Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:
1/22/19		SWD	pMAM1902255902

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: BOPCO, LP **OGRID Number:** 260737
Well Name: Big Eddy Unit 29 Federal SWD 001 **API:** 30-015-43253
Pool: Devonian; SWD (96101) **Pool Code:**

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
A. ☐ Offset operators or lease holders
B. ☐ Royalty, overriding royalty owners, revenue owners
C. ☒ Application requires published notice
D. ☐ Notification and/or concurrent approval by SLO
E. ☒ Notification and/or concurrent approval by BLM
F. ☒ Surface owner
G. ☒ For all of the above, proof of notification or publication is attached, and/or,
H. ☐ No notice required

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Tracie J. Cherry, Regulatory Coordinator
Print or Type Name

Signature

01/18/19
Date

432-571-8220
Phone Number

tracie_cherry@xtoenergy.com
e-mail Address

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance XX Disposal _____Storage
Application qualifies for administrative approval? XX Yes _____No

II. OPERATOR: BOPCO, LP

ADDRESS: 6401 Holiday Hill Rd. Bldg 5, Midland, TX 79707

CONTACT PARTY: Tracie J. Cherry, Regulatory Coordinator PHONE: 432-221-7379

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes XX No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Tracie J. Cherry TITLE: Regulatory Coordinator

SIGNATURE: Tracie J. Cherry DATE: 01/18/19

E-MAIL ADDRESS: tracie_cherry@xtoenergy.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

C-108 DATA

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well.
Map attached.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each wells type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
There are no wells penetrating the injection zone within the 1/2 mile area of review

> Modify order to reflect this AOR

VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected:
15,000 average, 20,000 maximum BWPD
2. Whether the system is open or closed: **closed**
3. Proposed average and maximum injection pressure: **2,000 psi average, 2,808 psi maximum**
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water:

Well will be part of a multi-well SWD system taking Permian waters. The majority of the produced water will come from Delaware, Bone Spring and Wolfcamp formations with minor amouts from Atoka and Morrow. An analysis of water representitative of that to be disposed, taken from an existing SWD, is attached.

5. If injection is for disposal purposes into a zone not productive of oil & gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water:
N/A

VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with TDS of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval:

Lithologic Detail:	**Carbonate (Ls./Dol.)**
Geological Name:	**Devonian, Silurian & Fusselman**
Thickness:	**Est. 850'**
Depth:	**14,022'-14,872'**

The Capitan Reef is a known drinking water aquifer that is not present in this area based on published maps. South of Reef by 4.3 miles NA

The Dewey Lake Red Beds, which consist of alluvial siltstones, shales and sandstones, are present at the surface to the top of the Rustler Anhydrite. The toso of the Ruster Anhydrite is estimated to be at 203 feet below the surface in the proposd BEU 29 Federal SWD well. These Dewey Lake Red Beds may contain fresh water throughout the geographic area, but is not likely of drinking water quality.

No sources of fresh water are known to exist below the proposed disposal zone.

We do not anticipate the Devonian to be oil bearing in this area. Two deep tests, bracketing the proposed application (BEU 29 FED 1 SWD) and within a two mile radius, found the Devonian to be wet. The 1957 vintage Shell BEU No. 1 (Sec 36-T21S-R28E) drilled 300' of Devonian section; drill stem tested water and had no oil show. The 1953 vintage Richardson and Bass: Fidel Federal No. 1 (Sec 27-T21S-R29E) drilled 170' of Devonian' drill stem tested sulfur water and had no oil show. Structurally, the proposed BEU 29 FED 1 SWD lies between these two locations characterized by monoclonal dip to the SE, no closure exists in which hydrocarbons would be trapped. The Devonian was chosen as a disposal interval due to the storage capacity of the dolomites associated with the formation.

IX. Describe the proposed stimulation program, if any:
Acid stimulate with approximately 5000 gallons of 15% NEFE HCL acid.

X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted.)
Logs will be submitted with completion paperwork when well is drilled.

XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
As search of the New Mexico Office of State Engineer water rights database show no water wells or points of diversion with 1 one mile radius of the subject well

XII. Applicants for disposal wells must make an affimative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydology connection between the disposal zone and any underground sources of drinking water.
(See attached affidavit)

BEU 29 Fed 1 SWD

Proposed SWD Schematic (Jan 9, 2019)

County: Lea
SHL: 980' FSL, 450' FWL
Sec 29, T 21S, R 29E

BHL: 980' FSL, 450' FWL
Sec 29, T 21S, R 29E

XTO ENERGY

AFE # 1702848
XTO ID # N/A

API # N/A
Elevation GL 3301.6', KB 3331.6' (30' AGL)
Rig: TBD (RKB 30')

Geology	Casing & Cement	Wellhead	Hole Size	General Notes
TVD Formation		(Tech Data Sheet)		
			24"	
203' Top Fresh Water	*Tail (100% OH excess)* 850 sx 14.8ppg Class C Top of Tail @ 0'			
	18-5/8" 87.5# J-55 BTC	390' MD		
			17-1/2"	
568' Top Salt	*Lead (150% OH excess)* 1875 sx 12.8ppg Poz/C Top of Lead @ 0			
	Tail (100% OH excess) 685 sx 14.8ppg Class C Top of Tail @ 2230'			
2,705' Base Salt	13-3/8" 68# HCL-80 BTC	2830' MD		
			12-1/4"	
2,952' Delaware	*Lead (100% OH excess)* 1755 sx 11.5ppg Poz/H Top of Lead @ 2230'		5-1/2" , 17# HCP-110 BTC(0-9,300')	
			Crossover @ 9,300'	
6,665' Bone Spring	*Tail (100% OH excess)* 400 sx 14.8ppg Poz/H Top of Tail @ 9530'	9830' MD	4-1/2" 13.5# HCP-110 BTC (9,300'-13,940)'	
9,980' Wolfcamp				
10,169' Wolfcamp Carbonate	9-5/8" 53.5# P-110 BTC	10230' MD		
			8-1/2"	
11,461' Strawn 11,699' Atoka 12,186' Morrow	*Tail (40% OH excess)* 620 sx 14.5ppg Poz/H Top of Tail @ 9830'			
13,416' Mississippian Lm 13,888' Woodford 14,022' Devonian	7" 32# P-110 BTC	14040' MD	Baker Signature Series permanent packer 13,940'	
			6"	
14,238' Fusselman 14,860' TVD at BHL 14,872' Montoya	Open hole completion	14,860' MD 14,860' TVD		

Approvals

Prepared by: _____

Peer Reviewed by: _____
Date

Reviewed by: _____

Approved by: _____

NALCO Champion
An Ecolab Company

Complete Water Analysis Report

Customer: **XTO ENERGY INC**
Region: **Carlsbad, NM**
Location: **James Ranch Unit 29 Federal Lease**
System: **Production System**

Equipment: **SWD**
Sample Point: **Inlet**
Sample ID: **AL07042**
Acct Rep Email: **Anthony.Baeza@ecolab.com**

Collection Date: **06/12/2018**
Receive Date: **06/21/2018**
Report Date: **06/25/2018**
Location Code: **373826**

Field Analysis

Bicarbonate	12 mg/L	Dissolved CO2	350 mg/L	Dissolved H2S	9 mg/L
Pressure Surface	20 psi	Temperature	98 ° F	pH of Water	6.1
Oil per Day	0 B/D	Gas per Day	0 Mcf/D	Water per Day	6500 B/D

Sample Analysis

Calculated Gaseous CO2	0.12 %	Calculated pH	6.10	Conductivity (Calculated)	437728 µS - cm3
Ionic Strength	5.82	Resistivity	0.023 ohms - m	Specific Gravity	1.200
Total Dissolved Solids	260169.9 mg/L				

