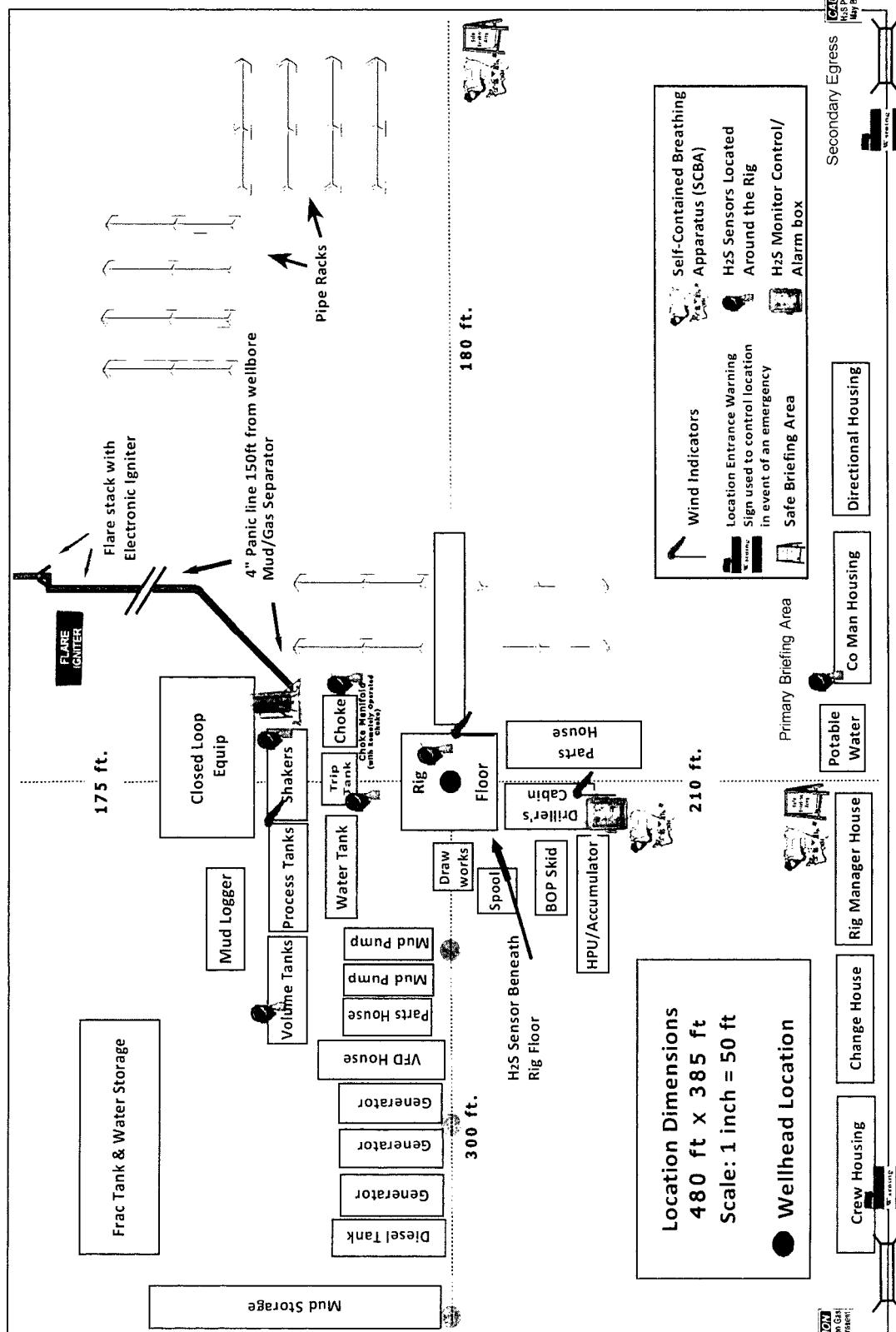
- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing 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.

<b><u>Devon Energy Corp. Company Call List</u></b>		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
Jerry Matthews – Day: 575-748-0161 Cell: 575-748-5234		
EHS Professional – Jason Robison		405-541-2841
<b><u>Agency Call List</u></b>		
<b><u>Lea County (575)</u></b>	<b>Hobbs</b>	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	<b>Ambulance</b>	<b>911</b>
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
<b><u>Eddy County (575)</u></b>	<b>Carlsbad</b>	
	State Police	885-3137
	City Police	885-2111
	Sheriff's Office	887-7551
	<b>Ambulance</b>	<b>911</b>
	Fire Department	885-3125
	LEPC (Local Emergency Planning Committee)	887-3798
	US Bureau of Land Management	887-6544
	NM Emergency Response Commission (Santa Fe)	(505) 476-9600
	24 HR	(505) 827-9126
	National Emergency Response Center	(800) 424-8802
	National Pollution Control Center: Direct	(703) 872-6000
	For Oil Spills	(800) 280-7118
	<b>Emergency Services</b>	
	Wild Well Control	(281) 784-4700
	Cudd Pressure Control	(915) 699-0139 (915) 563-3356
	Halliburton	(575) 746-2757
	B. J. Services	(575) 746-3569
<b><u>Give GPS position:</u></b>	Native Air – Emergency Helicopter – Hobbs	(575) 392-6429
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - <a href="http://www.nhc.noaa.gov">www.nhc.noaa.gov</a>	

Prepared in conjunction with  
Dave Small

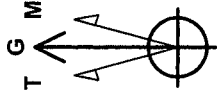


# Devon Energy - Well Pad Rig Location Layout Safety Equipment Location

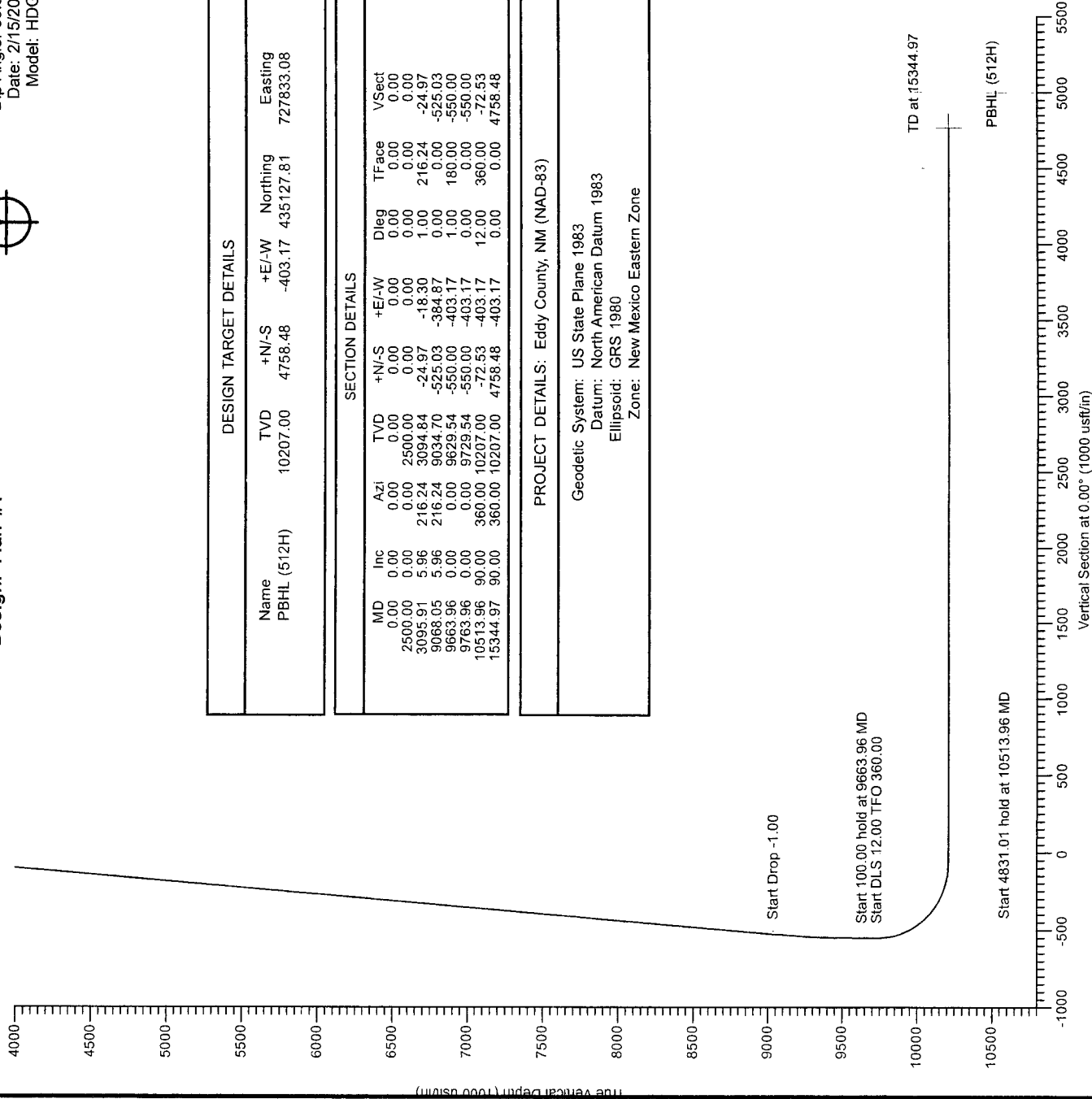




Project: Eddy County, NM (NAD-83)  
Site: Cotton Draw Unit  
Well: 512H  
Wellbore: OH  
Design: Plan #1



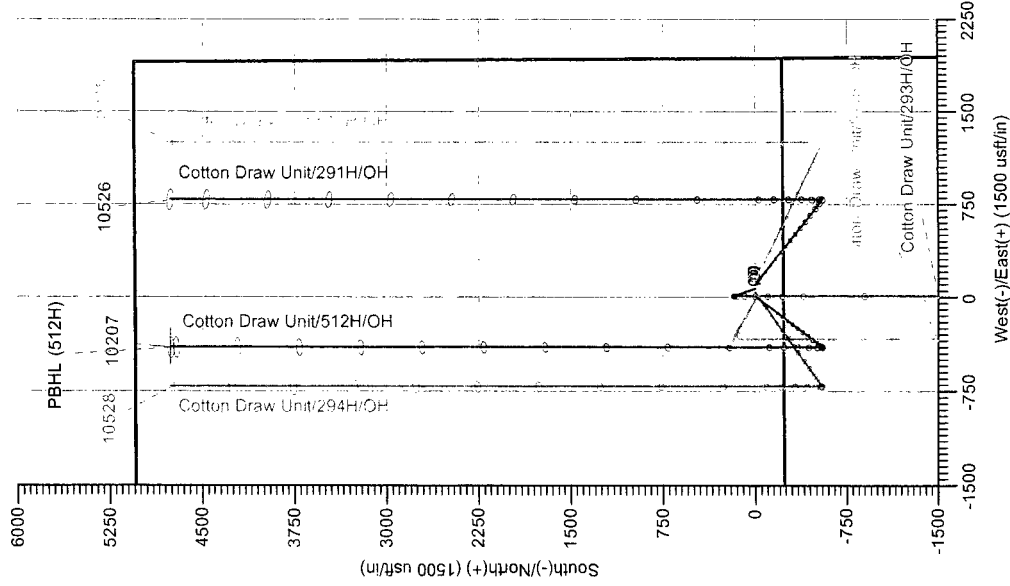
Azimuths to Grid North  
True North: -0.32°  
Magnetic North: 6.59°  
Magnetic Field  
Strength: 48124.8nT  
Dip Angle: 59.95°  
Date: 2/15/2017  
Model: HDGM



DESIGN TARGET DETAILS				
Name	TVD	+N/-S	+E/-W	Northing
PBHL (512H)	10207.00	4758.48	-403.17	435127.81
				727833.08

SECTION DETAILS						
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg
0.00	0.00	0.00	0.00	0.00	0.00	0.00
2500.00	0.00	0.00	2500.00	0.00	0.00	0.00
3095.91	5.96	216.24	3094.84	0.00	0.00	0.00
9068.05	5.96	216.24	9034.70	-525.03	-18.30	1.00
9663.96	0.00	0.00	9629.54	-550.00	-384.87	0.00
9763.96	0.00	0.00	9729.54	-550.00	-403.17	0.00
10513.96	90.00	360.00	10207.00	-72.53	-403.17	12.00
15344.97	90.00	360.00	10207.00	4758.48	-403.17	0.00

PROJECT DETAILS: Eddy County, NM (NAD-83)	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	New Mexico Eastern Zone





**NM OIL CONSERVATION**  
ARTESIA DISTRICT

**MAY 22 2017**

**RECEIVED**

# **Devon Energy**

**Eddy County, NM (NAD-83)**

**Cotton Draw Unit**

**512H**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**20 February, 2017**

# LEAM Drilling Systems LLC

## Planning Report

<b>Database:</b>	EDM 5000.1 Multi User Db	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Company:</b>	Devon Energy	<b>TVD Reference:</b>	3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)
<b>Project:</b>	Eddy County, NM (NAD-83)	<b>MD Reference:</b>	3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)
<b>Site:</b>	Cotton Draw Unit	<b>North Reference:</b>	Grid
<b>Well:</b>	512H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #1		

<b>Project</b>	Eddy County, NM (NAD-83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Eastern Zone		

<b>Site</b>	Cotton Draw Unit			
<b>Site Position:</b>		<b>Northing:</b>	419,194.51 usft	<b>Latitude:</b> 32° 9' 3.901 N
<b>From:</b>	Map	<b>Easting:</b>	722,955.98 usft	<b>Longitude:</b> 103° 44' 47.345 W
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.31 °

<b>Well</b>	512H			
<b>Well Position</b>	<b>+N/-S</b>	11,174.82 usft	<b>Northing:</b>	430,369.33 usft
	<b>+E/-W</b>	5,280.27 usft	<b>Easting:</b>	728,236.25 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	3,535.40 usft	<b>Ground Level:</b> 3,511.90 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	2/15/2017	6.92	59.95	48,125

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	0.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,095.91	5.96	216.24	3,094.84	-24.97	-18.30	1.00	1.00	0.00	216.24	
9,068.05	5.96	216.24	9,034.70	-525.03	-384.87	0.00	0.00	0.00	0.00	
9,663.96	0.00	0.00	9,629.54	-550.00	-403.17	1.00	-1.00	0.00	180.00	
9,763.96	0.00	0.00	9,729.54	-550.00	-403.17	0.00	0.00	0.00	0.00	
10,513.96	90.00	360.00	10,207.01	-72.53	-403.17	12.00	12.00	0.00	360.00	
15,344.98	90.00	360.00	10,207.00	4,758.48	-403.17	0.00	0.00	0.00	0.00	PBHL (512H)

# LEAM Drilling Systems LLC

## Planning Report

**Database:** EDM 5000.1 Multi User Db  
**Company:** Devon Energy

**Project:** Eddy County, NM (NAD-83)

**Site:** Cotton Draw Unit

**Well:** 512H

**Wellbore:** OH

**Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	1.00	216.24	2,599.99	-0.70	-0.52	-0.70	1.00	1.00	0.00
2,700.00	2.00	216.24	2,699.96	-2.81	-2.06	-2.81	1.00	1.00	0.00
2,800.00	3.00	216.24	2,799.86	-6.33	-4.64	-6.33	1.00	1.00	0.00
2,900.00	4.00	216.24	2,899.68	-11.26	-8.25	-11.26	1.00	1.00	0.00
3,000.00	5.00	216.24	2,999.37	-17.58	-12.89	-17.58	1.00	1.00	0.00
3,095.91	5.96	216.24	3,094.84	-24.97	-18.30	-24.97	1.00	1.00	0.00
3,100.00	5.96	216.24	3,098.90	-25.31	-18.56	-25.31	0.00	0.00	0.00
3,200.00	5.96	216.24	3,198.36	-33.69	-24.69	-33.69	0.00	0.00	0.00
3,300.00	5.96	216.24	3,297.82	-42.06	-30.83	-42.06	0.00	0.00	0.00
3,400.00	5.96	216.24	3,397.28	-50.43	-36.97	-50.43	0.00	0.00	0.00
3,500.00	5.96	216.24	3,496.74	-58.81	-43.11	-58.81	0.00	0.00	0.00
3,600.00	5.96	216.24	3,596.20	-67.18	-49.24	-67.18	0.00	0.00	0.00
3,700.00	5.96	216.24	3,695.66	-75.55	-55.38	-75.55	0.00	0.00	0.00
3,800.00	5.96	216.24	3,795.12	-83.93	-61.52	-83.93	0.00	0.00	0.00
3,900.00	5.96	216.24	3,894.58	-92.30	-67.66	-92.30	0.00	0.00	0.00
4,000.00	5.96	216.24	3,994.04	-100.67	-73.80	-100.67	0.00	0.00	0.00
4,100.00	5.96	216.24	4,093.50	-109.05	-79.93	-109.05	0.00	0.00	0.00
4,200.00	5.96	216.24	4,192.96	-117.42	-86.07	-117.42	0.00	0.00	0.00
4,300.00	5.96	216.24	4,292.42	-125.79	-92.21	-125.79	0.00	0.00	0.00
4,400.00	5.96	216.24	4,391.88	-134.16	-98.35	-134.16	0.00	0.00	0.00
4,500.00	5.96	216.24	4,491.34	-142.54	-104.49	-142.54	0.00	0.00	0.00
4,600.00	5.96	216.24	4,590.80	-150.91	-110.62	-150.91	0.00	0.00	0.00
4,700.00	5.96	216.24	4,690.26	-159.28	-116.76	-159.28	0.00	0.00	0.00
4,800.00	5.96	216.24	4,789.72	-167.66	-122.90	-167.66	0.00	0.00	0.00
4,900.00	5.96	216.24	4,889.18	-176.03	-129.04	-176.03	0.00	0.00	0.00
5,000.00	5.96	216.24	4,988.64	-184.40	-135.17	-184.40	0.00	0.00	0.00

# LEAM Drilling Systems LLC

## Planning Report

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**Well:** 512H  
**Wellbore:** OH  
**Design:** Plan #1

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**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,100.00	5.96	216.24	5,088.10	-192.78	-141.31	-192.78	0.00	0.00	0.00
5,200.00	5.96	216.24	5,187.56	-201.15	-147.45	-201.15	0.00	0.00	0.00
5,300.00	5.96	216.24	5,287.02	-209.52	-153.59	-209.52	0.00	0.00	0.00
5,400.00	5.96	216.24	5,386.48	-217.90	-159.73	-217.90	0.00	0.00	0.00
5,500.00	5.96	216.24	5,485.94	-226.27	-165.86	-226.27	0.00	0.00	0.00
5,600.00	5.96	216.24	5,585.39	-234.64	-172.00	-234.64	0.00	0.00	0.00
5,700.00	5.96	216.24	5,684.85	-243.02	-178.14	-243.02	0.00	0.00	0.00
5,800.00	5.96	216.24	5,784.31	-251.39	-184.28	-251.39	0.00	0.00	0.00
5,900.00	5.96	216.24	5,883.77	-259.76	-190.42	-259.76	0.00	0.00	0.00
6,000.00	5.96	216.24	5,983.23	-268.14	-196.55	-268.14	0.00	0.00	0.00
6,100.00	5.96	216.24	6,082.69	-276.51	-202.69	-276.51	0.00	0.00	0.00
6,200.00	5.96	216.24	6,182.15	-284.88	-208.83	-284.88	0.00	0.00	0.00
6,300.00	5.96	216.24	6,281.61	-293.26	-214.97	-293.26	0.00	0.00	0.00
6,400.00	5.96	216.24	6,381.07	-301.63	-221.10	-301.63	0.00	0.00	0.00
6,500.00	5.96	216.24	6,480.53	-310.00	-227.24	-310.00	0.00	0.00	0.00
6,600.00	5.96	216.24	6,579.99	-318.37	-233.38	-318.37	0.00	0.00	0.00
6,700.00	5.96	216.24	6,679.45	-326.75	-239.52	-326.75	0.00	0.00	0.00
6,800.00	5.96	216.24	6,778.91	-335.12	-245.66	-335.12	0.00	0.00	0.00
6,900.00	5.96	216.24	6,878.37	-343.49	-251.79	-343.49	0.00	0.00	0.00
7,000.00	5.96	216.24	6,977.83	-351.87	-257.93	-351.87	0.00	0.00	0.00
7,100.00	5.96	216.24	7,077.29	-360.24	-264.07	-360.24	0.00	0.00	0.00
7,200.00	5.96	216.24	7,176.75	-368.61	-270.21	-368.61	0.00	0.00	0.00
7,300.00	5.96	216.24	7,276.21	-376.99	-276.35	-376.99	0.00	0.00	0.00
7,400.00	5.96	216.24	7,375.67	-385.36	-282.48	-385.36	0.00	0.00	0.00
7,500.00	5.96	216.24	7,475.13	-393.73	-288.62	-393.73	0.00	0.00	0.00
7,600.00	5.96	216.24	7,574.59	-402.11	-294.76	-402.11	0.00	0.00	0.00
7,700.00	5.96	216.24	7,674.05	-410.48	-300.90	-410.48	0.00	0.00	0.00
7,800.00	5.96	216.24	7,773.51	-418.85	-307.03	-418.85	0.00	0.00	0.00
7,900.00	5.96	216.24	7,872.97	-427.23	-313.17	-427.23	0.00	0.00	0.00
8,000.00	5.96	216.24	7,972.43	-435.60	-319.31	-435.60	0.00	0.00	0.00
8,100.00	5.96	216.24	8,071.89	-443.97	-325.45	-443.97	0.00	0.00	0.00
8,200.00	5.96	216.24	8,171.35	-452.35	-331.59	-452.35	0.00	0.00	0.00
8,300.00	5.96	216.24	8,270.80	-460.72	-337.72	-460.72	0.00	0.00	0.00
8,400.00	5.96	216.24	8,370.26	-469.09	-343.86	-469.09	0.00	0.00	0.00
8,500.00	5.96	216.24	8,469.72	-477.47	-350.00	-477.47	0.00	0.00	0.00
8,600.00	5.96	216.24	8,569.18	-485.84	-356.14	-485.84	0.00	0.00	0.00
8,700.00	5.96	216.24	8,668.64	-494.21	-362.28	-494.21	0.00	0.00	0.00
8,800.00	5.96	216.24	8,768.10	-502.58	-368.41	-502.58	0.00	0.00	0.00
8,900.00	5.96	216.24	8,867.56	-510.96	-374.55	-510.96	0.00	0.00	0.00
9,000.00	5.96	216.24	8,967.02	-519.33	-380.69	-519.33	0.00	0.00	0.00
9,068.05	5.96	216.24	9,034.70	-525.03	-384.87	-525.03	0.00	0.00	0.00
9,100.00	5.64	216.24	9,066.49	-527.63	-386.77	-527.63	1.00	-1.00	0.00
9,200.00	4.64	216.24	9,166.09	-534.86	-392.07	-534.86	1.00	-1.00	0.00
9,300.00	3.64	216.24	9,265.83	-540.68	-396.34	-540.68	1.00	-1.00	0.00
9,400.00	2.64	216.24	9,365.67	-545.10	-399.58	-545.10	1.00	-1.00	0.00
9,500.00	1.64	216.24	9,465.60	-548.11	-401.78	-548.11	1.00	-1.00	0.00
9,600.00	0.64	216.24	9,565.58	-549.71	-402.96	-549.71	1.00	-1.00	0.00
9,663.96	0.00	0.00	9,629.54	-550.00	-403.17	-550.00	1.00	-1.00	0.00
9,700.00	0.00	0.00	9,665.58	-550.00	-403.17	-550.00	0.00	0.00	0.00
9,763.96	0.00	0.00	9,729.54	-550.00	-403.17	-550.00	0.00	0.00	0.00
9,775.00	1.32	360.00	9,740.58	-549.87	-403.17	-549.87	12.00	12.00	0.00
9,800.00	4.32	360.00	9,765.55	-548.64	-403.17	-548.64	12.00	12.00	0.00

# LEAM Drilling Systems LLC

## Planning Report

**Database:** EDM 5000.1 Multi User Db  
**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Site:** Cotton Draw Unit  
**Well:** 512H  
**Wellbore:** OH  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,825.00	7.32	360.00	9,790.41	-546.10	-403.17	-546.10	12.00	12.00	0.00
9,850.00	10.32	360.00	9,815.12	-542.27	-403.17	-542.27	12.00	12.00	0.00
9,875.00	13.32	360.00	9,839.58	-537.15	-403.17	-537.15	12.00	12.00	0.00
9,900.00	16.32	360.00	9,863.75	-530.75	-403.17	-530.75	12.00	12.00	0.00
9,925.00	19.32	360.00	9,887.54	-523.10	-403.17	-523.10	12.00	12.00	0.00
9,950.00	22.32	360.00	9,910.91	-514.21	-403.17	-514.21	12.00	12.00	0.00
9,975.00	25.32	360.00	9,933.78	-504.11	-403.17	-504.11	12.00	12.00	0.00
10,000.00	28.32	360.00	9,956.08	-492.83	-403.17	-492.83	12.00	12.00	0.00
10,025.00	31.32	360.00	9,977.77	-480.40	-403.17	-480.40	12.00	12.00	0.00
10,050.00	34.32	360.00	9,998.78	-466.85	-403.17	-466.85	12.00	12.00	0.00
10,075.00	37.32	360.00	10,019.04	-452.22	-403.17	-452.22	12.00	12.00	0.00
10,100.00	40.32	360.00	10,038.52	-436.55	-403.17	-436.55	12.00	12.00	0.00
10,125.00	43.32	360.00	10,057.15	-419.88	-403.17	-419.88	12.00	12.00	0.00
10,150.00	46.32	360.00	10,074.87	-402.26	-403.17	-402.26	12.00	12.00	0.00
10,175.00	49.32	360.00	10,091.66	-383.73	-403.17	-383.73	12.00	12.00	0.00
10,200.00	52.32	360.00	10,107.45	-364.35	-403.17	-364.35	12.00	12.00	0.00
10,225.00	55.32	360.00	10,122.20	-344.18	-403.17	-344.18	12.00	12.00	0.00
10,250.00	58.32	360.00	10,135.88	-323.25	-403.17	-323.25	12.00	12.00	0.00
10,275.00	61.32	360.00	10,148.45	-301.64	-403.17	-301.64	12.00	12.00	0.00
10,300.00	64.32	360.00	10,159.86	-279.41	-403.17	-279.41	12.00	12.00	0.00
10,325.00	67.32	360.00	10,170.10	-256.60	-403.17	-256.60	12.00	12.00	0.00
10,350.00	70.32	360.00	10,179.13	-233.29	-403.17	-233.29	12.00	12.00	0.00
10,375.00	73.32	360.00	10,186.93	-209.54	-403.17	-209.54	12.00	12.00	0.00
10,400.00	76.32	360.00	10,193.47	-185.42	-403.17	-185.42	12.00	12.00	0.00
10,425.00	79.32	360.00	10,198.74	-160.98	-403.17	-160.98	12.00	12.00	0.00
10,450.00	82.32	360.00	10,202.73	-136.30	-403.17	-136.30	12.00	12.00	0.00
10,475.00	85.32	360.00	10,205.42	-111.45	-403.17	-111.45	12.00	12.00	0.00
10,500.00	88.32	360.00	10,206.80	-86.49	-403.17	-86.49	12.00	12.00	0.00
10,513.96	90.00	360.00	10,207.01	-72.53	-403.17	-72.53	12.00	12.00	0.00
10,600.00	90.00	360.00	10,207.00	13.51	-403.17	13.51	0.00	0.00	0.00
10,700.00	90.00	360.00	10,207.00	113.51	-403.17	113.51	0.00	0.00	0.00
10,800.00	90.00	360.00	10,207.00	213.51	-403.17	213.51	0.00	0.00	0.00
10,900.00	90.00	360.00	10,207.00	313.51	-403.17	313.51	0.00	0.00	0.00
11,000.00	90.00	360.00	10,207.00	413.51	-403.17	413.51	0.00	0.00	0.00
11,100.00	90.00	360.00	10,207.00	513.51	-403.17	513.51	0.00	0.00	0.00
11,200.00	90.00	360.00	10,207.00	613.51	-403.17	613.51	0.00	0.00	0.00
11,300.00	90.00	360.00	10,207.00	713.51	-403.17	713.51	0.00	0.00	0.00
11,400.00	90.00	360.00	10,207.00	813.51	-403.17	813.51	0.00	0.00	0.00
11,500.00	90.00	360.00	10,207.00	913.51	-403.17	913.51	0.00	0.00	0.00
11,600.00	90.00	360.00	10,207.00	1,013.51	-403.17	1,013.51	0.00	0.00	0.00
11,700.00	90.00	360.00	10,207.00	1,113.51	-403.17	1,113.51	0.00	0.00	0.00
11,800.00	90.00	360.00	10,207.00	1,213.51	-403.17	1,213.51	0.00	0.00	0.00
11,900.00	90.00	360.00	10,207.00	1,313.51	-403.17	1,313.51	0.00	0.00	0.00
12,000.00	90.00	360.00	10,207.00	1,413.51	-403.17	1,413.51	0.00	0.00	0.00
12,100.00	90.00	360.00	10,207.00	1,513.51	-403.17	1,513.51	0.00	0.00	0.00
12,200.00	90.00	360.00	10,207.00	1,613.51	-403.17	1,613.51	0.00	0.00	0.00
12,300.00	90.00	360.00	10,207.00	1,713.51	-403.17	1,713.51	0.00	0.00	0.00
12,400.00	90.00	360.00	10,207.00	1,813.51	-403.17	1,813.51	0.00	0.00	0.00
12,500.00	90.00	360.00	10,207.00	1,913.51	-403.17	1,913.51	0.00	0.00	0.00
12,600.00	90.00	360.00	10,207.00	2,013.51	-403.17	2,013.51	0.00	0.00	0.00
12,700.00	90.00	360.00	10,207.00	2,113.51	-403.17	2,113.51	0.00	0.00	0.00
12,800.00	90.00	360.00	10,207.00	2,213.51	-403.17	2,213.51	0.00	0.00	0.00

# LEAM Drilling Systems LLC

## Planning Report

**Database:** EDM 5000.1 Multi User Db  
**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Site:** Cotton Draw Unit  
**Well:** 512H  
**Wellbore:** OH  
**Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,900.00	90.00	360.00	10,207.00	2,313.51	-403.17	2,313.51	0.00	0.00	0.00
13,000.00	90.00	360.00	10,207.00	2,413.51	-403.17	2,413.51	0.00	0.00	0.00
13,100.00	90.00	360.00	10,207.00	2,513.51	-403.17	2,513.51	0.00	0.00	0.00
13,200.00	90.00	360.00	10,207.00	2,613.51	-403.17	2,613.51	0.00	0.00	0.00
13,300.00	90.00	360.00	10,207.00	2,713.51	-403.17	2,713.51	0.00	0.00	0.00
13,400.00	90.00	360.00	10,207.00	2,813.51	-403.17	2,813.51	0.00	0.00	0.00
13,500.00	90.00	360.00	10,207.00	2,913.51	-403.17	2,913.51	0.00	0.00	0.00
13,600.00	90.00	360.00	10,207.00	3,013.51	-403.17	3,013.51	0.00	0.00	0.00
13,700.00	90.00	360.00	10,207.00	3,113.51	-403.17	3,113.51	0.00	0.00	0.00
13,800.00	90.00	360.00	10,207.00	3,213.51	-403.17	3,213.51	0.00	0.00	0.00
13,900.00	90.00	360.00	10,207.00	3,313.51	-403.17	3,313.51	0.00	0.00	0.00
14,000.00	90.00	360.00	10,207.00	3,413.51	-403.17	3,413.51	0.00	0.00	0.00
14,100.00	90.00	360.00	10,207.00	3,513.51	-403.17	3,513.51	0.00	0.00	0.00
14,200.00	90.00	360.00	10,207.00	3,613.51	-403.17	3,613.51	0.00	0.00	0.00
14,300.00	90.00	360.00	10,207.00	3,713.51	-403.17	3,713.51	0.00	0.00	0.00
14,400.00	90.00	360.00	10,207.00	3,813.51	-403.17	3,813.51	0.00	0.00	0.00
14,500.00	90.00	360.00	10,207.00	3,913.51	-403.17	3,913.51	0.00	0.00	0.00
14,600.00	90.00	360.00	10,207.00	4,013.51	-403.17	4,013.51	0.00	0.00	0.00
14,700.00	90.00	360.00	10,207.00	4,113.51	-403.17	4,113.51	0.00	0.00	0.00
14,800.00	90.00	360.00	10,207.00	4,213.51	-403.17	4,213.51	0.00	0.00	0.00
14,900.00	90.00	360.00	10,207.00	4,313.51	-403.17	4,313.51	0.00	0.00	0.00
15,000.00	90.00	360.00	10,207.00	4,413.51	-403.17	4,413.51	0.00	0.00	0.00
15,100.00	90.00	360.00	10,207.00	4,513.51	-403.17	4,513.51	0.00	0.00	0.00
15,200.00	90.00	360.00	10,207.00	4,613.51	-403.17	4,613.51	0.00	0.00	0.00
15,300.00	90.00	360.00	10,207.00	4,713.51	-403.17	4,713.51	0.00	0.00	0.00
15,344.98	90.00	360.00	10,207.00	4,758.48	-403.17	4,758.48	0.00	0.00	0.00
PBHL (512H)									

### Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL (512H)	0.00	0.00	10,207.00	4,758.48	-403.17	435,127.81	727,833.08	32° 11' 41.303 N	103° 43' 49.577 W
- plan hits target center									
- Point									

NM OIL CONSERVATION  
ARTESIA DISTRICT

MAY 22 2017

RECEIVED

# **Devon Energy**

Eddy County, NM (NAD-83)

Cotton Draw Unit

512H

OH

Plan #1

## **Anticollision Report**

20 February, 2017

# LEAM Drilling Systems LLC

## Anticollision Report

<b>Company:</b>	Devon Energy	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Project:</b>	Eddy County, NM (NAD-83)	<b>TVD Reference:</b>	3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)
<b>Reference Site:</b>	Cotton Draw Unit	<b>MD Reference:</b>	3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	512H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	OH	<b>Database:</b>	EDM 5000.1 Multi User Db
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria
<b>Interpolation Method:</b>	Stations
<b>Depth Range:</b>	Unlimited
<b>Results Limited by:</b>	Maximum center-center distance of 9,999.98 usft
<b>Warning Levels Evaluated at:</b>	2.00 Sigma
<b>Error Model:</b>	ISCWSA
<b>Scan Method:</b>	Closest Approach 3D
<b>Error Surface:</b>	Elliptical Conic
<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	2/20/2017
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>
0.00	15,344.98	Plan #1 (OH)
<b>Tool Name</b>	<b>Description</b>	
LEAM MWD+HDGM	MWD+HDGM	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Cotton Draw Unit						
291H - OH - Plan #1	2,416.02	2,417.92	89.88	79.29	8.489	CC
291H - OH - Plan #1	2,500.00	2,501.88	89.88	78.92	8.198	ES
291H - OH - Plan #1	15,345.97	15,687.79	1,226.94	1,064.80	7.567	SF
293H - OH - Plan #1	2,500.81	2,501.51	59.95	48.99	5.467	CC
293H - OH - Plan #1	2,600.00	2,601.01	60.21	48.82	5.289	ES
293H - OH - Plan #1	2,700.00	2,701.18	61.22	49.44	5.196	SF
294H - OH - Plan #1	2,500.00	2,500.20	29.88	18.92	2.726	CC, ES
294H - OH - Plan #1	4,800.00	4,806.32	47.36	26.30	2.249	SF
511H - OH - Plan #1	2,500.00	2,499.90	29.99	19.03	2.736	CC
511H - OH - Plan #1	10,397.97	10,372.36	61.08	16.09	1.358	Level 3, ES, SF
513H - OH - Plan #1	2,415.99	2,417.99	119.97	109.38	11.331	CC
513H - OH - Plan #1	2,500.00	2,501.96	119.97	109.01	10.942	ES
513H - OH - Plan #1	15,345.97	15,433.18	1,649.61	1,483.01	9.902	SF

