

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs

FORM APPROVED
OMB NO 1004-0135
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

OCD

SUBMIT IN TRIPLICATE - Other instructions on reverse

MAY 31 2012

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No NMNM114990
2. Name of Operator DEVON ENERGY PRODUCTION CO		6. If Indian, Allottee or Tribe Name
3a. Address 333 W SHERIDAN AVENUE OKLAHOMA CITY, OK 73102		7. If Unit or CA/Agreement, Name and/or No
3b. Phone No. (include area code) Ph: 405-552-4524		8. Well Name and No ICHABOD 7 FEDERAL 4H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 7 T26S R34E		9. API Well No 30-025-40574
		10. Field and Pool, or Exploratory SALADO GROWNE, BRUSHY
		11. County or Parish, and State LEA COUNTY, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Devon respectfully request to make a change to the bottom hole location of the Ichabod 7 Federal 4H.

The proposed BHL is 330' FNL & 980' FEL of Section 7.

Attached is a the following:

- New C-102
- Revised Drilling Plan
- Revised Directional Plan

Thank you

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**



14. I hereby certify that the foregoing is true and correct	
Electronic Submission #138292 verified by the BLM Well Information System For DEVON ENERGY PRODUCTION CO LP, sent to the Hobbs	
Name (Printed/Typed) MELANIE A CRAWFORD	Title REGULATORY ANALYST
Signature (Electronic Submission)	Date 05/16/2012

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By	Title PETROLEUM ENGINEER	Date
Conditions of approval, if any, are attached. Approval of this notice 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.		Office

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

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

WITNESS SURFACE CASING

MAY 31 2012

District I

1625 N. French Dr., Hobbs, NM 88240

District II

1301 W. Grand Avenue, Artesia, NM 88210

District III

1000 Rio Brazos Rd., Aztec, NM 87410

District IV

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico

Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.

Santa Fe, NM 87505.

Form C-102

Revised October 15, 2009

Submit one copy to appropriate
District Office☐ AMENDED REPORT

MAY 31 2012

RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number		2 Pool Code		3 Pool Name		
4 Property Code		5 Property Name			6 Well Number	
		ICHABOD "7" FEDERAL			4H	
7 OGRID No.		8 Operator Name			9 Elevation	
6137		DEVON ENERGY PRODUCTION COMPANY, L.P.			3367.8	

10 Surface Location

U.I. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	7	26 S	34 E		108	SOUTH	455	EAST	LEA

11 Bottom Hole Location If Different From Surface

U.I. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	7	26 S	34 E		330	NORTH	980	EAST	LEA

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.

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

NW CORNER SEC. 7 LAT. = 32.0652210°N LONG. = 103.5175327°W NMSP EAST (FT) N = 388420.13 E = 794050.54		BOTTOM OF HOLE LAT. = 32.0643191°N LONG. = 103.5036207°W NMSP EAST (FT) N = 388124.90 E = 798362.76		NE CORNER SEC. 7 LAT. = 32.0652287°N LONG. = 103.5004585°W NMSP EAST (FT) N = 388463.35 E = 799339.80	
		HARDLINE BOUNDARY			
		ICHABOD "7" FEDERAL #4H ELEV. = 3367.8' LAT. = 32.0509963°N (NAD83) LONG. = 103.5019135°W NMSP EAST (FT) N = 383282.28 E = 798928.94		SE CORNER SEC. 7 LAT. = 32.0508996°N LONG. = 103.5004449°W NMSP EAST (FT) N = 383177.86 E = 799384.79	
SW CORNER SEC. 7 LAT. = 32.0506927°N LONG. = 103.5175350°W NMSP EAST (FT) N = 383134.89 E = 794089.78		SURFACE LOCATION			