Cations

Iron	15.7 mg/L	Manganese	8.03 mg/L	Barium	3.97 mg/L
Strontium	1480 mg/L	Calcium	27900 mg/L	Magnesium	4440 mg/L
Sodium	71900.00 mg/L	Potassium	1800 mg/L	Boron	28.7 mg/L
Lithium	10.8 mg/L	Copper	0.01 mg/L	Nickel	0.055 mg/L
Zinc	0.138 mg/L	Lead	0.033 mg/L	Cobalt	0.053 mg/L
Chromium	0.003 mg/L	Silicon	3.02 mg/L	Aluminum	Not Detected mg/L
Molybdenum	0.023 mg/L	Phosphorus	Not Detected mg/L		

Anions

Bromide	1832.85 mg/L	Chloride	174225 mg/L	Sulfate	184.663 mg/L

PTB Value

	Barite PTB	Calcite PTB	Celestite PTB	Gypsum PTB	Halite PTB	Iron Carbonate PTB	Iron Sulfide PTB
50°	2.13	0.13	89.54	31.55	0.00	0.00	2.08
75°	1.79	0.00	70.73	0.00	0.00	0.00	1.75
100°	1.19	0.00	54.88	0.00	0.00	0.00	1.42
125°	0.28	0.00	43.34	0.00	0.00	0.00	1.11
150°	0.00	0.00	35.91	0.00	0.00	0.00	0.86
175°	0.00	0.00	31.61	0.00	0.00	0.00	0.66
200°	0.00	0.00	29.33	0.00	0.00	0.00	0.53
225°	0.00	0.00	28.19	0.00	0.00	0.00	0.45
250°	0.00	0.00	27.59	0.00	0.00	0.00	0.41
275°	0.00	0.00	27.18	0.00	0.00	0.00	0.41
300°	0.00	0.00	26.83	0.00	0.00	0.00	0.43
325°	0.00	0.00	26.54	0.00	0.00	0.00	0.46
350°	0.00	0.00	26.37	0.00	0.00	0.00	0.48
375°	0.00	0.00	26.26	0.00	0.00	0.00	0.47
400°	0.00	0.00	25.92	0.00	0.00	0.00	1.14

Saturation Index

	Barite SI	Calcite SI	Celestite SI	Gypsum SI	Halite SI	Iron Carbonate SI	Iron Sulfide SI
50°	1.01	0.05	0.60	0.14	-0.26	-1.89	1.55
75°	0.62	-0.14	0.40	-0.03	-0.29	-1.96	1.16
100°	0.31	-0.30	0.28	-0.13	-0.31	-2.03	0.85
125°	0.06	-0.44	0.20	-0.19	-0.33	-2.09	0.62
150°	-0.15	-0.55	0.16	-0.24	-0.35	-2.14	0.45
175°	-0.33	-0.64	0.14	-0.29	-0.37	-2.18	0.34
200°	-0.48	-0.70	0.14	-0.35	-0.39	-2.22	0.26
225°	-0.61	-0.75	0.12	-0.41	-0.41	-2.26	0.22
250°	-0.72	-0.78	0.12	-0.48	-0.43	-2.30	0.20
275°	-0.83	-0.80	0.12	-0.55	-0.45	-2.35	0.20
300°	-0.93	-0.81	0.12	-0.60	-0.47	-2.40	0.20
325°	-1.04	-0.82	0.12	-0.63	-0.49	-2.47	0.21
350°	-1.14	-0.83	0.11	-0.60	-0.51	-2.56	0.22
375°	-1.25	-0.86	0.11	-0.51	-0.52	-2.67	0.21
400°	-1.37	0.00	0.11	-0.33	-0.53	0.00	0.48

Scaling predictions calculated using Scale Soft Pitzer 2017
Scaling predictions dependent on provided field data. Incomplete/partial field data may impact results generated by scaling software.

NALCO Champion
An Ecolab Company

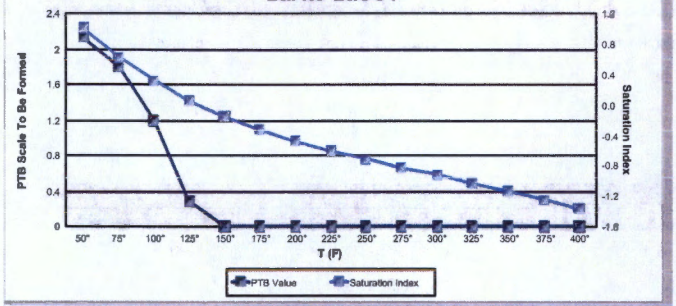
Complete Water Analysis Report

Customer: **XTO ENERGY INC**
Region: **Carlsbad, NM**
Location: **James Ranch Unit 29 Federal Lease**
System: **Production System**

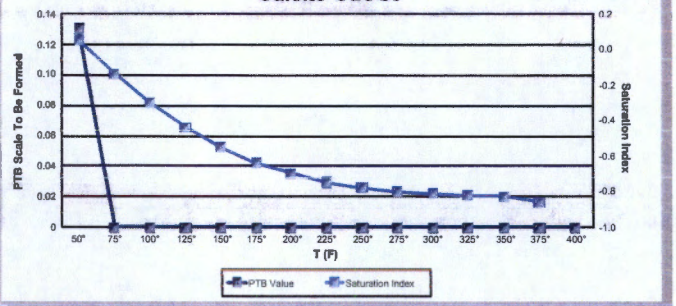
Equipment: **SWD**
Sample Point: **Inlet**
Sample ID: **AL07042**
Acct Rep Email: **Anthony.Baeza@ecolab.com**

Collection Date: **06/12/2018**
Receive Date: **06/21/2018**
Report Date: **06/25/2018**
Location Code: **373826**