Offset Design														Offset Site Error:	0.00 usft
Cotton Draw Unit - 291H - OH - Plan #1														Offset Well Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM															
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	1.90	1.90	0.00	0.00	89.59	0.65	89.88	89.88						
100.00	100.00	101.90	101.90	0.09	0.09	89.59	0.65	89.88	89.88	89.71	0.18	510.067			
200.00	200.00	201.90	201.90	0.31	0.32	89.59	0.65	89.88	89.88	89.26	0.63	143.640			
300.00	300.00	301.90	301.90	0.54	0.54	89.59	0.65	89.88	89.88	88.81	1.08	83.590			
400.00	400.00	401.90	401.90	0.76	0.76	89.59	0.65	89.88	89.88	88.36	1.52	58.946			
500.00	500.00	501.90	501.90	0.99	0.99	89.59	0.65	89.88	89.88	87.91	1.97	45.525			
600.00	600.00	601.90	601.90	1.21	1.21	89.59	0.65	89.88	89.88	87.46	2.42	37.082			
700.00	700.00	701.90	701.90	1.43	1.44	89.59	0.65	89.88	89.88	87.01	2.87	31.281			
800.00	800.00	801.90	801.90	1.66	1.66	89.59	0.65	89.88	89.88	86.56	3.32	27.049			
900.00	900.00	901.90	901.90	1.88	1.89	89.59	0.65	89.88	89.88	86.11	3.77	23.826			
1,000.00	1,000.00	1,001.90	1,001.90	2.11	2.11	89.59	0.65	89.88	89.88	85.66	4.22	21.289			
1,100.00	1,100.00	1,101.90	1,101.90	2.33	2.34	89.59	0.65	89.88	89.88	85.21	4.67	19.240			
1,200.00	1,200.00	1,201.90	1,201.90	2.56	2.56	89.59	0.65	89.88	89.88	84.76	5.12	17.551			

CC - Min centre to center distance or convergent point. SF - min separation factor ES - min ellipse separation



# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 291H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)		Between Centres (usft)	Between Ellipses (usft)				
1,300.00	1,300.00	1,301.90	1,301.90	2.78	2.79	89.59	0.65	89.88	89.88	84.31	5.57	16.135			
1,400.00	1,400.00	1,401.90	1,401.90	3.01	3.01	89.59	0.65	89.88	89.88	83.86	6.02	14.930			
1,500.00	1,500.00	1,501.90	1,501.90	3.23	3.24	89.59	0.65	89.88	89.88	83.41	6.47	13.893			
1,600.00	1,600.00	1,601.90	1,601.90	3.46	3.46	89.59	0.65	89.88	89.88	82.96	6.92	12.990			
1,700.00	1,700.00	1,701.90	1,701.90	3.68	3.69	89.59	0.65	89.88	89.88	82.51	7.37	12.198			
1,800.00	1,800.00	1,801.90	1,801.90	3.91	3.91	89.59	0.65	89.88	89.88	82.06	7.82	11.496			
1,900.00	1,900.00	1,901.90	1,901.90	4.13	4.14	89.59	0.65	89.88	89.88	81.61	8.27	10.871			
2,000.00	2,000.00	2,001.90	2,001.90	4.36	4.36	89.59	0.65	89.88	89.88	81.17	8.72	10.311			
2,100.00	2,100.00	2,101.90	2,101.90	4.58	4.59	89.59	0.65	89.88	89.88	80.72	9.17	9.805			
2,200.00	2,200.00	2,201.90	2,201.90	4.81	4.81	89.59	0.65	89.88	89.88	80.27	9.62	9.347			
2,300.00	2,300.00	2,301.90	2,301.90	5.03	5.04	89.59	0.65	89.88	89.88	79.82	10.07	8.929			
2,400.00	2,400.00	2,401.90	2,401.90	5.26	5.26	89.59	0.65	89.88	89.88	79.37	10.52	8.548			
2,416.02	2,416.02	2,417.92	2,417.92	5.29	5.30	89.59	0.65	89.88	89.88	79.29	10.59	8.489 CC			
2,500.00	2,500.00	2,501.88	2,501.88	5.48	5.48	89.59	0.65	89.88	89.88	78.92	10.96	8.198 ES			
2,600.00	2,599.99	2,600.66	2,600.65	5.68	5.68	-126.73	0.10	90.57	91.10	79.74	11.36	8.019			
2,700.00	2,699.96	2,699.35	2,699.31	5.85	5.86	-126.97	-1.51	92.59	94.70	82.99	11.71	8.088			
2,800.00	2,799.86	2,797.87	2,797.74	6.03	6.04	-127.34	-4.17	95.94	100.69	88.62	12.06	8.347			
2,900.00	2,899.68	2,896.14	2,895.82	6.22	6.23	-127.79	-7.87	100.59	109.05	96.63	12.42	8.779			
3,000.00	2,999.37	2,994.06	2,993.45	6.41	6.42	-128.27	-12.60	106.54	119.79	107.01	12.78	9.370			
3,095.91	3,094.84	3,087.60	3,086.57	6.59	6.61	-128.72	-18.09	113.44	132.32	119.18	13.14	10.070			
3,100.00	3,098.90	3,091.57	3,090.52	6.60	6.62	-128.75	-18.34	113.76	132.90	119.74	13.16	10.102			
3,200.00	3,198.36	3,188.68	3,187.02	6.80	6.82	-129.03	-25.08	122.24	147.78	134.25	13.53	10.922			
3,300.00	3,297.82	3,286.12	3,283.67	7.01	7.03	-128.89	-32.80	131.94	163.83	149.91	13.92	11.771			
3,400.00	3,397.28	3,384.78	3,381.49	7.22	7.25	-128.70	-40.83	142.05	180.14	165.82	14.33	12.573			
3,500.00	3,496.74	3,483.44	3,479.30	7.44	7.48	-128.54	-48.86	152.15	196.46	181.72	14.74	13.324			
3,600.00	3,596.20	3,582.10	3,577.11	7.66	7.72	-128.41	-56.89	162.25	212.78	197.61	15.17	14.026			
3,700.00	3,695.66	3,680.76	3,674.92	7.89	7.95	-128.30	-64.93	172.35	229.10	213.50	15.60	14.684			
3,800.00	3,795.12	3,779.42	3,772.73	8.12	8.20	-128.20	-72.96	182.45	245.42	229.38	16.04	15.300			
3,900.00	3,894.58	3,878.08	3,870.54	8.35	8.45	-128.11	-80.99	192.55	261.74	245.26	16.49	15.877			
4,000.00	3,994.04	3,976.73	3,968.35	8.59	8.70	-128.04	-89.02	202.65	278.06	261.13	16.94	16.419			
4,100.00	4,093.50	4,075.39	4,066.16	8.83	8.95	-127.97	-97.05	212.75	294.39	276.99	17.39	16.928			
4,200.00	4,192.96	4,174.05	4,163.97	9.07	9.21	-127.91	-105.08	222.85	310.71	292.86	17.85	17.406			
4,300.00	4,292.42	4,272.71	4,261.78	9.31	9.47	-127.85	-113.12	232.95	327.03	308.72	18.31	17.857			
4,400.00	4,391.88	4,371.37	4,359.59	9.56	9.74	-127.80	-121.15	243.05	343.35	324.57	18.78	18.281			
4,500.00	4,491.34	4,470.03	4,457.40	9.80	10.01	-127.76	-129.18	253.15	359.68	340.42	19.25	18.680			
4,600.00	4,590.80	4,568.68	4,555.21	10.06	10.27	-127.72	-137.21	263.25	376.00	356.27	19.73	19.058			
4,700.00	4,690.26	4,667.34	4,653.03	10.31	10.55	-127.68	-145.24	273.35	392.32	372.12	20.21	19.414			
4,800.00	4,789.72	4,766.00	4,750.84	10.56	10.82	-127.65	-153.28	283.45	408.65	387.96	20.69	19.751			
4,900.00	4,889.18	4,864.66	4,848.65	10.82	11.09	-127.61	-161.31	293.55	424.97	403.80	21.17	20.071			
5,000.00	4,988.64	4,963.32	4,946.46	11.07	11.37	-127.58	-169.34	303.66	441.30	419.64	21.66	20.373			
5,100.00	5,088.10	5,061.98	5,044.27	11.33	11.65	-127.56	-177.37	313.76	457.62	435.47	22.15	20.660			
5,200.00	5,187.56	5,160.63	5,142.08	11.59	11.93	-127.53	-185.40	323.86	473.94	451.30	22.64	20.932			
5,300.00	5,287.02	5,259.29	5,239.89	11.85	12.21	-127.51	-193.43	333.96	490.27	467.13	23.14	21.191			
5,400.00	5,386.48	5,357.95	5,337.70	12.11	12.50	-127.48	-201.47	344.06	506.59	482.96	23.63	21.438			
5,500.00	5,485.94	5,456.61	5,435.51	12.37	12.78	-127.46	-209.50	354.16	522.92	498.79	24.13	21.672			
5,600.00	5,585.39	5,555.27	5,533.32	12.64	13.06	-127.44	-217.53	364.26	539.24	514.61	24.63	21.896			
5,700.00	5,684.85	5,653.93	5,631.13	12.90	13.35	-127.43	-225.56	374.36	555.57	530.44	25.13	22.109			
5,800.00	5,784.31	5,752.58	5,728.94	13.17	13.64	-127.41	-233.59	384.46	571.89	546.26	25.63	22.312			
5,900.00	5,883.77	5,851.24	5,826.75	13.43	13.93	-127.39	-241.63	394.56	588.22	562.08	26.14	22.506			
6,000.00	5,983.23	5,949.90	5,924.56	13.70	14.22	-127.38	-249.66	404.66	604.54	577.90	26.64	22.692			
6,100.00	6,082.69	6,048.56	6,022.38	13.97	14.51	-127.36	-257.69	414.76	620.87	593.72	27.15	22.870			

CC - Min centre to center distance or convergent point, SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 291H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
6,200.00	6,182.15	6,147.22	6,120.19	14.23	14.80	-127.35	-265.72	424.86	637.19	609.53	27.66	23.040		
6,300.00	6,281.61	6,245.88	6,218.00	14.50	15.09	-127.33	-273.75	434.96	653.52	625.35	28.17	23.203		
6,400.00	6,381.07	6,344.53	6,315.81	14.77	15.38	-127.32	-281.78	445.06	669.84	641.16	28.68	23.359		
6,500.00	6,480.53	6,443.19	6,413.62	15.04	15.67	-127.31	-289.82	455.17	686.17	656.98	29.19	23.509		
6,600.00	6,579.99	6,541.85	6,511.43	15.31	15.97	-127.30	-297.85	465.27	702.49	672.79	29.70	23.653		
6,700.00	6,679.45	6,640.51	6,609.24	15.58	16.26	-127.29	-305.88	475.37	718.82	688.60	30.21	23.792		
6,800.00	6,778.91	6,739.17	6,707.05	15.85	16.55	-127.28	-313.91	485.47	735.14	704.41	30.73	23.925		
6,900.00	6,878.37	6,837.83	6,804.86	16.13	16.85	-127.27	-321.94	495.57	751.47	720.22	31.24	24.053		
7,000.00	6,977.83	6,936.48	6,902.67	16.40	17.14	-127.26	-329.98	505.67	767.79	736.03	31.76	24.176		
7,100.00	7,077.29	7,035.14	7,000.48	16.67	17.44	-127.25	-338.01	515.77	784.12	751.84	32.28	24.295		
7,200.00	7,176.75	7,133.80	7,098.29	16.94	17.74	-127.24	-346.04	525.87	800.44	767.65	32.79	24.409		
7,300.00	7,276.21	7,232.46	7,196.10	17.22	18.03	-127.23	-354.07	535.97	816.77	783.45	33.31	24.519		
7,400.00	7,375.67	7,331.12	7,293.92	17.49	18.33	-127.22	-362.10	546.07	833.09	799.26	33.83	24.626		
7,500.00	7,475.13	7,429.78	7,391.73	17.76	18.63	-127.21	-370.13	556.17	849.42	815.07	34.35	24.728		
7,600.00	7,574.59	7,528.44	7,489.54	18.04	18.93	-127.21	-378.17	566.27	865.74	830.87	34.87	24.827		
7,700.00	7,674.05	7,627.09	7,587.35	18.31	19.22	-127.20	-386.20	576.37	882.07	846.68	35.39	24.923		
7,800.00	7,773.51	7,725.75	7,685.16	18.59	19.52	-127.19	-394.23	586.47	898.39	862.48	35.91	25.016		
7,900.00	7,872.97	7,824.41	7,782.97	18.86	19.82	-127.18	-402.26	596.57	914.72	878.28	36.43	25.105		
8,000.00	7,972.43	7,923.07	7,880.78	19.14	20.12	-127.18	-410.29	606.67	931.04	894.08	36.96	25.192		
8,100.00	8,071.89	8,021.73	7,978.59	19.41	20.42	-127.17	-418.33	616.78	947.37	909.89	37.48	25.276		
8,200.00	8,171.35	8,120.39	8,076.40	19.69	20.72	-127.17	-426.36	626.88	963.69	925.69	38.00	25.357		
8,300.00	8,270.80	8,219.04	8,174.21	19.97	21.02	-127.16	-434.39	636.98	980.02	941.49	38.53	25.436		
8,400.00	8,370.26	8,317.70	8,272.02	20.24	21.32	-127.15	-442.42	647.08	996.34	957.29	39.05	25.512		
8,500.00	8,469.72	8,416.36	8,369.83	20.52	21.62	-127.15	-450.45	657.18	1,012.67	973.09	39.58	25.586		
8,600.00	8,569.18	8,515.02	8,467.64	20.80	21.92	-127.14	-458.48	667.28	1,028.99	988.89	40.10	25.658		
8,700.00	8,668.64	8,613.68	8,565.46	21.07	22.22	-127.14	-466.52	677.38	1,045.32	1,004.69	40.63	25.728		
8,800.00	8,768.10	8,712.34	8,663.27	21.35	22.52	-127.13	-474.55	687.48	1,061.64	1,020.49	41.16	25.795		
8,900.00	8,867.56	8,810.99	8,761.08	21.63	22.83	-127.13	-482.58	697.58	1,077.97	1,036.29	41.68	25.861		
9,000.00	8,967.02	8,909.65	8,858.89	21.91	23.13	-127.12	-490.61	707.68	1,094.30	1,052.08	42.21	25.925		
9,068.05	9,034.70	8,976.79	8,925.45	22.09	23.33	-127.12	-498.08	714.55	1,105.40	1,062.83	42.57	25.967		
9,100.00	9,066.49	9,008.32	8,956.71	22.17	23.43	-127.16	-498.64	717.78	1,110.57	1,067.84	42.73	25.991		
9,200.00	9,166.09	9,107.11	9,054.64	22.38	23.73	-127.22	-506.69	727.90	1,126.04	1,082.84	43.20	26.065		
9,300.00	9,265.83	9,206.02	9,152.71	22.59	24.03	-127.20	-514.74	738.02	1,140.47	1,096.81	43.66	26.119		
9,400.00	9,365.67	9,314.30	9,260.10	22.78	24.34	-127.10	-523.36	748.87	1,153.67	1,109.52	44.15	26.133		
9,500.00	9,465.60	9,432.09	9,377.16	22.97	24.60	-126.95	-531.45	759.04	1,164.45	1,119.84	44.61	26.102		
9,600.00	9,565.58	9,550.40	9,495.00	23.14	24.85	-126.78	-538.06	767.35	1,172.61	1,127.56	45.05	26.027		
9,663.96	9,629.54	9,626.30	9,570.69	23.26	25.01	89.59	-541.50	771.68	1,176.45	1,131.12	45.33	25.951		
9,700.00	9,665.58	9,669.13	9,613.44	23.32	25.09	89.67	-543.17	773.78	1,178.21	1,132.72	45.49	25.902		
9,763.96	9,729.54	9,745.22	9,689.43	23.43	25.23	89.79	-545.64	776.89	1,180.82	1,135.07	45.75	25.810		
9,775.00	9,740.58	9,758.36	9,702.55	23.45	25.26	89.77	-546.01	777.35	1,181.20	1,135.40	45.80	25.793		
9,800.00	9,765.55	9,788.06	9,732.23	23.49	25.31	89.78	-546.76	778.29	1,181.99	1,136.10	45.89	25.758		
9,825.00	9,790.41	9,817.64	9,761.79	23.52	25.36	89.87	-547.41	779.12	1,182.68	1,136.71	45.97	25.725		
9,850.00	9,815.12	9,847.01	9,791.15	23.55	25.41	90.05	-547.97	779.81	1,183.28	1,137.23	46.05	25.697		
9,875.00	9,839.58	9,876.12	9,820.25	23.57	25.46	90.29	-548.43	780.39	1,183.80	1,137.69	46.11	25.671		
9,900.00	9,863.75	9,904.91	9,849.03	23.59	25.51	90.61	-548.79	780.85	1,184.27	1,138.10	46.17	25.649		
9,925.00	9,887.54	9,933.29	9,877.40	23.59	25.56	90.99	-549.06	781.18	1,184.70	1,138.48	46.22	25.631		
9,950.00	9,910.91	9,961.20	9,905.32	23.60	25.61	91.43	-549.24	781.41	1,185.12	1,138.86	46.26	25.618		
9,975.00	9,933.78	9,988.59	9,932.70	23.60	25.65	91.91	-549.33	781.53	1,185.56	1,139.27	46.29	25.609		
10,000.00	9,956.08	10,013.87	9,957.98	23.59	25.70	92.40	-549.35	781.55	1,186.07	1,139.75	46.32	25.607		
10,025.00	9,977.77	10,035.55	9,979.67	23.58	25.73	92.85	-549.35	781.55	1,186.72	1,140.40	46.33	25.615		

CC - Min centre to center distance or convergent point. SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**Reference Site:** Cotton Draw Unit

**North Reference:** Grid

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Survey Calculation Method:** Minimum Curvature

**Well Error:** 0.00 usft

**Output errors are at** 2.00 sigma

**Reference Wellbore** OH

**Database:** EDM 5000.1 Multi User Db

**Reference Design:** Plan #1

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 291H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: O-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)										
10,050.00	9,998.78	10,056.66	10,000.68	23.56	25.77	93.29	-549.35	781.55	1,187.59	1,141.26	46.33	25.632			
10,075.00	10,019.04	10,076.83	10,020.94	23.55	25.80	93.73	-549.35	781.55	1,188.69	1,142.36	46.33	25.657			
10,100.00	10,038.52	10,096.30	10,040.42	23.52	25.84	94.15	-549.35	781.55	1,190.08	1,143.76	46.32	25.692			
10,125.00	10,057.15	10,118.09	10,062.21	23.50	25.87	94.64	-549.21	781.55	1,191.76	1,145.45	46.31	25.734			
10,150.00	10,074.87	10,144.26	10,088.34	23.47	25.91	95.25	-547.85	781.55	1,193.69	1,147.39	46.30	25.784			
10,175.00	10,091.66	10,171.88	10,115.79	23.44	25.94	95.87	-544.87	781.55	1,195.84	1,149.56	46.27	25.842			
10,200.00	10,107.45	10,201.17	10,144.66	23.40	25.97	96.51	-539.98	781.55	1,198.19	1,151.94	46.24	25.911			
10,225.00	10,122.20	10,232.41	10,175.07	23.37	26.00	97.18	-532.82	781.55	1,200.73	1,154.53	46.20	25.990			
10,250.00	10,135.88	10,265.93	10,207.09	23.33	26.01	97.87	-522.96	781.55	1,203.43	1,157.29	46.14	26.080			
10,275.00	10,148.45	10,302.09	10,240.78	23.29	26.02	98.60	-509.82	781.55	1,206.26	1,160.19	46.07	26.181			
10,300.00	10,159.86	10,341.34	10,276.09	23.26	26.01	99.37	-492.72	781.55	1,209.19	1,163.20	45.98	26.295			
10,325.00	10,170.10	10,384.15	10,312.87	23.22	25.99	100.17	-470.83	781.55	1,212.15	1,166.27	45.88	26.423			
10,350.00	10,179.13	10,431.04	10,350.72	23.18	25.95	101.01	-443.19	781.55	1,215.08	1,169.33	45.74	26.562			
10,375.00	10,186.93	10,482.51	10,388.93	23.14	25.90	101.86	-408.73	781.55	1,217.90	1,172.31	45.59	26.712			
10,400.00	10,193.47	10,538.99	10,426.31	23.10	25.82	102.71	-366.45	781.55	1,220.52	1,175.09	45.43	26.866			
10,425.00	10,198.74	10,600.66	10,461.12	23.07	25.72	103.51	-315.60	781.55	1,222.83	1,177.57	45.27	27.014			
10,450.00	10,202.73	10,667.36	10,491.06	23.03	25.61	104.20	-256.05	781.55	1,224.72	1,179.59	45.13	27.139			
10,475.00	10,205.42	10,738.39	10,513.49	23.00	25.47	104.73	-188.72	781.55	1,226.08	1,181.04	45.04	27.222			
10,500.00	10,206.80	10,812.45	10,525.98	22.97	25.33	105.03	-115.80	781.55	1,226.82	1,181.79	45.03	27.242			
10,513.96	10,207.01	10,854.47	10,528.00	22.95	25.26	105.07	-73.84	781.55	1,226.94	1,181.87	45.07	27.222			
10,600.00	10,207.00	10,941.82	10,528.00	22.88	25.12	105.07	13.51	781.55	1,226.94	1,181.65	45.29	27.089			
10,700.00	10,207.00	11,041.82	10,528.00	22.97	25.00	105.07	113.51	781.55	1,226.94	1,181.20	45.74	26.825			
10,800.00	10,207.00	11,141.82	10,528.00	23.31	25.02	105.07	213.51	781.55	1,226.94	1,180.54	46.40	26.444			
10,900.00	10,207.00	11,241.82	10,528.00	23.80	25.30	105.07	313.51	781.55	1,226.94	1,179.68	47.26	25.961			
11,000.00	10,207.00	11,341.82	10,528.00	24.41	25.82	105.07	413.51	781.55	1,226.94	1,178.62	48.32	25.392			
11,100.00	10,207.00	11,441.82	10,528.00	25.10	26.47	105.07	513.51	781.55	1,226.94	1,177.38	49.56	24.757			
11,200.00	10,207.00	11,541.82	10,528.00	25.87	27.22	105.07	613.51	781.55	1,226.94	1,175.97	50.97	24.072			
11,300.00	10,207.00	11,641.82	10,528.00	26.71	28.03	105.07	713.51	781.55	1,226.94	1,174.41	52.53	23.356			
11,400.00	10,207.00	11,741.82	10,528.00	27.63	28.91	105.07	813.51	781.55	1,226.94	1,172.70	54.24	22.621			
11,500.00	10,207.00	11,841.82	10,528.00	28.60	29.85	105.07	913.51	781.55	1,226.94	1,170.87	56.07	21.881			
11,600.00	10,207.00	11,941.82	10,528.00	29.64	30.85	105.07	1,013.51	781.55	1,226.94	1,168.92	58.02	21.145			
11,700.00	10,207.00	12,041.82	10,528.00	30.72	31.89	105.07	1,113.51	781.55	1,226.94	1,166.86	60.08	20.422			
11,800.00	10,207.00	12,141.82	10,528.00	31.85	32.98	105.07	1,213.51	781.55	1,226.94	1,164.71	62.23	19.716			
11,900.00	10,207.00	12,241.82	10,528.00	33.02	34.12	105.07	1,313.51	781.55	1,226.94	1,162.47	64.47	19.032			
12,000.00	10,207.00	12,341.82	10,528.00	34.22	35.29	105.07	1,413.51	781.55	1,226.94	1,160.16	66.78	18.373			
12,100.00	10,207.00	12,441.82	10,528.00	35.46	36.49	105.07	1,513.51	781.55	1,226.94	1,157.78	69.16	17.740			
12,200.00	10,207.00	12,541.82	10,528.00	36.74	37.73	105.07	1,613.51	781.55	1,226.94	1,155.34	71.61	17.134			
12,300.00	10,207.00	12,641.82	10,528.00	38.03	38.99	105.07	1,713.51	781.55	1,226.94	1,152.83	74.11	16.556			
12,400.00	10,207.00	12,741.82	10,528.00	39.36	40.28	105.07	1,813.51	781.55	1,226.94	1,150.28	76.66	16.005			
12,500.00	10,207.00	12,841.82	10,528.00	40.70	41.59	105.07	1,913.51	781.55	1,226.94	1,147.69	79.25	15.481			
12,600.00	10,207.00	12,941.82	10,528.00	42.07	42.93	105.07	2,013.51	781.55	1,226.94	1,145.05	81.89	14.982			
12,700.00	10,207.00	13,041.82	10,528.00	43.45	44.29	105.07	2,113.51	781.55	1,226.94	1,142.37	84.57	14.508			
12,800.00	10,207.00	13,141.82	10,528.00	44.86	45.66	105.07	2,213.51	781.55	1,226.94	1,139.67	87.28	14.058			
12,900.00	10,207.00	13,241.82	10,528.00	46.27	47.05	105.07	2,313.51	781.55	1,226.94	1,136.93	90.02	13.630			
13,000.00	10,207.00	13,341.82	10,528.00	47.70	48.45	105.07	2,413.51	781.55	1,226.94	1,134.16	92.78	13.223			
13,100.00	10,207.00	13,441.82	10,528.00	49.15	49.87	105.07	2,513.51	781.55	1,226.94	1,131.36	95.58	12.837			
13,200.00	10,207.00	13,541.82	10,528.00	50.60	51.30	105.07	2,613.51	781.55	1,226.94	1,128.55	98.40	12.469			
13,300.00	10,207.00	13,641.82	10,528.00	52.06	52.74	105.07	2,713.51	781.55	1,226.94	1,125.71	101.24	12.120			
13,400.00	10,207.00	13,741.82	10,528.00	53.54	54.20	105.07	2,813.51	781.55	1,226.94	1,122.85	104.09	11.787			
13,500.00	10,207.00	13,841.82	10,528.00	55.02	55.66	105.07	2,913.51	781.55	1,226.94	1,119.97	106.97	11.470			
13,600.00	10,207.00	13,941.82	10,528.00	56.52	57.13	105.07	3,013.51	781.55	1,226.94	1,117.08	109.87	11.168			

CC - Min centre to center distance or convergent point, SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 291H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offet Wellbore Centre +N/-S (usft)	+E/-W (usft)						
13,700.00	10,207.00	14,041.82	10,528.00	58.02	58.61	105.07	3,113.51	781.55	1,226.94	1,114.17	112.78	10.879		
13,800.00	10,207.00	14,141.82	10,528.00	59.52	60.10	105.07	3,213.51	781.55	1,226.94	1,111.24	115.70	10.605		
13,900.00	10,207.00	14,241.82	10,528.00	61.04	61.60	105.07	3,313.51	781.55	1,226.94	1,108.30	118.64	10.342		
14,000.00	10,207.00	14,341.82	10,528.00	62.56	63.10	105.07	3,413.51	781.55	1,226.94	1,105.36	121.59	10.091		
14,100.00	10,207.00	14,441.82	10,528.00	64.08	64.61	105.07	3,513.51	781.55	1,226.94	1,102.39	124.55	9.851		
14,200.00	10,207.00	14,541.82	10,528.00	65.61	66.12	105.07	3,613.51	781.55	1,226.94	1,099.42	127.52	9.622		
14,300.00	10,207.00	14,641.82	10,528.00	67.15	67.64	105.07	3,713.51	781.55	1,226.94	1,096.44	130.50	9.402		
14,400.00	10,207.00	14,741.82	10,528.00	68.69	69.17	105.07	3,813.51	781.55	1,226.94	1,093.45	133.49	9.191		
14,500.00	10,207.00	14,841.82	10,528.00	70.23	70.70	105.07	3,913.51	781.55	1,226.94	1,090.45	136.49	8.989		
14,600.00	10,207.00	14,941.82	10,528.00	71.78	72.23	105.07	4,013.51	781.55	1,226.94	1,087.44	139.50	8.795		
14,700.00	10,207.00	15,041.82	10,528.00	73.33	73.77	105.07	4,113.51	781.55	1,226.94	1,084.43	142.51	8.609		
14,800.00	10,207.00	15,141.82	10,528.00	74.89	75.32	105.07	4,213.51	781.55	1,226.94	1,081.41	145.53	8.431		
14,900.00	10,207.00	15,241.82	10,528.00	76.45	76.86	105.07	4,313.51	781.55	1,226.94	1,078.38	148.56	8.259		
15,000.00	10,207.00	15,341.82	10,528.00	78.01	78.42	105.07	4,413.51	781.55	1,226.94	1,075.34	151.60	8.093		
15,100.00	10,207.00	15,441.82	10,528.00	79.58	79.97	105.07	4,513.51	781.55	1,226.94	1,072.30	154.64	7.934		
15,200.00	10,207.00	15,541.82	10,528.00	81.14	81.53	105.07	4,613.51	781.55	1,226.94	1,069.26	157.69	7.781		
15,300.00	10,207.00	15,641.82	10,528.00	82.72	83.09	105.07	4,713.51	781.55	1,226.94	1,066.20	160.74	7.633		
15,344.98	10,207.00	15,686.79	10,528.00	83.42	83.79	105.07	4,758.48	781.55	1,226.94	1,064.83	162.11	7.569		
15,345.97	10,207.00	15,687.79	10,528.00	83.44	83.80	105.07	4,759.48	781.55	1,226.94	1,064.80	162.14	7.567 SF		