17 OPERATOR CERTIFICATION

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

Signature

Date

Printed Name

18 SURVEYOR CERTIFICATION

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

MAY 10, 2012

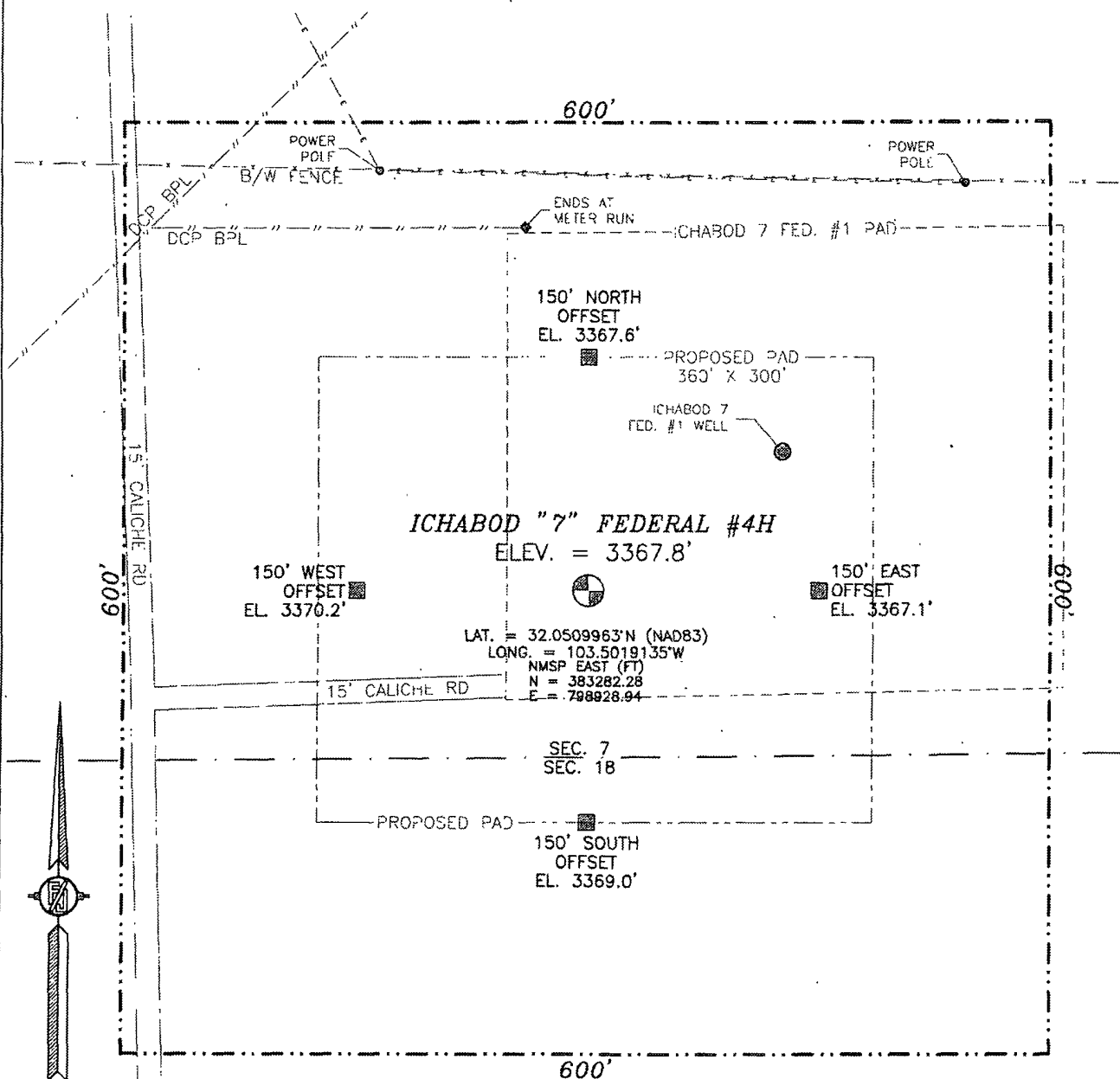
Date of Survey

Signature and Seal of Professional Surveyor

Certificate Number: FLEMING JARAMILLO, PLS 12797

SURVEY NO 787B

SECTION 7, TOWNSHIP 26 SOUTH, RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO



010	50	100	200
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SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM PAVED CR. #1 (ORLA RD.) AND CALICHE CR. #2 (BATTLE AXE)
GO EAST ON CR #2 11.9 MILES WHERE CR#2 BENDS NORTH AND
CONTINUE EAST ON CALICHE ROAD 2.6 MILES TURN RIGHT AND GO
SOUTH 0.9 MILES AND LOCATION IS ON THE LEFT (EAST) 280'.

DEVON ENERGY PRODUCTION COMPANY, L.P.

ICHABOD "7" FEDERAL #4H

LOCATED 108 FT. FROM THE SOUTH LINE
AND 455 FT. FROM THE EAST LINE OF
SECTION 7, TOWNSHIP 26 SOUTH,
RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

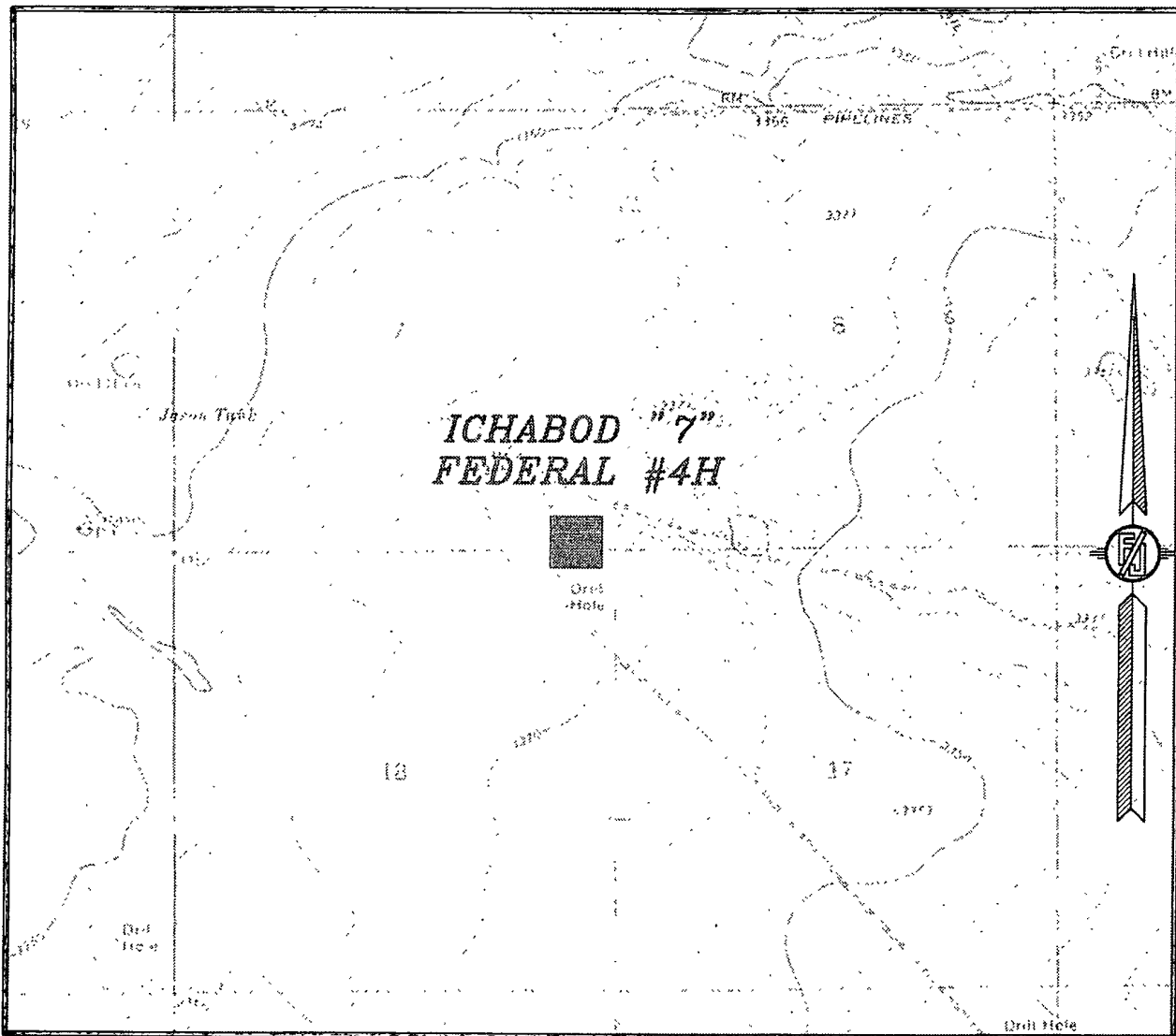
MAY 10, 2012

SURVEY NO. 787B

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

301 SOUTH CANAL
(572) 234-3341

SECTION 7, TOWNSHIP 26 SOUTH, RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