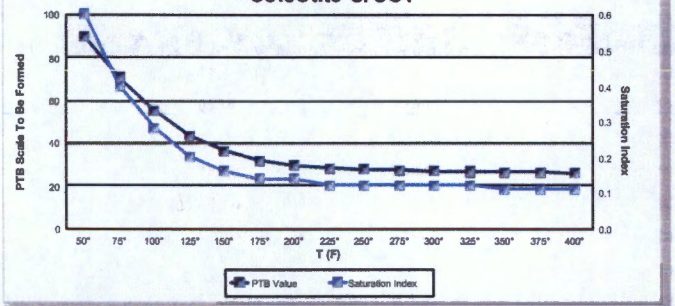
Barite BaSO4



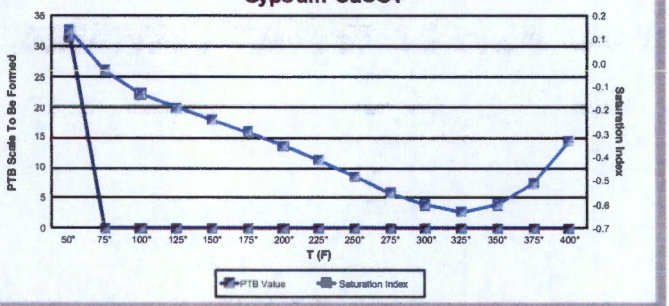
Calcite CaCO3



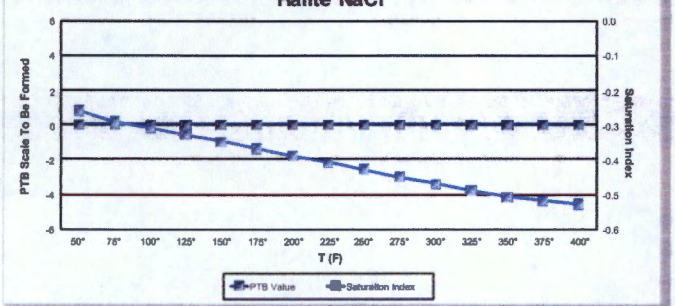
Celestite SrSO4



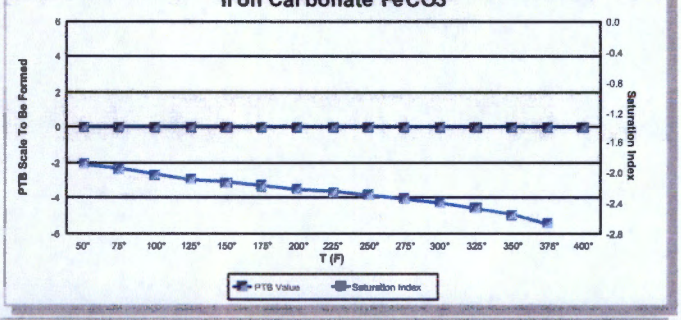
Gypsum CaSO4



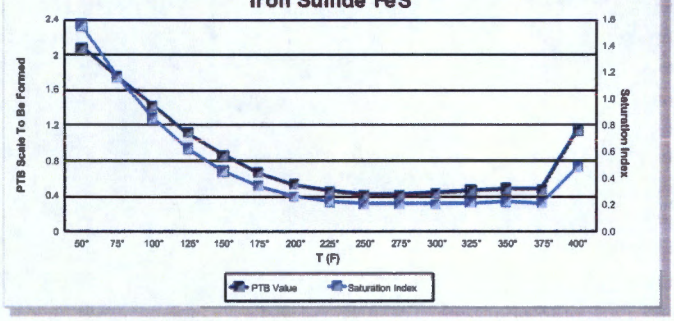
Halite NaCl



Iron Carbonate FeCO3



Iron Sulfide FeS



Comments

Scaling predictions calculated using Scale Soft Pitzer 2017
Scaling predictions dependent on provided field data. Incomplete/partial field data may impact results generated by scaling software.

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

No PODs found.

PLSS Search:

Section(s): 29, 30, 31, 32 **Township:** 21S **Range:** 29E

C-108 Application for Authorization to Inject

XTO Energy

Big Eddy Unit 29 1 SWD

Big Eddy Unit, 29-T21S-R29E

Eddy County, New Mexico

Available engineering and geological data have been examined and no evidence of open faults of hydrologic connection between the disposal zone and any underground sources of drinking water has been found

Michael T. Williams

1/16/18

Michael T. Williams **Date**

Geologist

XTO Energy

III. Well Data

A. 1) Lease name: **Big Eddy Unit 29 Federal SWD**
Well #: **1** **API # 30-015-43253**
Section: **29**
Township: **21S**
Range: **29E**
Footage: **980 FSL & 450 FWL**

2) Casing Info:

Casing size	Set depth	Sacks cmt	Hole size	TOC	Method
18-5/8" 87.5# J-55 BTC	390	850 'C'	24"	Surf	Circ
13-3/8" 68# HCL-80 BTC	2,830	1875 Poz/C 685 'C'	17-1/2"	Surf	Circ
9-5/8" 53.5# P-110 LTC	10,230	2155 Poz/H	12-1/4"	2330'	CBL
7" 32# P-110 BTC	14,040	620 Poz/H	8-1/2"	9930'	Circ

3) Tubing to be used (size, lining material, setting depth):
Tapered string
5-1/2" , 17# HCP-110 (0-9300')
4-1/2" 13.5# HCP-110 BTC (9300'-13940)'

4) Name, model, and depth of packer to be used:
Baker Signature Series nickle plated permanent packer @ 13,940'

B. 1) Name of the injection formation and, if applicable, the field or pool name:
SWD; Devonian

2) The injection interval and whether it is perforated or open hole:
Open hole; 14,040' - 14,860' (or to base of the Fusselman as determined by mud logs)

3) State if the well was drilled for injection or, if not, the original purpose of the well:
This well is being drilled for the purpose of injection

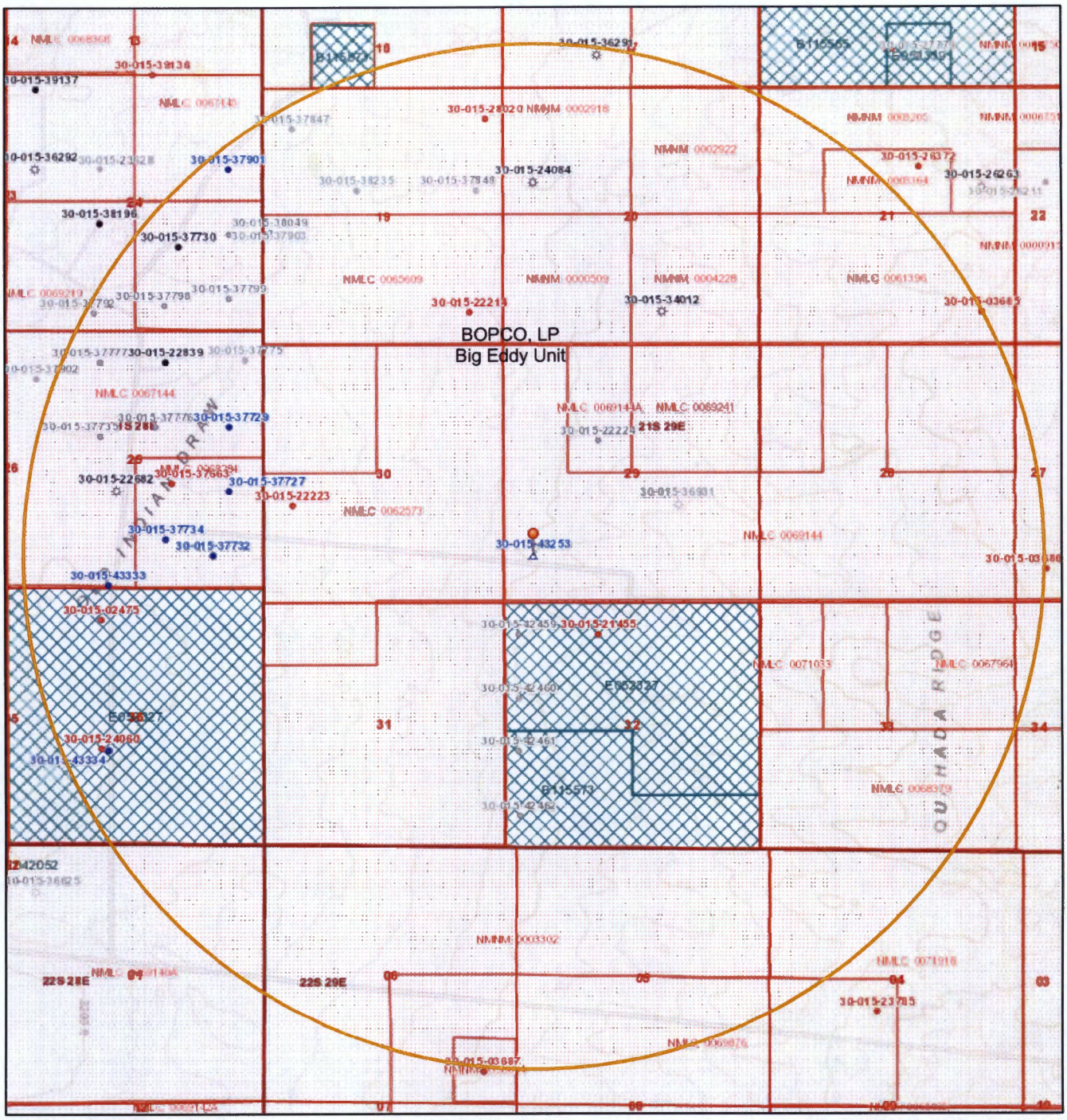
4) Give the depths of any other perforated intervals and detail on the sacks of cement or BPs used to seal off such perforations:
N/A