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 293H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.70	0.70	0.00	0.00	89.67	0.35	59.95	59.95				
100.00	100.00	100.70	100.70	0.09	0.09	89.67	0.35	59.95	59.95	59.78	0.17	345.500	
200.00	200.00	200.70	200.70	0.31	0.31	89.67	0.35	59.95	59.95	59.33	0.62	96.222	
300.00	300.00	300.70	300.70	0.54	0.54	89.67	0.35	59.95	59.95	58.88	1.07	55.894	
400.00	400.00	400.70	400.70	0.76	0.76	89.67	0.35	59.95	59.95	58.43	1.52	39.387	
500.00	500.00	500.70	500.70	0.99	0.99	89.67	0.35	59.95	59.95	57.98	1.97	30.407	
600.00	600.00	600.70	600.70	1.21	1.21	89.67	0.35	59.95	59.95	57.53	2.42	24.761	
700.00	700.00	700.70	700.70	1.43	1.44	89.67	0.35	59.95	59.95	57.08	2.87	20.884	
800.00	800.00	800.70	800.70	1.66	1.66	89.67	0.35	59.95	59.95	56.63	3.32	18.056	
900.00	900.00	900.70	900.70	1.88	1.89	89.67	0.35	59.95	59.95	56.18	3.77	15.903	
1,000.00	1,000.00	1,000.70	1,000.70	2.11	2.11	89.67	0.35	59.95	59.95	55.73	4.22	14.209	
1,100.00	1,100.00	1,100.70	1,100.70	2.33	2.34	89.67	0.35	59.95	59.95	55.28	4.67	12.841	
1,200.00	1,200.00	1,200.70	1,200.70	2.56	2.56	89.67	0.35	59.95	59.95	54.83	5.12	11.713	
1,300.00	1,300.00	1,300.70	1,300.70	2.78	2.78	89.67	0.35	59.95	59.95	54.38	5.57	10.767	
1,400.00	1,400.00	1,400.70	1,400.70	3.01	3.01	89.67	0.35	59.95	59.95	53.93	6.02	9.963	
1,500.00	1,500.00	1,500.70	1,500.70	3.23	3.23	89.67	0.35	59.95	59.95	53.48	6.47	9.270	
1,600.00	1,600.00	1,600.70	1,600.70	3.46	3.46	89.67	0.35	59.95	59.95	53.03	6.92	8.668	
1,700.00	1,700.00	1,700.70	1,700.70	3.68	3.68	89.67	0.35	59.95	59.95	52.58	7.37	8.139	
1,800.00	1,800.00	1,800.70	1,800.70	3.91	3.91	89.67	0.35	59.95	59.95	52.14	7.82	7.671	
1,900.00	1,900.00	1,900.70	1,900.70	4.13	4.13	89.67	0.35	59.95	59.95	51.69	8.27	7.254	
2,000.00	2,000.00	2,000.70	2,000.70	4.36	4.36	89.67	0.35	59.95	59.95	51.24	8.71	6.879	
2,100.00	2,100.00	2,100.70	2,100.70	4.58	4.58	89.67	0.35	59.95	59.95	50.79	9.16	6.542	
2,200.00	2,200.00	2,200.70	2,200.70	4.81	4.81	89.67	0.35	59.95	59.95	50.34	9.61	6.236	
2,300.00	2,300.00	2,300.70	2,300.70	5.03	5.03	89.67	0.35	59.95	59.95	49.89	10.06	5.957	
2,400.00	2,400.00	2,400.70	2,400.70	5.26	5.26	89.67	0.35	59.95	59.95	49.44	10.51	5.703	
2,500.00	2,500.00	2,500.70	2,500.70	5.48	5.48	89.67	0.35	59.95	59.95	48.99	10.96	5.469	
2,500.81	2,500.81	2,501.51	2,501.51	5.48	5.48	-126.58	0.35	59.95	59.95	48.99	10.97	5.467 CC	
2,600.00	2,599.99	2,601.01	2,601.01	5.68	5.71	-128.05	1.19	59.66	60.21	48.82	11.38	5.289 ES	
2,700.00	2,699.96	2,701.18	2,701.14	5.85	5.93	-132.34	3.69	58.81	61.22	49.44	11.78	5.196 SF	
2,800.00	2,799.86	2,801.05	2,800.91	6.03	6.15	-139.08	7.83	57.39	63.63	51.45	12.18	5.223	
2,900.00	2,899.68	2,900.50	2,900.17	6.22	6.38	-147.49	13.59	55.42	68.35	55.76	12.59	5.430	
3,000.00	2,999.37	2,999.63	2,999.07	6.41	6.60	-155.85	20.12	53.19	76.09	63.09	12.99	5.855	
3,095.91	3,094.84	3,094.51	3,093.71	6.59	6.82	-162.64	26.38	51.05	86.31	72.92	13.39	6.446	
3,100.00	3,098.90	3,098.55	3,097.74	6.60	6.83	-162.90	26.65	50.96	86.80	73.40	13.41	6.474	
3,200.00	3,198.36	3,197.35	3,196.31	6.80	7.05	-168.47	33.16	48.73	99.33	85.51	13.82	7.187	
3,300.00	3,297.82	3,296.16	3,294.87	7.01	7.28	-172.77	39.68	46.50	112.58	98.34	14.24	7.906	
3,400.00	3,397.28	3,394.96	3,393.43	7.22	7.50	-176.15	46.19	44.27	126.32	111.66	14.66	8.617	
3,500.00	3,496.74	3,493.77	3,492.00	7.44	7.73	-178.87	52.70	42.04	140.41	125.33	15.08	9.309	
3,600.00	3,596.20	3,592.57	3,590.56	7.66	7.96	-178.91	59.22	39.81	154.75	139.24	15.51	9.978	
3,700.00	3,695.66	3,691.37	3,689.13	7.89	8.19	-177.07	65.73	37.59	169.28	153.35	15.94	10.621	
3,800.00	3,795.12	3,790.18	3,787.69	8.12	8.43	-175.52	72.25	35.36	183.96	167.59	16.37	11.238	
3,900.00	3,894.58	3,888.98	3,886.25	8.35	8.66	-174.21	78.76	33.13	198.75	181.95	16.80	11.828	
4,000.00	3,994.04	3,987.79	3,984.82	8.59	8.89	-173.07	85.28	30.90	213.63	196.39	17.24	12.392	
4,100.00	4,093.50	4,086.59	4,083.38	8.83	9.12	-172.08	91.79	28.67	228.58	210.90	17.68	12.931	
4,200.00	4,192.96	4,185.40	4,181.95	9.07	9.36	-171.21	98.30	26.44	243.58	225.47	18.12	13.445	
4,300.00	4,292.42	4,284.20	4,280.51	9.31	9.59	-170.45	104.82	24.22	258.64	240.08	18.56	13.937	
4,400.00	4,391.88	4,383.00	4,379.07	9.56	9.83	-169.76	111.33	21.99	273.74	254.74	19.00	14.407	
4,500.00	4,491.34	4,481.81	4,477.64	9.80	10.06	-169.15	117.85	19.76	288.87	269.42	19.45	14.855	
4,600.00	4,590.80	4,580.61	4,576.20	10.06	10.30	-168.60	124.36	17.53	304.03	284.14	19.89	15.284	
4,700.00	4,690.26	4,679.42	4,674.77	10.31	10.54	-168.10	130.88	15.30	319.21	298.87	20.34	15.695	
4,800.00	4,789.72	4,778.22	4,773.33	10.56	10.78	-167.65	137.39	13.07	334.42	313.63	20.79	16.088	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
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**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 293H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: O-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)		
4,900.00	4,889.18	4,877.03	4,871.89	10.82	11.01	167.24	143.90	10.85	349.64	328.40	21.24	16.464			
5,000.00	4,988.64	4,975.83	4,970.46	11.07	11.25	166.86	150.42	8.62	364.88	343.19	21.69	16.824			
5,100.00	5,088.10	5,074.63	5,069.02	11.33	11.49	166.51	156.93	6.39	380.14	358.00	22.14	17.170			
5,200.00	5,187.56	5,174.49	5,168.64	11.59	11.72	166.19	163.48	4.15	395.38	372.79	22.59	17.501			
5,300.00	5,287.02	5,278.97	5,272.95	11.85	11.92	166.00	169.12	2.22	409.71	386.70	23.02	17.799			
5,400.00	5,386.48	5,383.86	5,377.75	12.11	12.11	165.99	172.97	0.90	422.69	399.26	23.43	18.037			
5,500.00	5,485.94	5,489.09	5,482.96	12.37	12.29	166.16	175.01	0.21	434.30	410.45	23.85	18.212			
5,600.00	5,585.39	5,592.22	5,586.09	12.64	12.48	166.46	175.35	0.09	444.65	420.39	24.26	18.330			
5,700.00	5,684.85	5,691.68	5,685.55	12.90	12.70	166.76	175.35	0.09	454.75	430.05	24.70	18.411			
5,800.00	5,784.31	5,781.14	5,785.01	13.17	12.91	167.06	175.35	0.09	464.86	439.72	25.14	18.489			
5,900.00	5,883.77	5,890.60	5,884.47	13.43	13.13	167.34	175.35	0.09	474.99	449.40	25.59	18.564			
6,000.00	5,983.23	5,990.06	5,983.93	13.70	13.35	167.60	175.35	0.09	485.13	459.10	26.03	18.636			
6,100.00	6,082.69	6,089.52	6,083.39	13.97	13.56	167.88	175.35	0.09	495.27	468.80	26.48	18.706			
6,200.00	6,182.15	6,188.98	6,182.85	14.23	13.78	168.11	175.35	0.09	505.43	478.51	26.92	18.774			
6,300.00	6,281.61	6,288.44	6,282.31	14.50	14.00	168.35	175.35	0.09	515.60	488.23	27.37	18.839			
6,400.00	6,381.07	6,387.90	6,381.77	14.77	14.22	168.58	175.35	0.09	525.77	497.96	27.81	18.903			
6,500.00	6,480.53	6,487.36	6,481.23	15.04	14.44	168.80	175.35	0.09	535.95	507.69	28.26	18.965			
6,600.00	6,579.99	6,586.82	6,580.69	15.31	14.66	169.01	175.35	0.09	546.14	517.44	28.71	19.024			
6,700.00	6,679.45	6,686.28	6,680.15	15.58	14.87	169.21	175.35	0.09	556.34	527.19	29.16	19.082			
6,800.00	6,778.91	6,785.74	6,779.61	15.85	15.09	169.41	175.35	0.09	566.54	536.94	29.60	19.138			
6,900.00	6,878.37	6,885.20	6,879.07	16.13	15.31	169.60	175.35	0.09	576.75	546.70	30.05	19.193			
7,000.00	6,977.83	6,984.66	6,978.53	16.40	15.53	169.78	175.35	0.09	586.97	556.47	30.50	19.246			
7,100.00	7,077.29	7,084.12	7,077.99	16.67	15.75	169.96	175.35	0.09	597.19	566.24	30.95	19.297			
7,200.00	7,176.75	7,183.58	7,177.45	16.94	15.97	170.13	175.35	0.09	607.42	576.02	31.40	19.347			
7,300.00	7,276.21	7,283.04	7,276.91	17.22	16.19	170.29	175.35	0.09	617.65	585.81	31.85	19.395			
7,400.00	7,375.67	7,382.50	7,376.37	17.49	16.41	170.45	175.35	0.09	627.89	595.59	32.30	19.442			
7,500.00	7,475.13	7,481.96	7,475.83	17.76	16.63	170.61	175.35	0.09	638.13	605.39	32.74	19.488			
7,600.00	7,574.59	7,581.42	7,575.29	18.04	16.85	170.76	175.35	0.09	648.38	615.18	33.19	19.532			
7,700.00	7,674.05	7,680.87	7,674.75	18.31	17.07	170.90	175.35	0.09	658.63	624.98	33.65	19.576			
7,800.00	7,773.51	7,780.33	7,774.21	18.59	17.29	171.04	175.35	0.09	668.88	634.79	34.10	19.618			
7,900.00	7,872.97	7,879.79	7,873.67	18.86	17.51	171.18	175.35	0.09	679.14	644.59	34.55	19.659			
8,000.00	7,972.43	7,979.25	7,973.13	19.14	17.73	171.31	175.35	0.09	689.40	654.41	35.00	19.699			
8,100.00	8,071.89	8,078.71	8,072.59	19.41	17.95	171.44	175.35	0.09	699.67	664.22	35.45	19.738			
8,200.00	8,171.35	8,178.17	8,172.05	19.69	18.17	171.56	175.35	0.09	709.94	674.04	35.90	19.775			
8,300.00	8,270.80	8,277.63	8,271.50	19.97	18.39	171.69	175.35	0.09	720.21	683.86	36.35	19.812			
8,400.00	8,370.26	8,377.09	8,370.96	20.24	18.61	171.80	175.35	0.09	730.49	693.68	36.80	19.848			
8,500.00	8,469.72	8,476.55	8,470.42	20.52	18.83	171.92	175.35	0.09	740.76	703.51	37.26	19.883			
8,600.00	8,569.18	8,576.01	8,569.88	20.80	19.05	172.03	175.35	0.09	751.04	713.34	37.71	19.918			
8,700.00	8,668.64	8,675.47	8,669.34	21.07	19.27	172.14	175.35	0.09	761.33	723.17	38.16	19.951			
8,800.00	8,768.10	8,774.93	8,768.80	21.35	19.49	172.24	175.35	0.09	771.62	733.00	38.61	19.984			
8,900.00	8,867.56	8,874.39	8,868.26	21.63	19.71	172.35	175.35	0.09	781.90	742.84	39.07	20.015			
9,000.00	8,967.02	8,973.85	8,967.72	21.91	19.93	172.45	175.35	0.09	792.20	752.68	39.52	20.046			
9,068.05	9,034.70	9,041.53	9,035.40	22.09	20.08	172.51	175.35	0.09	799.20	759.37	39.83	20.067			
9,100.00	9,066.49	9,073.32	9,067.19	22.17	20.15	172.55	175.35	0.09	802.40	762.44	39.97	20.077			
9,200.00	9,166.09	9,172.92	9,166.79	22.38	20.38	172.64	175.35	0.09	811.29	770.90	40.39	20.087			
9,300.00	9,265.83	9,272.65	9,266.53	22.59	20.60	172.71	175.35	0.09	818.45	777.64	40.81	20.056			
9,400.00	9,365.67	9,372.50	9,366.37	22.78	20.82	172.77	175.35	0.09	823.88	782.65	41.23	19.984			
9,500.00	9,465.60	9,472.43	9,466.30	22.97	21.04	172.81	175.35	0.09	827.58	785.94	41.64	19.874			
9,600.00	9,565.58	9,572.41	9,566.28	23.14	21.26	172.83	175.35	0.09	829.56	787.50	42.06	19.725			
9,663.96	9,629.54	9,636.37	9,630.24	23.26	21.41	29.07	175.35	0.09	829.91	787.59	42.32	19.608			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 293H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
9,700.00	9,665.58	9,672.41	9,666.28	23.32	21.49	29.07	175.35	0.09	829.91	787.43	42.48	19.538			
9,763.96	9,729.54	9,736.37	9,730.24	23.43	21.63	29.07	175.35	0.09	829.91	787.17	42.74	19.416			
9,775.00	9,740.58	9,747.41	9,741.28	23.45	21.65	29.08	175.35	0.09	829.80	787.01	42.79	19.393			
9,800.00	9,765.55	9,772.37	9,766.25	23.49	21.71	29.19	175.35	0.09	828.72	785.83	42.89	19.322			
9,825.00	9,790.41	9,797.24	9,791.11	23.52	21.76	29.40	175.35	0.09	826.51	783.52	42.99	19.225			
9,850.00	9,815.12	11,046.82	10,528.00	23.55	24.69	107.56	-542.27	0.09	818.43	785.21	33.22	24.636			
9,875.00	9,839.58	11,041.70	10,528.00	23.57	24.66	111.46	-537.15	0.09	797.23	763.68	33.56	23.758			
9,900.00	9,863.75	11,035.30	10,528.00	23.59	24.62	114.82	-530.75	0.09	776.48	742.59	33.90	22.908			
9,925.00	9,887.54	11,027.65	10,528.00	23.59	24.57	117.70	-523.10	0.09	756.25	722.01	34.24	22.086			
9,950.00	9,910.91	11,018.77	10,528.00	23.60	24.52	120.14	-514.21	0.09	736.59	702.00	34.59	21.295			
9,975.00	9,933.78	11,008.67	10,528.00	23.60	24.46	122.19	-504.11	0.09	717.56	682.62	34.94	20.537			
10,000.00	9,956.08	10,997.39	10,528.00	23.59	24.40	123.90	-492.83	0.09	699.22	663.93	35.29	19.812			
10,025.00	9,977.77	10,984.96	10,528.00	23.58	24.33	125.32	-480.40	0.09	681.62	645.97	35.65	19.120			
10,050.00	9,998.78	10,971.40	10,528.00	23.56	24.27	126.47	-466.85	0.09	664.80	628.80	36.01	18.464			
10,075.00	10,019.04	10,956.77	10,528.00	23.55	24.19	127.39	-452.22	0.09	648.81	612.45	36.36	17.846			
10,100.00	10,038.52	10,941.10	10,528.00	23.52	24.11	128.11	-436.55	0.09	633.67	596.97	36.70	17.266			
10,125.00	10,057.15	10,924.43	10,528.00	23.50	24.03	128.66	-419.88	0.09	619.41	582.38	37.03	16.726			
10,150.00	10,074.87	10,906.81	10,528.01	23.47	23.94	129.06	-402.26	0.09	606.06	568.71	37.36	16.224			
10,175.00	10,091.66	10,888.29	10,528.01	23.44	23.86	129.33	-383.73	0.09	593.64	555.97	37.67	15.759			
10,200.00	10,107.45	10,868.91	10,528.01	23.40	23.78	129.49	-364.35	0.09	582.15	544.18	37.97	15.330			
10,225.00	10,122.20	10,848.73	10,528.01	23.37	23.70	129.56	-344.18	0.09	571.60	533.34	38.26	14.940			
10,250.00	10,135.88	10,827.81	10,528.01	23.33	23.62	129.56	-323.25	0.09	561.99	523.47	38.52	14.588			
10,275.00	10,148.45	10,804.39	10,528.00	23.29	23.52	129.42	-299.83	0.09	553.31	514.56	38.75	14.277			
10,300.00	10,159.86	10,709.48	10,518.15	23.26	23.22	125.75	-205.60	0.09	544.00	504.96	39.04	13.936			
10,325.00	10,170.10	10,633.92	10,497.09	23.22	23.04	122.15	-133.11	0.09	533.23	493.44	39.79	13.401			
10,350.00	10,179.13	10,573.11	10,472.01	23.18	22.93	118.92	-77.76	0.09	521.71	481.05	40.65	12.833			
10,375.00	10,186.93	10,523.08	10,446.23	23.14	22.89	116.11	-34.91	0.09	509.90	468.42	41.48	12.294			
10,400.00	10,193.47	10,480.89	10,421.11	23.10	22.86	113.69	-1.03	0.09	498.11	455.91	42.20	11.803			
10,425.00	10,198.74	10,444.45	10,397.08	23.07	22.83	111.58	26.34	0.09	486.59	443.76	42.83	11.362			
10,450.00	10,202.73	10,412.32	10,374.20	23.03	22.80	109.72	48.91	0.09	475.48	432.13	43.35	10.967			
10,475.00	10,205.42	10,383.45	10,352.40	23.00	22.77	108.02	67.82	0.09	464.93	421.13	43.80	10.616			
10,500.00	10,206.80	10,357.11	10,331.54	22.97	22.74	106.44	83.90	0.09	455.02	410.86	44.16	10.304			
10,513.96	10,207.01	10,343.29	10,320.25	22.95	22.72	105.59	91.87	0.09	449.80	405.46	44.34	10.145			
10,600.00	10,207.00	10,277.26	10,263.37	22.88	22.65	97.86	125.29	0.09	422.15	377.08	45.08	9.365			
10,700.00	10,207.00	10,229.28	10,219.42	22.97	22.59	91.66	144.49	0.09	404.62	359.11	45.51	8.892			
10,735.24	10,207.00	10,216.82	10,207.70	23.07	22.58	90.00	148.74	0.09	403.26	357.66	45.60	8.843			
10,800.00	10,207.00	10,197.93	10,189.75	23.31	22.55	87.45	154.60	0.09	407.93	362.24	45.69	8.928			
10,900.00	10,207.00	10,175.00	10,167.66	23.80	22.52	84.33	160.76	0.09	433.07	387.36	45.71	9.473			
11,000.00	10,207.00	10,159.89	10,152.96	24.41	22.50	82.27	164.24	0.09	477.23	431.56	45.68	10.448			
11,100.00	10,207.00	10,150.00	10,143.28	25.10	22.49	80.92	166.26	0.09	536.05	490.43	45.62	11.751			
11,200.00	10,207.00	10,137.83	10,131.31	25.87	22.47	79.27	168.47	0.09	605.40	559.88	45.52	13.299			
11,300.00	10,207.00	10,125.00	10,118.64	26.71	22.45	77.55	170.47	0.09	682.23	636.80	45.43	15.018			
11,400.00	10,207.00	10,125.00	10,118.64	27.63	22.45	77.55	170.47	0.09	764.23	718.82	45.41	16.830			
11,500.00	10,207.00	10,125.00	10,118.64	28.60	22.45	77.55	170.47	0.09	850.09	804.71	45.38	18.731			
11,600.00	10,207.00	10,113.44	10,107.18	29.64	22.44	76.00	171.98	0.09	938.56	893.23	45.33	20.705			
11,700.00	10,207.00	10,109.46	10,103.23	30.72	22.43	75.47	172.43	0.09	1,029.15	983.84	45.31	22.714			
11,800.00	10,207.00	10,100.00	10,093.81	31.85	22.42	74.23	173.39	0.09	1,121.36	1,076.07	45.28	24.763			
11,900.00	10,207.00	10,100.00	10,093.81	33.02	22.42	74.23	173.39	0.09	1,214.69	1,169.40	45.28	26.825			
12,000.00	10,207.00	10,100.00	10,093.81	34.22	22.42	74.23	173.39	0.09	1,309.00	1,263.72	45.28	28.907			
12,100.00	10,207.00	10,100.00	10,093.81	35.46	22.42	74.23	173.39	0.09	1,404.11	1,358.82	45.29	31.004			
12,200.00	10,207.00	10,100.00	10,093.81	36.74	22.42	74.23	173.39	0.09	1,499.85	1,454.55	45.30	33.112			

CC - Min centre to center distance or covergent point. SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 293H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)	
12,300.00	10,207.00	10,100.00	10,093.81	38.03	22.42	74.23	173.39	0.09	1,596.11	1,550.80	45.31	35.229		
12,400.00	10,207.00	10,100.00	10,093.81	39.36	22.42	74.23	173.39	0.09	1,692.80	1,647.48	45.32	37.352		
12,500.00	10,207.00	10,100.00	10,093.81	40.70	22.42	74.23	173.39	0.09	1,789.86	1,744.53	45.34	39.479		
12,600.00	10,207.00	10,089.02	10,082.87	42.07	22.40	72.80	174.25	0.09	1,887.07	1,841.72	45.35	41.607		
12,700.00	10,207.00	10,087.69	10,081.54	43.45	22.40	72.63	174.34	0.09	1,984.66	1,939.29	45.38	43.737		
12,800.00	10,207.00	10,086.46	10,080.31	44.86	22.39	72.47	174.42	0.09	2,082.48	2,037.07	45.40	45.867		
12,900.00	10,207.00	10,085.32	10,079.18	46.27	22.39	72.32	174.49	0.09	2,180.49	2,135.06	45.43	47.996		
13,000.00	10,207.00	10,075.00	10,068.87	47.70	22.38	71.00	175.00	0.09	2,278.77	2,233.31	45.46	50.126		
13,100.00	10,207.00	10,075.00	10,068.87	49.15	22.38	71.00	175.00	0.09	2,377.08	2,331.59	45.49	52.251		
13,200.00	10,207.00	10,075.00	10,068.87	50.60	22.38	71.00	175.00	0.09	2,475.52	2,429.99	45.53	54.373		
13,300.00	10,207.00	10,075.00	10,068.87	52.06	22.38	71.00	175.00	0.09	2,574.08	2,528.52	45.57	56.492		
13,400.00	10,207.00	10,075.00	10,068.87	53.54	22.38	71.00	175.00	0.09	2,672.75	2,627.15	45.60	58.608		
13,500.00	10,207.00	10,075.00	10,068.87	55.02	22.38	71.00	175.00	0.09	2,771.52	2,725.87	45.64	60.720		
13,600.00	10,207.00	10,075.00	10,068.87	56.52	22.38	71.00	175.00	0.09	2,870.37	2,824.68	45.69	62.827		
13,700.00	10,207.00	10,075.00	10,068.87	58.02	22.38	71.00	175.00	0.09	2,969.30	2,923.56	45.73	64.929		
13,800.00	10,207.00	10,075.00	10,068.87	59.52	22.38	71.00	175.00	0.09	3,068.29	3,022.52	45.78	67.026		
13,900.00	10,207.00	10,075.00	10,068.87	61.04	22.38	71.00	175.00	0.09	3,167.35	3,121.53	45.83	69.118		
14,000.00	10,207.00	10,075.00	10,068.87	62.56	22.38	71.00	175.00	0.09	3,266.47	3,220.59	45.87	71.204		
14,100.00	10,207.00	10,075.00	10,068.87	64.08	22.38	71.00	175.00	0.09	3,365.64	3,319.71	45.93	73.284		
14,200.00	10,207.00	10,075.00	10,068.87	65.61	22.38	71.00	175.00	0.09	3,464.86	3,418.88	45.98	75.357		
14,300.00	10,207.00	10,075.00	10,068.87	67.15	22.38	71.00	175.00	0.09	3,564.12	3,518.08	46.03	77.424		
14,400.00	10,207.00	10,075.00	10,068.87	68.69	22.38	71.00	175.00	0.09	3,663.42	3,617.33	46.09	79.484		
14,500.00	10,207.00	10,075.00	10,068.87	70.23	22.38	71.00	175.00	0.09	3,762.76	3,716.61	46.15	81.537		
14,600.00	10,207.00	10,075.00	10,068.87	71.78	22.38	71.00	175.00	0.09	3,862.13	3,815.92	46.21	83.583		
14,700.00	10,207.00	10,075.00	10,068.87	73.33	22.38	71.00	175.00	0.09	3,961.53	3,915.26	46.27	85.621		
14,800.00	10,207.00	10,075.00	10,068.87	74.89	22.38	71.00	175.00	0.09	4,060.96	4,014.63	46.33	87.652		
14,900.00	10,207.00	10,075.00	10,068.87	76.45	22.38	71.00	175.00	0.09	4,160.42	4,114.03	46.39	89.675		
15,000.00	10,207.00	10,075.00	10,068.87	78.01	22.38	71.00	175.00	0.09	4,259.91	4,213.45	46.46	91.690		
15,100.00	10,207.00	10,075.00	10,068.87	79.58	22.38	71.00	175.00	0.09	4,359.42	4,312.89	46.53	93.697		
15,200.00	10,207.00	10,075.00	10,068.87	81.14	22.38	71.00	175.00	0.09	4,458.95	4,412.36	46.60	95.695		
15,300.00	10,207.00	10,075.00	10,068.87	82.72	22.38	71.00	175.00	0.09	4,558.50	4,511.84	46.67	97.686		
15,344.98	10,207.00	10,075.00	10,068.87	83.42	22.38	71.00	175.00	0.09	4,603.28	4,556.58	46.70	98.578		
15,345.97	10,207.00	10,075.00	10,068.87	83.44	22.38	71.00	175.00	0.09	4,604.27	4,553.77	50.50	91.177		



# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 294H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
0.00	0.00	0.20	0.20	0.00	0.00	89.54	0.24	29.88	29.88				
100.00	100.00	100.20	100.20	0.09	0.09	89.54	0.24	29.88	29.88	29.71	0.17	173.328	
200.00	200.00	200.20	200.20	0.31	0.31	89.54	0.24	29.88	29.88	29.26	0.62	48.046	
300.00	300.00	300.20	300.20	0.54	0.54	89.54	0.24	29.88	29.88	28.81	1.07	27.888	
400.00	400.00	400.20	400.20	0.76	0.76	89.54	0.24	29.88	29.88	28.36	1.52	19.646	
500.00	500.00	500.20	500.20	0.99	0.99	89.54	0.24	29.88	29.88	27.91	1.97	15.164	
600.00	600.00	600.20	600.20	1.21	1.21	89.54	0.24	29.88	29.88	27.46	2.42	12.347	
700.00	700.00	700.20	700.20	1.43	1.44	89.54	0.24	29.88	29.88	27.01	2.87	10.413	
800.00	800.00	800.20	800.20	1.66	1.66	89.54	0.24	29.88	29.88	26.56	3.32	9.003	
900.00	900.00	900.20	900.20	1.88	1.88	89.54	0.24	29.88	29.88	26.11	3.77	7.929	
1,000.00	1,000.00	1,000.20	1,000.20	2.11	2.11	89.54	0.24	29.88	29.88	25.66	4.22	7.084	
1,100.00	1,100.00	1,100.20	1,100.20	2.33	2.33	89.54	0.24	29.88	29.88	25.21	4.67	6.402	
1,200.00	1,200.00	1,200.20	1,200.20	2.56	2.56	89.54	0.24	29.88	29.88	24.76	5.12	5.839	
1,300.00	1,300.00	1,300.20	1,300.20	2.78	2.78	89.54	0.24	29.88	29.88	24.31	5.57	5.368	
1,400.00	1,400.00	1,400.20	1,400.20	3.01	3.01	89.54	0.24	29.88	29.88	23.86	6.02	4.967	
1,500.00	1,500.00	1,500.20	1,500.20	3.23	3.23	89.54	0.24	29.88	29.88	23.42	6.47	4.621	
1,600.00	1,600.00	1,600.20	1,600.20	3.46	3.46	89.54	0.24	29.88	29.88	22.97	6.92	4.321	
1,700.00	1,700.00	1,700.20	1,700.20	3.68	3.68	89.54	0.24	29.88	29.88	22.52	7.36	4.057	
1,800.00	1,800.00	1,800.20	1,800.20	3.91	3.91	89.54	0.24	29.88	29.88	22.07	7.81	3.824	
1,900.00	1,900.00	1,900.20	1,900.20	4.13	4.13	89.54	0.24	29.88	29.88	21.62	8.26	3.616	
2,000.00	2,000.00	2,000.20	2,000.20	4.36	4.36	89.54	0.24	29.88	29.88	21.17	8.71	3.429	
2,100.00	2,100.00	2,100.20	2,100.20	4.58	4.58	89.54	0.24	29.88	29.88	20.72	9.16	3.261	
2,200.00	2,200.00	2,200.20	2,200.20	4.81	4.81	89.54	0.24	29.88	29.88	20.27	9.61	3.109	
2,300.00	2,300.00	2,300.20	2,300.20	5.03	5.03	89.54	0.24	29.88	29.88	19.82	10.06	2.970	
2,400.00	2,400.00	2,400.20	2,400.20	5.26	5.26	89.54	0.24	29.88	29.88	19.37	10.51	2.843	
2,500.00	2,500.00	2,500.20	2,500.20	5.48	5.48	89.54	0.24	29.88	29.88	18.92	10.96	2.726 CC, ES	
2,600.00	2,599.99	2,600.19	2,600.19	5.68	5.71	-128.02	0.24	29.88	30.41	19.03	11.38	2.671	
2,700.00	2,699.96	2,700.16	2,700.16	5.85	5.93	-131.69	0.24	29.88	32.09	20.31	11.78	2.723	
2,800.00	2,799.96	2,800.06	2,800.06	6.03	6.15	-136.98	0.24	29.88	35.14	22.96	12.19	2.884	
2,900.00	2,899.68	2,899.88	2,899.88	6.22	6.38	-142.95	0.24	29.88	39.83	27.24	12.59	3.163	
3,000.00	2,999.37	2,999.57	2,999.57	6.41	6.60	-148.77	0.24	29.88	46.34	33.34	13.00	3.564	
3,095.91	3,094.84	3,095.93	3,095.92	6.59	6.80	-153.65	-0.24	29.23	53.60	40.22	13.37	4.008	
3,100.00	3,098.90	3,100.04	3,100.03	6.80	6.81	-153.84	-0.28	29.18	53.91	40.52	13.39	4.026	
3,200.00	3,198.36	3,200.73	3,200.69	6.80	6.99	-157.82	-1.84	27.05	60.79	47.04	13.76	4.419	
3,300.00	3,297.82	3,301.64	3,301.50	7.01	7.18	-160.94	-4.46	23.48	66.15	52.02	14.13	4.683	
3,400.00	3,397.28	3,402.72	3,402.39	7.22	7.37	-163.61	-8.14	18.48	69.91	55.42	14.50	4.823	
3,500.00	3,496.74	3,503.91	3,503.26	7.44	7.56	-166.09	-12.88	12.04	72.04	57.18	14.87	4.846	
3,600.00	3,596.20	3,605.13	3,604.01	7.66	7.76	-168.56	-18.67	4.16	72.54	57.30	15.24	4.760	
3,700.00	3,695.66	3,706.34	3,704.55	7.89	7.97	-171.19	-25.52	-5.15	71.43	55.81	15.61	4.574	
3,800.00	3,795.12	3,807.45	3,804.78	8.12	8.19	-174.20	-33.41	-15.88	68.73	52.74	15.99	4.298	
3,900.00	3,894.58	3,907.98	3,904.21	8.35	8.41	-177.79	-42.21	-27.85	64.67	48.29	16.39	3.947	
4,000.00	3,994.04	4,007.80	4,002.88	8.59	8.65	178.09	-51.13	-39.99	60.59	43.78	16.81	3.604	
4,100.00	4,093.50	4,107.61	4,101.55	8.83	8.88	173.40	-60.06	-52.13	56.87	39.62	17.25	3.297	
4,200.00	4,192.96	4,207.43	4,200.22	9.07	9.13	168.10	-68.98	-64.26	53.59	35.87	17.71	3.025	
4,300.00	4,292.42	4,307.24	4,298.90	9.31	9.38	162.17	-77.91	-76.40	50.81	32.61	18.20	2.792	
4,400.00	4,391.88	4,407.06	4,397.57	9.56	9.64	155.63	-86.83	-88.54	48.65	29.93	18.72	2.599	
4,500.00	4,491.34	4,506.87	4,496.24	9.80	9.90	148.59	-95.76	-100.67	47.17	27.90	19.27	2.448	
4,600.00	4,590.80	4,606.69	4,594.91	10.05	10.16	141.21	-104.68	-112.81	46.44	26.60	19.85	2.340	
4,641.85	4,632.42	4,648.46	4,636.20	10.16	10.27	138.08	-108.42	-117.89	46.37	26.28	20.10	2.307	
4,700.00	4,690.26	4,706.50	4,693.58	10.31	10.43	133.73	-113.61	-124.95	46.51	26.06	20.45	2.274	
4,800.00	4,789.72	4,806.32	4,792.25	10.56	10.70	126.39	-122.53	-137.09	47.36	26.30	21.06	2.249 SF	

CC - Min centre to center distance or convergent point. SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 294H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: O-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,900.00	4,889.18	4,906.14	4,890.93	10.82	10.98	119.42	-131.46	-149.22	48.96	27.29	21.66	2.260		
5,000.00	4,988.64	5,005.95	4,989.60	11.07	11.26	112.98	-140.38	-161.36	51.23	28.97	22.26	2.302		
5,100.00	5,088.10	5,105.77	5,088.27	11.33	11.54	107.15	-149.31	-173.50	54.09	31.26	22.83	2.369		
5,200.00	5,187.56	5,205.58	5,186.94	11.59	11.83	101.95	-158.23	-185.64	57.45	34.07	23.39	2.457		
5,300.00	5,287.02	5,305.40	5,285.61	11.85	12.12	97.36	-167.16	-197.77	61.24	37.31	23.93	2.559		
5,400.00	5,386.48	5,405.21	5,384.28	12.11	12.41	93.32	-176.08	-209.91	65.37	40.91	24.45	2.673		
5,500.00	5,485.94	5,505.03	5,482.96	12.37	12.70	89.78	-185.01	-222.05	69.78	44.81	24.97	2.795		
5,600.00	5,585.39	5,604.84	5,581.63	12.64	13.00	86.67	-193.93	-234.19	74.43	48.95	25.48	2.921		
5,700.00	5,684.85	5,704.66	5,680.30	12.90	13.30	83.93	-202.86	-246.32	79.27	53.29	25.99	3.050		
5,800.00	5,784.31	5,804.47	5,778.97	13.17	13.60	81.51	-211.78	-258.46	84.28	57.79	26.49	3.181		
5,900.00	5,883.77	5,904.29	5,877.64	13.43	13.90	79.37	-220.71	-270.60	89.41	62.42	26.99	3.312		
6,000.00	5,983.23	6,004.10	5,976.32	13.70	14.20	77.46	-229.63	-282.73	94.66	67.16	27.50	3.443		
6,100.00	6,082.69	6,103.92	6,074.99	13.97	14.51	75.75	-238.55	-294.87	100.00	72.00	28.00	3.572		
6,200.00	6,182.15	6,203.73	6,173.66	14.23	14.81	74.22	-247.48	-307.01	105.42	76.92	28.50	3.699		
6,300.00	6,281.61	6,303.55	6,272.33	14.50	15.12	72.83	-256.40	-319.15	110.91	81.91	29.00	3.824		
6,400.00	6,381.07	6,403.36	6,371.00	14.77	15.43	71.58	-265.33	-331.28	116.46	86.95	29.51	3.947		
6,500.00	6,480.53	6,503.18	6,469.67	15.04	15.74	70.45	-274.25	-343.42	122.06	92.05	30.01	4.067		
6,600.00	6,579.99	6,602.99	6,568.35	15.31	16.05	69.41	-283.18	-355.56	127.70	97.18	30.51	4.185		
6,700.00	6,679.45	6,702.81	6,667.02	15.58	16.36	68.46	-292.10	-367.70	133.38	102.36	31.02	4.300		
6,800.00	6,778.91	6,802.62	6,765.69	15.85	16.67	67.59	-301.03	-379.83	139.09	107.56	31.53	4.411		
6,900.00	6,878.37	6,902.44	6,864.36	16.13	16.99	66.79	-309.95	-391.97	144.83	112.79	32.04	4.521		
7,000.00	6,977.83	7,002.26	6,963.03	16.40	17.30	66.04	-318.88	-404.11	150.60	118.05	32.55	4.627		
7,100.00	7,077.29	7,102.07	7,061.70	16.67	17.62	65.36	-327.80	-416.25	156.39	123.34	33.06	4.731		
7,200.00	7,176.75	7,201.89	7,160.38	16.94	17.93	64.72	-336.73	-428.38	162.21	128.64	33.57	4.832		
7,300.00	7,276.21	7,301.70	7,259.05	17.22	18.25	64.13	-345.65	-440.52	168.04	133.95	34.08	4.930		
7,400.00	7,375.67	7,401.52	7,357.72	17.49	18.57	63.57	-354.58	-452.66	173.89	139.29	34.60	5.026		
7,500.00	7,475.13	7,501.33	7,456.39	17.76	18.88	63.06	-363.50	-464.80	179.75	144.64	35.11	5.119		
7,600.00	7,574.59	7,601.15	7,555.06	18.04	19.20	62.57	-372.43	-476.93	185.63	150.00	35.63	5.210		
7,700.00	7,674.05	7,700.96	7,653.73	18.31	19.52	62.12	-381.35	-489.07	191.52	155.37	36.14	5.299		
7,800.00	7,773.51	7,800.78	7,752.41	18.59	19.84	61.69	-390.28	-501.21	197.42	160.76	36.66	5.385		
7,900.00	7,872.97	7,900.59	7,851.08	18.86	20.16	61.29	-399.20	-513.34	203.33	166.15	37.18	5.469		
8,000.00	7,972.43	8,000.41	7,949.75	19.14	20.49	60.91	-408.13	-525.48	209.25	171.55	37.70	5.551		
8,100.00	8,071.89	8,100.22	8,048.42	19.41	20.81	60.55	-417.05	-537.62	215.18	176.96	38.22	5.630		
8,200.00	8,171.35	8,200.04	8,147.09	19.69	21.13	60.21	-425.97	-549.76	221.11	182.38	38.74	5.708		
8,300.00	8,270.80	8,299.85	8,245.77	19.97	21.45	59.88	-434.90	-561.89	227.06	187.80	39.26	5.784		
8,400.00	8,370.26	8,399.67	8,344.44	20.24	21.78	59.58	-443.82	-574.03	233.01	193.23	39.78	5.857		
8,500.00	8,469.72	8,499.48	8,443.11	20.52	22.10	59.29	-452.75	-586.17	238.97	198.67	40.30	5.929		
8,600.00	8,569.18	8,599.30	8,541.78	20.80	22.42	59.01	-461.67	-598.31	244.93	204.11	40.83	5.999		
8,700.00	8,668.64	8,699.11	8,640.45	21.07	22.75	58.75	-470.60	-610.44	250.90	209.55	41.35	6.068		
8,800.00	8,768.10	8,798.93	8,739.12	21.35	23.07	58.50	-479.52	-622.58	256.87	215.00	41.87	6.135		
8,900.00	8,867.56	8,898.74	8,837.80	21.63	23.40	58.26	-488.45	-634.72	262.85	220.46	42.40	6.200		
9,000.00	8,967.02	8,998.56	8,936.47	21.91	23.72	58.03	-497.37	-646.86	268.84	225.91	42.92	6.263		
9,068.05	9,034.70	9,066.48	9,003.61	22.09	23.95	57.88	-503.45	-655.11	272.91	229.63	43.28	6.306		
9,100.00	9,066.49	9,098.37	9,035.14	22.17	24.05	57.81	-506.30	-658.99	274.87	231.43	43.44	6.328		
9,200.00	9,166.09	9,200.01	9,135.65	22.38	24.36	57.43	-515.26	-671.17	281.46	237.58	43.88	6.414		
9,300.00	9,265.83	9,303.74	9,238.45	22.59	24.61	56.97	-523.44	-682.31	287.82	243.53	44.28	6.500		
9,400.00	9,365.67	9,407.61	9,341.62	22.78	24.85	56.45	-530.54	-691.96	293.75	249.09	44.66	6.578		
9,500.00	9,465.60	9,511.61	9,445.13	22.97	25.08	55.90	-536.53	-700.11	299.26	254.25	45.01	6.649		
9,600.00	9,565.58	9,615.74	9,548.93	23.14	25.30	55.29	-541.41	-706.75	304.37	259.03	45.34	6.714		
9,663.96	9,629.54	9,682.41	9,615.46	23.26	25.43	-88.87	-543.95	-710.20	307.42	261.88	45.54	6.751		