USGS QUAD MAP:
PADUCA BREAKS EAST

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

ICHABOD "7" FEDERAL #4H

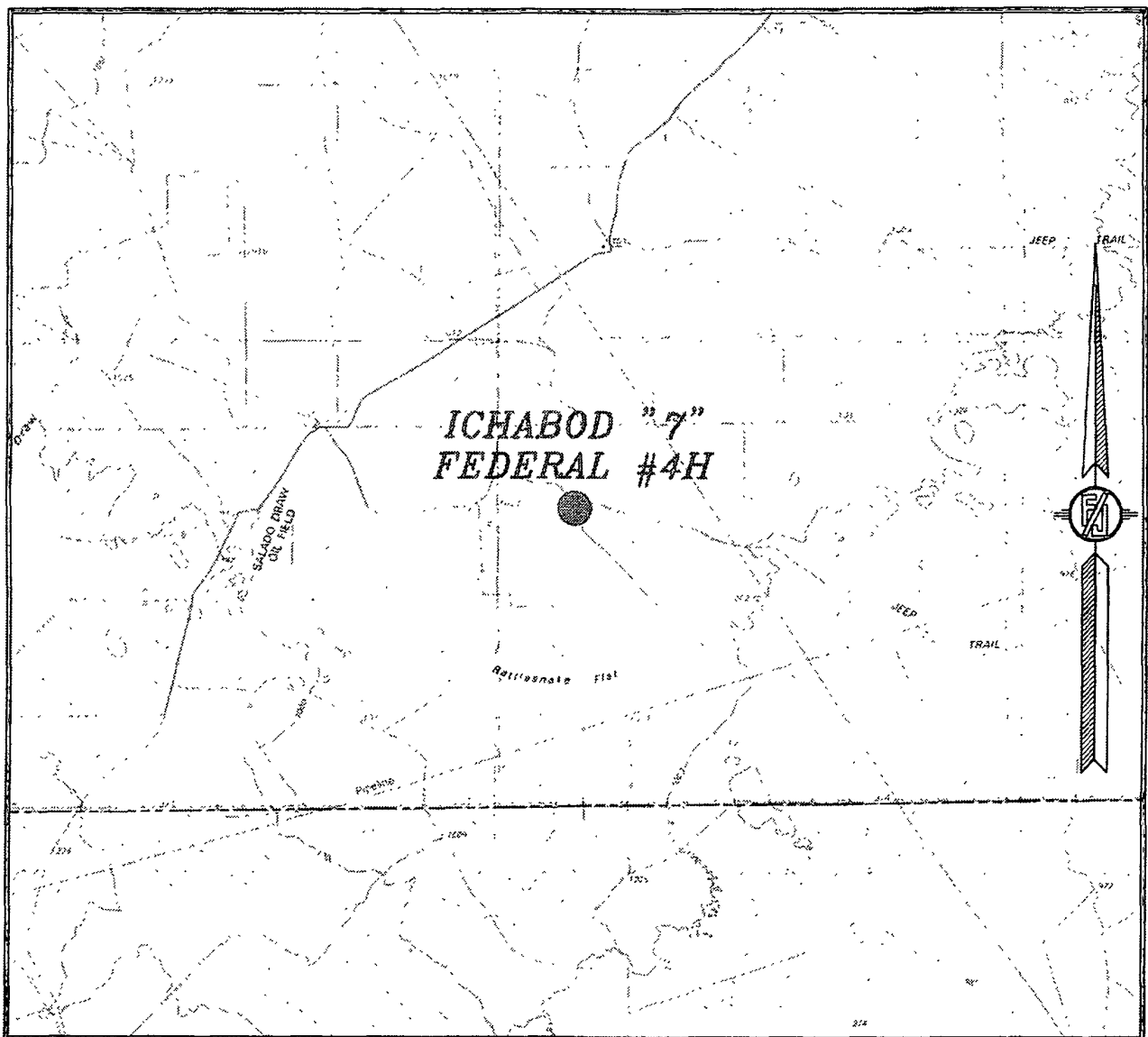
LOCATED 108 FT. FROM THE SOUTH LINE
AND 455 FT. FROM THE EAST LINE OF
SECTION 7, TOWNSHIP 26 SOUTH,
RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

MAY 10, 2012

SURVEY NO. 787B

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

SECTION 7, TOWNSHIP 26 SOUTH, RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
VICINITY MAP



NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

ICHABOD "7" FEDERAL #4H

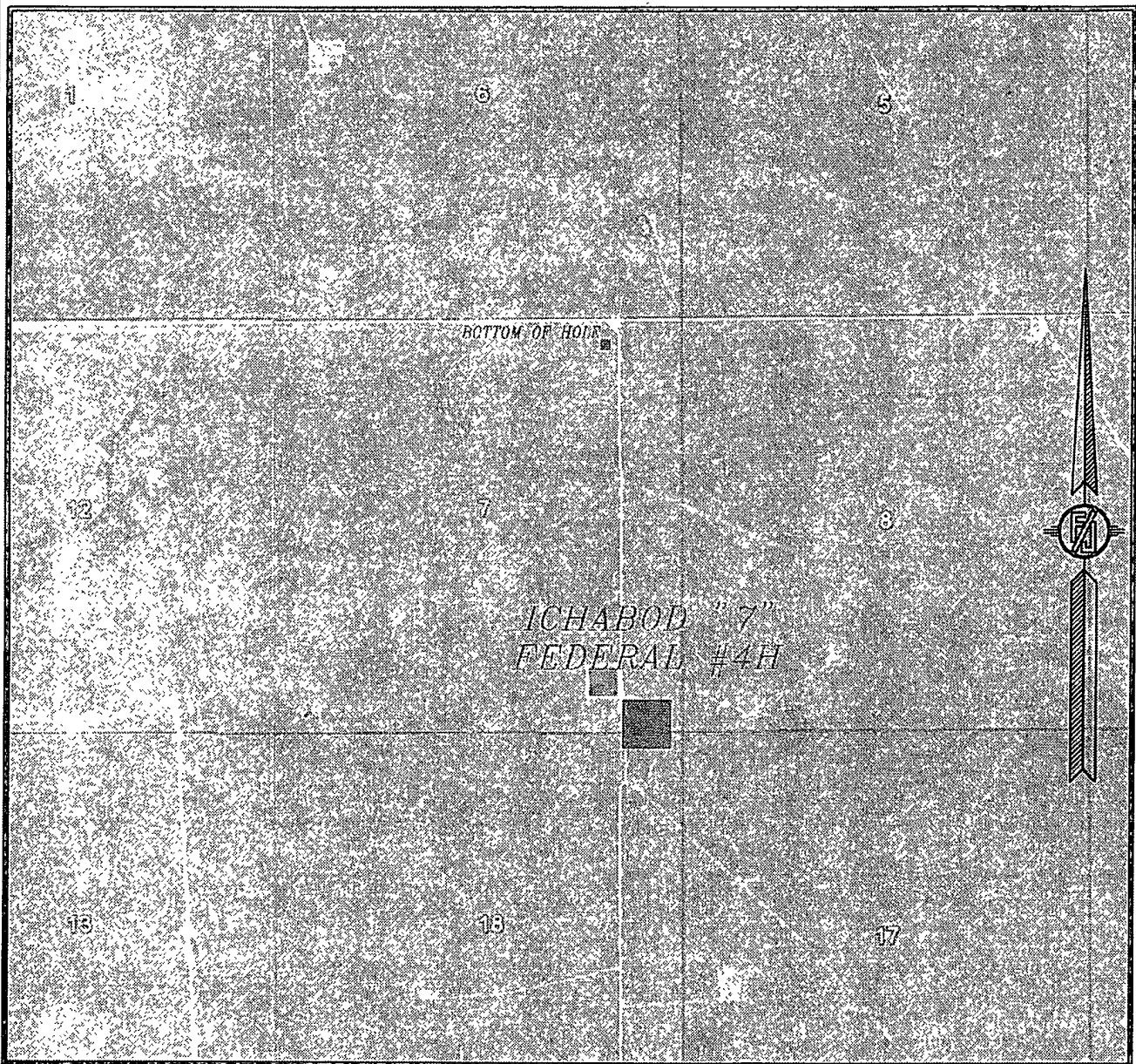
LOCATED 108 FT. FROM THE SOUTH LINE
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LEA COUNTY, STATE OF NEW MEXICO