5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any:

Higher: Cherry Canyon (3954'), Brushy Canyon (5380'), Avalon/Bone Spring (6757'), Atoka (11,699'), Morrow (12,186'). Depths based on offset logs

Lower: None

Big Eddy Unit 29 Fed SWD 2 mile AOR



1/9/2019 9:15:40 AM

1:28,500

0 0.28 0.55 1.1 mi

0 0.45 0.9 1.8 km

Well Locations - Large Scale

- Miscellaneous
- CO2 Active
- CO2 Cancelled
- CO2 New
- CO2, Plugged
- CO2, Temporarily Abandoned
- Gas Active
- Gas, Cancelled, Never Drilled
- Gas, New
- Gas, Plugged
- Gas, Temporarily Abandoned
- Injection, Active
- Injection, Cancelled
- Injection, New
- Injection, Plugged
- Injection, Temporarily Abandoned
- Oil, Active
- Oil, Cancelled
- Oil, New
- Oil, Plugged
- Oil, Temporarily Abondoned
- Salt Water Injection, Active
- Salt Water Injection, Cancelled
- Salt Water Injection, New
- Salt Water Injection, Plugged
- Salt Water InjectionTemporarily Abandoned
- Water, Active
- Water, Cancelled
- Water, New
- Water, Plugged
- Water, Temporarily Abandoned

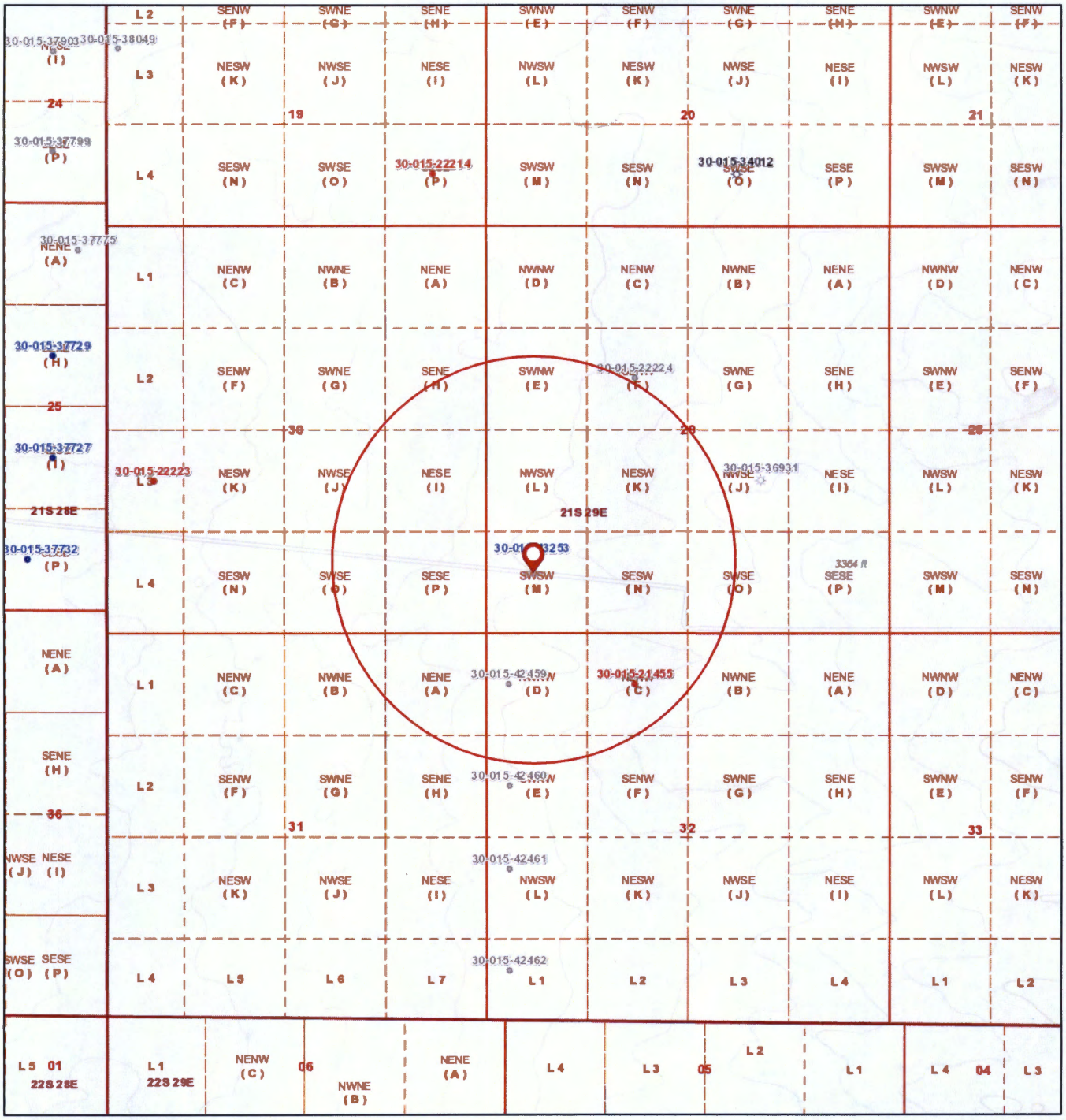
Well Locations - Small Scale

- Active
- New
- Plugged
- Cancelled
- Temporarily Abandoned
- PLSS First Division
- PLSS Second Division
- PLSS Townships

New Mexico Oil Conservation Division

NM OCD Oil and Gas Map. http://nm-emnrd.maps.arcgis.com/apps/webappviewer/: New Mexico Oil Conservation Division

Big Eddy Unit 29 SWD 1/2 Mile AOR



1/16/2019 10:47:03 AM

1:18,056

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

Well Locations - Small Scale
- Active
- New
- Plugged
- Cancelled
- Temporarily Abandoned

Well Locations - Large Scale
- Miscellaneous
- CO2 Active
- CO2 Cancelled
- CO2 New
- CO2, Plugged
- CO2, Temporarily Abandoned
- Gas Active
- Gas, Cancelled, Never Drilled
- Gas, New
- Gas, Plugged
- Gas, Temporarily Abandoned
- Injection, Active
- Injection, Cancelled
- Injection, New
- Injection, Plugged
- Injection, Temporarily Abandoned
- Oil, Active
- Oil, Cancelled
- Oil, New
- Oil, Plugged
- Oil, Temporarily Abondoned
- Salt Water Injection, Active
- Salt Water Injection, Cancelled
- Salt Water Injection, New
- Salt Water Injection, Plugged
- Salt Water InjectionTemporarily Abandoned
- Water, Active
- Water, Cancelled
- Water, New
- Water, Plugged
- Water, Temporarily Abandoned
- OCD Districts
- OCD District Offices

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User

New Mexico Oil Conservation Division

NM OCD Oil and Gas Map. http://nm-emnrd.maps.arcgis.com/apps/webappviewer/: New Mexico Oil Conservation Division

CERTIFIED MAILING LIST

BOPCO, LP

Big Eddy Unit 29 Federal SWD 001

Certified #7018 2290 0001 1289 2602

Bureau of Land Management

620 E. Greene Street

Carlsbad, NM 88220-6292

I, Tracie J Cherry, do hereby certify the surface owner for the well(s) shown were furnished a copy of BOPCO, LP's application for salt water disposal, via certified mail.