CC - Min centre to center distance or covergent point, SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 294H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,700.00	9,665.58	9,720.00	9,653.00	23.32	25.50	-89.11	-545.18	-711.87	309.00	263.35	45.65	6.768		
9,763.96	9,729.54	9,786.78	9,719.70	23.43	25.63	-89.45	-547.00	-714.35	311.36	265.50	45.85	6.790		
9,775.00	9,740.58	9,798.31	9,731.22	23.45	25.65	-89.48	-547.27	-714.72	311.70	265.82	45.89	6.793		
9,800.00	9,765.55	9,824.37	9,757.27	23.49	25.69	-89.73	-547.83	-715.47	312.42	266.48	45.94	6.801		
9,825.00	9,790.41	9,850.33	9,783.21	23.52	25.74	-90.23	-548.31	-716.13	313.06	267.10	45.96	6.812		
9,850.00	9,815.12	9,876.10	9,808.98	23.55	25.78	-90.95	-548.72	-716.69	313.65	267.71	45.94	6.827		
9,875.00	9,839.58	9,901.65	9,834.52	23.57	25.83	-91.89	-549.06	-717.15	314.25	268.35	45.90	6.846		
9,900.00	9,863.75	9,926.90	9,859.76	23.59	25.87	-93.03	-549.33	-717.52	314.93	269.09	45.83	6.871		
9,925.00	9,887.54	9,951.79	9,884.65	23.59	25.91	-94.35	-549.54	-717.79	315.75	270.01	45.74	6.904		
9,950.00	9,910.91	9,976.26	9,909.12	23.60	25.95	-95.81	-549.67	-717.98	316.81	271.19	45.61	6.945		
9,975.00	9,933.78	10,000.26	9,933.12	23.60	25.99	-97.40	-549.74	-718.08	318.20	272.73	45.47	6.998		
10,000.00	9,956.08	10,023.42	9,956.28	23.59	26.03	-99.04	-549.76	-718.10	320.03	274.72	45.31	7.062		
10,025.00	9,977.77	10,045.11	9,977.97	23.58	26.06	-100.65	-549.76	-718.10	322.48	277.33	45.15	7.142		
10,050.00	9,998.78	10,066.11	9,998.98	23.56	26.10	-102.27	-549.76	-718.10	325.66	280.68	44.98	7.240		
10,075.00	10,019.04	10,086.38	10,019.24	23.55	26.13	-103.84	-549.76	-718.10	329.69	284.88	44.81	7.357		
10,100.00	10,038.52	10,105.86	10,038.72	23.52	26.16	-105.33	-549.76	-718.10	334.66	290.01	44.65	7.495		
10,125.00	10,057.15	10,127.03	10,059.89	23.50	26.20	-106.98	-549.67	-718.10	340.64	296.14	44.50	7.655		
10,150.00	10,074.87	10,153.12	10,085.94	23.47	26.24	-109.06	-548.45	-718.10	347.38	303.04	44.33	7.836		
10,175.00	10,091.66	10,180.66	10,113.33	23.44	26.27	-111.14	-545.61	-718.10	354.75	310.59	44.16	8.034		
10,200.00	10,107.45	10,209.88	10,142.17	23.40	26.30	-113.24	-540.89	-718.10	362.68	318.71	43.96	8.249		
10,225.00	10,122.20	10,241.06	10,172.55	23.37	26.32	-115.35	-533.91	-718.10	371.07	327.34	43.73	8.486		
10,250.00	10,135.88	10,274.53	10,204.59	23.33	26.34	-117.48	-524.23	-718.10	379.82	336.39	43.43	8.745		
10,275.00	10,148.45	10,310.67	10,238.32	23.29	26.34	-119.65	-511.28	-718.10	388.81	345.76	43.04	9.033		
10,300.00	10,159.86	10,349.93	10,273.74	23.26	26.34	-121.84	-494.38	-718.10	397.89	355.35	42.54	9.353		
10,325.00	10,170.10	10,392.81	10,310.69	23.22	26.32	-124.05	-472.66	-718.10	406.91	365.01	41.90	9.711		
10,350.00	10,179.13	10,439.83	10,348.80	23.18	26.28	-126.25	-445.14	-718.10	415.67	374.57	41.10	10.113		
10,375.00	10,186.93	10,491.53	10,387.34	23.14	26.22	-128.39	-410.73	-718.10	423.96	383.81	40.15	10.559		
10,400.00	10,193.47	10,548.34	10,425.14	23.10	26.14	-130.41	-368.35	-718.10	431.54	392.46	39.07	11.044		
10,425.00	10,198.74	10,610.49	10,460.39	23.07	26.04	-132.23	-317.23	-718.10	438.12	400.17	37.95	11.545		
10,450.00	10,202.73	10,677.81	10,490.75	23.03	25.91	-133.74	-257.20	-718.10	443.44	406.51	36.93	12.009		
10,475.00	10,205.42	10,749.59	10,513.48	23.00	25.77	-134.84	-189.18	-718.10	447.21	411.01	36.21	12.352		
10,500.00	10,206.80	10,824.47	10,526.05	22.97	25.64	-135.44	-115.44	-718.10	449.24	413.25	35.99	12.483		
10,513.96	10,207.01	10,866.95	10,528.00	22.95	25.57	-135.53	-73.03	-718.10	449.55	413.42	36.13	12.442		
10,600.00	10,207.00	10,953.48	10,528.00	22.88	25.45	-135.53	13.51	-718.10	449.55	413.29	36.26	12.398		
10,700.00	10,207.00	11,053.48	10,528.00	22.97	25.39	-135.53	113.51	-718.10	449.55	412.99	36.55	12.298		
10,800.00	10,207.00	11,153.48	10,528.00	23.31	25.43	-135.53	213.51	-718.10	449.55	412.53	37.02	12.144		
10,900.00	10,207.00	11,253.48	10,528.00	23.80	25.66	-135.53	313.51	-718.10	449.55	411.90	37.65	11.942		
11,000.00	10,207.00	11,353.48	10,528.00	24.41	26.07	-135.53	413.51	-718.10	449.55	411.12	38.43	11.699		
11,100.00	10,207.00	11,453.48	10,528.00	25.10	26.64	-135.53	513.51	-718.10	449.55	410.19	39.36	11.423		
11,200.00	10,207.00	11,553.48	10,528.00	25.87	27.33	-135.53	613.51	-718.10	449.55	409.13	40.42	11.122		
11,300.00	10,207.00	11,653.48	10,528.00	26.71	28.10	-135.53	713.51	-718.10	449.55	407.94	41.61	10.804		
11,400.00	10,207.00	11,753.48	10,528.00	27.63	28.95	-135.53	813.51	-718.10	449.55	406.63	42.91	10.476		
11,500.00	10,207.00	11,853.48	10,528.00	28.60	29.86	-135.53	913.51	-718.10	449.55	405.22	44.32	10.142		
11,600.00	10,207.00	11,953.48	10,528.00	29.64	30.84	-135.53	1,013.51	-718.10	449.55	403.72	45.83	9.809		
11,700.00	10,207.00	12,053.48	10,528.00	30.72	31.86	-135.53	1,113.51	-718.10	449.55	402.13	47.42	9.480		
11,800.00	10,207.00	12,153.48	10,528.00	31.85	32.94	-135.53	1,213.51	-718.10	449.55	400.46	49.09	9.158		
11,900.00	10,207.00	12,253.48	10,528.00	33.02	34.06	-135.53	1,313.51	-718.10	449.55	398.72	50.83	8.844		
12,000.00	10,207.00	12,353.48	10,528.00	34.22	35.21	-135.53	1,413.51	-718.10	449.55	396.92	52.63	8.541		
12,100.00	10,207.00	12,453.48	10,528.00	35.46	36.40	-135.53	1,513.51	-718.10	449.55	395.06	54.49	8.250		
12,200.00	10,207.00	12,553.48	10,528.00	36.74	37.63	-135.53	1,613.51	-718.10	449.55	393.14	56.40	7.970		
12,300.00	10,207.00	12,653.48	10,528.00	38.03	38.88	-135.53	1,713.51	-718.10	449.55	391.19	58.36	7.703		

CC - Min centre to center distance or convergent point, SF - min separation factor ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

Company: Devon Energy  
Project: Eddy County, NM (NAD-83)  
Reference Site: Cotton Draw Unit  
Site Error: 0.00 usft  
Reference Well: 512H  
Well Error: 0.00 usft  
Reference Wellbore: OH  
Reference Design: Plan #1

Local Co-ordinate Reference: Well 512H  
TVD Reference: 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)  
MD Reference: 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: EDM 5000.1 Multi User Db  
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 294H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,400.00	10,207.00	12,753.48	10,528.00	39.36	40.16	-135.53	1,813.51	-718.10	449.55	389.19	60.36	7.448	
12,500.00	10,207.00	12,853.48	10,528.00	40.70	41.47	-135.53	1,913.51	-718.10	449.55	387.15	62.40	7.205	
12,600.00	10,207.00	12,953.48	10,528.00	42.07	42.80	-135.53	2,013.51	-718.10	449.55	385.08	64.47	6.973	
12,700.00	10,207.00	13,053.48	10,528.00	43.45	44.14	-135.53	2,113.51	-718.10	449.55	382.98	66.57	6.753	
12,800.00	10,207.00	13,153.48	10,528.00	44.86	45.51	-135.53	2,213.51	-718.10	449.55	380.85	68.70	6.543	
12,900.00	10,207.00	13,253.48	10,528.00	46.27	46.89	-135.53	2,313.51	-718.10	449.55	378.69	70.86	6.344	
13,000.00	10,207.00	13,353.48	10,528.00	47.70	48.29	-135.53	2,413.51	-718.10	449.55	376.51	73.04	6.155	
13,100.00	10,207.00	13,453.48	10,528.00	49.15	49.70	-135.53	2,513.51	-718.10	449.55	374.31	75.24	5.975	
13,200.00	10,207.00	13,553.48	10,528.00	50.60	51.13	-135.53	2,613.51	-718.10	449.55	372.09	77.46	5.804	
13,300.00	10,207.00	13,653.48	10,528.00	52.06	52.56	-135.53	2,713.51	-718.10	449.55	369.85	79.70	5.641	
13,400.00	10,207.00	13,753.48	10,528.00	53.54	54.01	-135.53	2,813.51	-718.10	449.55	367.60	81.95	5.485	
13,500.00	10,207.00	13,853.48	10,528.00	55.02	55.47	-135.53	2,913.51	-718.10	449.55	365.33	84.22	5.338	
13,600.00	10,207.00	13,953.48	10,528.00	56.52	56.94	-135.53	3,013.51	-718.10	449.55	363.04	86.51	5.197	
13,700.00	10,207.00	14,053.48	10,528.00	58.02	58.42	-135.53	3,113.51	-718.10	449.55	360.75	88.80	5.062	
13,800.00	10,207.00	14,153.48	10,528.00	59.52	59.90	-135.53	3,213.51	-718.10	449.55	358.44	91.11	4.934	
13,900.00	10,207.00	14,253.48	10,528.00	61.04	61.39	-135.53	3,313.51	-718.10	449.55	356.12	93.43	4.812	
14,000.00	10,207.00	14,353.48	10,528.00	62.56	62.89	-135.53	3,413.51	-718.10	449.55	353.79	95.76	4.695	
14,100.00	10,207.00	14,453.48	10,528.00	64.08	64.40	-135.53	3,513.51	-718.10	449.55	351.45	98.10	4.583	
14,200.00	10,207.00	14,553.48	10,528.00	65.61	65.91	-135.53	3,613.51	-718.10	449.55	349.10	100.45	4.475	
14,300.00	10,207.00	14,653.48	10,528.00	67.15	67.43	-135.53	3,713.51	-718.10	449.55	346.75	102.80	4.373	
14,400.00	10,207.00	14,753.48	10,528.00	68.69	68.95	-135.53	3,813.51	-718.10	449.55	344.38	105.17	4.275	
14,500.00	10,207.00	14,853.48	10,528.00	70.23	70.48	-135.53	3,913.51	-718.10	449.55	342.01	107.54	4.180	
14,600.00	10,207.00	14,953.48	10,528.00	71.78	72.01	-135.53	4,013.51	-718.10	449.55	339.63	109.91	4.090	
14,700.00	10,207.00	15,053.48	10,528.00	73.33	73.55	-135.53	4,113.51	-718.10	449.55	337.25	112.30	4.003	
14,800.00	10,207.00	15,153.48	10,528.00	74.89	75.09	-135.53	4,213.51	-718.10	449.55	334.86	114.69	3.920	
14,900.00	10,207.00	15,253.48	10,528.00	76.45	76.64	-135.53	4,313.51	-718.10	449.55	332.47	117.08	3.840	
15,000.00	10,207.00	15,353.48	10,528.00	78.01	78.18	-135.53	4,413.51	-718.10	449.55	330.07	119.48	3.762	
15,100.00	10,207.00	15,453.48	10,528.00	79.58	79.74	-135.53	4,513.51	-718.10	449.55	327.66	121.89	3.688	
15,200.00	10,207.00	15,553.48	10,528.00	81.14	81.29	-135.53	4,613.51	-718.10	449.55	325.25	124.30	3.617	
15,300.00	10,207.00	15,653.48	10,528.00	82.72	82.67	-135.53	4,713.51	-718.10	449.55	323.02	126.53	3.553	
15,343.08	10,207.00	15,696.56	10,528.00	83.39	83.21	-135.53	4,756.59	-718.10	449.55	322.12	127.43	3.528	
15,344.98	10,207.00	15,696.80	10,528.00	83.42	83.21	-135.53	4,756.82	-718.10	449.55	322.07	127.48	3.526	
15,345.97	10,207.00	15,696.80	10,528.00	83.44	83.21	-135.53	4,756.82	-718.10	449.56	322.04	127.51	3.526	

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 511H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
0.00	0.00	0.00	0.00	0.00	0.00	-90.34	-0.18	-29.99	29.99						
100.00	100.00	99.90	99.90	0.09	0.09	-90.34	-0.18	-29.99	29.99	29.82	0.17	174.505			
200.00	200.00	199.90	199.90	0.31	0.31	-90.34	-0.18	-29.99	29.99	29.37	0.62	48.274			
300.00	300.00	299.90	299.90	0.54	0.54	-90.34	-0.18	-29.99	29.99	28.92	1.07	28.008			
400.00	400.00	399.90	399.90	0.76	0.76	-90.34	-0.18	-29.99	29.99	28.47	1.52	19.726			
500.00	500.00	499.90	499.90	0.99	0.98	-90.34	-0.18	-29.99	29.99	28.02	1.97	15.225			
600.00	600.00	599.90	599.90	1.21	1.21	-90.34	-0.18	-29.99	29.99	27.57	2.42	12.396			
700.00	700.00	699.90	699.90	1.43	1.43	-90.34	-0.18	-29.99	29.99	27.12	2.87	10.454			
800.00	800.00	799.90	799.90	1.66	1.66	-90.34	-0.18	-29.99	29.99	26.67	3.32	9.038			
900.00	900.00	899.90	899.90	1.88	1.88	-90.34	-0.18	-29.99	29.99	26.22	3.77	7.959			
1,000.00	1,000.00	999.90	999.90	2.11	2.11	-90.34	-0.18	-29.99	29.99	25.77	4.22	7.111			
1,100.00	1,100.00	1,099.90	1,099.90	2.33	2.33	-90.34	-0.18	-29.99	29.99	25.32	4.67	6.426			
1,200.00	1,200.00	1,199.90	1,199.90	2.56	2.56	-90.34	-0.18	-29.99	29.99	24.87	5.12	5.861			
1,300.00	1,300.00	1,299.90	1,299.90	2.78	2.78	-90.34	-0.18	-29.99	29.99	24.42	5.57	5.388			
1,400.00	1,400.00	1,399.90	1,399.90	3.01	3.01	-90.34	-0.18	-29.99	29.99	23.97	6.02	4.965			
1,500.00	1,500.00	1,499.90	1,499.90	3.23	3.23	-90.34	-0.18	-29.99	29.99	23.53	6.47	4.639			
1,600.00	1,600.00	1,599.90	1,599.90	3.46	3.46	-90.34	-0.18	-29.99	29.99	23.08	6.91	4.337			
1,700.00	1,700.00	1,699.90	1,699.90	3.68	3.68	-90.34	-0.18	-29.99	29.99	22.63	7.36	4.072			
1,800.00	1,800.00	1,799.90	1,799.90	3.91	3.91	-90.34	-0.18	-29.99	29.99	22.18	7.81	3.838			
1,900.00	1,900.00	1,899.90	1,899.90	4.13	4.13	-90.34	-0.18	-29.99	29.99	21.73	8.26	3.629			
2,000.00	2,000.00	1,999.90	1,999.90	4.36	4.36	-90.34	-0.18	-29.99	29.99	21.28	8.71	3.442			
2,100.00	2,100.00	2,099.90	2,099.90	4.58	4.58	-90.34	-0.18	-29.99	29.99	20.83	9.16	3.273			
2,200.00	2,200.00	2,199.90	2,199.90	4.81	4.81	-90.34	-0.18	-29.99	29.99	20.38	9.61	3.120			
2,300.00	2,300.00	2,299.90	2,299.90	5.03	5.03	-90.34	-0.18	-29.99	29.99	19.93	10.06	2.981			
2,400.00	2,400.00	2,399.90	2,399.90	5.26	5.26	-90.34	-0.18	-29.99	29.99	19.48	10.51	2.853			
2,500.00	2,500.00	2,499.90	2,499.90	5.48	5.48	-90.34	-0.18	-29.99	29.99	19.03	10.96	2.736 CC			
2,600.00	2,599.99	2,599.43	2,599.43	5.68	5.70	55.54	0.24	-30.74	30.25	18.87	11.37	2.659			
2,700.00	2,699.96	2,698.89	2,698.85	5.85	5.91	61.67	1.51	-33.00	31.25	19.50	11.75	2.659			
2,800.00	2,799.86	2,798.19	2,798.05	6.03	6.12	70.85	3.61	-36.76	33.66	21.53	12.13	2.774			
2,900.00	2,899.68	2,897.89	2,897.62	6.22	6.34	81.36	6.17	-41.31	37.42	24.89	12.53	2.987			
3,000.00	2,999.37	2,997.49	2,997.09	6.41	6.55	92.07	8.71	-45.85	42.22	29.29	12.93	3.265			
3,095.91	3,094.84	3,092.89	3,092.35	6.59	6.76	101.96	11.16	-50.21	48.25	34.92	13.33	3.620			
3,100.00	3,098.90	3,096.96	3,096.41	6.60	6.77	102.37	11.26	-50.39	48.55	35.20	13.35	3.637			
3,200.00	3,198.36	3,196.35	3,195.67	6.80	6.99	110.91	13.80	-54.93	56.36	42.59	13.77	4.093			
3,300.00	3,297.82	3,295.73	3,294.92	7.01	7.21	117.29	16.35	-59.46	65.11	50.91	14.19	4.587			
3,400.00	3,397.28	3,395.12	3,394.17	7.22	7.43	122.11	18.89	-64.00	74.47	59.84	14.62	5.092			
3,500.00	3,496.74	3,494.51	3,493.42	7.44	7.65	125.84	21.43	-68.53	84.23	69.18	15.05	5.595			
3,600.00	3,596.20	3,593.90	3,592.68	7.66	7.88	128.79	23.98	-73.07	94.28	78.79	15.49	6.087			
3,700.00	3,695.66	3,693.29	3,691.93	7.89	8.10	131.16	26.52	-77.61	104.53	88.60	15.92	6.564			
3,800.00	3,795.12	3,792.68	3,791.18	8.12	8.32	133.11	29.06	-82.14	114.92	98.56	16.36	7.023			
3,900.00	3,894.58	3,892.07	3,890.44	8.35	8.55	134.74	31.61	-86.68	125.42	108.62	16.80	7.464			
4,000.00	3,994.04	3,991.46	3,989.69	8.59	8.78	136.11	34.15	-91.21	136.01	118.76	17.25	7.887			
4,100.00	4,093.50	4,090.85	4,088.94	8.83	9.00	137.29	36.69	-95.75	146.66	128.97	17.69	8.291			
4,200.00	4,192.96	4,190.24	4,188.20	9.07	9.23	138.30	39.23	-100.28	157.37	139.23	18.14	8.677			
4,300.00	4,292.42	4,289.63	4,287.45	9.31	9.46	139.19	41.78	-104.82	168.11	149.53	18.58	9.046			
4,400.00	4,391.88	4,389.02	4,386.70	9.56	9.69	139.97	44.32	-109.36	178.90	159.86	19.03	9.399			
4,500.00	4,491.34	4,488.41	4,485.96	9.80	9.91	140.66	46.86	-113.89	189.71	170.22	19.49	9.736			
4,600.00	4,590.80	4,587.79	4,585.21	10.06	10.14	141.27	49.41	-118.43	200.55	180.61	19.94	10.058			
4,700.00	4,690.26	4,687.18	4,684.46	10.31	10.37	141.83	51.95	-122.96	211.40	191.01	20.39	10.366			
4,800.00	4,789.72	4,786.57	4,783.72	10.56	10.60	142.32	54.49	-127.50	222.28	201.43	20.85	10.662			
4,900.00	4,889.18	4,885.96	4,882.97	10.82	10.83	142.78	57.04	-132.03	233.17	211.86	21.31	10.944			

CC - Min centre to center distance or convergent point. SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 511H - OH - Plan #1													Offset Site Error: 0.00 usft	
Survey Program: O-LEAM MWD+HDGM													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.00	4,988.64	4,985.35	4,982.22	11.07	11.06	143.19	59.58	-136.57	244.07	222.31	21.76	11.215		
5,100.00	5,088.10	5,084.74	5,081.47	11.33	11.29	143.57	62.12	-141.10	254.98	232.76	22.22	11.474		
5,200.00	5,187.56	5,184.13	5,180.73	11.59	11.53	143.91	64.67	-145.64	265.91	243.23	22.68	11.723		
5,300.00	5,287.02	5,283.52	5,279.98	11.85	11.76	144.23	67.21	-150.18	276.84	253.70	23.14	11.962		
5,400.00	5,386.48	5,382.91	5,379.23	12.11	11.99	144.52	69.75	-154.71	287.78	264.18	23.60	12.192		
5,500.00	5,485.94	5,482.30	5,478.49	12.37	12.22	144.80	72.30	-159.25	298.73	274.66	24.07	12.413		
5,600.00	5,585.39	5,581.69	5,577.74	12.64	12.45	145.05	74.84	-163.78	309.68	285.15	24.53	12.625		
5,700.00	5,684.85	5,681.08	5,676.99	12.90	12.69	145.29	77.38	-168.32	320.64	295.65	24.99	12.829		
5,800.00	5,784.31	5,780.47	5,776.25	13.17	12.92	145.51	79.93	-172.85	331.61	306.15	25.46	13.025		
5,900.00	5,883.77	5,879.85	5,875.50	13.43	13.15	145.71	82.47	-177.39	342.58	316.65	25.92	13.214		
6,000.00	5,983.23	5,979.24	5,974.75	13.70	13.38	145.91	85.01	-181.93	353.55	327.16	26.39	13.397		
6,100.00	6,082.69	6,078.63	6,074.01	13.97	13.62	146.09	87.56	-186.46	364.53	337.67	26.86	13.573		
6,200.00	6,182.15	6,178.02	6,173.26	14.23	13.85	146.26	90.10	-191.00	375.51	348.18	27.32	13.742		
6,300.00	6,281.61	6,277.41	6,272.51	14.50	14.08	146.42	92.64	-195.53	386.49	358.70	27.79	13.906		
6,400.00	6,381.07	6,376.80	6,371.77	14.77	14.32	146.57	95.19	-200.07	397.48	369.22	28.26	14.065		
6,500.00	6,480.53	6,476.19	6,471.02	15.04	14.55	146.72	97.73	-204.60	408.47	379.74	28.73	14.217		
6,600.00	6,579.99	6,575.58	6,570.27	15.31	14.78	146.85	100.27	-209.14	419.46	390.26	29.20	14.365		
6,700.00	6,679.45	6,674.97	6,669.52	15.58	15.02	146.98	102.82	-213.68	430.45	400.78	29.67	14.508		
6,800.00	6,778.91	6,774.36	6,768.78	15.85	15.25	147.11	105.36	-218.21	441.45	411.31	30.14	14.647		
6,900.00	6,878.37	6,873.75	6,868.03	16.13	15.49	147.22	107.90	-222.75	452.45	421.84	30.61	14.781		
7,000.00	6,977.83	6,973.14	6,967.28	16.40	15.72	147.34	110.45	-227.28	463.45	432.36	31.08	14.911		
7,100.00	7,077.29	7,072.53	7,066.54	16.67	15.95	147.44	112.99	-231.82	474.45	442.89	31.55	15.037		
7,200.00	7,176.75	7,171.92	7,165.79	16.94	16.19	147.55	115.53	-236.35	485.45	453.43	32.02	15.159		
7,300.00	7,276.21	7,271.30	7,265.04	17.22	16.42	147.64	118.08	-240.89	496.45	463.96	32.50	15.277		
7,400.00	7,375.67	7,370.69	7,364.30	17.49	16.66	147.74	120.62	-245.43	507.46	474.49	32.97	15.392		
7,500.00	7,475.13	7,470.08	7,463.55	17.76	16.89	147.82	123.16	-249.96	518.47	485.02	33.44	15.503		
7,600.00	7,574.59	7,569.47	7,562.80	18.04	17.13	147.91	125.71	-254.50	529.47	495.56	33.92	15.612		
7,700.00	7,674.05	7,668.86	7,662.06	18.31	17.36	147.99	128.25	-259.03	540.48	506.09	34.39	15.717		
7,800.00	7,773.51	7,768.25	7,761.31	18.59	17.60	148.07	130.79	-263.57	551.49	516.63	34.86	15.819		
7,900.00	7,872.97	7,867.64	7,860.56	18.86	17.83	148.15	133.34	-268.10	562.50	527.17	35.34	15.918		
8,000.00	7,972.43	7,967.03	7,959.82	19.14	18.07	148.22	135.88	-272.64	573.52	537.71	35.81	16.015		
8,100.00	8,071.89	8,066.42	8,059.07	19.41	18.30	148.29	138.42	-277.18	584.53	548.24	36.29	16.109		
8,200.00	8,171.35	8,165.81	8,158.32	19.69	18.54	148.36	140.96	-281.71	595.54	558.78	36.76	16.201		
8,300.00	8,270.80	8,265.20	8,257.57	19.97	18.77	148.42	143.51	-286.25	606.56	569.32	37.24	16.290		
8,400.00	8,370.26	8,364.59	8,356.83	20.24	19.01	148.48	146.05	-290.78	617.57	579.86	37.71	16.377		
8,500.00	8,469.72	8,463.98	8,456.08	20.52	19.24	148.54	148.59	-295.32	628.59	590.40	38.19	16.461		
8,600.00	8,569.18	8,563.36	8,555.33	20.80	19.48	148.60	151.14	-299.85	639.61	600.94	38.66	16.544		
8,700.00	8,668.64	8,662.75	8,654.59	21.07	19.71	148.66	153.68	-304.39	650.62	611.49	39.14	16.624		
8,800.00	8,768.10	8,762.14	8,753.84	21.35	19.95	148.71	156.22	-308.93	661.64	622.03	39.61	16.702		
8,900.00	8,867.56	8,861.53	8,853.09	21.63	20.19	148.77	158.77	-313.46	672.66	632.57	40.09	16.779		
9,000.00	8,967.02	8,960.92	8,952.35	21.91	20.42	148.82	161.31	-318.00	683.68	643.11	40.57	16.853		
9,068.05	9,034.70	9,028.55	9,019.89	22.09	20.58	148.85	163.04	-321.08	691.18	650.29	40.89	16.903		
9,100.00	9,066.49	9,060.32	9,051.61	22.17	20.66	148.88	163.85	-322.53	694.62	653.58	41.04	16.926		
9,200.00	9,166.09	9,159.84	9,150.99	22.38	20.89	148.92	166.40	-327.08	704.42	662.95	41.48	16.983		
9,300.00	9,265.83	9,259.48	9,250.50	22.59	21.13	148.88	168.95	-331.62	712.74	670.82	41.92	17.004		
9,400.00	9,365.67	9,360.34	9,351.22	22.78	21.36	148.76	171.51	-336.19	719.55	677.20	42.35	16.991		
9,500.00	9,465.60	9,465.67	9,456.47	22.97	21.56	148.64	173.54	-339.81	724.36	681.61	42.75	16.944		
9,600.00	9,565.58	10,735.84	10,207.00	23.14	24.45	-131.31	-549.71	-342.09	644.40	618.91	25.50	25.275		
9,663.96	9,629.54	10,736.13	10,207.00	23.26	24.45	90.00	-550.00	-342.09	580.79	555.04	25.74	22.560		
9,700.00	9,665.58	10,736.13	10,207.00	23.32	24.45	90.00	-550.00	-342.09	544.96	519.06	25.89	21.045		

CC - Min centre to center distance or covergent point. SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 511H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
9,763.96	9,729.54	10,736.13	10,207.00	23.43	24.45	90.00	-550.00	-342.09	481.45	455.26	26.19	18.382			
9,775.00	9,740.58	10,736.00	10,207.00	23.45	24.45	100.02	-549.87	-342.09	470.51	444.26	26.25	17.925			
9,800.00	9,765.55	10,734.77	10,207.00	23.49	24.44	118.60	-548.64	-342.09	445.76	419.38	26.38	16.898			
9,825.00	9,790.41	10,732.23	10,207.00	23.52	24.42	131.02	-546.10	-342.09	421.14	394.63	26.52	15.883			
9,850.00	9,815.12	10,728.39	10,207.00	23.55	24.40	139.00	-542.27	-342.09	396.72	370.06	26.66	14.881			
9,875.00	9,839.58	10,723.27	10,207.00	23.57	24.37	144.20	-537.15	-342.09	372.56	345.75	26.81	13.894			
9,900.00	9,863.75	10,716.88	10,207.00	23.59	24.33	147.67	-530.75	-342.09	348.75	321.77	26.98	12.925			
9,925.00	9,887.54	10,709.22	10,207.00	23.59	24.28	149.99	-523.10	-342.09	325.35	298.18	27.17	11.975			
9,950.00	9,910.91	10,700.34	10,207.00	23.60	24.23	151.50	-514.21	-342.09	302.43	275.05	27.38	11.047			
9,975.00	9,933.78	10,690.24	10,207.00	23.60	24.17	152.42	-504.11	-342.09	280.07	252.45	27.62	10.141			
10,000.00	9,956.08	10,678.96	10,207.00	23.59	24.11	152.85	-492.83	-342.09	258.35	230.45	27.90	9.261			
10,025.00	9,977.77	10,666.53	10,207.00	23.58	24.04	152.87	-480.40	-342.09	237.33	209.11	28.22	8.409			
10,050.00	9,998.78	10,652.98	10,207.00	23.56	23.97	152.53	-466.85	-342.09	217.10	188.49	28.61	7.588			
10,075.00	10,019.04	10,638.35	10,207.00	23.55	23.89	151.82	-452.22	-342.09	197.73	168.66	29.07	6.801			
10,100.00	10,038.52	10,622.67	10,207.00	23.52	23.81	150.76	-436.55	-342.09	179.31	149.68	29.63	6.051			
10,125.00	10,057.15	10,606.00	10,207.00	23.50	23.72	149.31	-419.88	-342.09	161.92	131.61	30.31	5.341			
10,150.00	10,074.87	10,588.38	10,207.00	23.47	23.64	147.44	-402.26	-342.09	145.66	114.51	31.15	4.676			
10,175.00	10,091.66	10,569.86	10,207.00	23.44	23.56	145.10	-383.73	-342.09	130.61	98.45	32.16	4.061			
10,200.00	10,107.45	10,550.48	10,207.00	23.40	23.47	142.25	-364.35	-342.09	116.89	83.51	33.37	3.502			
10,225.00	10,122.20	10,530.30	10,207.01	23.37	23.39	138.82	-344.18	-342.09	104.59	69.79	34.80	3.006			
10,250.00	10,135.88	10,509.38	10,207.01	23.33	23.30	134.78	-323.25	-342.09	93.83	57.41	36.42	2.577			
10,275.00	10,148.45	10,487.63	10,207.00	23.29	23.22	130.08	-301.50	-342.09	84.68	46.51	38.17	2.218			
10,300.00	10,159.86	10,463.00	10,206.31	23.26	23.14	123.78	-276.89	-342.09	76.84	36.81	40.02	1.920			
10,325.00	10,170.10	10,439.04	10,204.42	23.22	23.06	116.44	-253.00	-342.09	70.20	28.24	41.96	1.673			
10,350.00	10,179.13	10,415.68	10,201.42	23.18	22.99	108.06	-229.84	-342.09	65.15	21.46	43.69	1.491 Level 3			
10,375.00	10,186.93	10,392.87	10,197.41	23.14	22.93	98.86	-207.39	-342.09	62.03	17.23	44.79	1.385 Level 3			
10,397.97	10,192.99	10,372.36	10,192.89	23.11	22.88	90.00	-187.39	-342.09	61.08	16.09	44.99	1.358 Level 3, ES, SF			
10,400.00	10,193.47	10,370.57	10,192.45	23.10	22.88	89.21	-185.65	-342.09	61.09	16.12	44.97	1.358 Level 3			
10,425.00	10,198.74	10,348.74	10,186.62	23.07	22.83	79.66	-164.61	-342.09	62.36	18.17	44.19	1.411 Level 3			
10,450.00	10,202.73	10,327.34	10,179.97	23.03	22.79	70.70	-144.27	-342.09	65.63	22.85	42.78	1.534			
10,475.00	10,205.42	10,306.33	10,172.57	23.00	22.76	62.67	-124.61	-342.09	70.54	29.38	41.17	1.714			
10,500.00	10,206.80	10,285.68	10,164.46	22.97	22.73	55.70	-105.63	-342.09	76.69	36.98	39.70	1.931			
10,513.96	10,207.01	10,275.00	10,159.94	22.95	22.71	52.45	-95.95	-342.09	80.52	41.41	39.11	2.059			
10,600.00	10,207.00	10,209.47	10,127.62	22.88	22.63	37.61	-39.00	-342.09	113.02	76.33	36.69	3.080			
10,700.00	10,207.00	10,146.43	10,089.45	22.97	22.57	27.47	11.11	-342.09	167.37	130.31	37.06	4.516			
10,800.00	10,207.00	10,095.14	10,053.73	23.31	22.52	21.74	47.89	-342.09	233.71	195.28	38.43	6.081			
10,900.00	10,207.00	10,050.00	10,019.19	23.80	22.48	18.02	76.93	-342.09	308.12	268.52	39.59	7.782			
11,000.00	10,207.00	10,025.00	9,998.93	24.41	22.45	16.37	91.56	-342.09	388.11	347.02	41.09	9.446			
11,100.00	10,207.00	9,991.46	9,970.60	25.10	22.42	14.49	109.50	-342.09	472.01	430.25	41.75	11.305			
11,200.00	10,207.00	9,968.12	9,950.17	25.87	22.39	13.38	120.79	-342.09	558.94	516.51	42.43	13.173			
11,300.00	10,207.00	9,950.00	9,933.95	26.71	22.37	12.61	128.85	-342.09	648.12	605.12	42.99	15.075			
11,400.00	10,207.00	9,925.00	9,911.08	27.63	22.34	11.67	138.96	-342.09	739.09	695.79	43.30	17.068			
11,500.00	10,207.00	9,925.00	9,911.08	28.60	22.34	11.67	138.96	-342.09	831.36	787.55	43.81	18.976			
11,600.00	10,207.00	9,900.00	9,887.72	29.64	22.31	10.83	147.86	-342.09	924.64	880.67	43.97	21.028			
11,700.00	10,207.00	9,900.00	9,887.72	30.72	22.31	10.83	147.86	-342.09	1,018.87	974.58	44.29	23.006			
11,800.00	10,207.00	9,884.41	9,872.93	31.85	22.29	10.36	152.78	-342.09	1,113.74	1,069.29	44.44	25.061			
11,900.00	10,207.00	9,875.00	9,863.93	33.02	22.28	10.10	155.52	-342.09	1,209.26	1,164.65	44.61	27.110			
12,000.00	10,207.00	9,875.00	9,863.93	34.22	22.28	10.10	155.52	-342.09	1,305.33	1,260.55	44.78	29.149			
12,100.00	10,207.00	9,861.49	9,850.92	35.46	22.26	9.74	159.13	-342.09	1,401.70	1,356.82	44.88	31.231			
12,200.00	10,207.00	9,850.00	9,839.77	36.74	22.24	9.45	161.92	-342.09	1,498.54	1,453.56	44.98	33.315			
12,300.00	10,207.00	9,850.00	9,839.77	38.03	22.24	9.45	161.92	-342.09	1,595.60	1,550.50	45.10	35.380			