MAY 10, 2012

SURVEY NO. 787B

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

SECTION 7, TOWNSHIP 26 SOUTH, RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
JUNE 2011

DEVON ENERGY PRODUCTION COMPANY, L.P.

ICHABOD "7" FEDERAL #4H

LOCATED 108 FT. FROM THE SOUTH LINE
AND 455 FT. FROM THE EAST LINE OF
SECTION 7, TOWNSHIP 26 SOUTH,
RANGE 34 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

MAY 10, 2012

SURVEY NO. 787B

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

' 13 3/8" 1 1/2" 1 1/2" 1 1/2"

1. Casing and Cementing Plan Summary

The surface fresh water sands will be protected by setting 13 3/8" casing at 800' and circulating cement back to surface. The fresh water sands will be protected by setting 9 5/8" casing at 5250' and circulating cement to surface. The Delaware intervals will be isolated by setting 5 1/2" casing to total depth and circulating cement above the base of the 9 5/8" casing. All casing is new and API approved.

2. Casing Program: * See COA

Hole Size	Hole Interval	OD Csg	Casing Interval	Weight	Collar	Grade
17 1/2"	0-800'	13 3/8"	0-800'	48#	STC	H40
12 1/4"	800-5250	9 5/8"	0'-5250'	40#	LTC	HCK-55
8 3/4"	5250-9050	5 1/2"	0-9050'	17#	LTC	P110
8 3/4"	9050-14273	5 1/2"	9050-14273'	17#	BTC	P110

3. Casing Program Comments:

4. Design Factors:

	Casing Size	Collapse Design Factor	Burst Design Factor	Tension Design Factor
Surface	13 3/8" H40 48# STC	2.06	4.62	8.39
Intermediate	9 5/8" J55 40# LTC	1.55	1.45	3.30
Production	5 1/2" P110 17# LTC	1.76	2.51	1.83
	5 1/2" P110 17# BTC	1.68	2.40	6.40

5. Design Factor Comments:

Drilling Program / Surface Use Plan
Discipline-Specific Input Form

6. Cement Program: * See COA

Casing Size	String	Stage	Slurry	Amount and Type of Cement
13 3/8" 48#	Surface		Lead	505 sacks ExtendaCem – CZ, 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Density: 13.5 ppg Yield: 1.75 TOC @ Surface
13 3/8" 48#			Tail	340 sacks HalCem – C, 2 % Calcium Chloride - Flake (Accelerator), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Density 14.8 ppg Yield: 1.35 cf/sk
9 5/8" 40#	Intermediate		Lead	1310 sacks EconoCem – HLC, 5 % Salt, 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Density 12.7 ppg Yield: 1.94 cf/sk TOC @ surface
9 5/8" 40#			Tail	490 sacks HalCem – C, 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Density 14.8 ppg Yield: 1.33 cf/sk
5 1/2" 17#	Production	1 st Stage	Lead	565 sacks EconoCem – HLH, 0.2 % HR-601 (Retarder) Density 12.5 ppg Yield: 1.95 cf/sk
5 1/2" 17#			Tail	1560 sacks VersaCem –H, 0.5 % Halad®-344 (Low Fluid Loss Control), 0.4 % CFR-3 (Dispersant), 1 lbm/sk Salt (Salt), 0.1 % HR-601 (Retarder) Density 14.5 ppg Yield: 1.22 cf/sk TOC @ 6,500'
DV TOOL				6,500' MD
5 1/2" 17#		2 nd Stage	Lead	170 sacks ExtendaCem – C, 1 % Calcium Chloride - Flake (Accelerator), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Density 11.4 ppg Yield: 2.89 cf/sk
5 1/2" 17#			Tail	150 sacks EconoCem - C (Mod), 0.1 % Econolite (Light Weight Additive), 2 % Salt (Salt), 4 % Silicalite (Light Weight Additive), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Density 13.8 ppg Yield: 1.357 cf/sk

7. Top of Cement for All Strings

String	TOC
Surface	Surface
Intermediate	Surface
Production	4915'

See COA

4750

8. **Cement Program Comments:**

** See COA*
The above cement volumes could be revised pending the caliper measurement from the open hole logs. The top of cement is designed to reach approximately 500' above the 9 5/8" casing shoe. All casing is new and API approved.

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

9. **Pressure Control Equipment**

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

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

Pipe rams will be operated and checked each 24 hour period and blind rams tested each time the drill pipe is out of the hole. These tests will be logged in the daily 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 5,000 psi WP.

10. **Proposed Mud Circulation System:** *(Insert/delete rows as necessary)*

See COA

Depth Range	Mud Weight	Viscosity	Fluid Loss	Type System
0' - 950'	8.4-9.0	30-34	NC	FW
950' - 5250'	9.8-10.0	28-32	NC	Brine
5250'-14273'	8.6-9.3	28-32	NC	FW

11. **Mud System Comments:**

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

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

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

13. **Potential Hazards:**

14. Anticipated Starting Date and Duration of Operations:

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

15. Location and Types of Water Supply:

This location will be drilled using a combination of water mud systems (outlined in the Drilling Program). The water will be obtained from commercial water stations in the area and hauled to location by transport truck using the existing and proposed roads shown in the C-102. On occasion, water will be obtained from a pre-existing water well, running a pump directly to the drill rig. In these cases where a poly pipeline is used to transport water for drilling purposes, proper authorizations will be secured. If a poly pipeline is used, the size, distance, and map showing route will be provided to the BLM via sundry notice.