Signed: Tracie J. Cherry

Title: Regulatory Coordinator

Date: 01/18/19

CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001274643

Tracie J Cherry
XTO ENERGY
6401 HOLIDAY HILL RD. BLDG 5

MIDLAND TX 79707

I, a legal clerk of the **Carlsbad Current-Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

01/18/19

Legal Clerk

Subscribed and sworn before me this
18th of January 2019.

State of WI, County of Brown
NOTARY PUBLIC

9-19-21
My Commission Expires

VICKY FELTY
NOTARY
PUBLIC
STATE OF WISCONSIN

Ad#:0001274643
P O : 0001274643
# of Affidavits :0.00

NOTICE OF APPLICATION FOR WATER DISPOSAL WELL PERMIT

BOPCO, L.P. has applied to the New Mexico Oil Conservation Division for a permit to dispose of produced water into a porous formation not productive of oil or gas.

The applicant proposes to dispose of produced water into the **Big Eddy Unit 29 Federal SWD #1** (Siluro-Devonian and Fusselman Formations). The maximum injection pressure will be 2,808 psi and the maximum rate will be 20,000 bbls. produced water per day. The proposed disposal well is located approximately 5-1/2 miles South of Halfway, New Mexico in Section 29, T21S, R29E, 980' FSL & 450' FWL, Eddy County, New Mexico. The produced water will be disposed at a subsurface depth of 14,040'-14,860'.

Any questions concerning this application should be directed to Tracie J Cherry, Regulatory Coordinator, BOPCO, L.P, 6401 Holiday Hill Rd, Bldg 5, Midland, Texas 79707, (432) 221-7379.

Interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, New Mexico 87505 within 15 days.

Pub: January 18, 2019 #1274643

XTO ENERGY

Statements Regarding Seismicity

XTO has performed a seismicity risk assessment associated with the proposed Big Eddy Unit 29 Federal 1 SWD Well by investigating historic seismicity, the presence of deep faulting, orientation of faults relative to the current stress regime and the potential for pore pressure build up that might cause a fault to slip. The analysis was done utilizing Stanford's Fault Slip Potential Tool (FSP; Walsh et al. 2017). To accommodate the tool's analytics, a simplified spatial relationship between the proposed well and possible fault was established.

As part of our risk assessment we also consider mitigation options to address inherent uncertainties associated with the evaluation of possible seismicity. XTO has developed and will implement, as a precautionary measure, a seismicity monitoring plan to address the inherent uncertainty in the subsurface characterization, future rates of disposal and reservoir response.

A summary of the evaluation and seismicity monitoring plan follows:

Historic Seismicity

There are no seismic events reported on the USGS earthquake websiste within 6 miles of the proposed well. Additionally, the Texas Bureau of Economic Geology's TexNet website shows no recent earthquakes in Texas within ~25 miles of the New Mexico border in the Delaware Basin (Figure 1).

Deep Faulting

Utilizing licensed 3D seismic data in the area of the proposed SWD well, XTO has interpreted a fault and/or linear feature with an azimuth of 37 degrees from north with a dip of approximately 90 degrees. Additionally, there are several seismic discontinuities that are interpreted as karst features in the Devonian section that do not appear to have significant lateral continuity.

Stress Regime

Utilizing data and analysis from Snee and Zoback, 'State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity' (Feb 2018, The Leading Edge) the region of the well is primarily a normal faulting regime and sits at the boundary of two different stress directions in Snee's paper. Accordingly, we analyzed the fault using both. One set of analysis was done using a maximum horizontal stress oriented at 38 degrees from north and a second oriented at 75 degrees from north.

Geomechanical Modeling

A simple screening level geometric / geomechanical assessment of the possible fault was performed utilizing the FSP tool. The model was run using the Aphi option which makes a simplifying and conservative assumption that faults are critically stressed and thus close to failure. Additionally, given the uncertainties in the geophysical interpretation and stress information, a probabilistic scenario was run varying fault and stress characteristics. The results of the model runs are shown in Figure 2a and 2b.

Pore Pressure Modeling

A screening level investigation of possible pore pressure increases due to the proposed SWD well was performed utilizing the FSP tool and a range of reservoir parameters. For this screening level

analysis a 'high-side' model was run assuming disposal of 35,000 BWPD beginning in 2019 and continuing at that rate until 2040. Sensitivities were performed by varying several reservoir parameters. Results of the model and the screening level inputs are shown in Figure 3a and 3b.

Integration of Geomechanical and Pore Pressure Modeling

Integration of the geomechanical and hydrological elements of the assessment was performed using the FSP Integrated module and are shown in Figure 4a and 4b. Note the y-axis in the lower right hand colored graph in Figure 4a and 4b is labeled 'Fault Slip Potential'. This a labeling convention within the tool but overstates the efficacy of the analysis. The FSP output should not be taken as calculating a reliable probability of a fault slipping but rather a screening method for assessing the relative potential of faults to slip.

Uncertainty

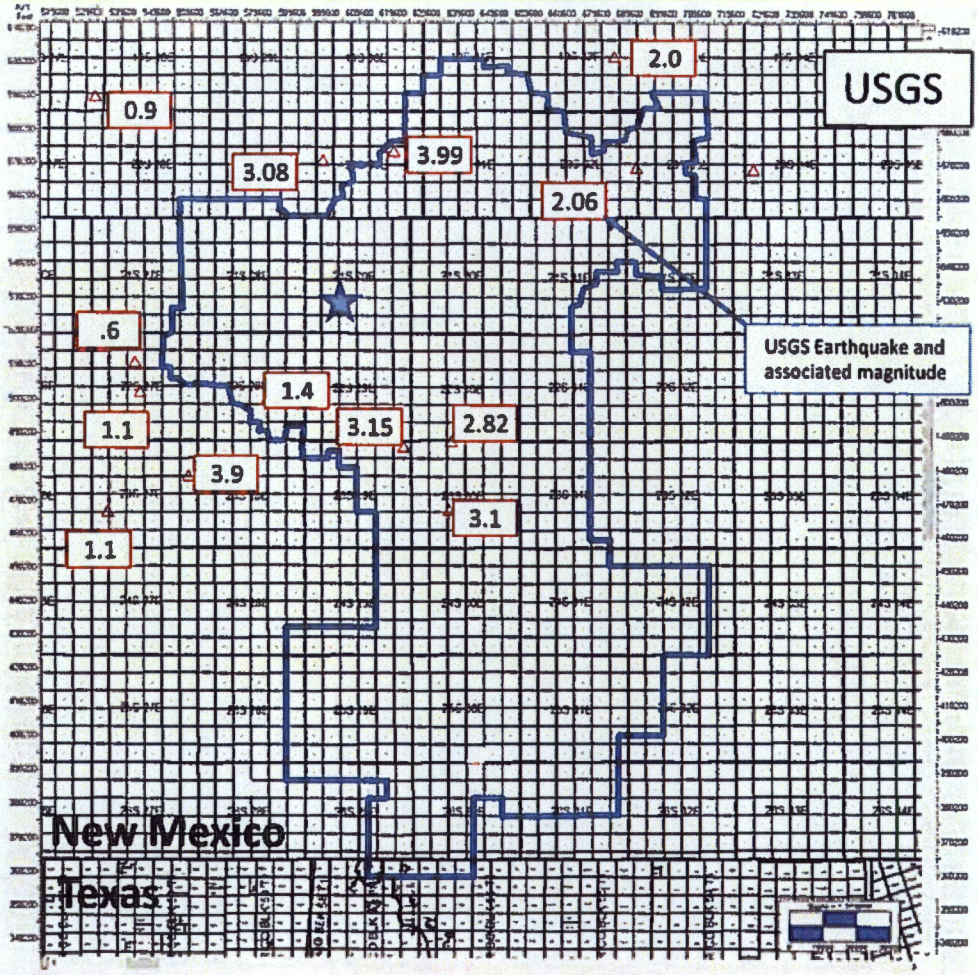
The analysis presented is a screening level approach that encompasses a range of uncertainties in several components that are difficult to individually constrain due to the limited static and dynamic data available for deep disposal wells. Accordingly, the analysis was done by varying key inputs to understand the relative importance of each and guide the focus of future data collection efforts.