CC - Min centre to center distance or convergent point. SF - min separation factor ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
 (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 511H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: D-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
12,400.00	10,207.00	9,850.00	9,839.77	39.36	22.24	9.45	161.92	-342.09	1,693.00	1,647.80	45.20	37.454		
12,500.00	10,207.00	9,840.07	9,830.08	40.70	22.23	9.21	164.11	-342.09	1,790.56	1,745.28	45.28	39.545		
12,600.00	10,207.00	9,835.82	9,825.92	42.07	22.22	9.11	164.99	-342.09	1,888.35	1,842.99	45.36	41.631		
12,700.00	10,207.00	9,825.00	9,815.30	43.45	22.20	8.87	167.05	-342.09	1,986.39	1,940.96	45.43	43.726		
12,800.00	10,207.00	9,825.00	9,815.30	44.86	22.20	8.87	167.05	-342.09	2,084.48	2,038.97	45.51	45.807		
12,900.00	10,207.00	9,825.00	9,815.30	46.27	22.20	8.87	167.05	-342.09	2,182.74	2,137.16	45.58	47.890		
13,000.00	10,207.00	9,825.00	9,815.30	47.70	22.20	8.87	167.05	-342.09	2,281.14	2,235.50	45.65	49.973		
13,100.00	10,207.00	9,825.00	9,815.30	49.15	22.20	8.87	167.05	-342.09	2,379.69	2,333.97	45.71	52.056		
13,200.00	10,207.00	9,825.00	9,815.30	50.60	22.20	8.87	167.05	-342.09	2,478.35	2,432.57	45.78	54.138		
13,300.00	10,207.00	9,813.72	9,804.18	52.06	22.19	8.62	168.95	-342.09	2,576.95	2,531.11	45.84	56.217		
13,400.00	10,207.00	9,811.35	9,801.84	53.54	22.18	8.58	169.31	-342.09	2,675.73	2,629.83	45.90	58.292		
13,500.00	10,207.00	9,800.00	9,790.60	55.02	22.16	8.35	170.90	-342.09	2,774.69	2,728.73	45.96	60.366		
13,600.00	10,207.00	9,800.00	9,790.60	56.52	22.16	8.35	170.90	-342.09	2,873.58	2,827.55	46.03	62.432		
13,700.00	10,207.00	9,800.00	9,790.60	58.02	22.16	8.35	170.90	-342.09	2,972.54	2,926.45	46.09	64.495		
13,800.00	10,207.00	9,800.00	9,790.60	59.52	22.16	8.35	170.90	-342.09	3,071.56	3,025.41	46.15	66.554		
13,900.00	10,207.00	9,800.00	9,790.60	61.04	22.16	8.35	170.90	-342.09	3,170.65	3,124.43	46.21	68.609		
14,000.00	10,207.00	9,800.00	9,790.60	62.56	22.16	8.35	170.90	-342.09	3,269.79	3,223.51	46.28	70.658		
14,100.00	10,207.00	9,800.00	9,790.60	64.08	22.16	8.35	170.90	-342.09	3,368.98	3,322.64	46.34	72.703		
14,200.00	10,207.00	9,800.00	9,790.60	65.61	22.16	8.35	170.90	-342.09	3,468.22	3,421.82	46.40	74.743		
14,300.00	10,207.00	9,800.00	9,790.60	67.15	22.16	8.35	170.90	-342.09	3,567.51	3,521.04	46.47	76.777		
14,400.00	10,207.00	9,800.00	9,790.60	68.69	22.16	8.35	170.90	-342.09	3,666.83	3,620.30	46.53	78.805		
14,500.00	10,207.00	9,800.00	9,790.60	70.23	22.16	8.35	170.90	-342.09	3,766.18	3,719.59	46.60	80.827		
14,600.00	10,207.00	9,800.00	9,790.60	71.78	22.16	8.35	170.90	-342.09	3,865.57	3,818.91	46.66	82.842		
14,700.00	10,207.00	9,800.00	9,790.60	73.33	22.16	8.35	170.90	-342.09	3,964.99	3,918.27	46.73	84.851		
14,800.00	10,207.00	9,800.00	9,790.60	74.89	22.16	8.35	170.90	-342.09	4,064.44	4,017.65	46.80	86.853		
14,900.00	10,207.00	9,787.97	9,778.65	76.45	22.15	8.12	172.29	-342.09	4,163.75	4,116.88	46.87	88.831		
15,000.00	10,207.00	9,786.93	9,777.62	78.01	22.14	8.10	172.39	-342.09	4,263.22	4,216.28	46.94	90.817		
15,100.00	10,207.00	9,775.00	9,765.74	79.58	22.12	7.88	173.45	-342.09	4,362.85	4,315.83	47.02	92.785		
15,200.00	10,207.00	9,775.00	9,765.74	81.14	22.12	7.88	173.45	-342.09	4,462.34	4,415.25	47.09	94.755		
15,300.00	10,207.00	9,775.00	9,765.74	82.72	22.12	7.88	173.45	-342.09	4,561.85	4,514.69	47.17	96.718		
15,344.98	10,207.00	9,775.00	9,765.74	83.42	22.12	7.88	173.45	-342.09	4,606.61	4,559.41	47.20	97.599		
15,345.97	10,207.00	9,775.00	9,765.74	83.44	22.12	7.88	173.45	-342.09	4,607.60	4,556.92	50.68	90.915		



# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 513H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	2.00	2.00	0.00	0.00	89.66	0.72	119.97	119.97				
100.00	100.00	102.00	102.00	0.09	0.09	89.66	0.72	119.97	119.97	119.80	0.18	679.954	
200.00	200.00	202.00	202.00	0.31	0.32	89.66	0.72	119.97	119.97	119.35	0.63	191.657	
300.00	300.00	302.00	302.00	0.54	0.54	89.66	0.72	119.97	119.97	118.90	1.08	111.550	
400.00	400.00	402.00	402.00	0.76	0.76	89.66	0.72	119.97	119.97	118.45	1.53	78.668	
500.00	500.00	502.00	502.00	0.99	0.99	89.66	0.72	119.97	119.97	118.00	1.97	60.759	
600.00	600.00	602.00	602.00	1.21	1.21	89.66	0.72	119.97	119.97	117.55	2.42	49.491	
700.00	700.00	702.00	702.00	1.43	1.44	89.66	0.72	119.97	119.97	117.10	2.87	41.749	
800.00	800.00	802.00	802.00	1.66	1.66	89.66	0.72	119.97	119.97	116.65	3.32	36.102	
900.00	900.00	902.00	902.00	1.88	1.89	89.66	0.72	119.97	119.97	116.20	3.77	31.800	
1,000.00	1,000.00	1,002.00	1,002.00	2.11	2.11	89.66	0.72	119.97	119.97	115.75	4.22	28.414	
1,100.00	1,100.00	1,102.00	1,102.00	2.33	2.34	89.66	0.72	119.97	119.97	115.30	4.67	25.680	
1,200.00	1,200.00	1,202.00	1,202.00	2.56	2.56	89.66	0.72	119.97	119.97	114.85	5.12	23.426	
1,300.00	1,300.00	1,302.00	1,302.00	2.78	2.79	89.66	0.72	119.97	119.97	114.40	5.57	21.536	
1,400.00	1,400.00	1,402.00	1,402.00	3.01	3.01	89.66	0.72	119.97	119.97	113.95	6.02	19.928	
1,500.00	1,500.00	1,502.00	1,502.00	3.23	3.24	89.66	0.72	119.97	119.97	113.50	6.47	18.543	
1,600.00	1,600.00	1,602.00	1,602.00	3.46	3.46	89.66	0.72	119.97	119.97	113.05	6.92	17.338	
1,700.00	1,700.00	1,702.00	1,702.00	3.68	3.69	89.66	0.72	119.97	119.97	112.60	7.37	16.281	
1,800.00	1,800.00	1,802.00	1,802.00	3.91	3.91	89.66	0.72	119.97	119.97	112.15	7.82	15.345	
1,900.00	1,900.00	1,902.00	1,902.00	4.13	4.14	89.66	0.72	119.97	119.97	111.70	8.27	14.510	
2,000.00	2,000.00	2,002.00	2,002.00	4.36	4.36	89.66	0.72	119.97	119.97	111.25	8.72	13.762	
2,100.00	2,100.00	2,102.00	2,102.00	4.58	4.59	89.66	0.72	119.97	119.97	110.81	9.17	13.087	
2,200.00	2,200.00	2,202.00	2,202.00	4.81	4.81	89.66	0.72	119.97	119.97	110.36	9.62	12.476	
2,300.00	2,300.00	2,302.00	2,302.00	5.03	5.04	89.66	0.72	119.97	119.97	109.91	10.07	11.918	
2,400.00	2,400.00	2,402.00	2,402.00	5.26	5.26	89.66	0.72	119.97	119.97	109.46	10.52	11.409	
2,415.99	2,415.99	2,417.99	2,417.99	5.29	5.30	89.66	0.72	119.97	119.97	109.38	10.59	11.331 CC	
2,500.00	2,500.00	2,501.96	2,501.96	5.48	5.48	89.66	0.72	119.97	119.97	109.01	10.96	10.942 ES	
2,600.00	2,599.99	2,600.00	2,599.99	5.68	5.68	-126.72	0.34	120.75	121.29	109.93	11.36	10.676	
2,700.00	2,699.96	2,698.14	2,698.10	5.85	5.87	-127.11	-0.78	123.05	125.19	113.47	11.71	10.687	
2,800.00	2,799.86	2,795.97	2,795.84	6.03	6.05	-127.71	-2.63	126.84	131.67	119.60	12.07	10.909	
2,900.00	2,899.68	2,893.49	2,893.18	6.22	6.24	-128.45	-5.21	132.11	140.75	128.32	12.43	11.324	
3,000.00	2,999.37	2,990.60	2,990.01	6.41	6.44	-129.28	-8.49	138.83	152.42	139.63	12.79	11.915	
3,095.91	3,094.84	3,083.27	3,082.27	6.59	6.63	-130.08	-12.29	146.63	166.06	152.91	13.14	12.633	
3,100.00	3,098.90	3,087.21	3,086.18	6.60	6.64	-130.12	-12.47	146.99	166.69	153.53	13.16	12.666	
3,200.00	3,198.36	3,183.34	3,181.72	6.80	6.84	-130.84	-17.14	156.54	182.94	169.41	13.53	13.520	
3,300.00	3,297.82	3,279.02	3,276.62	7.01	7.05	-131.20	-22.48	167.49	200.63	186.72	13.91	14.427	
3,400.00	3,397.28	3,374.20	3,370.81	7.22	7.28	-131.29	-28.48	179.78	219.71	205.43	14.29	15.380	
3,500.00	3,496.74	3,468.84	3,464.23	7.44	7.51	-131.15	-35.13	193.40	240.18	225.52	14.67	16.374	
3,600.00	3,596.20	3,562.89	3,556.81	7.66	7.75	-130.86	-42.41	208.31	262.03	246.98	15.05	17.405	
3,700.00	3,695.66	3,656.31	3,648.48	7.89	8.00	-130.45	-50.30	224.46	285.26	269.81	15.44	18.471	
3,800.00	3,795.12	3,751.66	3,741.79	8.12	8.28	-129.97	-58.90	242.08	309.61	293.75	15.86	19.517	
3,900.00	3,894.58	3,848.59	3,836.63	8.35	8.56	-129.54	-67.69	260.08	334.09	317.78	16.31	20.485	
4,000.00	3,994.04	3,945.52	3,931.46	8.59	8.86	-129.18	-76.48	278.09	358.58	341.82	16.76	21.394	
4,100.00	4,093.50	4,042.45	4,026.30	8.83	9.17	-128.85	-85.28	296.10	383.09	365.87	17.22	22.247	
4,200.00	4,192.96	4,139.38	4,121.13	9.07	9.48	-128.57	-94.07	314.11	407.61	389.92	17.68	23.049	
4,300.00	4,292.42	4,236.31	4,215.97	9.31	9.80	-128.32	-102.86	332.12	432.13	413.98	18.15	23.803	
4,400.00	4,391.88	4,333.24	4,310.80	9.56	10.12	-128.10	-111.66	350.13	456.66	438.03	18.63	24.513	
4,500.00	4,491.34	4,430.17	4,405.64	9.80	10.45	-127.90	-120.45	368.14	481.20	462.09	19.11	25.182	
4,600.00	4,590.80	4,527.10	4,500.47	10.06	10.79	-127.71	-129.24	386.15	505.74	486.15	19.59	25.813	
4,700.00	4,690.26	4,624.03	4,595.31	10.31	11.13	-127.55	-138.03	404.16	530.29	510.21	20.08	26.408	
4,800.00	4,789.72	4,720.96	4,690.14	10.56	11.47	-127.40	-146.83	422.17	554.84	534.27	20.57	26.971	

CC - Min centre to center distance or covergent point. SF - min separation factor. ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore:** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 513H - OH - Plan #1														Offset Site Error:	0.00 usft
Survey Program: 0-LEAM MWD+HDGM														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)		
4,900.00	4,889.18	4,817.89	4,784.98	10.82	11.82	-127.26	-155.62	440.17	579.39	558.33	21.07	27.503			
5,000.00	4,988.64	4,914.82	4,879.81	11.07	12.17	-127.13	-164.41	458.18	603.95	582.39	21.56	28.007			
5,100.00	5,088.10	5,011.75	4,974.65	11.33	12.52	-127.02	-173.21	476.19	628.51	606.44	22.07	28.484			
5,200.00	5,187.56	5,108.87	5,069.48	11.59	12.88	-126.91	-182.00	494.20	653.07	630.50	22.57	28.937			
5,300.00	5,287.02	5,205.60	5,164.32	11.85	13.24	-126.81	-190.79	512.21	677.63	654.56	23.08	29.366			
5,400.00	5,386.48	5,302.53	5,259.15	12.11	13.60	-126.72	-199.58	530.22	702.20	678.62	23.58	29.775			
5,500.00	5,485.94	5,399.46	5,353.99	12.37	13.96	-126.63	-208.38	548.23	726.77	702.67	24.09	30.163			
5,600.00	5,585.39	5,496.39	5,448.82	12.64	14.33	-126.55	-217.17	566.24	751.34	726.73	24.61	30.533			
5,700.00	5,684.85	5,593.32	5,543.66	12.90	14.69	-126.47	-225.96	584.25	775.91	750.78	25.12	30.885			
5,800.00	5,784.31	5,690.25	5,638.49	13.17	15.06	-126.40	-234.76	602.26	800.48	774.84	25.64	31.220			
5,900.00	5,883.77	5,787.18	5,733.33	13.43	15.43	-126.34	-243.55	620.27	825.05	798.89	26.16	31.541			
6,000.00	5,983.23	5,884.11	5,828.17	13.70	15.81	-126.27	-252.34	638.27	849.62	822.94	26.68	31.847			
6,100.00	6,082.69	5,981.04	5,923.00	13.97	16.18	-126.21	-261.14	656.28	874.20	846.99	27.20	32.139			
6,200.00	6,182.15	6,077.97	6,017.84	14.23	16.55	-126.16	-269.93	674.29	898.77	871.05	27.72	32.419			
6,300.00	6,281.61	6,174.90	6,112.67	14.50	16.93	-126.10	-278.72	692.30	923.35	895.10	28.25	32.686			
6,400.00	6,381.07	6,271.83	6,207.51	14.77	17.31	-126.05	-287.51	710.31	947.92	919.15	28.77	32.943			
6,500.00	6,480.53	6,368.76	6,302.34	15.04	17.69	-126.01	-296.31	728.32	972.50	943.20	29.30	33.189			
6,600.00	6,579.99	6,465.69	6,397.18	15.31	18.07	-125.96	-305.10	746.33	997.08	967.25	29.83	33.424			
6,700.00	6,679.45	6,562.62	6,492.01	15.58	18.45	-125.92	-313.89	764.34	1,021.65	991.29	30.36	33.651			
6,800.00	6,778.91	6,659.55	6,586.85	15.85	18.83	-125.88	-322.69	782.35	1,046.23	1,015.34	30.89	33.868			
6,900.00	6,878.37	6,756.48	6,681.68	16.13	19.21	-125.84	-331.48	800.36	1,070.81	1,039.39	31.42	34.077			
7,000.00	6,977.83	6,853.41	6,776.52	16.40	19.59	-125.80	-340.27	818.36	1,095.39	1,063.44	31.96	34.278			
7,100.00	7,077.29	6,950.34	6,871.35	16.67	19.98	-125.76	-349.06	836.37	1,119.97	1,087.48	32.49	34.471			
7,200.00	7,176.75	7,047.27	6,966.19	16.94	20.36	-125.73	-357.86	854.38	1,144.55	1,111.53	33.03	34.657			
7,300.00	7,276.21	7,144.20	7,061.02	17.22	20.74	-125.69	-366.65	872.39	1,169.13	1,135.57	33.56	34.836			
7,400.00	7,375.67	7,241.13	7,155.86	17.49	21.13	-125.66	-375.44	890.40	1,193.71	1,159.62	34.10	35.009			
7,500.00	7,475.13	7,338.06	7,250.69	17.76	21.52	-125.63	-384.24	908.41	1,218.30	1,183.66	34.63	35.176			
7,600.00	7,574.59	7,434.99	7,345.53	18.04	21.90	-125.60	-393.03	926.42	1,242.88	1,207.71	35.17	35.336			
7,700.00	7,674.05	7,531.92	7,440.36	18.31	22.29	-125.58	-401.82	944.43	1,267.46	1,231.75	35.71	35.492			
7,800.00	7,773.51	7,628.85	7,535.20	18.59	22.68	-125.55	-410.62	962.44	1,292.04	1,255.79	36.25	35.641			
7,900.00	7,872.97	7,725.78	7,630.04	18.86	23.07	-125.52	-419.41	980.45	1,316.62	1,279.83	36.79	35.786			
8,000.00	7,972.43	7,822.71	7,724.87	19.14	23.45	-125.50	-428.20	998.46	1,341.21	1,303.88	37.33	35.926			
8,100.00	8,071.89	7,919.64	7,819.71	19.41	23.84	-125.47	-436.99	1,016.46	1,365.79	1,327.92	37.87	36.061			
8,200.00	8,171.35	8,016.57	7,914.54	19.69	24.23	-125.45	-445.79	1,034.47	1,390.37	1,351.96	38.42	36.192			
8,300.00	8,270.80	8,113.50	8,009.38	19.97	24.62	-125.43	-454.58	1,052.48	1,414.96	1,376.00	38.96	36.319			
8,400.00	8,370.26	8,210.43	8,104.21	20.24	25.01	-125.41	-463.37	1,070.49	1,439.54	1,400.04	39.50	36.442			
8,500.00	8,469.72	8,307.35	8,199.05	20.52	25.40	-125.38	-472.17	1,088.50	1,464.13	1,424.08	40.05	36.561			
8,600.00	8,569.18	8,404.28	8,293.88	20.80	25.79	-125.36	-480.96	1,106.51	1,488.71	1,448.12	40.59	36.676			
8,700.00	8,668.64	8,501.21	8,388.72	21.07	26.19	-125.34	-489.75	1,124.52	1,513.29	1,472.16	41.14	36.788			
8,800.00	8,768.10	8,610.75	8,495.93	21.35	26.60	-125.33	-498.59	1,144.66	1,537.72	1,495.98	41.74	36.842			
8,900.00	8,867.56	8,739.48	8,622.39	21.63	26.97	-125.35	-510.14	1,166.27	1,560.52	1,518.14	42.39	36.817			
9,000.00	8,967.02	8,869.36	8,750.50	21.91	27.33	-125.41	-519.52	1,185.48	1,581.34	1,538.33	43.02	36.760			
9,068.05	9,034.70	8,958.34	8,838.53	22.09	27.56	-125.48	-525.21	1,197.14	1,594.37	1,550.93	43.44	36.705			
9,100.00	9,066.49	9,000.29	8,880.10	22.17	27.66	-125.56	-527.68	1,202.21	1,600.11	1,556.49	43.62	36.680			
9,200.00	9,166.09	9,132.34	9,011.20	22.38	27.97	-125.80	-534.60	1,216.37	1,616.07	1,571.92	44.16	36.599			
9,300.00	9,265.83	9,265.37	9,143.61	22.59	28.26	-125.98	-540.22	1,227.89	1,628.97	1,584.31	44.66	36.475			
9,400.00	9,365.67	9,399.18	9,277.06	22.78	28.52	-126.12	-544.52	1,236.69	1,638.77	1,593.64	45.13	36.311			
9,500.00	9,465.60	9,533.57	9,411.28	22.97	28.75	-126.21	-547.46	1,242.70	1,645.45	1,599.88	45.57	36.109			
9,600.00	9,565.58	9,668.32	9,545.97	23.14	28.96	-126.26	-549.01	1,245.89	1,648.99	1,603.02	45.97	35.869			
9,663.96	9,629.54	9,753.89	9,631.54	23.26	29.09	89.97	-549.28	1,246.44	1,649.61	1,603.39	46.22	35.687			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Offset Design Cotton Draw Unit - 513H - OH - Plan #1													Offset Site Error:	0.00 usft
Survey Program: O-LEAM MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
9,700.00	9,665.58	9,789.93	9,667.58	23.32	29.14	89.97	-549.28	1,246.44	1,649.61	1,603.26	46.35	35.587		
9,709.97	9,675.55	9,799.90	9,677.55	23.34	29.15	89.97	-549.28	1,246.44	1,649.61	1,603.22	46.39	35.560		
9,763.96	9,729.54	9,853.88	9,731.54	23.43	29.23	89.97	-549.28	1,246.44	1,649.61	1,603.03	46.58	35.414		
9,775.00	9,740.58	9,864.91	9,742.56	23.45	29.25	89.97	-549.10	1,246.44	1,649.61	1,602.99	46.62	35.386		
9,800.00	9,765.55	9,889.86	9,767.48	23.49	29.28	89.97	-547.77	1,246.44	1,649.61	1,602.92	46.69	35.328		
9,825.00	9,790.41	9,914.81	9,792.29	23.52	29.31	89.97	-545.14	1,246.44	1,649.61	1,602.85	46.76	35.280		
9,850.00	9,815.12	9,939.76	9,816.92	23.55	29.33	89.96	-541.22	1,246.44	1,649.61	1,602.80	46.81	35.241		
9,875.00	9,839.58	9,964.70	9,841.31	23.57	29.35	89.96	-536.01	1,246.44	1,649.61	1,602.76	46.85	35.212		
9,900.00	9,863.75	9,989.64	9,865.39	23.59	29.36	89.96	-529.55	1,246.44	1,649.61	1,602.74	46.88	35.191		
9,925.00	9,887.54	10,014.57	9,889.10	23.59	29.37	89.95	-521.83	1,246.44	1,649.61	1,602.72	46.89	35.180		
9,950.00	9,910.91	10,039.50	9,912.36	23.60	29.37	89.95	-512.89	1,246.44	1,649.61	1,602.71	46.90	35.176		
9,975.00	9,933.78	10,064.42	9,935.13	23.60	29.37	89.95	-502.75	1,246.44	1,649.61	1,602.72	46.89	35.179		
10,000.00	9,956.08	10,089.34	9,957.33	23.59	29.36	89.94	-491.44	1,246.44	1,649.61	1,602.73	46.88	35.190		
10,025.00	9,977.77	10,114.26	9,978.90	23.58	29.35	89.94	-478.99	1,246.44	1,649.61	1,602.76	46.86	35.206		
10,050.00	9,998.78	10,139.17	9,999.80	23.56	29.33	89.94	-465.43	1,246.44	1,649.61	1,602.79	46.83	35.229		
10,075.00	10,019.04	10,164.08	10,019.96	23.55	29.31	89.94	-450.80	1,246.44	1,649.61	1,602.82	46.79	35.256		
10,100.00	10,038.52	10,188.98	10,039.32	23.52	29.29	89.94	-435.15	1,246.44	1,649.61	1,602.86	46.75	35.286		
10,125.00	10,057.15	10,213.88	10,057.84	23.50	29.26	89.93	-418.50	1,246.44	1,649.61	1,602.91	46.70	35.320		
10,150.00	10,074.87	10,238.78	10,075.47	23.47	29.23	89.93	-400.92	1,246.44	1,649.61	1,602.95	46.66	35.356		
10,175.00	10,091.66	10,263.68	10,092.15	23.44	29.20	89.93	-382.44	1,246.44	1,649.61	1,603.00	46.61	35.393		
10,200.00	10,107.45	10,288.58	10,107.84	23.40	29.17	89.93	-363.12	1,246.44	1,649.61	1,603.05	46.56	35.431		
10,225.00	10,122.20	10,313.47	10,122.51	23.37	29.13	89.93	-343.01	1,246.44	1,649.61	1,603.10	46.51	35.467		
10,250.00	10,135.88	10,338.36	10,136.11	23.33	29.09	89.93	-322.16	1,246.44	1,649.61	1,603.15	46.46	35.503		
10,275.00	10,148.45	10,363.25	10,148.60	23.29	29.05	89.93	-300.64	1,246.44	1,649.61	1,603.19	46.42	35.535		
10,300.00	10,159.86	10,388.14	10,159.96	23.26	29.00	89.93	-278.49	1,246.44	1,649.61	1,603.23	46.38	35.565		
10,325.00	10,170.10	10,413.03	10,170.14	23.22	28.96	89.93	-255.78	1,246.44	1,649.61	1,603.26	46.35	35.590		
10,350.00	10,179.13	10,437.92	10,179.13	23.18	28.91	89.93	-232.58	1,246.44	1,649.61	1,603.29	46.32	35.611		
10,375.00	10,186.93	10,462.81	10,186.89	23.14	28.87	89.93	-208.93	1,246.44	1,649.61	1,603.31	46.30	35.626		
10,400.00	10,193.47	10,487.70	10,193.42	23.10	28.82	89.93	-184.92	1,246.44	1,649.61	1,603.32	46.29	35.635		
10,425.00	10,198.74	10,512.59	10,198.68	23.07	28.78	89.93	-160.59	1,246.44	1,649.61	1,603.32	46.29	35.637		
10,450.00	10,202.73	10,537.48	10,202.67	23.03	28.74	89.93	-136.02	1,246.44	1,649.61	1,603.32	46.29	35.633		
10,475.00	10,205.42	10,562.37	10,205.37	23.00	28.70	89.93	-111.28	1,246.44	1,649.61	1,603.30	46.31	35.621		
10,500.00	10,206.80	10,587.27	10,206.78	22.97	28.66	89.93	-86.43	1,246.44	1,649.61	1,603.28	46.33	35.602		
10,513.96	10,207.01	10,601.17	10,207.00	22.95	28.64	89.93	-72.53	1,246.44	1,649.61	1,603.26	46.35	35.589		
10,514.88	10,207.01	10,602.08	10,207.01	22.95	28.64	89.93	-71.62	1,246.44	1,649.61	1,603.26	46.35	35.588		
10,600.00	10,207.00	10,687.21	10,207.00	22.88	28.53	89.93	13.51	1,246.44	1,649.61	1,603.05	46.56	35.429		
10,700.00	10,207.00	10,787.21	10,207.00	22.97	28.48	89.93	113.51	1,246.44	1,649.61	1,602.60	47.01	35.091		
10,800.00	10,207.00	10,887.21	10,207.00	23.31	28.48	89.93	213.51	1,246.44	1,649.61	1,601.93	47.68	34.599		
10,900.00	10,207.00	10,987.21	10,207.00	23.80	28.59	89.93	313.51	1,246.44	1,649.61	1,601.05	48.56	33.971		
11,000.00	10,207.00	11,087.21	10,207.00	24.41	28.80	89.93	413.51	1,246.44	1,649.61	1,599.97	49.64	33.232		
11,100.00	10,207.00	11,187.21	10,207.00	25.10	29.14	89.93	513.51	1,246.44	1,649.61	1,598.70	50.91	32.404		
11,200.00	10,207.00	11,287.21	10,207.00	25.87	29.60	89.93	613.51	1,246.44	1,649.61	1,597.26	52.35	31.511		
11,300.00	10,207.00	11,387.21	10,207.00	26.71	30.19	89.93	713.51	1,246.44	1,649.61	1,595.66	53.95	30.575		
11,400.00	10,207.00	11,487.21	10,207.00	27.63	30.89	89.93	813.51	1,246.44	1,649.61	1,593.91	55.70	29.615		
11,500.00	10,207.00	11,587.21	10,207.00	28.60	31.68	89.93	913.51	1,246.44	1,649.61	1,592.03	57.58	28.647		
11,600.00	10,207.00	11,687.21	10,207.00	29.64	32.56	89.93	1,013.51	1,246.44	1,649.61	1,590.03	59.59	27.685		
11,700.00	10,207.00	11,787.21	10,207.00	30.72	33.51	89.93	1,113.51	1,246.44	1,649.61	1,587.92	61.70	26.738		
11,800.00	10,207.00	11,887.21	10,207.00	31.85	34.51	89.93	1,213.51	1,246.44	1,649.61	1,585.71	63.90	25.814		
11,900.00	10,207.00	11,987.21	10,207.00	33.02	35.57	89.93	1,313.51	1,246.44	1,649.61	1,583.41	66.20	24.919		
12,000.00	10,207.00	12,087.21	10,207.00	34.22	36.68	89.93	1,413.51	1,246.44	1,649.61	1,581.04	68.58	24.055		
12,100.00	10,207.00	12,187.21	10,207.00	35.46	37.82	89.93	1,513.51	1,246.44	1,649.61	1,578.59	71.02	23.227		

CC - Min centre to center distance or covergent point SF - min separation factor ES - min ellipse separation

# LEAM Drilling Systems LLC

## Anticollision Report

Company: Devon Energy  
Project: Eddy County, NM (NAD-83)  
Reference Site: Cotton Draw Unit  
Site Error: 0.00 usft  
Reference Well: 512H  
Well Error: 0.00 usft  
Reference Wellbore: OH  
Reference Design: Plan #1

Local Co-ordinate Reference: Well 512H  
TVD Reference: 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)  
MD Reference: 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: EDM 5000.1 Multi User Db  
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 513H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: O-LEAM MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
12,200.00	10,207.00	12,287.21	10,207.00	36.74	39.00	89.93	1,613.51	1,246.44	1,649.61	1,576.08	73.53	22.434	
12,300.00	10,207.00	12,387.21	10,207.00	38.03	40.22	89.93	1,713.51	1,246.44	1,649.61	1,573.51	76.10	21.676	
12,400.00	10,207.00	12,487.21	10,207.00	39.36	41.46	89.93	1,813.51	1,246.44	1,649.61	1,570.89	78.72	20.955	
12,500.00	10,207.00	12,587.21	10,207.00	40.70	42.73	89.93	1,913.51	1,246.44	1,649.61	1,568.22	81.39	20.268	
12,600.00	10,207.00	12,687.21	10,207.00	42.07	44.03	89.93	2,013.51	1,246.44	1,649.61	1,565.51	84.10	19.615	
12,700.00	10,207.00	12,787.21	10,207.00	43.45	45.34	89.93	2,113.51	1,246.44	1,649.61	1,562.76	86.85	18.994	
12,800.00	10,207.00	12,887.21	10,207.00	44.86	46.68	89.93	2,213.51	1,246.44	1,649.61	1,559.98	89.63	18.404	
12,900.00	10,207.00	12,987.21	10,207.00	46.27	48.03	89.93	2,313.51	1,246.44	1,649.61	1,557.16	92.45	17.843	
13,000.00	10,207.00	13,087.21	10,207.00	47.70	49.41	89.93	2,413.51	1,246.44	1,649.61	1,554.31	95.30	17.310	
13,100.00	10,207.00	13,187.21	10,207.00	49.15	50.79	89.93	2,513.51	1,246.44	1,649.61	1,551.44	98.17	16.804	
13,200.00	10,207.00	13,287.21	10,207.00	50.60	52.19	89.93	2,613.51	1,246.44	1,649.61	1,548.55	101.06	16.322	
13,300.00	10,207.00	13,387.21	10,207.00	52.06	53.61	89.93	2,713.51	1,246.44	1,649.61	1,545.63	103.98	15.864	
13,400.00	10,207.00	13,487.21	10,207.00	53.54	55.03	89.93	2,813.51	1,246.44	1,649.61	1,542.69	106.92	15.428	
13,500.00	10,207.00	13,587.21	10,207.00	55.02	56.47	89.93	2,913.51	1,246.44	1,649.61	1,539.73	109.88	15.013	
13,600.00	10,207.00	13,687.21	10,207.00	56.52	57.92	89.93	3,013.51	1,246.44	1,649.61	1,536.76	112.85	14.617	
13,700.00	10,207.00	13,787.21	10,207.00	58.02	59.38	89.93	3,113.51	1,246.44	1,649.61	1,533.77	115.85	14.240	
13,800.00	10,207.00	13,887.21	10,207.00	59.52	60.84	89.93	3,213.51	1,246.44	1,649.61	1,530.76	118.85	13.880	
13,900.00	10,207.00	13,987.21	10,207.00	61.04	62.32	89.93	3,313.51	1,246.44	1,649.61	1,527.74	121.87	13.536	
14,000.00	10,207.00	14,087.21	10,207.00	62.56	63.80	89.93	3,413.51	1,246.44	1,649.61	1,524.71	124.90	13.207	
14,100.00	10,207.00	14,187.21	10,207.00	64.08	65.29	89.93	3,513.51	1,246.44	1,649.61	1,521.66	127.95	12.893	
14,200.00	10,207.00	14,287.21	10,207.00	65.61	66.78	89.93	3,613.51	1,246.44	1,649.61	1,518.61	131.00	12.592	
14,300.00	10,207.00	14,387.21	10,207.00	67.15	68.29	89.93	3,713.51	1,246.44	1,649.61	1,515.54	134.07	12.304	
14,400.00	10,207.00	14,487.21	10,207.00	68.69	69.80	89.93	3,813.51	1,246.44	1,649.61	1,512.47	137.14	12.028	
14,500.00	10,207.00	14,587.21	10,207.00	70.23	71.31	89.93	3,913.51	1,246.44	1,649.61	1,509.39	140.23	11.764	
14,600.00	10,207.00	14,687.21	10,207.00	71.78	72.83	89.93	4,013.51	1,246.44	1,649.61	1,506.29	143.32	11.510	
14,700.00	10,207.00	14,787.21	10,207.00	73.33	74.35	89.93	4,113.51	1,246.44	1,649.61	1,503.19	146.42	11.266	
14,800.00	10,207.00	14,887.21	10,207.00	74.89	75.88	89.93	4,213.51	1,246.44	1,649.61	1,500.09	149.53	11.032	
14,900.00	10,207.00	14,987.21	10,207.00	76.45	77.41	89.93	4,313.51	1,246.44	1,649.61	1,496.97	152.64	10.807	
15,000.00	10,207.00	15,087.21	10,207.00	78.01	78.95	89.93	4,413.51	1,246.44	1,649.61	1,493.85	155.76	10.591	
15,100.00	10,207.00	15,187.21	10,207.00	79.58	80.49	89.93	4,513.51	1,246.44	1,649.61	1,490.73	158.89	10.382	
15,200.00	10,207.00	15,287.21	10,207.00	81.14	82.03	89.93	4,613.51	1,246.44	1,649.61	1,487.59	162.02	10.182	
15,300.00	10,207.00	15,387.21	10,207.00	82.72	83.58	89.93	4,713.51	1,246.44	1,649.61	1,484.46	165.16	9.988	
15,344.98	10,207.00	15,432.18	10,207.00	83.42	84.28	89.93	4,758.48	1,246.44	1,649.61	1,483.04	166.57	9.903	
15,345.97	10,207.00	15,433.18	10,207.00	83.44	84.29	89.93	4,759.47	1,246.44	1,649.61	1,483.01	166.60	9.902 SF	