16. Methods of Handling Waste Material:

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



PROJECT DETAILS Lea County (NAD83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid



Azimuths to Grid North
True North: -0.44°
Magnetic North: 6.99°

Magnetic Field
Strength: 48429.5 nT
Dip Angle: 60.02°
Date: 5/10/2012
Model: IGRF2010



A Schlumberger Company

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

Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Plan: Plan #2 (#4H/OH)

WELL DETAILS #4H

Ground Elevation	3367.8					
RKB Elevation	KB = 19 @ 3386.8usft (McVay 7)					
Rig Name	McVay 7					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	383282.280	798928.940	32.051	-103.502	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

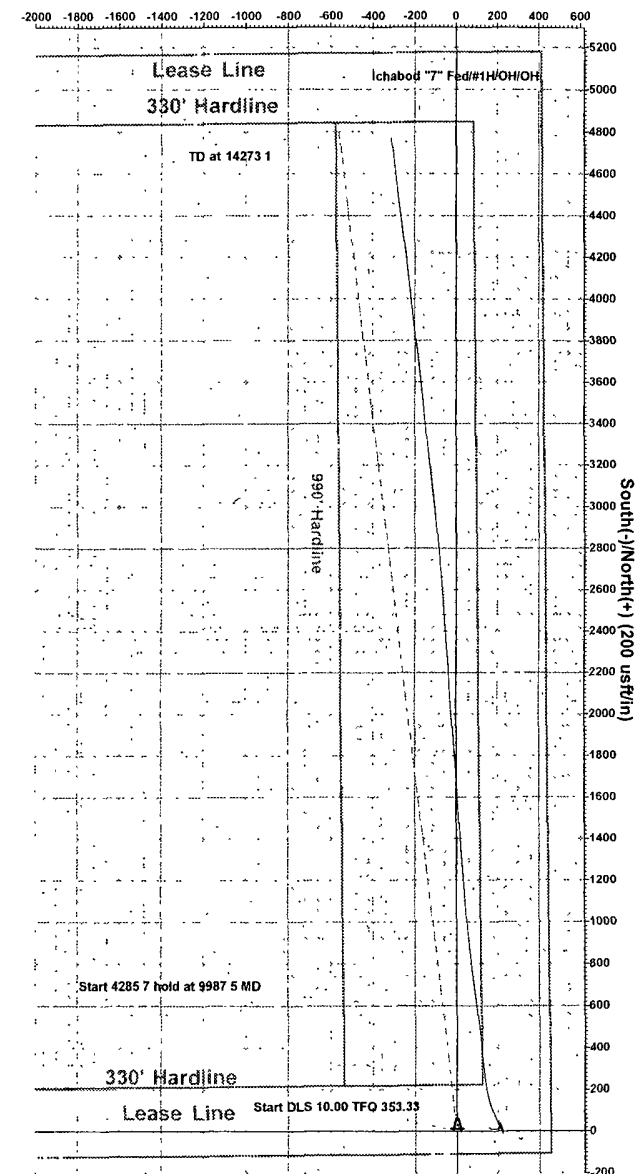
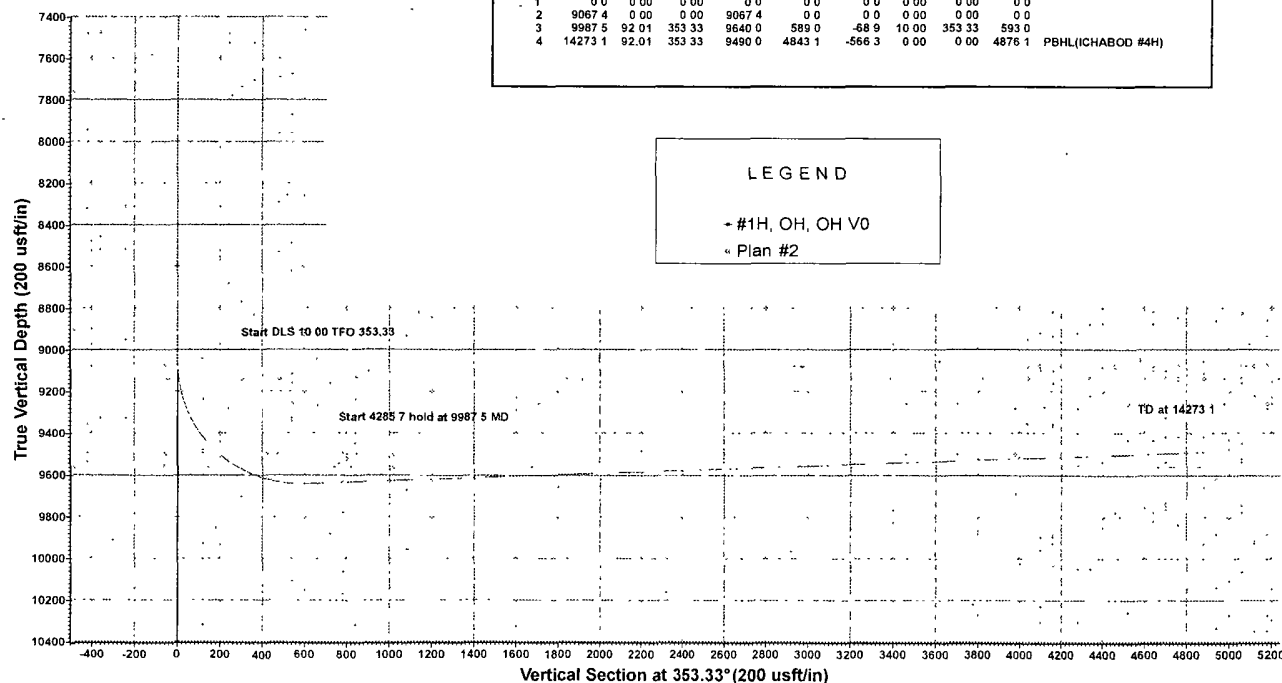
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL(ICHABOD #4H)	9490.0	4843.1	-566.3	388125.354	795362.642	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	9967.4	0.00	0.00	9067.4	0.0	0.0	0.00	0.00	0.0	
3	9987.5	92.01	353.33	9640.0	589.0	-68.9	10.00	353.33	593.0	
4	14273.1	92.01	353.33	9490.0	4843.1	-566.3	0.00	0.00	4876.1	PBHL(ICHABOD #4H)

LEGEND

- + #1H, OH, OH V0
- « Plan #2



Plan Plan #2 (#4H/OH)

Created By: Sam Bille Date: 15.45, May 10 2012

Checked: _____ Date: _____



Devon Energy, Inc.