Monitoring Plan

To manage the inherent uncertainty, XTO has contracted with a third party to provide seismicity monitoring using public seismometers augmented by a private array in the area of the proposed well. This will allow for a better determination of baseline seismicity as well as early detection should there be anomalous events. Additionally, XTO will determine the original pore pressure of the disposal interval prior to initiating operations. Upon request, XTO will share the results of this work with the EMNRD's UIC staff.

Tim Tyrrell
XTO Geoscience Technical Manager

Big Eddy Unit 29 Federal 1 SWD Well
Historic Seismicity



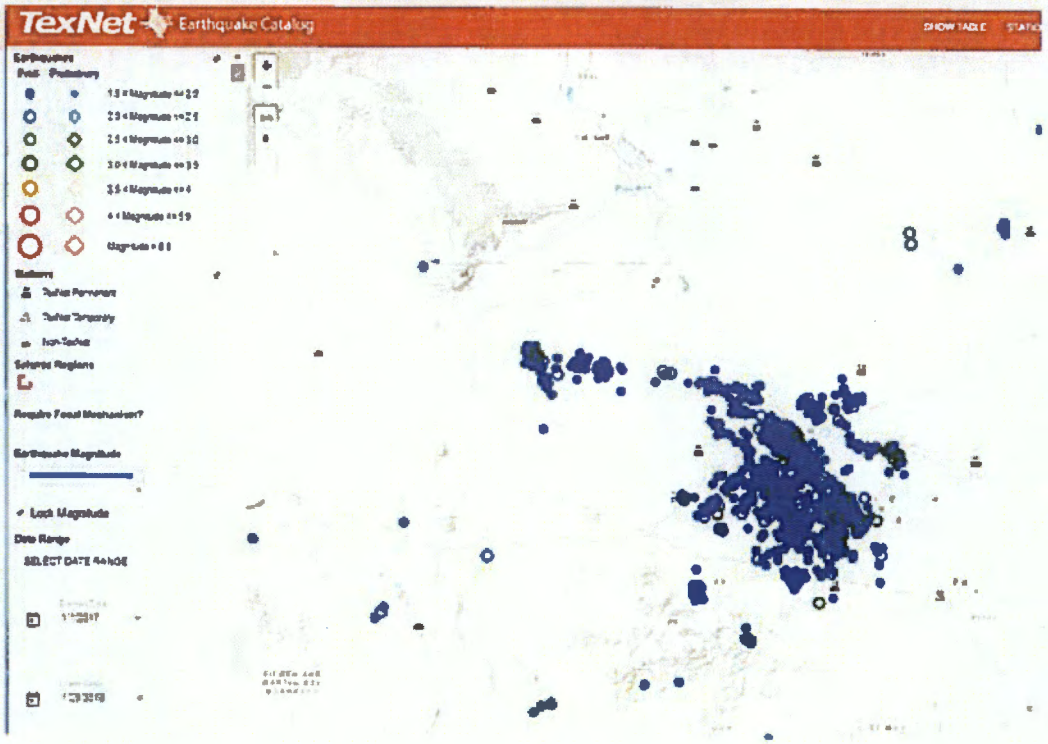
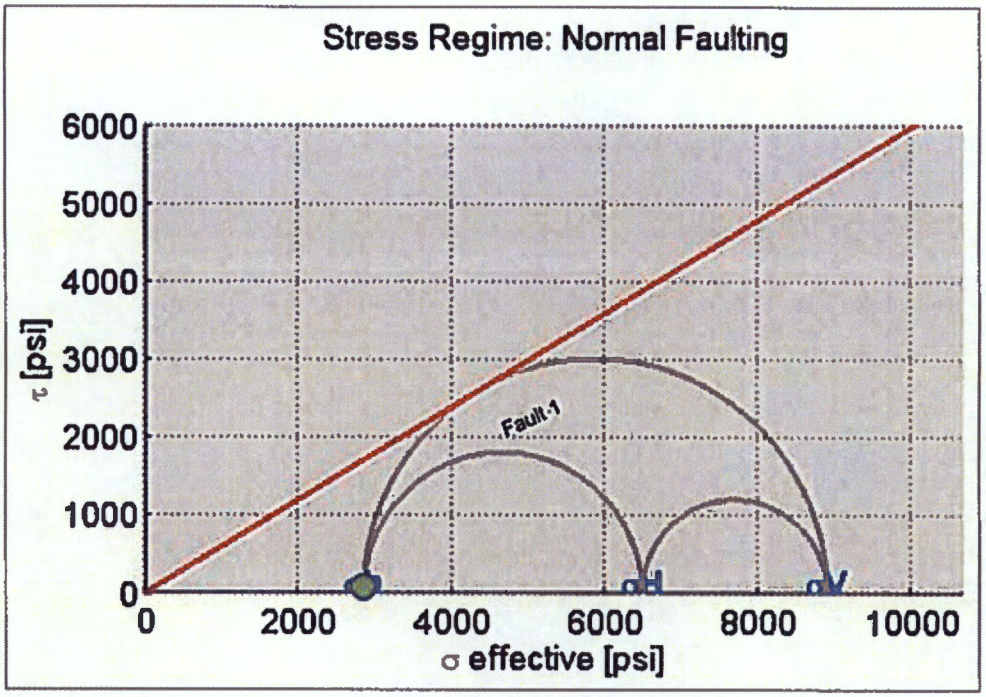
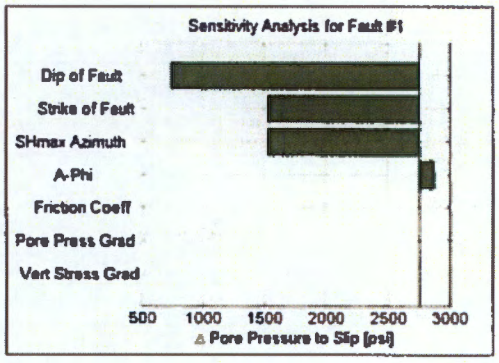


Figure 1

Big Eddy Unit 29 Federal 1 SWD Well
Geomechanical Analysis – Shmax 38 degrees





Uncertainty Ranges

Strike Angles [37 degrees]	15
Dip Angles [70 degrees]	15
Max Horiz. Stress Dir [38 degrees]	15
Friction Coeff Mu [0.6]	0
A Phi Parameter [0.6]	0.5