# LEAM Drilling Systems LLC

## Anticollision Report

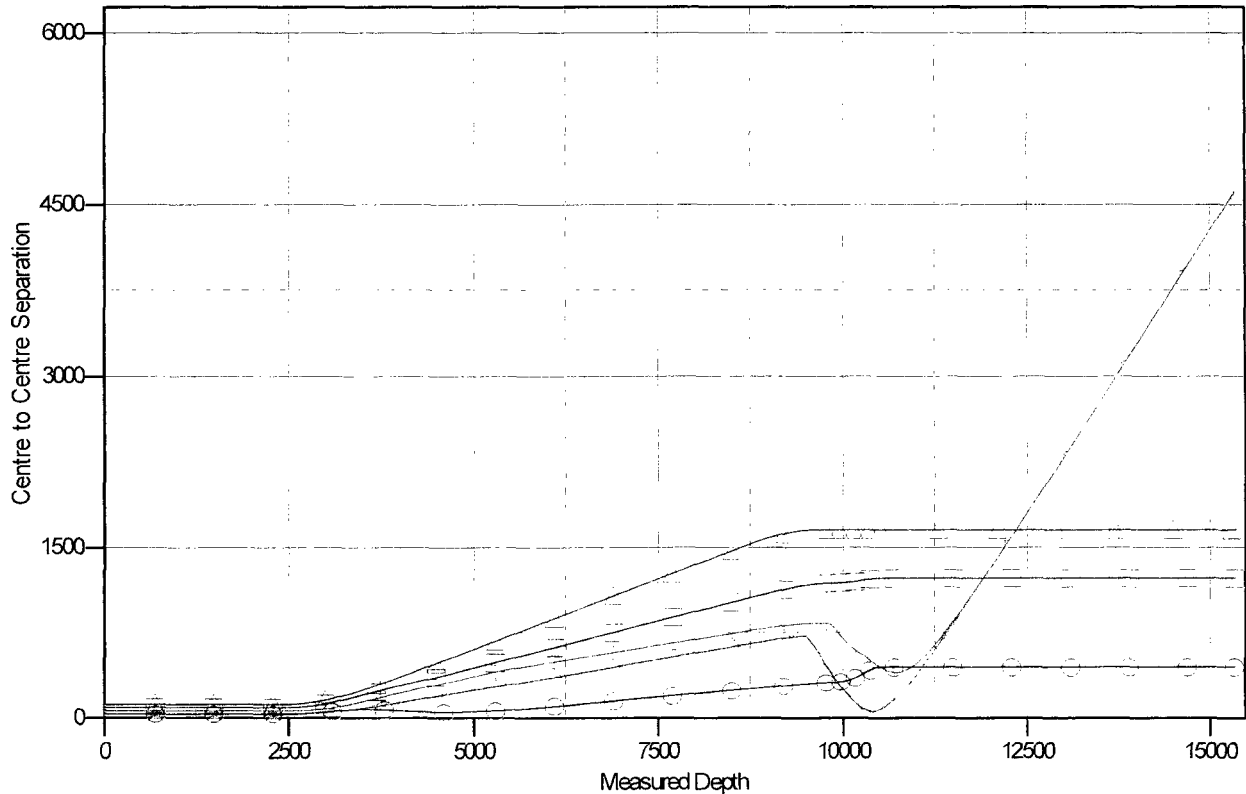
**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)  
**Reference Site:** Cotton Draw Unit  
**Site Error:** 0.00 usft  
**Reference Well:** 512H  
**Well Error:** 0.00 usft  
**Reference Wellbore:** OH  
**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H  
**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** EDM 5000.1 Multi User Db  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to 3511.9' GE + 23.5' KB @ 3535.40usft  
 Offset Depths are relative to Offset Datum  
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 512H  
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone  
 Grid Convergence at Surface is: 0.32°

### Ladder Plot



### LEGEND

✕ 511H, OH, Plan #1 V0    □ 291H, OH, Plan #1 V0    ⊙ 294H, OH, Plan #1 V0  
 ▲ 513H, OH, Plan #1 V0    ✱ 293H, OH, Plan #1 V0

# LEAM Drilling Systems LLC

## Anticollision Report

**Company:** Devon Energy  
**Project:** Eddy County, NM (NAD-83)

**Reference Site:** Cotton Draw Unit

**Site Error:** 0.00 usft

**Reference Well:** 512H

**Well Error:** 0.00 usft

**Reference Wellbore** OH

**Reference Design:** Plan #1

**Local Co-ordinate Reference:** Well 512H

**TVD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**MD Reference:** 3511.9' GE + 23.5' KB @ 3535.40usft  
(Original Well Elev)

**North Reference:** Grid

**Survey Calculation Method:** Minimum Curvature

**Output errors are at** 2.00 sigma

**Database:** EDM 5000.1 Multi User Db

**Offset TVD Reference:** Offset Datum

Reference Depths are relative to 3511.9' GE + 23.5' KB @ 3535.40usft

Offset Depths are relative to Offset Datum

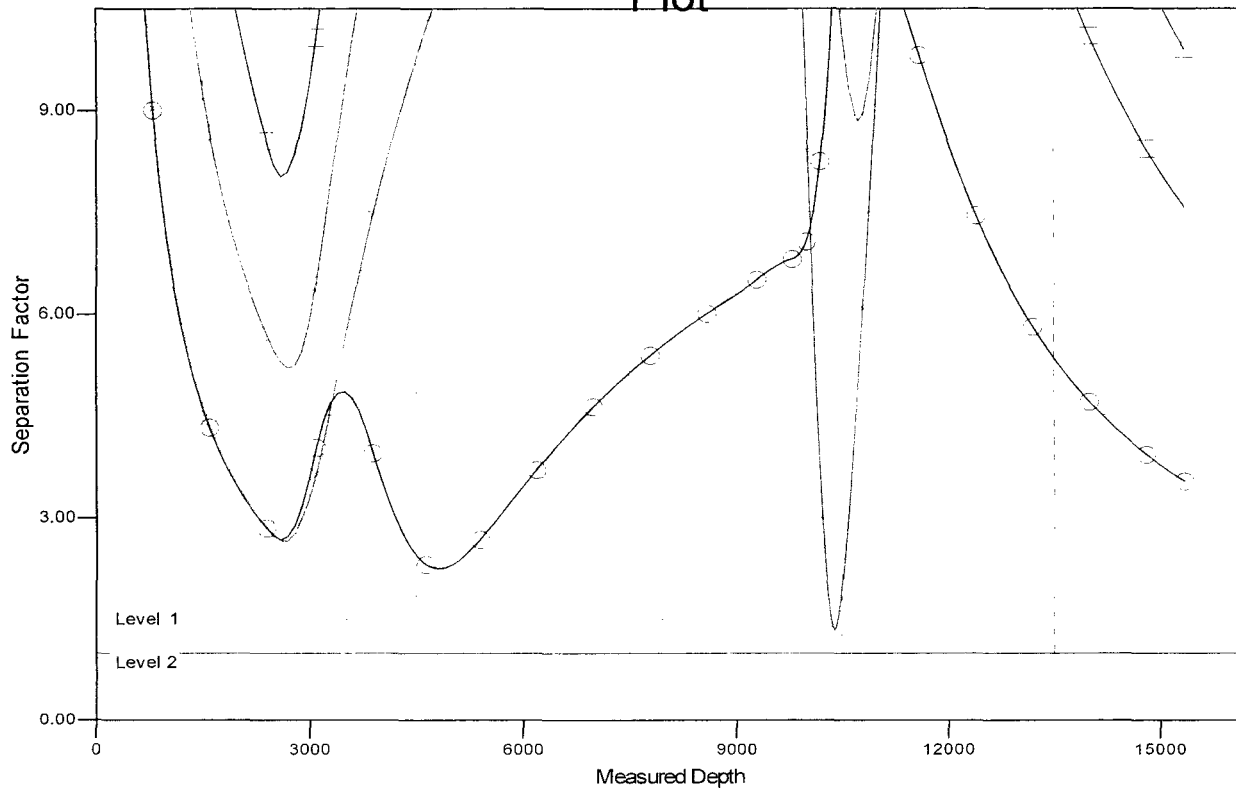
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 512H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

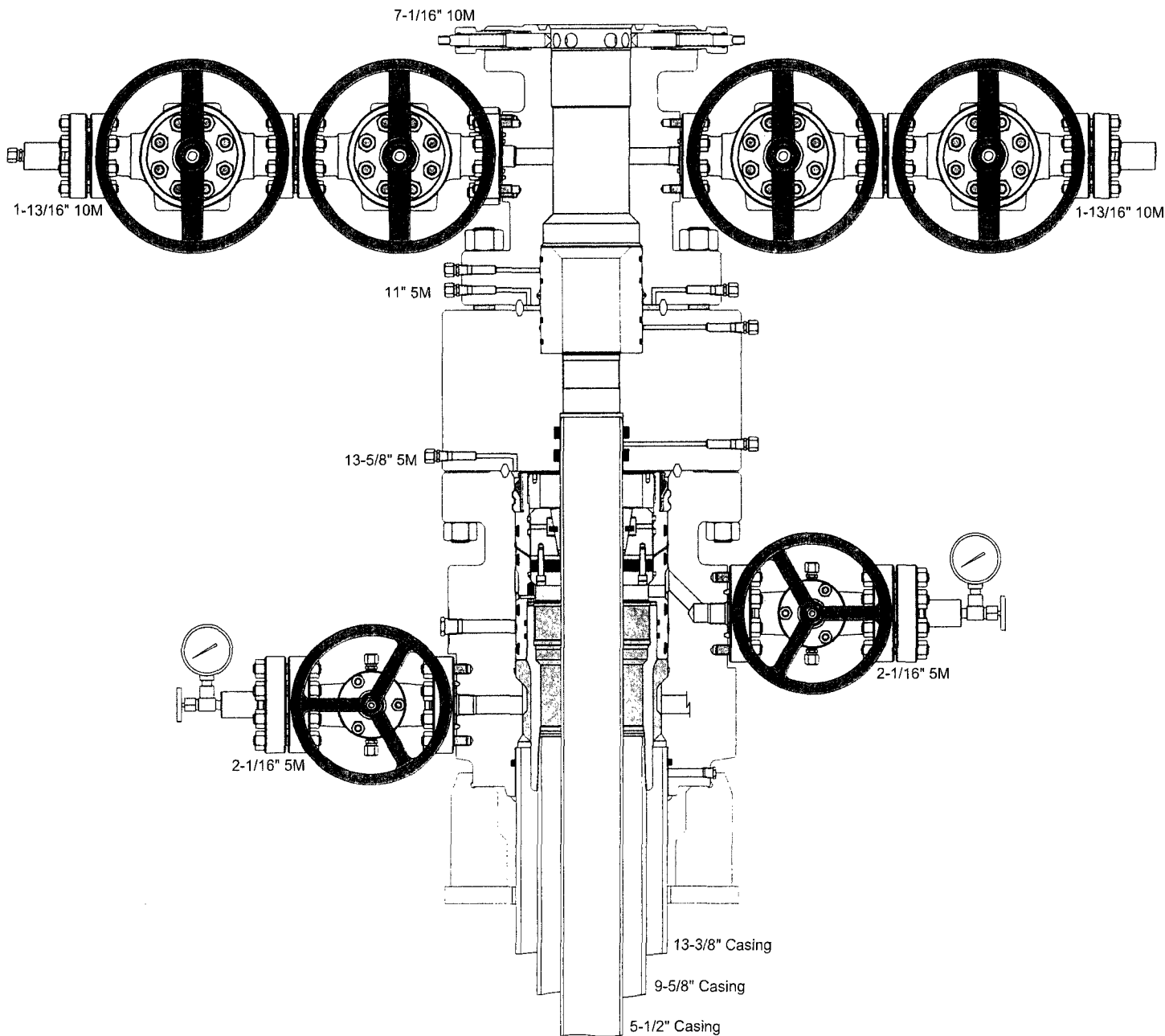
Grid Convergence at Surface is: 0.32°

### Separation Factor Plot



### LEGEND

✕ 511H, OH, Plan #1 V0    ⊞ 291H, OH, Plan #1 V0    ⊙ 294H, OH, Plan #1 V0  
⊠ 513H, OH, Plan #1 V0    ⊡ 293H, OH, Plan #1 V0



A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Devon proposes using a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. 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.

- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial BOP test.
- Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 3M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.
- If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.
- Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.
- Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.

After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.

After running the 9-5/8" intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the wellhead.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. 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's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.





Commitment Runs Deep



Devon  
Energy  
Production  
Company

1

2

## **I. Design Plan**

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS 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.

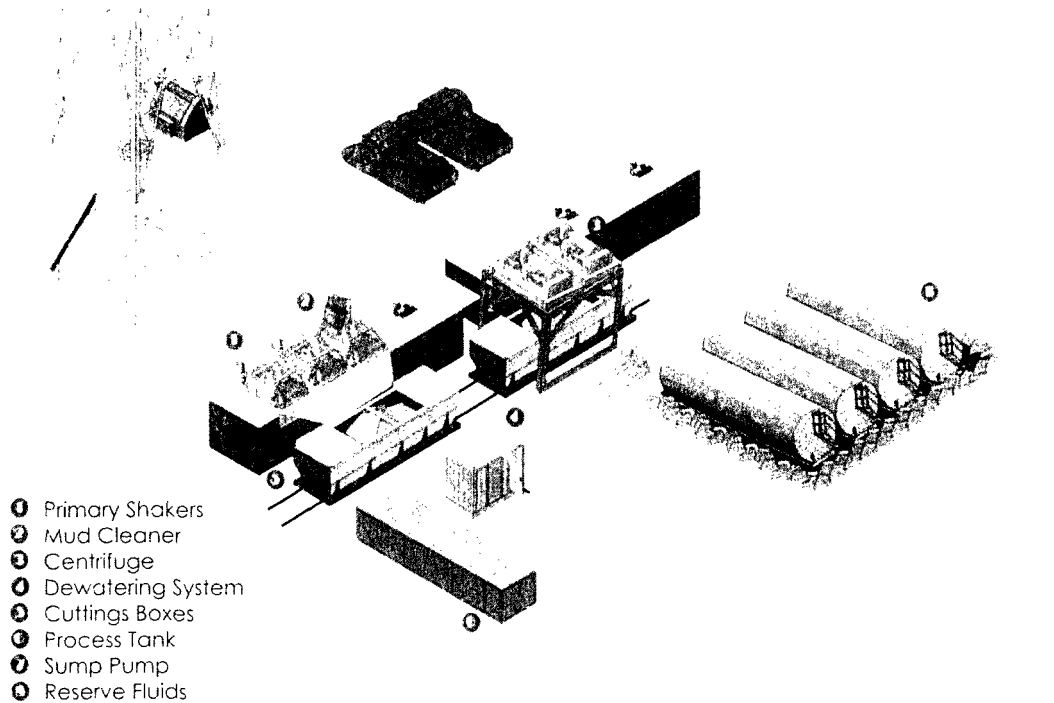
## **II. Operations and Maintenance Plan**

*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.



Closed Loop Schematic



**Centrifuges:** The centrifuges can be one or two in number 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 Mi Swaco 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.

A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

### **III. Closure Plan**

A maximum 340' X 340' 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.



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.

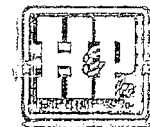
Should you have any questions or require any additional information/clarifications then please do not hesitate to contact us.

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)



RIG 212



## QUALITY DOCUMENT

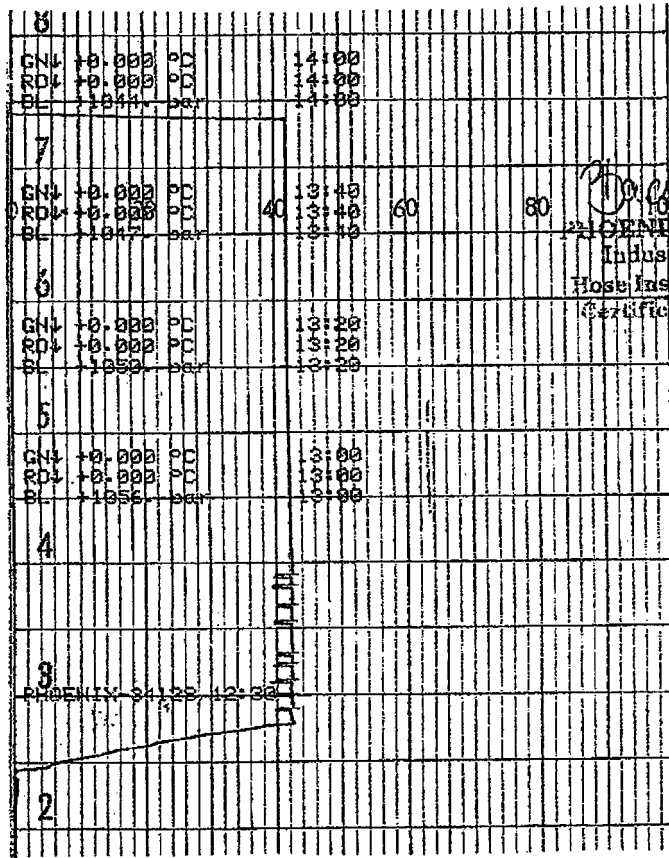
**PHOENIX RUBBER  
INDUSTRIAL LTD.**

 6728 Szeged, Budapesti út 10. Hungary • H-6701 Szeged, P. O. Box 152  
 Phone: (3662) 566-737 • Fax: (3662) 566-738

 SALES & MARKETING: H-1092 Budapest, Ráday u. 42-44. Hungary • H-1440 Budapest, P. O. Box 28  
 Phone: (361) 456-4200 • Fax: (361) 217-2972, 456-4273 • www.tauruserge.hu

<b>QUALITY CONTROL INSPECTION AND TEST CERTIFICATE</b>				CERT. N°: 552	
PURCHASER: Phoenix Beattie Co.				P.O. N°: 1519FA-871	
PHOENIX RUBBER order N°: 170466		HOSE TYPE: 3" ID Choke and Kill Hose			
HOSE SERIAL N°: 34128		NOMINAL / ACTUAL LENGTH: 11,43 m			
W.P. 68,96 MPa 10000 psi		T.P. 103,4 MPa 15000 psi		Duration: 60 min.	
Pressure test with water at ambient temperature  <div style="text-align: center;">See attachment. (1 page)</div>					
↑ 10 mm = 10 Min. → 10 mm = 25 MPa					
COUPLINGS					
Type	Serial N°	Quality	Heat N°		
3" coupling with 4 1/16" Flange end	720 719	AISI 4130	C7626		
		AISI 4130	47357		
API Spec 16 C Temperature rate: "B"					
All metal parts are flawless					
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.					
Date:	Inspector	Quality Control			
29. April. 2002.		PHOENIX RUBBER Industrial Ltd. Hose Inspection and VERIFIED TRUE COPY PHOENIX RUBBER G.C.			

40920-0-00015 N800C 14094-66



*[Signature]*  
**PHOENIX RUBBER**  
Industrial Ltd.  
Hose Inspection and  
Certification Dept.

VERIFIED TRUE CO.  
PHOENIX RUBBER CO.



**APD ID:** 10400011715

**Submission Date:** 02/23/2017

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Well Type:** OIL WELL

**Well Work Type:** Drill

## Section 1 - Existing Roads

**Will existing roads be used?** YES

**Existing Road Map:**

CDU 513H\_Ex AccessRd\_02-22-2017.pdf

**Existing Road Purpose:** ACCESS,FLUID TRANSPORT

**Row(s) Exist?** NO

### ROW ID(s)

**ID:**

**Do the existing roads need to be improved?** YES

**Existing Road Improvement Description:** Improve road to accommodate Drilling and Completion operations.

**Existing Road Improvement Attachment:**

## Section 2 - New or Reconstructed Access Roads

**Will new roads be needed?** YES

**New Road Map:**

CDU 513\_Access Rd\_02-22-2017.pdf

**New road type:** COLLECTOR,RESOURCE

**Length:** 177

Feet

**Width (ft.):** 16

**Max slope (%):** 6

**Max grade (%):** 4

**Army Corp of Engineers (ACOE) permit required?** NO

**ACOE Permit Number(s):**

**New road travel width:** 14

**New road access erosion control:** N/A

**New road access plan or profile prepared?** NO

**New road access plan attachment:**

**Access road engineering design?** NO

**Access road engineering design attachment:**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Access surfacing type:** GRAVEL

**Access topsoil source:** ONSITE

**Access surfacing type description:**

**Access onsite topsoil source depth:** 6

**Offsite topsoil source description:**

**Onsite topsoil removal process:** See attached Interim reclamation diagram.

**Access other construction information:**

**Access miscellaneous information:**

**Number of access turnouts:**

**Access turnout map:**

### **Drainage Control**

**New road drainage crossing:** OTHER

**Drainage Control comments:** N/A

**Road Drainage Control Structures (DCS) description:** N/A

**Road Drainage Control Structures (DCS) attachment:**

### **Access Additional Attachments**

**Additional Attachment(s):**

## **Section 3 - Location of Existing Wells**

**Existing Wells Map?** YES

**Attach Well map:**

CDU 513H\_1 Mile Map\_02-22-2017.pdf

**Existing Wells description:**

## **Section 4 - Location of Existing and/or Proposed Production Facilities**

**Submit or defer a Proposed Production Facilities plan?** DEFER

**Estimated Production Facilities description:** ALL FLOWLINES WILL BE BURIED GOING TO THE COTTON DRAW UNIT  
25 CTB

## **Section 5 - Location and Types of Water Supply**

### **Water Source Table**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Water source use type:** STIMULATION

**Water source type:** RECYCLED

**Describe type:**

**Source latitude:**

**Source longitude:**

**Source datum:**

**Water source permit type:** OTHER

**Source land ownership:** FEDERAL

**Water source transport method:** PIPELINE,TRUCKING

**Source transportation land ownership:** FEDERAL

**Water source volume (barrels):** 150000

**Source volume (acre-feet):** 19.333965

**Source volume (gal):** 6300000

**Water source and transportation map:**

CDU 513H\_Wtr Xfr Map\_02-22-2017.pdf

**Water source comments:** The attached Water Transfer Map is a proposal only and the final route and documentation will be provided by a Devon contractor prior to installation. When available Devon will always follow existing disturbance.

**New water well?** NO

### **New Water Well Info**

**Well latitude:**

**Well Longitude:**

**Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):**

**Est thickness of aquifer:**

**Aquifer comments:**

**Aquifer documentation:**

**Well depth (ft):**

**Well casing type:**

**Well casing outside diameter (in.):**

**Well casing inside diameter (in.):**

**New water well casing?**

**Used casing source:**

**Drilling method:**

**Drill material:**

**Grout material:**

**Grout depth:**

**Casing length (ft.):**

**Casing top depth (ft.):**

**Well Production type:**

**Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

## **Section 6 - Construction Materials**

**Construction Materials description:** Dirt fill and caliche will be used to construct well pad.

**Construction Materials source location attachment:**

CDU 513H\_Caliche Pit\_02-22-2017.pdf

## **Section 7 - Methods for Handling Waste**

**Waste type:** DRILLING

**Waste content description:** WATER BASED CUTTINGS

**Amount of waste:** 1400 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** N/A

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** R360, Sundance, or equivalent.

**Waste type:** COMPLETIONS/STIMULATION

**Waste content description:** Flow back water during completion operations.

**Amount of waste:** 3000 barrels

**Waste disposal frequency :** One Time Only

**Safe containment description:** N/A

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

**Disposal type description:**

**Disposal location description:** Various disposal locations in Lea and Eddy counties.

**Waste type:** FLOWBACK

**Waste content description:** Produced water during flowback operations. This amount is a daily average during flowback (BWPD).

**Amount of waste:** 1500 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** N/A

**Safe containmant attachment:**

**Waste disposal type:** ON-LEASE INJECTION **Disposal location ownership:** PRIVATE

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Disposal type description:**

**Disposal location description:** One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

**Waste type:** PRODUCED WATER

**Waste content description:** Produced water during production operations. This amount is a daily average during the first year of production (BWPD).

**Amount of waste:** 1000 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** N/A

**Safe containmant attachment:**

**Waste disposal type:** ON-LEASE INJECTION      **Disposal location ownership:** PRIVATE

**Disposal type description:**

**Disposal location description:** One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

### Reserve Pit

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Reserve pit length (ft.)**      **Reserve pit width (ft.)**

**Reserve pit depth (ft.)**      **Reserve pit volume (cu. yd.)**

**Is at least 50% of the reserve pit in cut?**

**Reserve pit liner**

**Reserve pit liner specifications and installation description**

### Cuttings Area

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** NO

**Description of cuttings location**

**Cuttings area length (ft.)**      **Cuttings area width (ft.)**

**Cuttings area depth (ft.)**      **Cuttings area volume (cu. yd.)**

**Is at least 50% of the cuttings area in cut?**

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

## **Section 8 - Ancillary Facilities**

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:**

## **Section 9 - Well Site Layout**

**Well Site Layout Diagram:**

CDU 513H\_Rig Layout\_02-22-2017.pdf

**Comments:**

## **Section 10 - Plans for Surface Reclamation**

**Type of disturbance:** NO NEW SURFACE DISTURBANCE

**Recontouring attachment:**

CDU 513H\_Reclamation\_02-22-2017.pdf

**Drainage/Erosion control construction:** All areas disturbed shall be reclaimed as early and as nearly as practicable to their original condition or their final land use and shall be maintained to control dust and minimize erosion to the extent practicable.

**Drainage/Erosion control reclamation:** Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area then shall be reseeded in the first favorable growing season.

**Wellpad long term disturbance (acres):** 4.245

**Wellpad short term disturbance (acres):** 4.245

**Access road long term disturbance (acres):** 0.081

**Access road short term disturbance (acres):** 0.081

**Pipeline long term disturbance (acres):** 2.844387

**Pipeline short term disturbance (acres):** 2.844387

**Other long term disturbance (acres):** 0

**Other short term disturbance (acres):** 0

**Total long term disturbance:** 7.1703873

**Total short term disturbance:** 7.1703873

**Reconstruction method:** Operator will use Best Management Practices"BMP" to mechanically recontour to obtain the desired outcome.

**Topsoil redistribution:** Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

**Soil treatment:** Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

**Existing Vegetation at the well pad:**

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:**

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:**

**Existing Vegetation Community at the pipeline attachment:**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Existing Vegetation Community at other disturbances:**

**Existing Vegetation Community at other disturbances attachment:**

**Non native seed used?** NO

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?** NO

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?** NO

**Seed harvest description:**

**Seed harvest description attachment:**

### **Seed Management**

#### **Seed Table**

**Seed type:**

**Seed source:**

**Seed name:**

**Source name:**

**Source address:**

**Source phone:**

**Seed cultivar:**

**Seed use location:**

**PLS pounds per acre:**

**Proposed seeding season:**

#### **Seed Summary**

**Total pounds/Acre:**

**Seed Type**

**Pounds/Acre**

**Seed reclamation attachment:**

### **Operator Contact/Responsible Official Contact Info**

**First Name:** MARK

**Last Name:** SMITH

**Phone:** (575)746-5559

**Email:** mark.smith@dvn.com

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** Maintain weeds on an as need basis.

**Weed treatment plan attachment:**

**Monitoring plan description:** Monitor as needed.

**Monitoring plan attachment:**

**Success standards:** N/A

**Pit closure description:** N/A

**Pit closure attachment:**

## **Section 11 - Surface Ownership**

**Disturbance type:** EXISTING ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Disturbance type:** NEW ACCESS ROAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**



**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

**Operator Name:** DEVON ENERGY PRODUCTION COMPANY LP

**Well Name:** COTTON DRAW UNIT

**Well Number:** 513H

**Disturbance type:** PIPELINE

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

## **Section 12 - Other Information**

**Right of Way needed?** NO

**Use APD as ROW?**

**ROW Type(s):**

### **ROW Applications**

**SUPO Additional Information:** Electrical (BLM) Survey Electrical (ST NM) Survey Flowline Survey

**Use a previously conducted onsite?** YES

**Previous Onsite information:** COTTON DRAW UNIT 291H/293H/294H ONSITED ON 4/2016

### **Other SUPO Attachment**

CDU 513H\_Electric\_BLM\_02-22-2017.PDF

CDU 513H\_Electric\_STNM\_02-22-2017.PDF

CDU 513H\_Flowlines\_02-22-2017.pdf

## One Mile Radius Map

### Estimated distances to nearest wellbores:

\*From SHL:  
 Cotton Draw Unit 292H 941 Ft SE  
 Cotton Draw Unit 99 771 Ft SW  
 \*From BHL:  
 King Tut Fed 1H 940 Ft E

# 24S 31E

**devon**

Cotton Draw Unit 513H

1 Mile Radius Map

0 1 1/2  
 FEET

POSTED WELL DATA

Well Name  
 Well Number

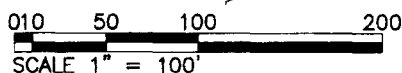
WELL SYMBOLS  
 ABANDONED WATER WELL  
 ABANDONED OIL WELL  
 CORE HOLE  
 DRY HOLE WITH SHOW OF OIL  
 GAS PRODUCING WELL  
 JUNKED AND ABANDONED  
 OIL PRODUCING WELL  
 PROPOSED  
 DRILLING WELL SPUD  
 SALT WATER DISPOSAL WELL  
 AITD

By D. Voss  
 February 14, 2017

[illegible]

PROPOSED 178 LF  
ACCESS ROAD

EXISTING  
CDU 99H PAD



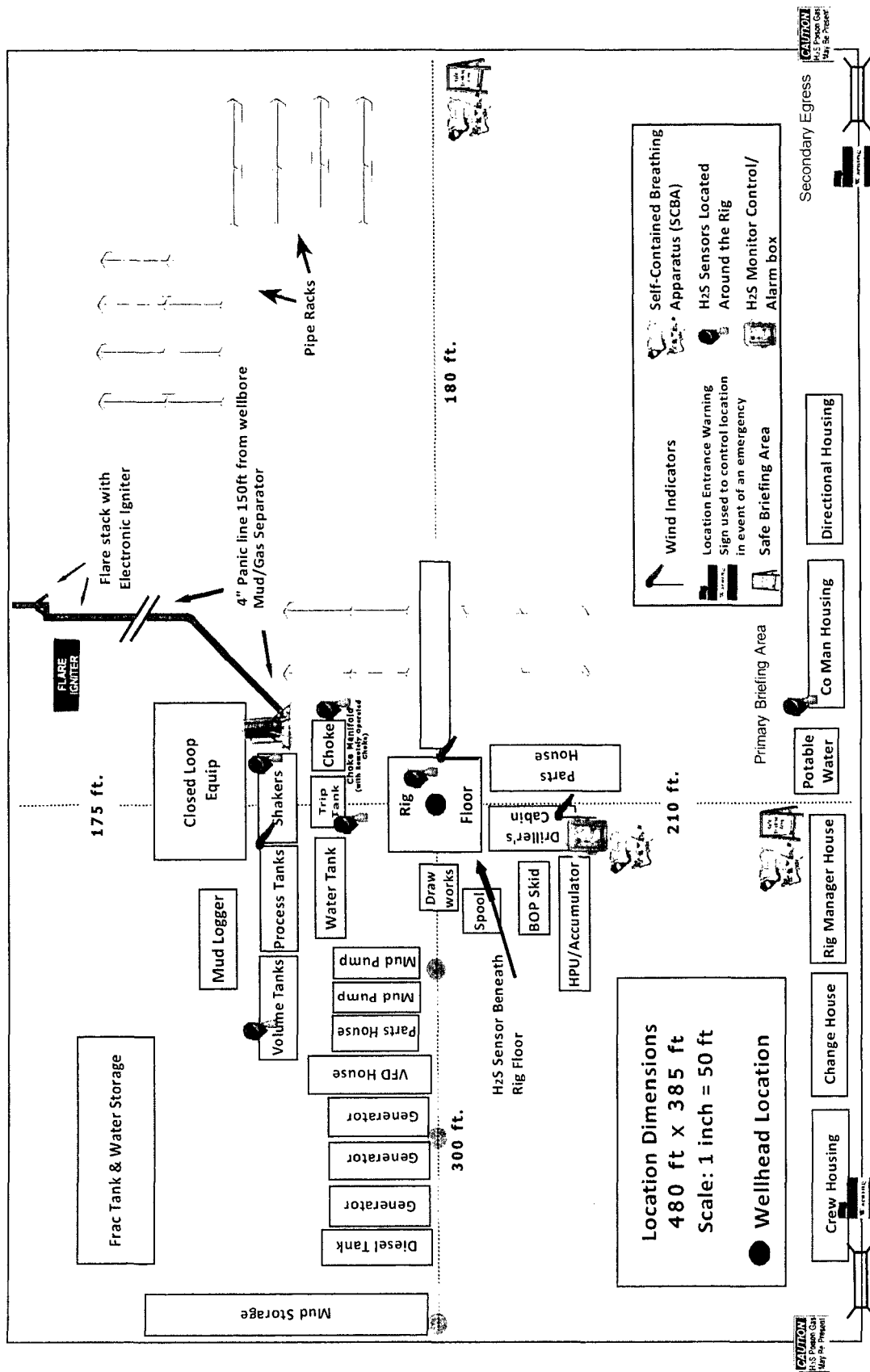
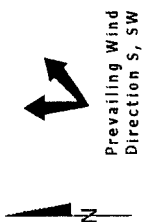
FEBRUARY 7, 2017

*SURVEY NO. 5156*

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

301 SOUTH CANAL  
(575) 234-3341

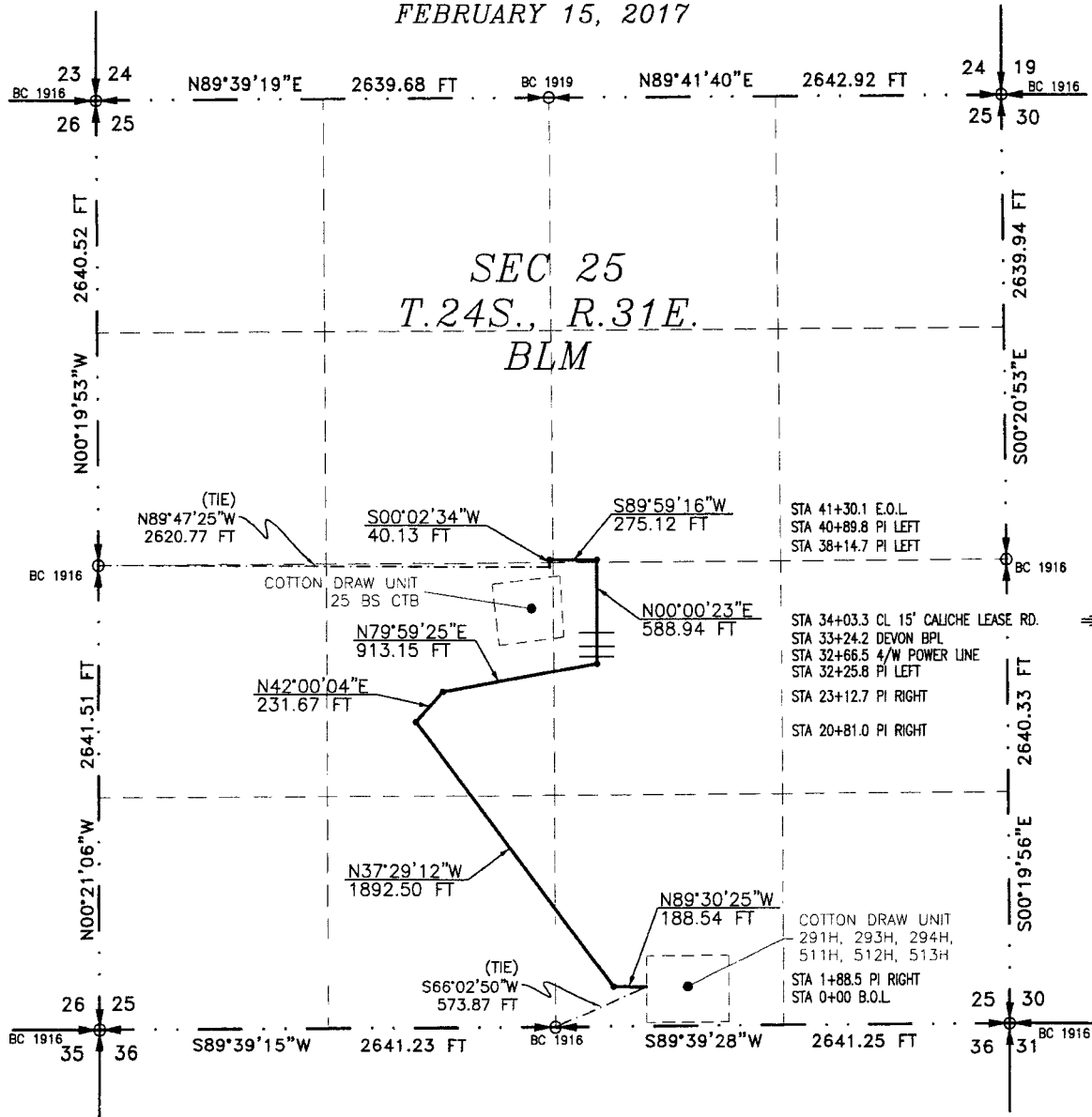
# Devon Energy - Well Pad Rig Location Layout Safety Equipment Location