Lea County (NAD83)

Ichabod "7" Fed

#4H

OH

Plan: Plan #2

PathfinderX & Y Report

10 May, 2012



A Schlumberger Company



Pathfinder
PathfinderX & Y Report

PATHFINDER
A Schlumberger Company

Company: Devon Energy, Inc
Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 19 @ 3386 8usft (McVay 7)
MD Reference: KB = 19 @ 3386 8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project: Lea County (NAD83)

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

Site: Ichabod "7" Fed

Site Position:	From: Map	Position Uncertainty:	0 0 usft	Northing:	383,300 450 usft	Latitude:	32 051
				Easting:	799,081 340 usft	Longitude:	-103 501
				Slot Radius:	13-3/16 "	Grid Convergence:	0 44 °

Well: #4H

Well Position	+N/-S	0 0 usft	Northing:	383,282 280 usft	Latitude:	32.051
	+E/-W	0 0 usft	Easting:	798,928 940 usft	Longitude:	-103 502
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	3,367 8 usft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/10/2012	7 43	60 02	48,430

Design: Plan #2

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 0	0 0	0 0	353 33

Survey Tool Program Date 5/10/2012

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0 0	14,273 1	Plan #2 (OH)	MWD	MWD - Standard



Pathfinder
PathfinderX & Y Report

PATHFINDER
A Schlumberger Company

Company: Devon Energy, Inc
Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
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MD Reference: KB = 19 @ 3386.8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0 0	0 00	0 00	0 0	-3,386.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
20 0	0 00	0 00	20 0	-3,366.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
QUATERNARY										
100 0	0 00	0 00	100 0	-3,286.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
200 0	0 00	0 00	200 0	-3,186.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
300 0	0 00	0 00	300 0	-3,086.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
400 0	0 00	0 00	400 0	-2,986.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
500 0	0 00	0 00	500 0	-2,886.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
600 0	0 00	0 00	600 0	-2,786.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
700 0	0 00	0 00	700 0	-2,686.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
800 0	0 00	0 00	800 0	-2,586.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
900 0	0 00	0 00	900 0	-2,486.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
903 0	0 00	0 00	903.0	-2,483.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
RUSTLER DOL.										
1,000 0	0 00	0 00	1,000 0	-2,386.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,100 0	0 00	0 00	1,100 0	-2,286.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,200 0	0 00	0 00	1,200 0	-2,186.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,300 0	0 00	0 00	1,300 0	-2,086.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,330 0	0 00	0 00	1,330 0	-2,056.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
SALADO SALT										
1,400 0	0 00	0 00	1,400 0	-1,986.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,500 0	0 00	0 00	1,500 0	-1,886.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,600 0	0 00	0 00	1,600 0	-1,786.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,700 0	0 00	0 00	1,700 0	-1,686.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,800 0	0 00	0 00	1,800 0	-1,586.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
1,900 0	0 00	0 00	1,900 0	-1,486.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
2,000 0	0 00	0 00	2,000 0	-1,386.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94
2,100 0	0 00	0 00	2,100 0	-1,286.8	0 0	0 0	0 0	0 00	383,282.28	798,928.94



Pathfinder
PathfinderX & Y Report



Company: Devon Energy, Inc.
Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 19 @ 3386 8usft (McVay 7)
MD Reference: KB = 19 @ 3386 8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
2,200 0	0 00	0 00	2,200.0	-1,186 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,300 0	0 00	0 00	2,300 0	-1,086 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,400 0	0 00	0 00	2,400 0	-986 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,500 0	0 00	0 00	2,500 0	-886 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,600 0	0 00	0 00	2,600 0	-786 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,700 0	0 00	0 00	2,700 0	-686 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,800 0	0 00	0 00	2,800 0	-586 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
2,900 0	0 00	0 00	2,900 0	-486 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,000 0	0 00	0 00	3,000 0	-386 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,100 0	0 00	0 00	3,100 0	-286 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,200 0	0 00	0 00	3,200 0	-186 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,300 0	0 00	0 00	3,300 0	-86 8	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,400 0	0 00	0 00	3,400 0	13 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,500 0	0 00	0 00	3,500 0	113 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,600 0	0 00	0 00	3,600 0	213 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,700 0	0 00	0 00	3,700 0	313 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,800 0	0 00	0 00	3,800 0	413 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
3,900 0	0 00	0 00	3,900 0	513 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,000 0	0 00	0 00	4,000 0	613 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,100 0	0 00	0 00	4,100 0	713 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,200 0	0 00	0 00	4,200 0	813 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,300 0	0 00	0 00	4,300 0	913 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,400 0	0 00	0 00	4,400 0	1,013 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,500 0	0 00	0 00	4,500 0	1,113 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,600 0	0 00	0 00	4,600 0	1,213 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,700 0	0 00	0 00	4,700 0	1,313 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94
4,800 0	0 00	0 00	4,800 0	1,413 2	0 0	0 0	0 0	0 00	383,282 28	798,928 94

Company: Devon Energy, Inc.
Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 19 @ 3386 8usft (McVay 7)
MD Reference: KB = 19 @ 3386 8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
4,900 0	0 00	0 00	4,900 0	1,513.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,000 0	0 00	0 00	5,000 0	1,613.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,100 0	0 00	0 00	5,100 0	1,713.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,200 0	0 00	0 00	5,200.0	1,813.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,300 0	0 00	0 00	5,300 0	1,913.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,390 0	0 00	0 00	5,390 0	2,003.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
BELL CANYON										
5,400 0	0 00	0 00	5,400 0	2,013.2	0.0	0 0	0 0	0 00	383,282.28	798,928.94
5,500 0	0 00	0 00	5,500 0	2,113.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,600 0	0 00	0 00	5,600 0	2,213.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,700 0	0 00	0 00	5,700 0	2,313.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,800 0	0 00	0 00	5,800 0	2,413.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
5,900 0	0 00	0 00	5,900 0	2,513.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,000 0	0 00	0 00	6,000 0	2,613.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,100 0	0 00	0 00	6,100 0	2,713.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,200 0	0 00	0 00	6,200 0	2,813.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,300 0	0 00	0 00	6,300 0	2,913.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,392 0	0 00	0 00	6,392.0	3,005.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
CHERRY CANYON										
6,400 0	0 00	0 00	6,400 0	3,013.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,500 0	0 00	0 00	6,500 0	3,113.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,600 0	0 00	0 00	6,600 0	3,213.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,700.0	0 00	0 00	6,700 0	3,313.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,800 0	0 00	0 00	6,800 0	3,413.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
6,900 0	0 00	0 00	6,900 0	3,513.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
7,000 0	0 00	0 00	7,000 0	3,613.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94
7,100 0	0 00	0 00	7,100 0	3,713.2	0 0	0 0	0 0	0 00	383,282.28	798,928.94

Company: Devon Energy, Inc
 Project: Lea County (NAD83)
 Site: Ichabod "7" Fed
 Well: #4H
 Wellbore: OH
 Design: Plan #2