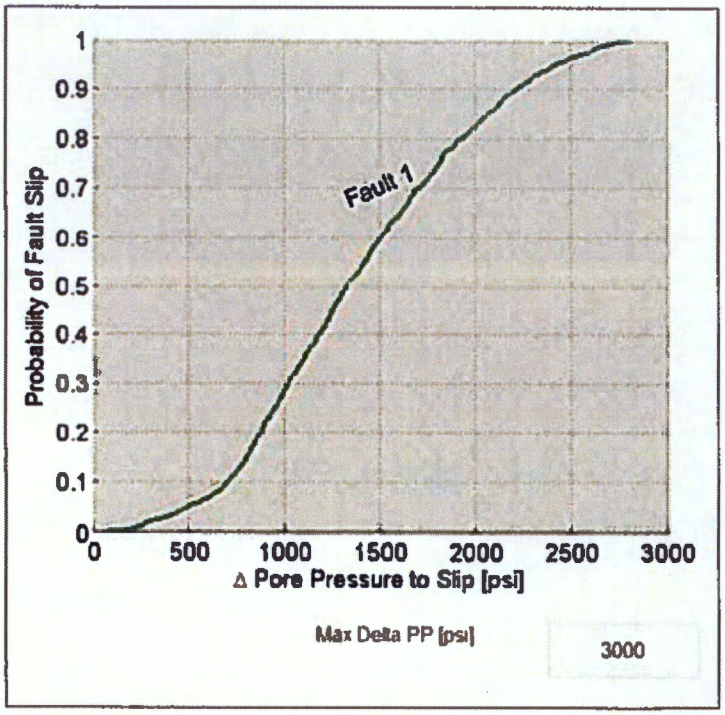
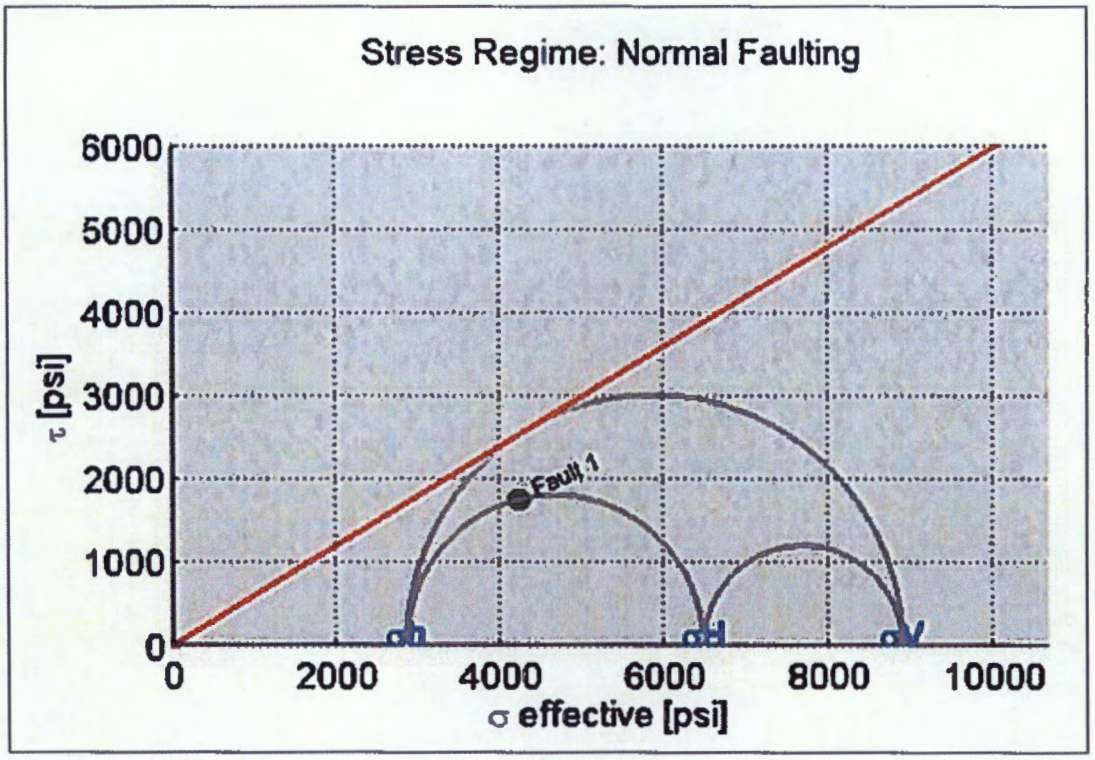
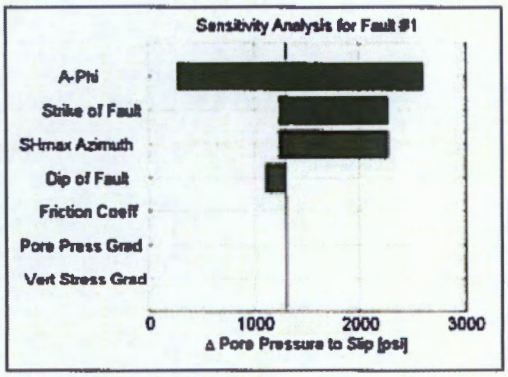


Figure 2a

Big Eddy Unit 29 Federal 1 SWD Well
Geomechanical Analysis – Shmax 75degrees





Uncertainty Ranges

Strike Angles [37 degrees]	15
Dip Angles [70 degrees]	15
Max Horiz. Stress Dir [38 degrees]	15
Friction Coeff Mu [0.6]	0
A Phi Parameter [0.6]	0.5

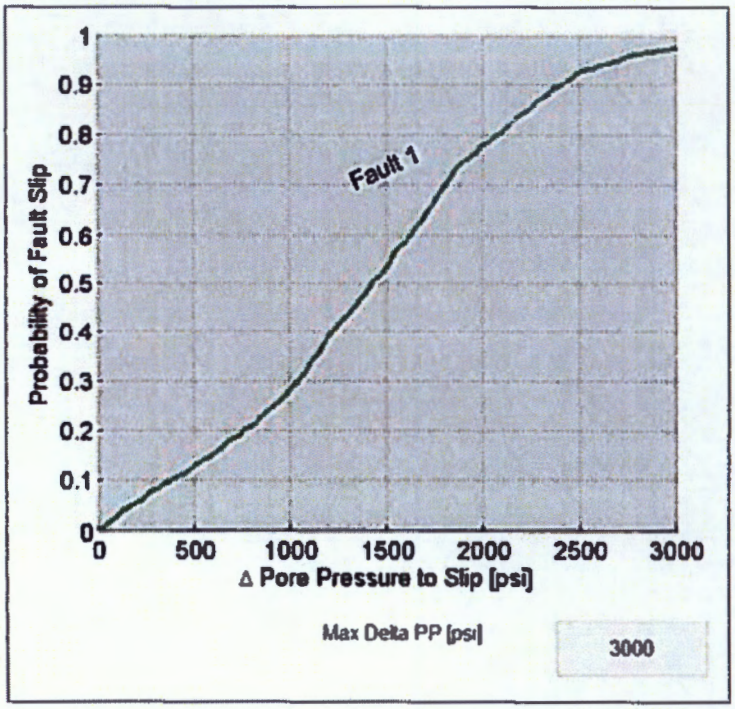
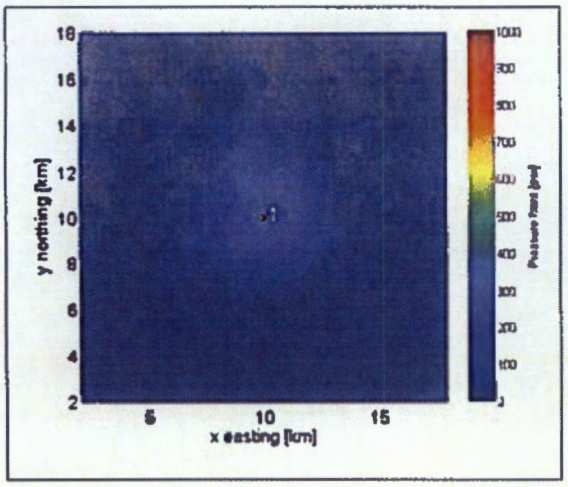
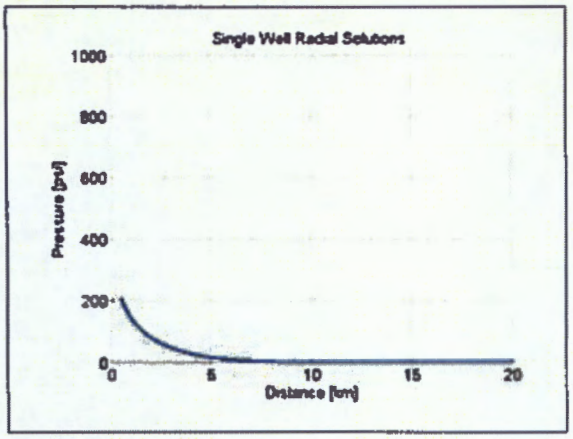