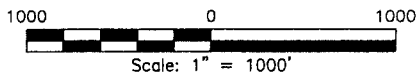
# FLOWLINE PLAT (400654XYZ)

SIX 6" GAS LIFT LINES & SIX 6" FLOWLINES FROM THE COTTON DRAW UNIT 291H, 293H, 294H, 511H, 512H, & 513H TO THE COTTON DRAW UNIT 25 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF A PIPELINE CROSSING  
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 15, 2017



SEE NEXT SHEET (2-4) FOR DESCRIPTION



## SURVEYOR CERTIFICATE

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 15 DAY OF FEBRUARY 2017

## GENERAL NOTES

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY

MADRON SURVEYING, INC.  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 88220  
Phone (575) 234-3341

SHEET: 1-4

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

SURVEY NO. 4685A

**FLOWLINE PLAT (400654XYZ)**

SIX 6" GAS LIFT LINES & SIX 6" FLOWLINES FROM THE COTTON DRAW UNIT 291H, 293H, 294H, 511H, 512H, & 513H TO THE COTTON DRAW UNIT 25 BS CTB

**DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF A PIPELINE CROSSING  
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 15, 2017**

**DESCRIPTION**

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SW/4 SE/4 OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS S66°02'50"W, A DISTANCE OF 573.87 FEET;

THENCE N89°30'25"W A DISTANCE OF 188.54 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE N37°29'12"W A DISTANCE OF 1892.50 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE N42°00'04"E A DISTANCE OF 231.67 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE N79°59'25"E A DISTANCE OF 913.15 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE N00°00'23"E A DISTANCE OF 588.94 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE S89°59'16"W A DISTANCE OF 275.12 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE S00°02'34"W A DISTANCE OF 40.13 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE WEST QUARTER CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N89°47'25"W, A DISTANCE OF 2620.77 FEET;

SAID STRIP OF LAND BEING 4130.05 FEET OR 250.31 RODS IN LENGTH, CONTAINING 2.844 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SW/4 SE/4	747.48 L.F.	45.30 RODS	0.515 ACRES
SE/4 SW/4	805.80 L.F.	48.84 RODS	0.555 ACRES
NE/4 SW/4	1442.36 L.F.	87.42 RODS	0.993 ACRES
NW/4 SE/4	830.06 L.F.	50.31 RODS	0.572 ACRES
SW/4 NE/4	268.97 L.F.	16.30 RODS	0.185 ACRES
SE/4 NW/4	35.38 L.F.	2.14 RODS	0.024 ACRES

**SURVEYOR CERTIFICATE**

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 15 DAY OF FEBRUARY 2017

**GENERAL NOTES**

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

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Phone (575) 234-3341

SHEET: 2-4

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

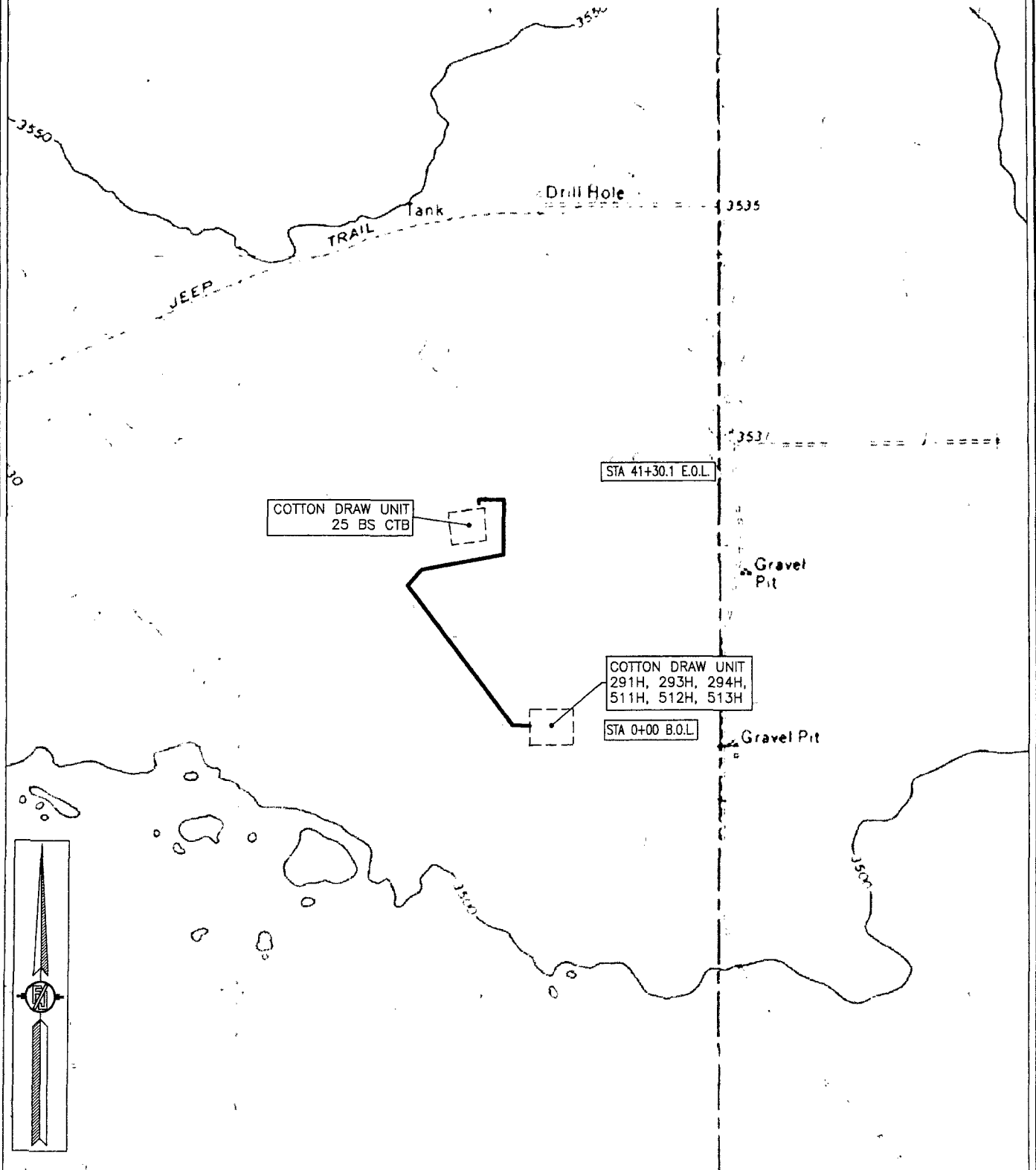
SURVEY NO. 4685A

CARLSBAD, NEW MEXICO

**FLOWLINE PLAT (400654XYZ)**

SIX 6" GAS LIFT LINES & SIX 6" FLOWLINES FROM THE COTTON DRAW UNIT 291H, 293H, 294H, 511H, 512H, & 513H TO THE COTTON DRAW UNIT 25 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF A PIPELINE CROSSING  
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 15, 2017



SHEET: 3-4

MADRON SURVEYING, INC. 30" SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

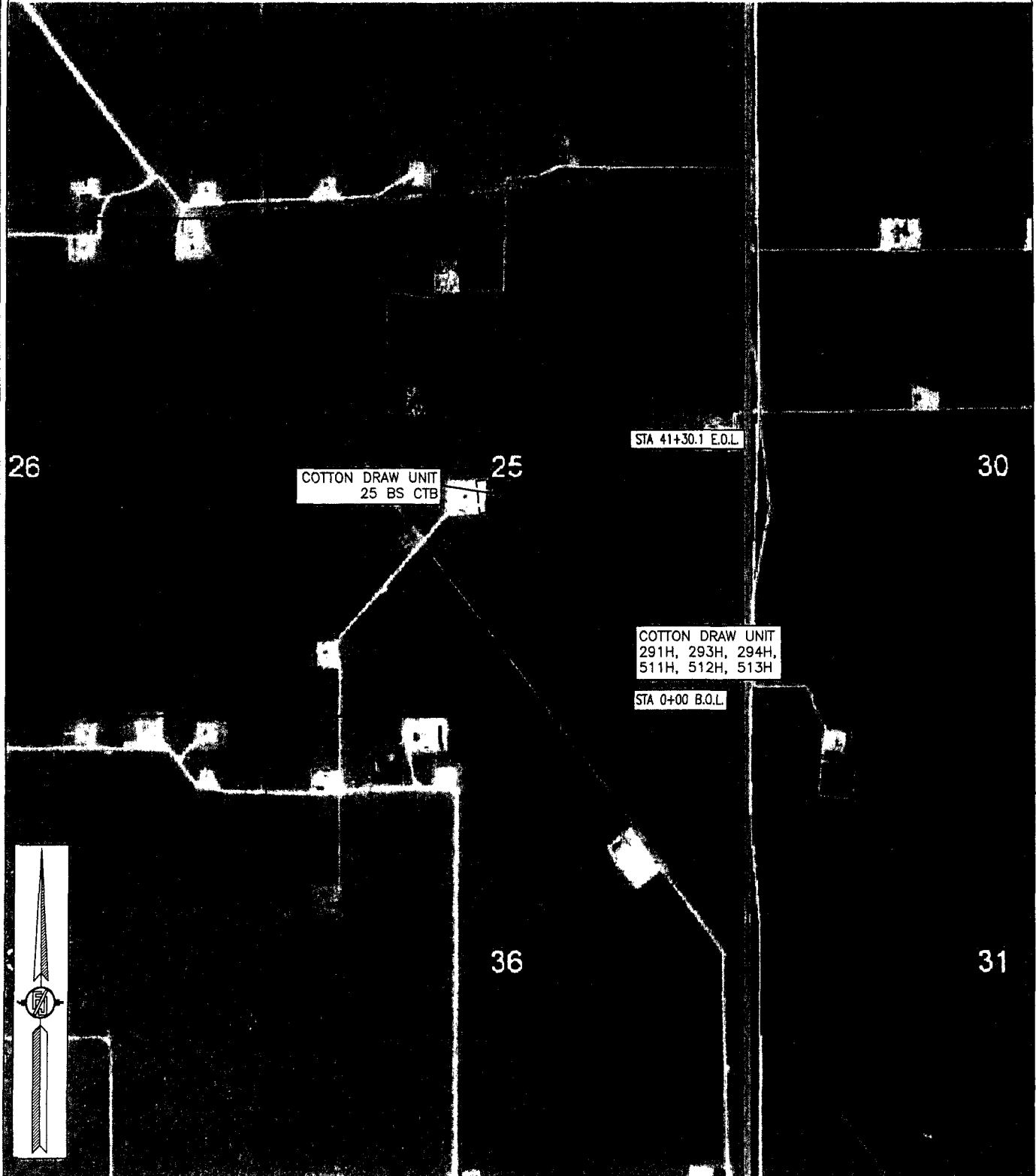
SURVEY NO. 4685A



**FLOWLINE PLAT (400654XYZ)**

SIX 6" GAS LIFT LINES & SIX 6" FLOWLINES FROM THE COTTON DRAW UNIT 291H, 293H, 294H, 511H, 512H, & 513H TO THE COTTON DRAW UNIT 25 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF A PIPELINE CROSSING  
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 15, 2017

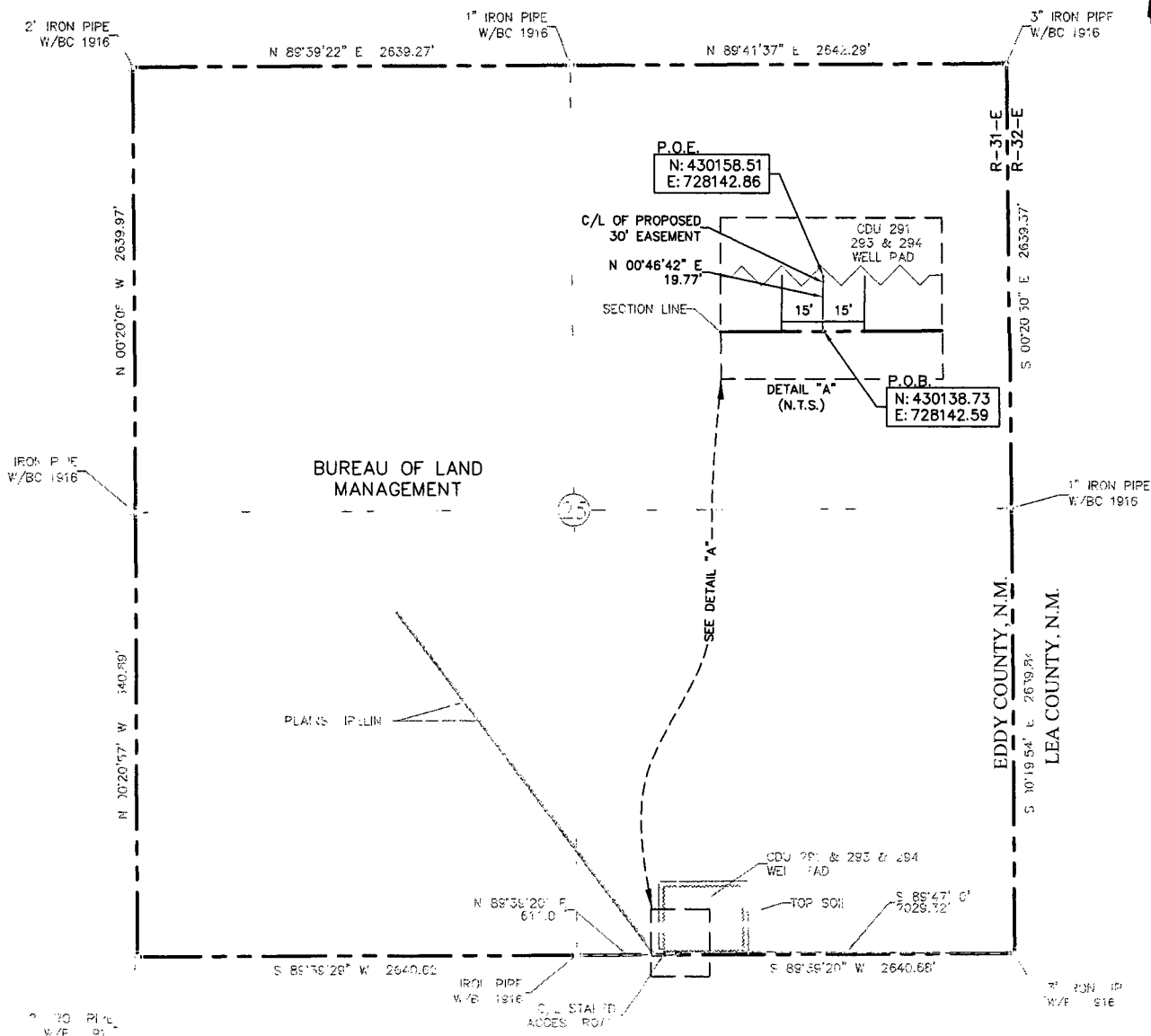


SHEET: 4-4

SURVEY NO. 4685A

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

EXHIBIT "A"  
PAGE 1 of 4  
ELECTRIC LINE PLAT  
SECTION 25, T24S-R31E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



7+93.8 SECTION LINE  
8+13.6 P.O.E./CDU 291 & 293 & 294 WELL PAD

30' EASEMENT AREA = 0.014 ACRE(S)  
19.77 FEET OR 1.20 RODS

SEE THE ATTACHED LEGAL DESCRIPTION

Note: All bearings recited herein are based on the New Mexico State Plane Coordinate System, NAD 83, New Mexico East Zone 3001, US Survey Feet, all distances are grid.

I, B.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.

LEGEND  
• POWER POLE

0 1000 2000

B.L. Laman  
Date Signed: 06-02-2016  
571 State Street, Jasper, TX.  
(409) 202-5111 75951  
Employee of Horizonrow, LLC

**HORIZON ROW LLC**  
Drawn for:  
**devon**  
Drawn by:  
CHRIS MAAS  
Date: 05/24/2016

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CDU 291 & 293 & 294  
PAD CONNECT ELECTRIC LINE  
PROPOSED 30' EASEMENT  
ON THE PROPERTY OF  
BUREAU OF LAND MANAGEMENT  
SECTION 25, T24S-R31E, N.M.P.M.

LINE NUMBER:  
EL7831  
WBS NUMBER:  
CC-112971.AL  
SCALE:  
1" = 1000'  
REVISIONS:  
SHEET:  
1 OF 4

SECTION 25, T24S-R31E, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO

ELECTRIC LINE  
LEGAL DESCRIPTION

FOR

DEVON ENERGY PRODUCTION COMPANY, L.P.

BUREAU OF LAND MANAGEMENT

30' EASEMENT DESCRIPTION:

**BEING** an easement thirty (30) feet in width lying fifteen (15) feet on the right side and fifteen (15) feet on the left side of the survey centerline described below, being out of the southeast quarter (SE ¼) of Section 25, Township 24 South, Range 31 East, N.M.P.M., Eddy County, New Mexico, and being out of a parcel of land owned by the Bureau of Land Management. Said centerline of easement being more particularly described as follows:

Commencing from a 1" iron pipe w/ BC1916 found for the south quarter corner of Section 25, T24S-R31E, N.M.P.M., Eddy County, New Mexico;

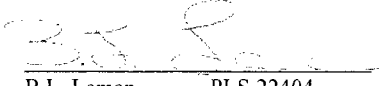
Thence N 89°39'20" E a distance of 611.07' to the **Point of Beginning** of this easement having coordinates of Northing=430138.73, Easting=728142.59 feet and continuing the following course:

Thence N 00°46'42" E, a distance of 19.77' to the **Point of Ending** having coordinates of Northing=430158.51, Easting=728142.86 feet, from said point a 3" iron pipe w/ BC1916 found for the southeast corner of Section 25, T24S-R31E, N.M.P.M., Eddy County, New Mexico bears S 89°47'10" E a distance of 2029.32', covering **19.77' or 1.20 rods** and having an area of **0.014 acres**.

NOTES:

Bearings, distances and coordinates shown herein are based on New Mexico State Plane Coordinate System, NAD 83, East Zone 3001, US Survey Feet, all distances are grid.

I, B.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.

  
B.L. Laman PLS 22404

Date Signed: 06/02/2016

Horizon Row, LLC

571 State Street, Jasper, TX

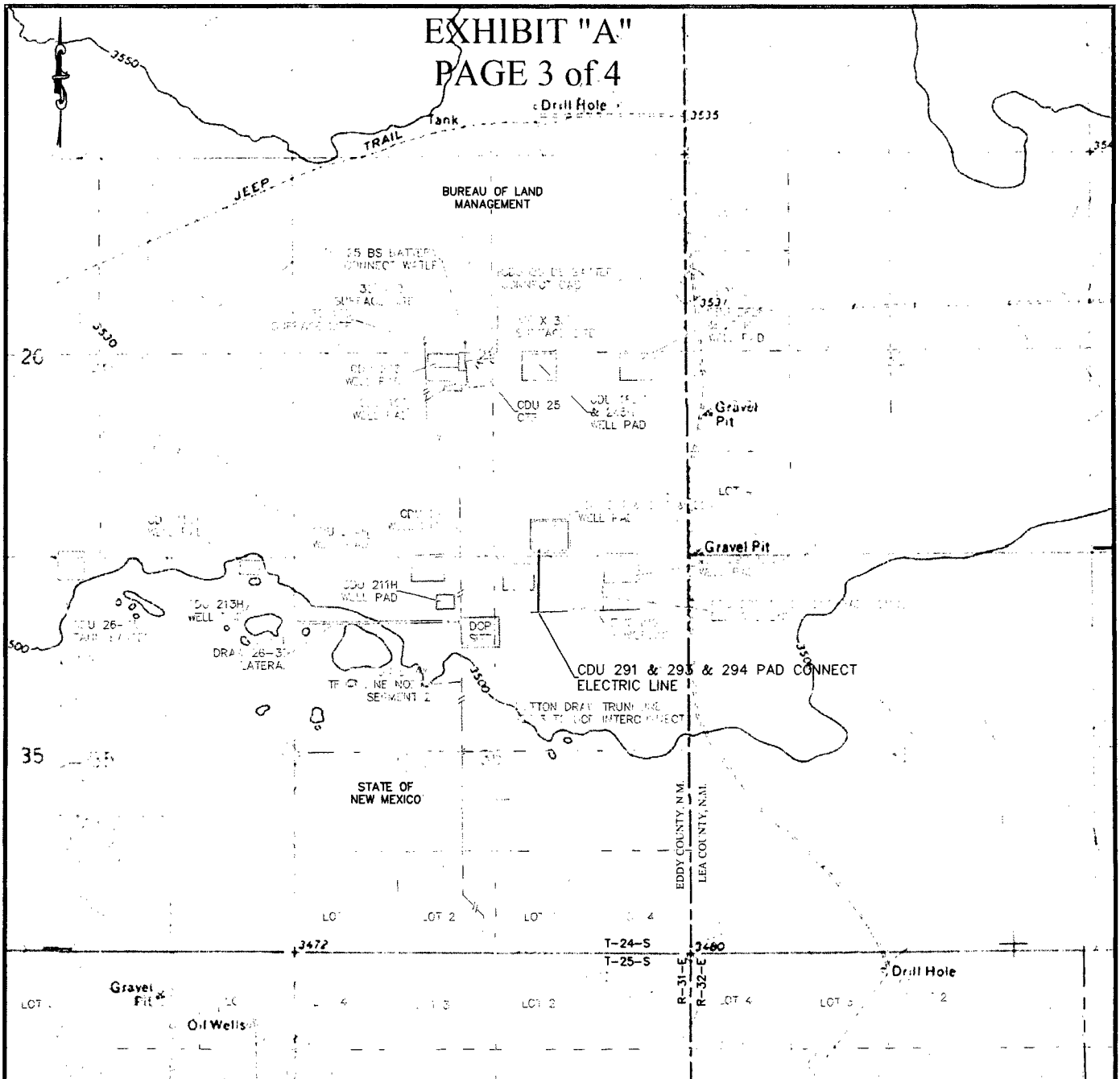
(903) 388-3045 75951

Employee of Horizon Row, LLC



# EXHIBIT "A"

## PAGE 3 of 4



### QUAD MAP

SECTION 36, T24S-R31E, N.M.P.M.  
SECTION 25, T24S-R31E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO

**HORIZON ROW LLC**

DEVON ENERGY PRODUCTION CO., L.P.

PROPOSED 30' EASEMENT

Drawn by:  
CHRIS MAAS

Date: 05/24/2016

Drawn for:



LINE NUMBER:  
EL7831

WBS NUMBER:  
CC-112971.AL

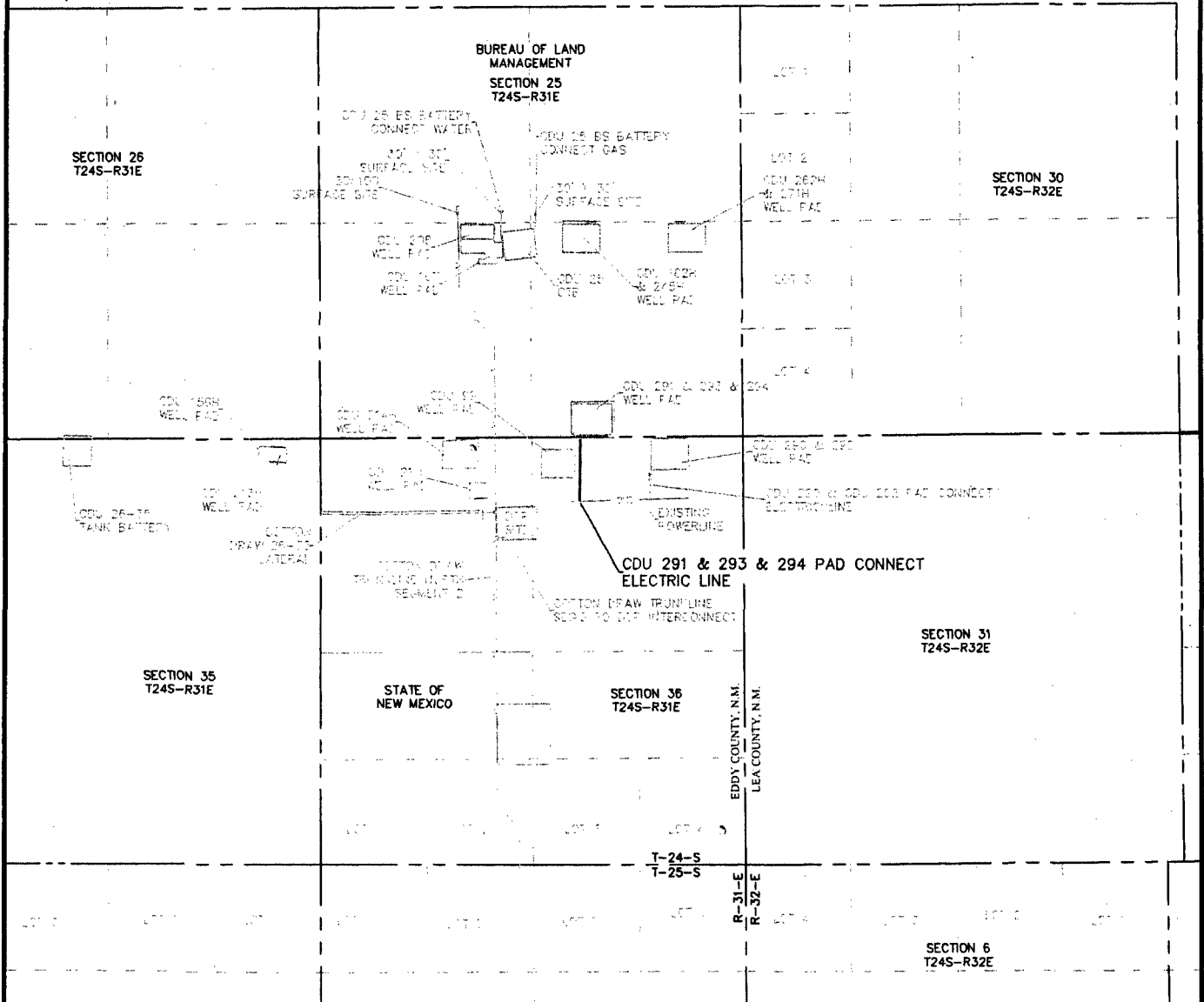
SCALE:  
1" = 2000'

REVISIONS:

SHEET:  
3 OF 4

# EXHIBIT "A"

## PAGE 4 of 4



### AERIAL MAP

SECTION 36, T24S-R31E, N.M.P.M.  
SECTION 25, T24S-R31E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO

**HORIZON ROW LLC**

DEVON ENERGY PRODUCTION CO., L.P.

PROPOSED 30' EASEMENT

Drawn by:  
CHRIS MAAS

Date: 05/24/2016

Drawn for:

**devon**

LINE NUMBER:  
EL7831

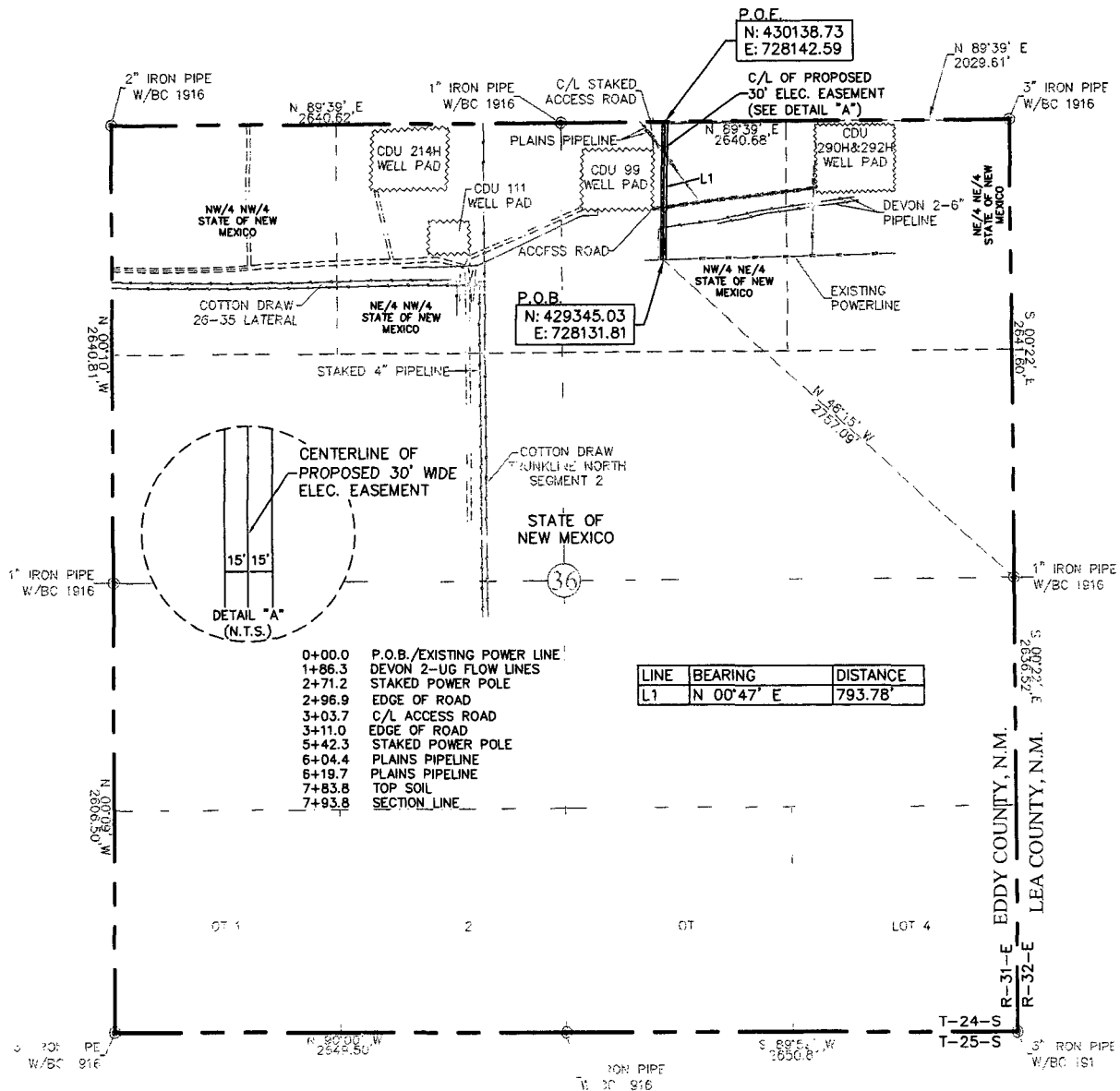
WBS NUMBER:  
CC-112971.AL

SCALE:  
1" = 2000'

REVISIONS:

SHEET:  
4 OF 4

EXHIBIT "A"  
PAGE 1 of 2  
ELECTRIC LINE PLAT  
SECTION 36, T24S-R31E, N.M.P.M.  
EDDY COUNTY, NEW MEXICO



QUARTER/QUARTER	30' ESMT. AREA	FEET	RODS
NW 1/4 OF NE 1/4	0.55 ACRES	793.78	48.11

SEE THE ATTACHED LEGAL DESCRIPTION

Note: All bearings recited herein are based on the New Mexico State Plane Coordinate System, NAD 83, New Mexico East Zone 3001, US Survey Feet, all distances are grid.

I, B.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.

LEGEND

• POWER POLE

0

1000

2000

HORIZON ROW LLC

Drawn for:

devon

Drawn by:  
CHRIS MAAS

Date: 05/24/2016

DEVON ENERGY PRODUCTION COMPANY, L.P.

CDU 291 & 293 & 294  
PAD CONNECT ELECTRIC LINE

PROPOSED 30' EASEMENT  
ON THE PROPERTY OF  
STATE OF NEW MEXICO

SECTION 36, T24S-R31E, N.M.P.M.

LINE NUMBER:  
EL7831

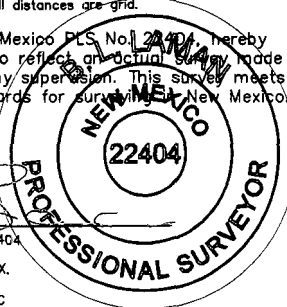
WBS NUMBER:  
CC-112971.AL

SCALE:  
1" = 1000'

REVISIONS:

SHEET:  
1 OF 2

B.L. Laman PLS #22404  
Date Signed: 06-02-2016  
571 State Street, Jasper, TX.  
(409) 202-5111 75951  
Employee of Horizonrow, LLC



SECTION 36, T24S-R31E, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO

ELECTRIC LINE PLAT  
LEGAL DESCRIPTION

FOR

DEVON ENERGY PRODUCTION COMPANY, L.P.

STATE OF NEW MEXICO

30' EASEMENT DESCRIPTION:

**BEING** an easement thirty (30) feet in width lying fifteen (15) feet on the right side and fifteen (15) feet on the left side of the survey centerline described below, being out of the northwest quarter of the northeast quarter (NW ¼, NE ¼) of Section 36, Township 24 South, Range 31 East, N.M.P.M., Eddy County, New Mexico, and being out of a parcel of land owned by the State of New Mexico. Said centerline of easement being more particularly described as follows:

Commencing from a 1" iron pipe w/ BC1916 found for the east quarter corner of Section 36, T24S-R31E, N.M.P.M., Eddy County, New Mexico;


Thence N 48°15' W a distance of 2757.09' to the **Point of Beginning** of this easement having coordinates of Northing=429345.03, Easting=728131.81 feet and continuing the following course:

Thence N 00°47' E, a distance of 793.78' to the **Point of Ending** having coordinates of Northing=430138.73, Easting=728142.59 feet, from said point a 3" iron pipe w/ BC1916 found for the northeast corner of Section 36, T24S-R31E, N.M.P.M., Eddy County, New Mexico bears N 89°39' E a distance of 2029.61', covering **793.78' or 48.11 rods** and having an area of **0.55 acres**.

NOTES:

Bearings, distances and coordinates shown herein are based on New Mexico State Plane Coordinate System, NAD 83, East Zone 3001, US Survey Feet, all distances are grid.

I, B.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.