Local Co-ordinate Reference: Well #4H
 TVD Reference: KB = 19 @ 3386.8usft (McVay 7)
 MD Reference: KB = 19 @ 3386.8usft (McVay 7)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
7,200.0	0.00	0.00	7,200.0	3,813.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,300.0	0.00	0.00	7,300.0	3,913.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,400.0	0.00	0.00	7,400.0	4,013.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,500.0	0.00	0.00	7,500.0	4,113.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,600.0	0.00	0.00	7,600.0	4,213.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,700.0	0.00	0.00	7,700.0	4,313.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,800.0	0.00	0.00	7,800.0	4,413.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
7,900.0	0.00	0.00	7,900.0	4,513.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,000.0	0.00	0.00	8,000.0	4,613.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,035.0	0.00	0.00	8,035.0	4,648.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
BRUSHY CANYON										
8,100.0	0.00	0.00	8,100.0	4,713.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,200.0	0.00	0.00	8,200.0	4,813.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,300.0	0.00	0.00	8,300.0	4,913.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,400.0	0.00	0.00	8,400.0	5,013.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,500.0	0.00	0.00	8,500.0	5,113.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,600.0	0.00	0.00	8,600.0	5,213.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,700.0	0.00	0.00	8,700.0	5,313.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,800.0	0.00	0.00	8,800.0	5,413.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
8,900.0	0.00	0.00	8,900.0	5,513.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
9,000.0	0.00	0.00	9,000.0	5,613.2	0.0	0.0	0.0	0.00	383,282.28	798,928.94
9,067.4	0.00	0.00	9,067.4	5,680.6	0.0	0.0	0.0	0.00	383,282.28	798,928.94
9,100.0	3.26	353.33	9,100.0	5,713.2	0.9	-0.1	0.9	10.00	383,283.20	798,928.83
9,150.0	8.26	353.33	9,149.7	5,762.9	5.9	-0.7	5.9	10.00	383,288.18	798,928.25
9,200.0	13.26	353.33	9,198.8	5,812.0	15.2	-1.8	15.3	10.00	383,297.45	798,927.17
9,250.0	18.26	353.33	9,246.9	5,860.1	28.7	-3.4	28.9	10.00	383,310.94	798,925.59
9,300.0	23.26	353.33	9,293.7	5,906.9	46.3	-5.4	46.6	10.00	383,328.53	798,923.53

Company: Devon Energy, Inc
Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 19 @ 3386.8usft (McVay 7)
MD Reference: KB = 19 @ 3386.8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
9,350.0	28.26	353.33	9,338.7	5,951.9	67.8	-7.9	68.3	10.00	383,350.11	798,921.01
9,400.0	33.26	353.33	9,381.6	5,994.8	93.2	-10.9	93.9	10.00	383,375.50	798,918.04
9,450.0	38.26	353.33	9,422.2	6,035.4	122.2	-14.3	123.1	10.00	383,404.51	798,914.65
9,500.0	43.26	353.33	9,460.1	6,073.3	154.6	-18.1	155.7	10.00	383,436.93	798,910.86
9,550.0	48.26	353.33	9,494.9	6,108.1	190.2	-22.2	191.5	10.00	383,472.49	798,906.70
9,600.0	53.26	353.33	9,526.5	6,139.7	228.7	-26.7	230.2	10.00	383,510.95	798,902.20
9,650.0	58.26	353.33	9,554.7	6,167.9	269.7	-31.5	271.5	10.00	383,551.99	798,897.40
9,700.0	63.26	353.33	9,579.1	6,192.3	313.0	-36.6	315.2	10.00	383,595.31	798,892.34
9,750.0	68.26	353.33	9,599.6	6,212.8	358.3	-41.9	360.7	10.00	383,640.58	798,887.04
9,759.4	69.20	353.33	9,603.0	6,216.2	367.0	-42.9	369.5	10.00	383,649.24	798,886.03
AVALON/ TOP OF BONESPRING FM										
9,800.0	73.26	353.33	9,616.1	6,229.3	405.2	-47.4	407.9	10.00	383,687.45	798,881.56
9,850.0	78.26	353.33	9,628.4	6,241.6	453.3	-53.0	456.4	10.00	383,735.57	798,875.94
9,900.0	83.26	353.33	9,636.4	6,249.6	502.3	-58.7	505.7	10.00	383,784.57	798,870.21
9,950.0	88.26	353.33	9,640.1	6,253.3	551.8	-64.5	555.6	10.00	383,834.08	798,864.42
9,987.5	92.01	353.33	9,640.0	6,253.2	589.0	-68.9	593.0	10.00	383,871.28	798,860.07
10,000.0	92.01	353.33	9,639.6	6,252.8	601.4	-70.3	605.5	0.00	383,883.73	798,858.61
10,100.0	92.01	353.33	9,636.1	6,249.3	700.7	-81.9	705.5	0.00	383,982.99	798,847.01
10,200.0	92.01	353.33	9,632.6	6,245.8	800.0	-93.5	805.4	0.00	384,082.25	798,835.40
10,300.0	92.01	353.33	9,629.1	6,242.3	899.2	-105.1	905.4	0.00	384,181.52	798,823.79
10,400.0	92.01	353.33	9,625.6	6,238.8	998.5	-116.8	1,005.3	0.00	384,280.78	798,812.19
10,500.0	92.01	353.33	9,622.1	6,235.3	1,097.8	-128.4	1,105.2	0.00	384,380.04	798,800.58
10,600.0	92.01	353.33	9,618.6	6,231.8	1,197.0	-140.0	1,205.2	0.00	384,479.30	798,788.97
10,700.0	92.01	353.33	9,615.1	6,228.3	1,296.3	-151.6	1,305.1	0.00	384,578.57	798,777.37
10,800.0	92.01	353.33	9,611.6	6,224.8	1,395.5	-163.2	1,405.1	0.00	384,677.83	798,765.76
10,900.0	92.01	353.33	9,608.1	6,221.3	1,494.8	-174.8	1,505.0	0.00	384,777.09	798,754.15
11,000.0	92.01	353.33	9,604.6	6,217.8	1,594.1	-186.4	1,604.9	0.00	384,876.35	798,742.55

Company: Devon Energy, Inc
Project: Lea County (NAD83)
Site: Ichabod "7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 19 @ 3386.8usft (McVay 7)
MD Reference: KB = 19 @ 3386.8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,100.0	92.01	353.33	9,601.1	6,214.3	1,693.3	-198.0	1,704.9	0.00	384,975.62	798,730.94
11,200.0	92.01	353.33	9,597.6	6,210.8	1,792.6	-209.6	1,804.8	0.00	385,074.88	798,719.33
11,300.0	92.01	353.33	9,594.1	6,207.3	1,891.9	-221.2	1,904.7	0.00	385,174.14	798,707.73
11,400.0	92.01	353.33	9,590.6	6,203.8	1,991.1	-232.8	2,004.7	0.00	385,273.40	798,696.12
11,500.0	92.01	353.33	9,587.1	6,200.3	2,090.4	-244.4	2,104.6	0.00	385,372.66	798,684.51
11,600.0	92.01	353.33	9,583.6	6,196.8	2,189.6	-256.0	2,204.6	0.00	385,471.93	798,672.91
11,700.0	92.01	353.33	9,580.1	6,193.3	2,288.9	-267.6	2,304.5	0.00	385,571.19	798,661.30
11,800.0	92.01	353.33	9,576.6	6,189.8	2,388.2	-279.2	2,404.4	0.00	385,670.45	798,649.69
11,900.0	92.01	353.33	9,573.1	6,186.3	2,487.4	-290.9	2,504.4	0.00	385,769.71	798,638.09
12,000.0	92.01	353.33	9,569.6	6,182.8	2,586.7	-302.5	2,604.3	0.00	385,868.98	798,626.48
12,100.0	92.01	353.33	9,566.1	6,179.3	2,686.0	-314.1	2,704.3	0.00	385,968.24	798,614.87
12,200.0	92.01	353.33	9,562.6	6,175.8	2,785.2	-325.7	2,804.2	0.00	386,067.50	798,603.27
12,300.0	92.01	353.33	9,559.1	6,172.3	2,884.5	-337.3	2,904.1	0.00	386,166.76	798,591.66
12,400.0	92.01	353.33	9,555.6	6,168.8	2,983.7	-348.9	3,004.1	0.00	386,266.03	798,580.05
12,500.0	92.01	353.33	9,552.1	6,165.3	3,083.0	-360.5	3,104.0	0.00	386,365.29	798,568.45
12,600.0	92.01	353.33	9,548.6	6,161.8	3,182.3	-372.1	3,204.0	0.00	386,464.55	798,556.84
12,700.0	92.01	353.33	9,545.1	6,158.3	3,281.5	-383.7	3,303.9	0.00	386,563.81	798,545.23
12,800.0	92.01	353.33	9,541.6	6,154.8	3,380.8	-395.3	3,403.8	0.00	386,663.08	798,533.62
12,900.0	92.01	353.33	9,538.1	6,151.3	3,480.1	-406.9	3,503.8	0.00	386,762.34	798,522.02
13,000.0	92.01	353.33	9,534.6	6,147.8	3,579.3	-418.5	3,603.7	0.00	386,861.60	798,510.41
13,100.0	92.01	353.33	9,531.1	6,144.3	3,678.6	-430.1	3,703.6	0.00	386,960.86	798,498.80
13,200.0	92.01	353.33	9,527.6	6,140.8	3,777.8	-441.7	3,803.6	0.00	387,060.13	798,487.20
13,300.0	92.01	353.33	9,524.1	6,137.3	3,877.1	-453.3	3,903.5	0.00	387,159.39	798,475.59
13,400.0	92.01	353.33	9,520.6	6,133.8	3,976.4	-465.0	4,003.5	0.00	387,258.65	798,463.98
13,500.0	92.01	353.33	9,517.1	6,130.3	4,075.6	-476.6	4,103.4	0.00	387,357.91	798,452.38
13,600.0	92.01	353.33	9,513.6	6,126.8	4,174.9	-488.2	4,203.3	0.00	387,457.18	798,440.77
13,700.0	92.01	353.33	9,510.1	6,123.3	4,274.2	-499.8	4,303.3	0.00	387,556.44	798,429.16



Pathfinder
PathfinderX & Y Report

PATHFINDER
A Schlumberger Company

Company: Devon Energy, Inc.
Project: Lea County (NAD83)
Site: Ichabod-"7" Fed
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 19 @ 3386.8usft (McVay 7)
MD Reference: KB = 19 @ 3386.8usft (McVay 7)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V- Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,800 0	92 01	353 33	9,506 6	6,119 8	4,373 4	-511 4	4,403 2	0 00	387,655 70	798,417 56
13,900 0	92 01	353 33	9,503 1	6,116 3	4,472 7	-523 0	4,503 2	0 00	387,754 96	798,405 95
14,000 0	92 01	353 33	9,499 6	6,112 8	4,571 9	-534 6	4,603 1	0 00	387,854.23	798,394.34
14,100 0	92 01	353 33	9,496 1	6,109 3	4,671 2	-546 2	4,703 0	0 00	387,953 49	798,382 74
14,200 0	92 01	353 33	9,492 6	6,105 8	4,770 5	-557 8	4,803 0	0 00	388,052 75	798,371 13
14,273 1	92 01	353 33	9,490 0	6,103 2	4,843 1	-566 3	4,876 1	0 00	388,125 35	798,362 64

PBHL(ICHABOD #4H)

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,392 0	6,392 0	CHERRY CANYON		0 00	
20 0	20 0	QUATERNARY		0 00	
903 0	903.0	RUSTLER DOL		0 00	
8,035 0	8,035 0	BRUSHY CANYON		0 00	
5,390 0	5,390 0	BELL CANYON		0 00	
1,330 0	1,330 0	SALADO SALT		0 00	
9,759 4	9,603 0	AVALON/ TOP OF BONESPRING FM		0 00	

Checked By: _____ Approved By: _____ Date: _____

CONDITIONS OF APPROVAL

Original COA still applies with the following changes:

OPERATOR'S NAME:	Devon Energy Prod Co
LEASE NO.:	NM114990
WELL NAME & NO.:	4H Ichabod 7 Federal
SURFACE HOLE FOOTAGE:	108' FSL & 455' FEL
BOTTOM HOLE FOOTAGE:	330' FNL & 980' FEL
LOCATION:	Section 7, T.26 S., R.34 E., NMPM
COUNTY:	Lea County, New Mexico

A. DRILLING OPERATIONS REQUIREMENTS

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

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

☒ **Lea County**

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

1. **Hydrogen Sulfide has been reported as a hazard in formations deeper than the proposed depth. It is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide. If Hydrogen Sulfide is encountered, please report measurements 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 are located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#).

Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

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

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. **DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE.** Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possible lost circulation in the Delaware and Bone Spring.

Possible water and brine flows in the Salado, Castile, Delaware and Bone Spring.

1. The 13-3/8 inch surface casing shall be set at approximately **800 feet (below the Magenta Dolomite of the Rustler Anhydrite and above the salt)**. If salt is encountered, set casing at least 25 feet above the salt and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, **which is to be set in the Lamar or the base of the Castile at approximately 5250**, is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

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

a. First stage to DV tool, cement shall:

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

b. Second stage above DV tool, cement shall:

☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

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

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8"** intermediate casing shoe shall be **3000 (3M)** psi.

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) prior to initiating the test.
 - c. The results of the test shall be reported to the appropriate BLM office.
 - d. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
 - e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

D. DRILL STEM TEST

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

E. WASTE MATERIAL AND FLUIDS

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

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

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