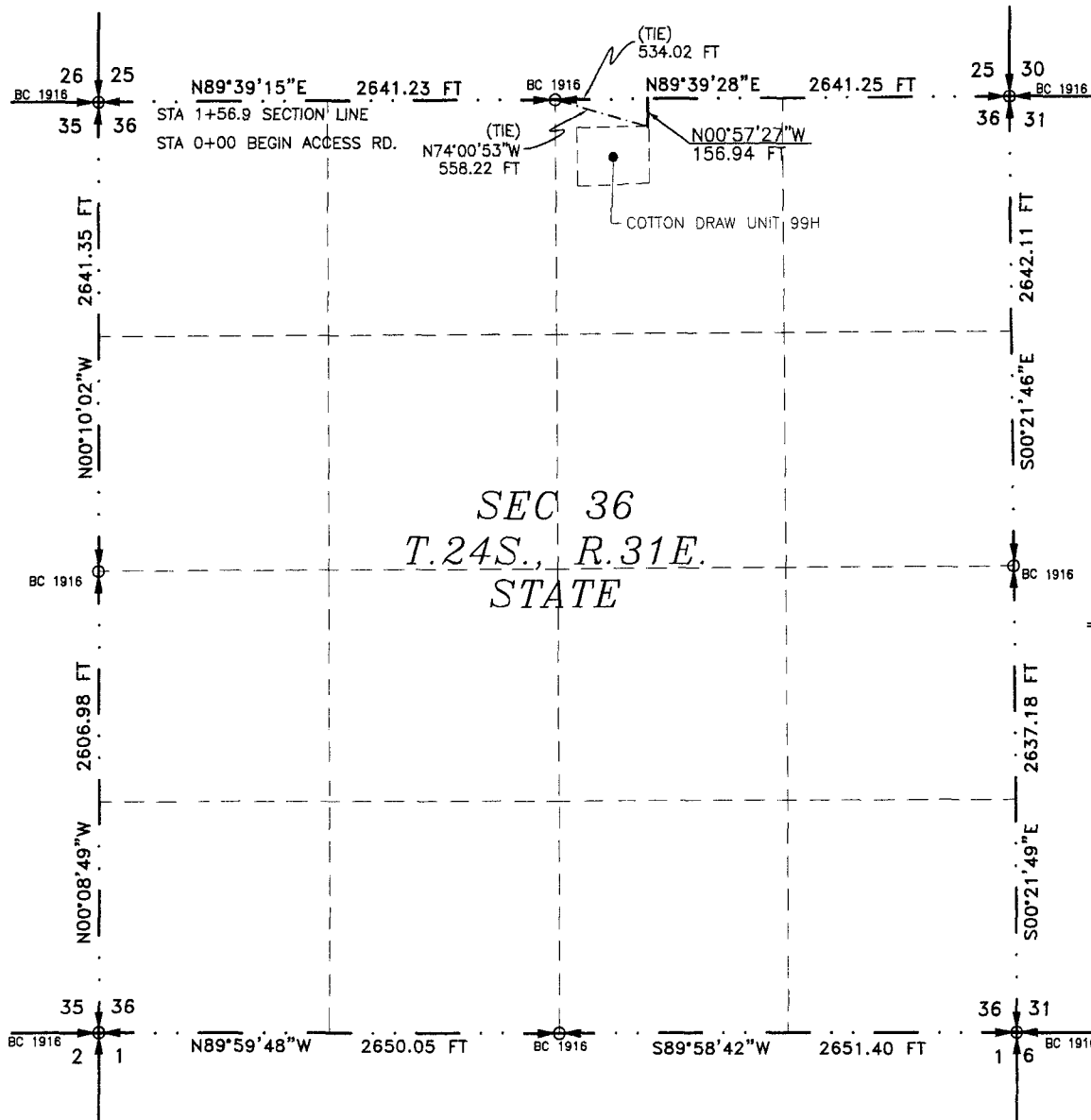
  
B.L. Laman      PLS 22404  
Date Signed: 06/02/2016  
Horizon Row, LLC  
571 State Street, Jasper, TX  
(409) 202-5111      75951  
Employee of Horizon Row, LLC



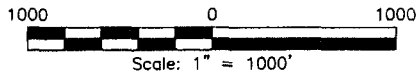
**ACCESS ROAD PLAT (AA000000000)**

ACCESS ROAD TO THE COTTON DRAW UNIT 294H, 293H, 291H, 511H, 512H, & 513H

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING  
SECTION 36, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 14, 2017



SEE NEXT SHEET (2-6) FOR DESCRIPTION



**GENERAL NOTES**

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY

**SURVEYOR CERTIFICATE**

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 14 DAY OF FEBRUARY 2017

*[Signature of Filimon F. Jaramillo]*  
FILIMON F. JARAMILLO, PLS. 12797

MADRON SURVEYING, INC  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 88220  
Phone (575) 234-3341

SHEET: 1-6

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

SURVEY NO. 4738A



**ACCESS ROAD PLAT (AA000000000)**

ACCESS ROAD TO THE COTTON DRAW UNIT 294H, 293H, 291H, 511H, 512H, & 513H

**DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING  
SECTION 36, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 14, 2017**

**DESCRIPTION**

A STRIP OF LAND 20 FEET WIDE CROSSING STATE OF NEW MEXICO LAND IN SECTION 36, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NW/4 NE/4 OF SAID SECTION 36, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 36, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N74°00'53"W, A DISTANCE OF 558.22 FEET;

THENCE N00°57'27"W A DISTANCE OF 156.94 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 36, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS S89°39'28"W, A DISTANCE OF 534.02 FEET;

SAID STRIP OF LAND BEING 156.94 FEET OR 9.51 RODS IN LENGTH, CONTAINING 0.072 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NW/4 NE/4 156.94 L.F. 9.51 RODS 0.072 ACRES

**GENERAL NOTES**

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

**SURVEYOR CERTIFICATE**

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 14 DAY OF FEBRUARY 2017

FILIMON F. JARAMILLO, PLS. 12797

MADRON SURVEYING, INC  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 86220  
Phone (575) 234-3341

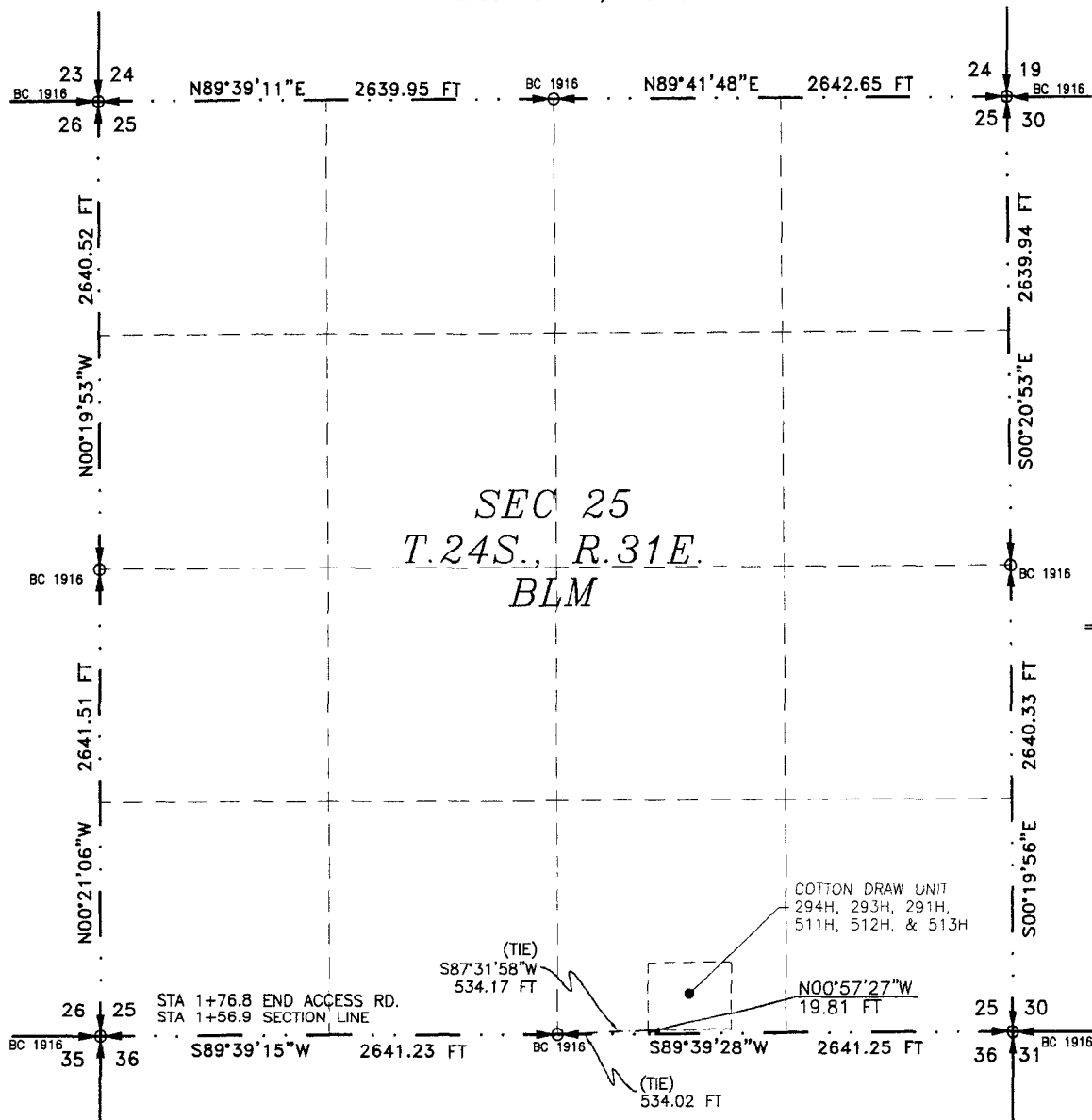
SURVEY NO. 4738A

SHEET: 2-6

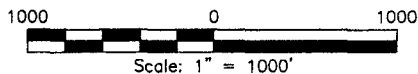
MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(575) 234-3341

**ACCESS ROAD PLAT (AA000000000)**  
ACCESS ROAD TO THE COTTON DRAW UNIT 294H, 293H, 291H, 511H, 512H, & 513H

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING  
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 14, 2017



SEE NEXT SHEET (4-6) FOR DESCRIPTION



**GENERAL NOTES**

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

**SURVEYOR CERTIFICATE**

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 14 DAY OF FEBRUARY 2017

*[Signature of Filimon F. Jaramillo]*  
FILIMON F. JARAMILLO, P.L.S. 12797

MADRON SURVEYING, INC  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 88220  
Phone (575) 234-3341

SHEET: 3-6

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SURVEY NO. 4738A

**ACCESS ROAD PLAT (AA000000000)**

ACCESS ROAD TO THE COTTON DRAW UNIT 294H, 293H, 291H, 511H, 512H, & 513H

**DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING  
SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 14, 2017**

**DESCRIPTION**

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SW/4 SE/4 OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS S89°39'28"W, A DISTANCE OF 534.02 FEET;

THENCE N00°57'27"W A DISTANCE OF 19.81 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS S87°31'58"W, A DISTANCE OF 534.17 FEET;

SAID STRIP OF LAND BEING 19.81 FEET OR 1.20 RODS IN LENGTH, CONTAINING 0.009 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SW/4 SE/4 19.81 L.F. 1.20 RODS 0.009 ACRES

**SURVEYOR CERTIFICATE**

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 14 DAY OF FEBRUARY 2017

**GENERAL NOTES**

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SHEET: 4-6

**MADRON SURVEYING, INC.**

FILIMON F. JARAMILLO PLS. 12797

301 SOUTH CANAL  
(975) 234-3341

MADRON SURVEYING, INC  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 88220  
Phone (575) 234-3341

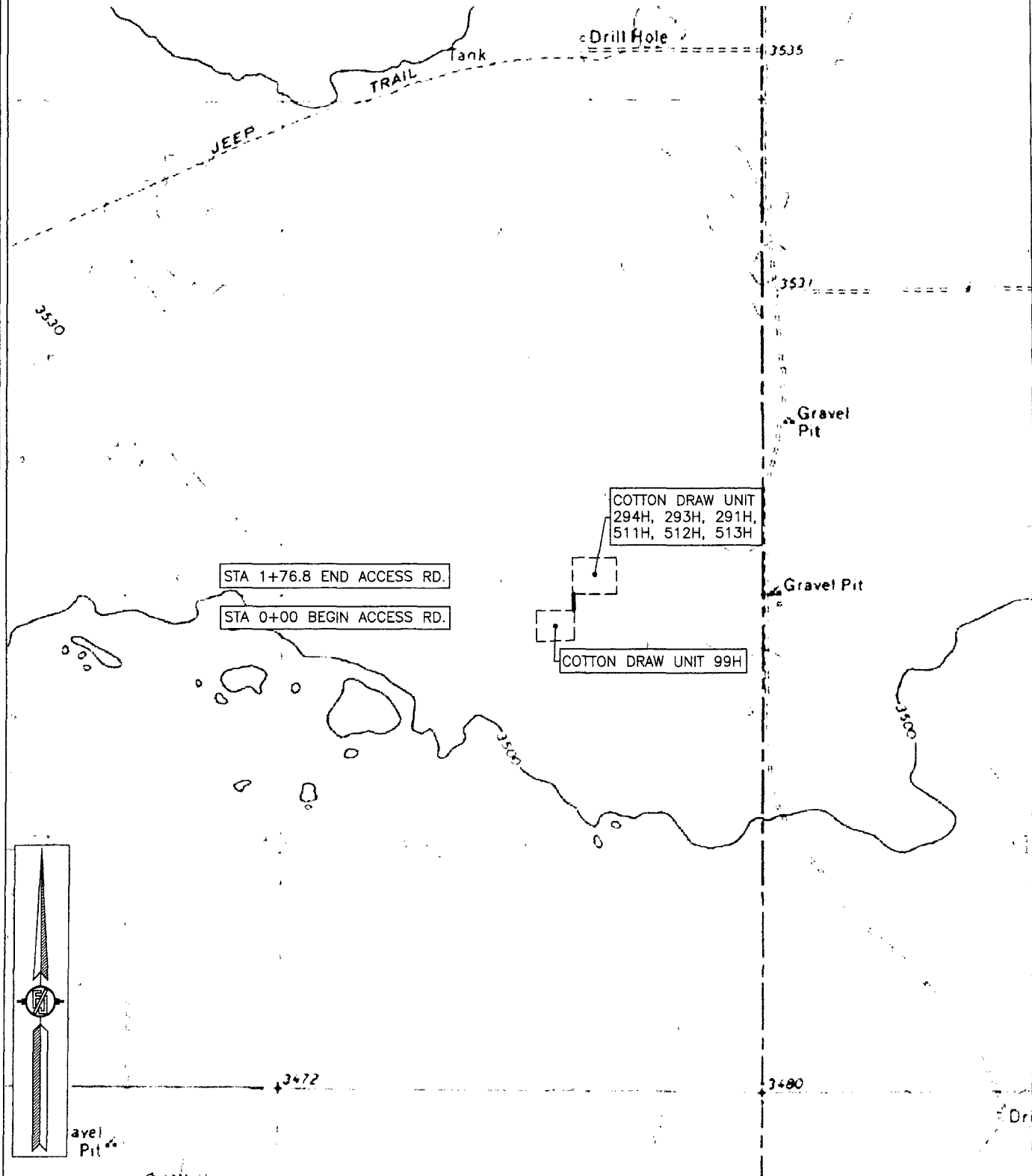
**SURVEY NO. 4738A**

**CARLSBAD, NEW MEXICO**

**ACCESS ROAD PLAT (AA000000000)**

ACCESS ROAD TO THE COTTON DRAW UNIT 294H, 293H, 291H, 511H, 512H, & 513H

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING  
SECTIONS 36, 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 14, 2017



SHEET: 5-6

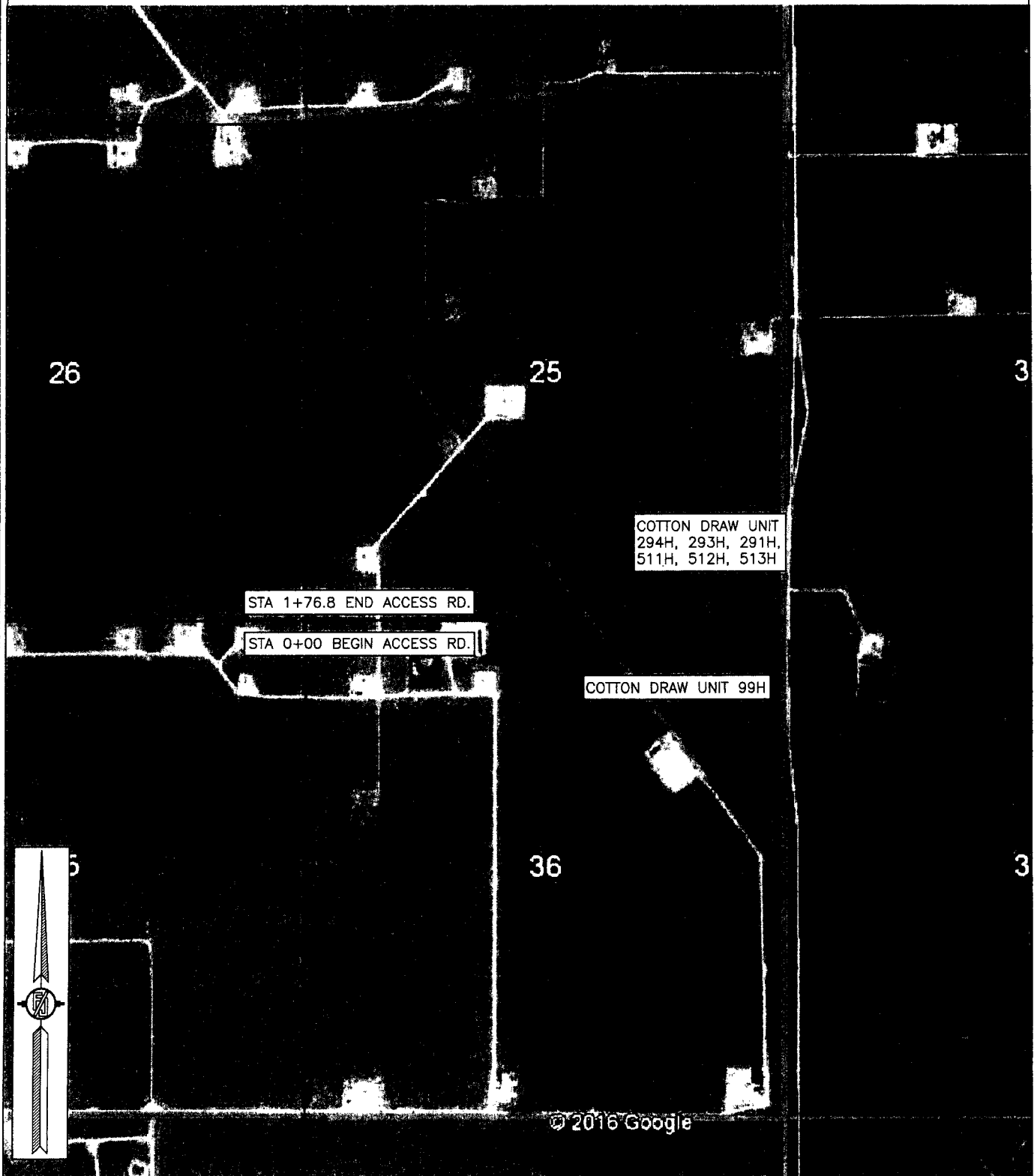
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SURVEY NO. 4738A

**ACCESS ROAD PLAT (AA000000000)**

ACCESS ROAD TO THE COTTON DRAW UNIT 294H, 293H, 291H, 511H, 512H, & 513H

DEVON ENERGY PRODUCTION COMPANY, L.P.  
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING  
SECTIONS 36, 25, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
FEBRUARY 14, 2017





## COTTON DRAW UNIT 513H

devon

This map is for illustrative purposes only and is neither a legally recorded map nor survey and is not intended to be used as one. Devon makes no warranty, representation, or guarantee of any kind regarding this map.

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

Prepared by: User

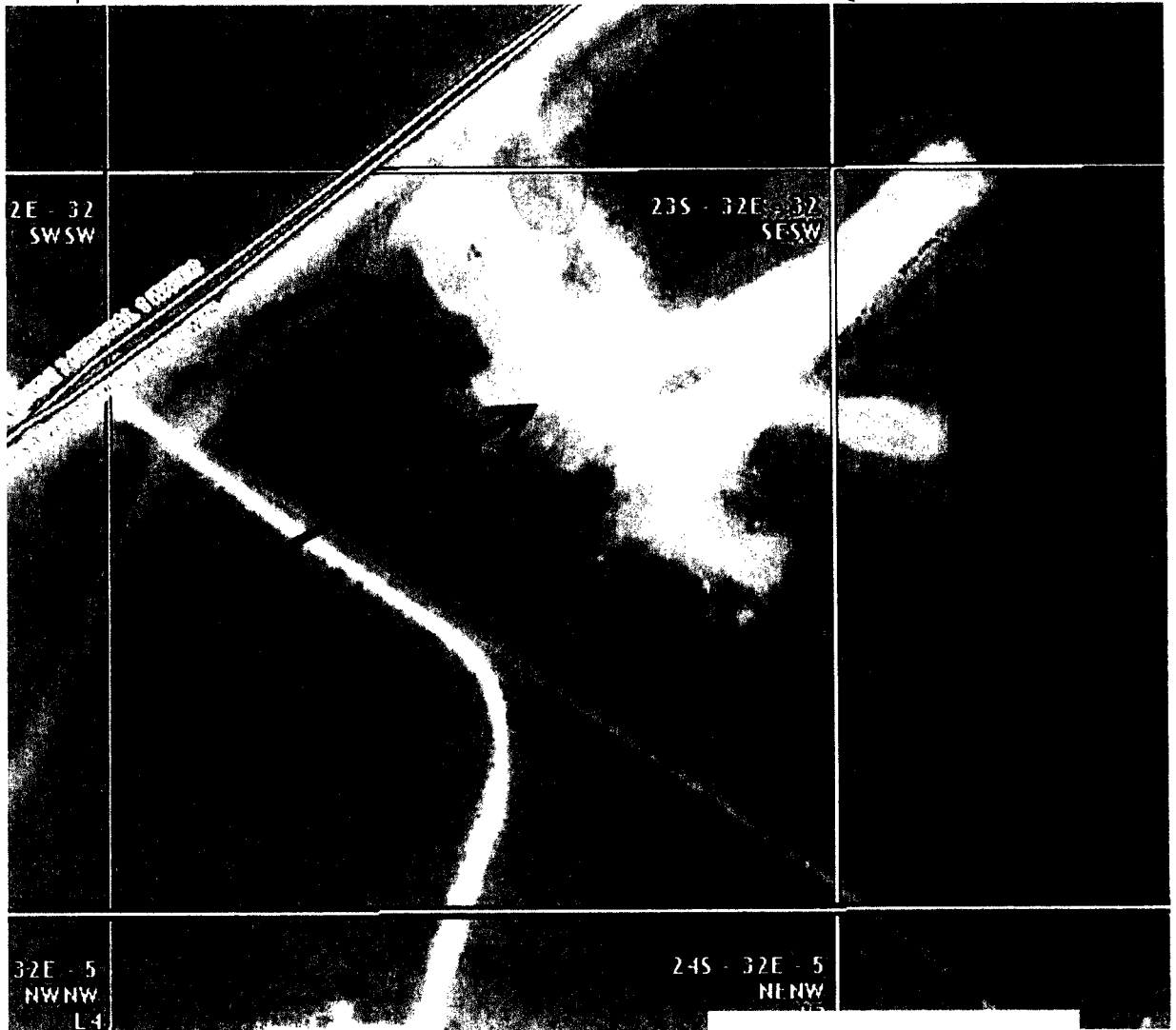
Map is current as of: 16-Feb-2017



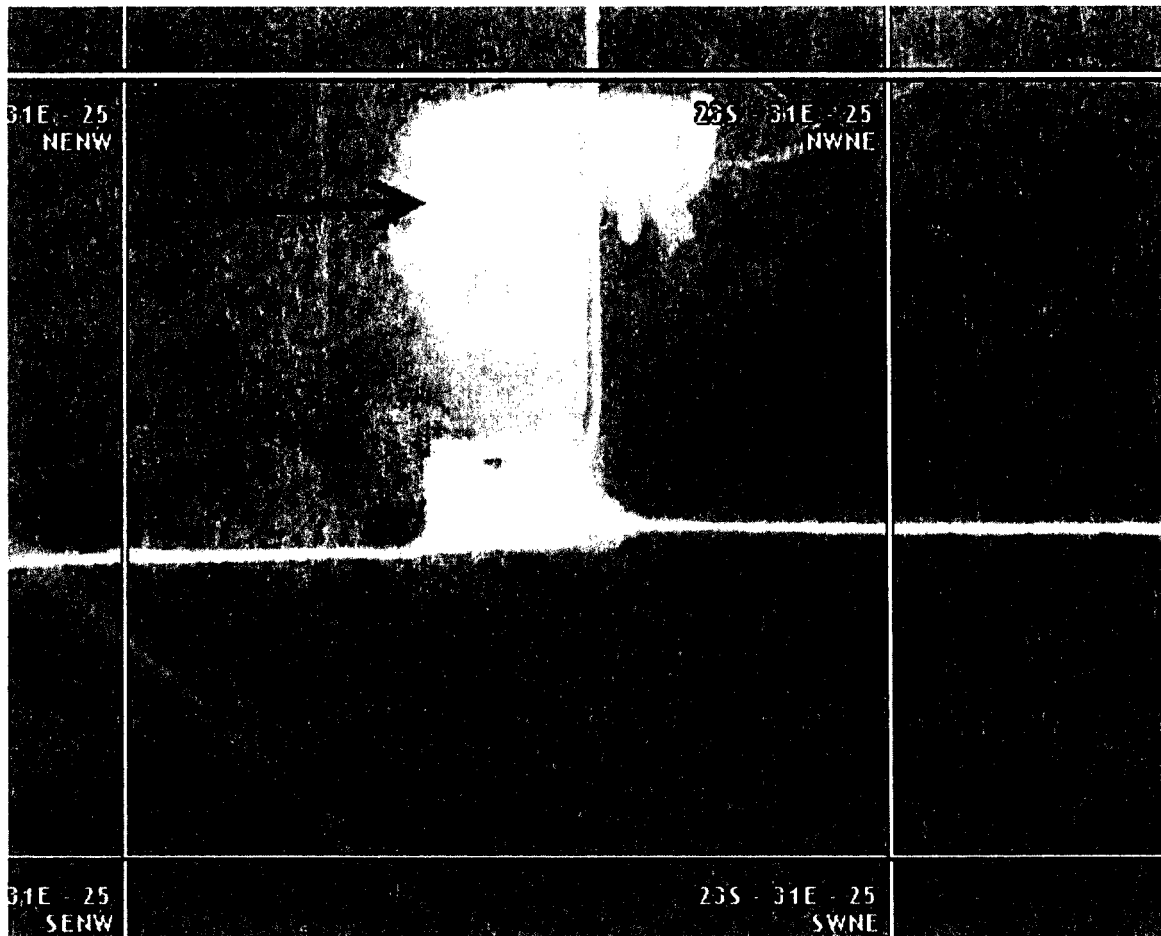
Miles

0 0.07 0.14 0.28 1:14,228

- State pit 616 and 617 32- 23S- 32E



- Fed pit 25- 23S- 31E



- Private pit 26- 23S- 31E





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**Section 1 - General**

---

Would you like to address long-term produced water disposal? NO

---

**Section 2 - Lined Pits**

---

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

### **Section 3 - Unlined Pits**

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

### **Section 4 - Injection**

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

**Injection well type:**

**Injection well number:**

**Injection well name:**

**Assigned injection well API number?**

**Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

---

## **Section 5 - Surface Discharge**

**Would you like to utilize Surface Discharge PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

---

## **Section 6 - Other**

**Would you like to utilize Other PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**

**AFMSS**

*U.S. Department of the Interior*  
**BUREAU OF LAND MANAGEMENT**

## ***Bond Info Data Report***

**05/18/2017**

### **Bond Information**

**Federal/Indian APD: FED**

**BLM Bond number: CO1104**

**BIA Bond number:**

**Do you have a reclamation bond? NO**

**Is the reclamation bond a rider under the BLM bond?**

**Is the reclamation bond BLM or Forest Service?**

**BLM reclamation bond number:**

**Forest Service reclamation bond number:**

**Forest Service reclamation bond attachment:**

**Reclamation bond number:**

**Reclamation bond amount:**

**Reclamation bond rider amount:**

**Additional reclamation bond information attachment:**

MAY 22 2017

RECEIVED

**PECOS DISTRICT  
DRILLING OPERATIONS  
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Devon Energy Production Company, LP
LEASE NO.:	NMNM012121
WELL NAME & NO.:	513H-Cotton Draw Unit
SURFACE HOLE FOOTAGE:	230'/S & 1815'/E
BOTTOM HOLE FOOTAGE:	290'/N & 660'/E
LOCATION:	Section 25, T.24 S., R.31 E., NMPM
COUNTY:	Eddy County, New Mexico

**Unit Wells**

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

**Commercial Well Determination**

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

**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)

☒ **Lea County**

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240,  
(575) 393-3612

1. Hydrogen Sulfide (H<sub>2</sub>S) monitors shall be installed prior to drilling out the surface shoe. If H<sub>2</sub>S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

## **B. CASING**

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

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

### Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. 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.

### **Possibility of water flows in the Castile and Salado.**

### **Possibility of lost circulation in Rustler, Delaware and Red Beds.**

1. The **13-3/8 inch surface casing shall be set at approximately 700 feet (in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt) and cemented to the surface. Additional cement maybe required.**
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature

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

- b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing, is:

**Intermediate casing must maintain 1/3 fluid filled during drilling operations**

- ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.  
**Additional cement maybe required. Excess calculates to 12%.**

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

**Option 1:**

**Operator has proposed DV tool at depth of 4350', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. Additional cement may be required – excess calculates to 12%.**

- 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 200 feet into previous casing string. Operator shall provide method of verification.

**Option 2:**

- ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Additional cement may be required – excess calculates to 12%.**



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 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. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. 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. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
  - b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
  - c. **Manufacturer representative shall install the test plug for the initial BOP test.**
  - d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
  - e. **If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**

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**.
  - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
  - d. The results of the test shall be reported to the appropriate BLM office.
  - e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
  - f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

**D. DRILL STEM TEST**

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

**E. WASTE MATERIAL AND FLUIDS**

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

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

**CLN 05042017**

**PECOS DISTRICT  
SURFACE USE  
CONDITIONS OF APPROVAL**

**MAY 22 2017**

**RECEIVED**

OPERATOR'S NAME:	Devon Energy Production Company, LP
LEASE NO.:	NMNM012121
WELL NAME & NO.:	513H-Cotton Draw Unit
SURFACE HOLE FOOTAGE:	230'/S & 1815'/E
BOTTOM HOLE FOOTAGE:	290'/N & 660'/E
LOCATION:	Section 25, T.24 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**
  - BLM is Not approving any Waterline with this APD**
  - Lesser Prairie-Chicken Timing Stipulations
  - Below Ground-level Abandoned Well Marker
  - Avian Protection
  - Range
- ☐ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☒ **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)**

### **The BLM is Not Approving Any water line with this APD!!!**

#### **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.

**Below 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.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

#### **Avian Protection**

Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

During construction, the proponent shall minimize disturbance to existing fences, water lines, troughs, windmills, and other improvements on public lands. The proponent 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 grazing permittee/allottee prior to disturbing any range improvement projects. 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.

## **VI. CONSTRUCTION**

### **A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### **B. TOPSOIL**

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

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

### **C. CLOSED LOOP SYSTEM**

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### **D. FEDERAL MINERAL MATERIALS PIT**

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

### **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

### **F. EXCLOSURE FENCING (CELLARS & PITS)**



**Exclosure Fencing**

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

**G. ON LEASE ACCESS ROADS****Road Width**

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

**Surfacing**

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

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

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

**Crowning**

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

**Ditching**

Ditching shall be required on both sides of the road.

**Turnouts**

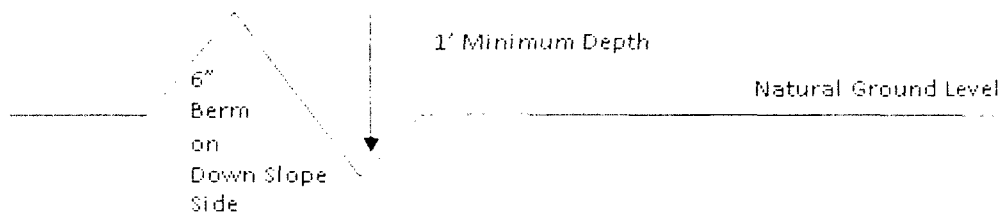
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

**Drainage**

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

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

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



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

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

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

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

#### **Cattle guards**

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards 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 cattle guards that are in place and are utilized during lease operations.

#### **Fence Requirement**

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

#### **Public Access**

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

### Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

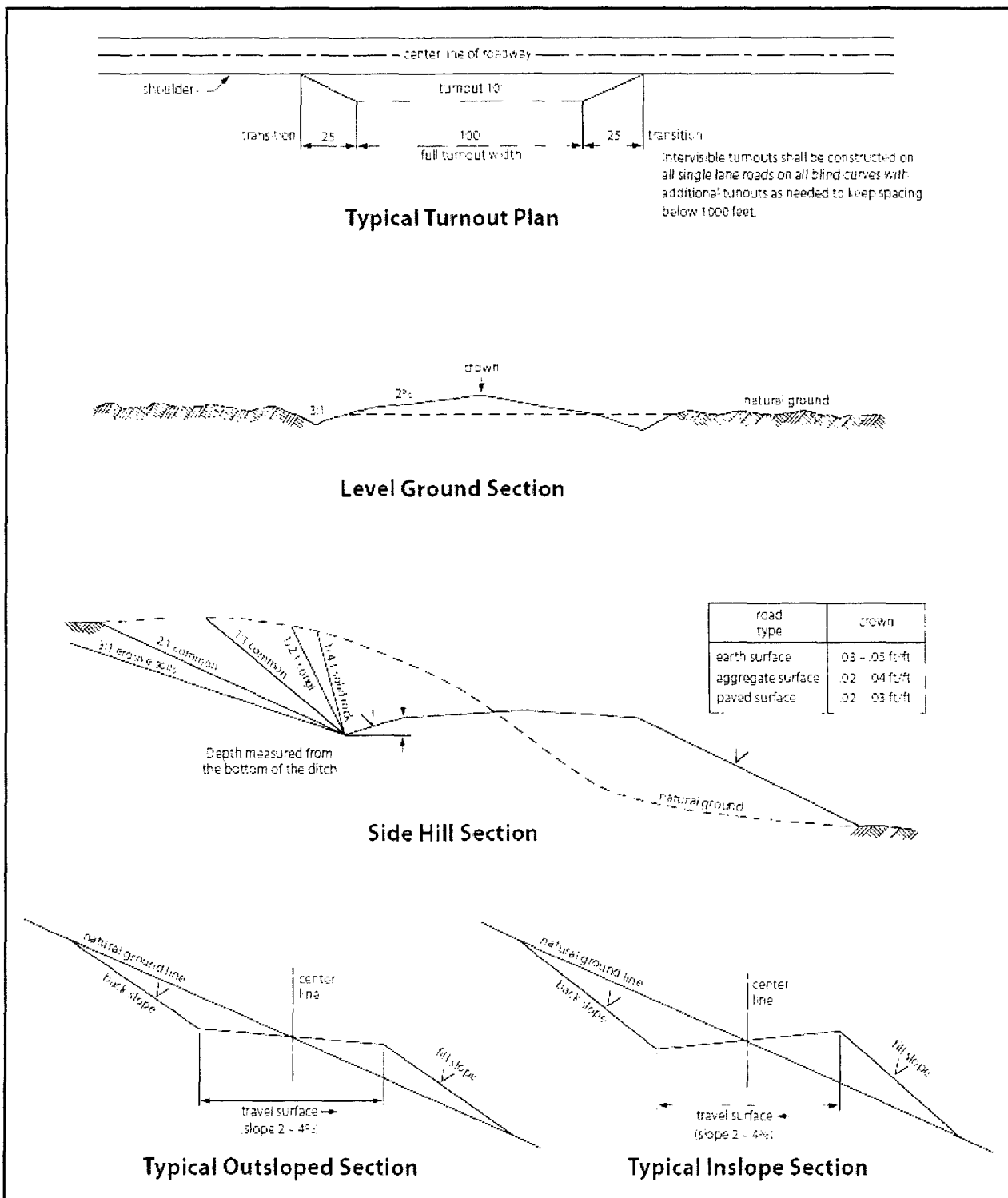


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## **VII. 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).

#### **A. PIPELINES**

##### **BURIED PIPELINE STIPULATIONS**

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, 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 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. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil 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 or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of 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 holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. 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.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

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. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

☐ seed mixture 1

☐ seed mixture 3

☐ seed mixture 2

☐ seed mixture 4

☒ seed mixture 2/LPC

☐ Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. 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. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. 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 before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (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 actions to prevent the loss of significant 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.

17. 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 associated roads, 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.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

19. Special Stipulations:

**Lesser Prairie-Chicken**

Oil and gas activities 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, geophysical exploration other than 3-D operations, and 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. 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 ft. from the source of the noise.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

**B. ELECTRIC LINES**  
**STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES**

**A copy of the grant 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 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. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. 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 the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends

service to an active, adjoining facility or facilities.

10. 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 actions to prevent the loss of significant 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.

11. Special Stipulations:

- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

**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, geophysical exploration other than 3-D operations, and 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 ft. from the source of the noise.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

## **VIII. 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).

## **IX. 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).

Below 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.

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## Seed Mixture for LPC Sand/Shinnery Sites

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 shall be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall 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). 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. Seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may 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

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**Operator Certification**

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

**NAME:** Linda Good**Signed on:** 02/23/2017**Title:** Regulatory Compliance Professional**Street Address:** 333 West Sheridan Avenue**City:** Oklahoma City**State:** OK**Zip:** 73102**Phone:** (405)552-6558**Email address:** Linda.Good@dvn.com

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**Field Representative**

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**Representative Name:** Ray Vaz**Street Address:** 6488 Seven Rivers Hwy**City:** Artesia**State:** NM**Zip:** 88210**Phone:** (575)748-1871**Email address:** ray.vaz@dvn.com