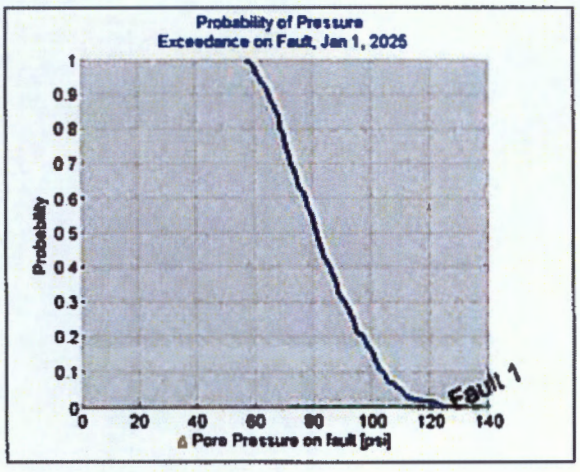
Figure 2b

Big Eddy Unit 29 Federal 1 SWD Well
Pore Pressure Analysis – Shmax 38 degrees

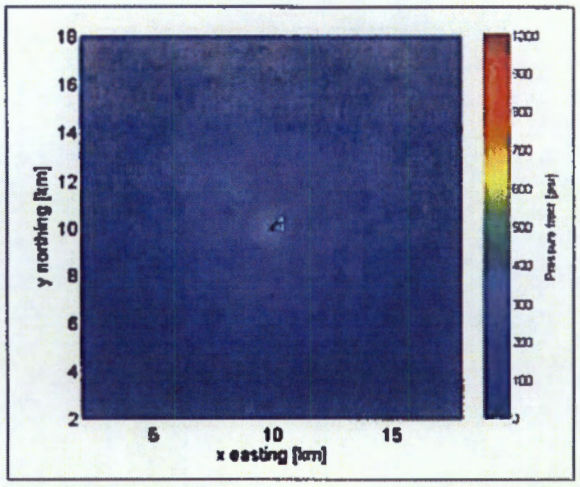
2025 Snapshot

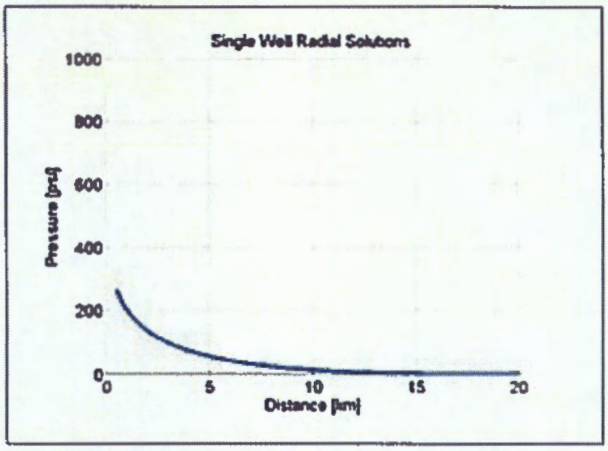


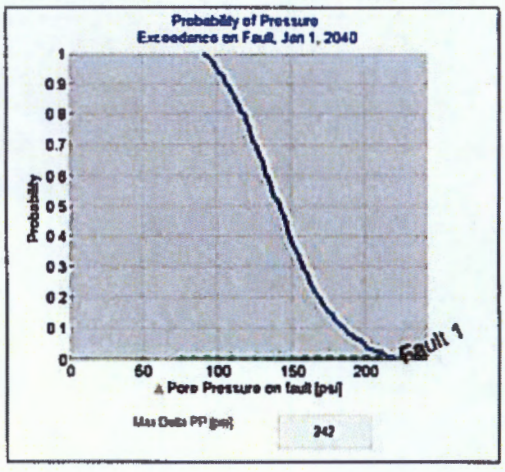




2040 Snapshot







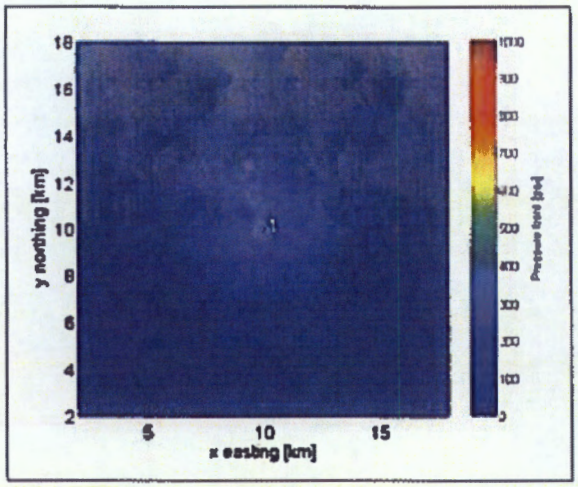
Uncertainty Ranges

Aquifer Thickness [1600 ft]	350
Porosity [10 %]	3
Perm [40 mD]	15

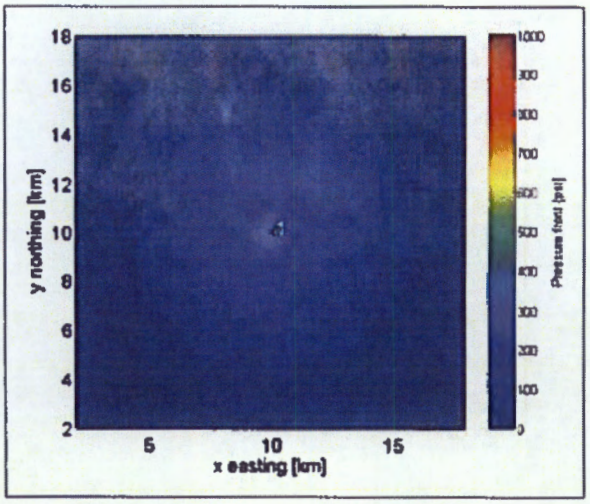
Figure 3a

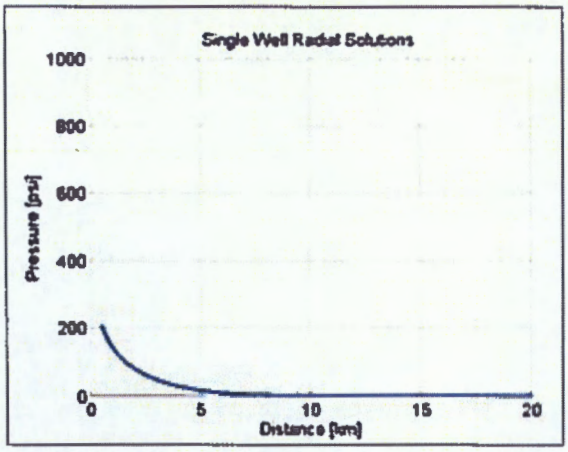
Big Eddy Unit 29 Federal 1 SWD Well
Pore Pressure Analysis – Shmax 75 degrees

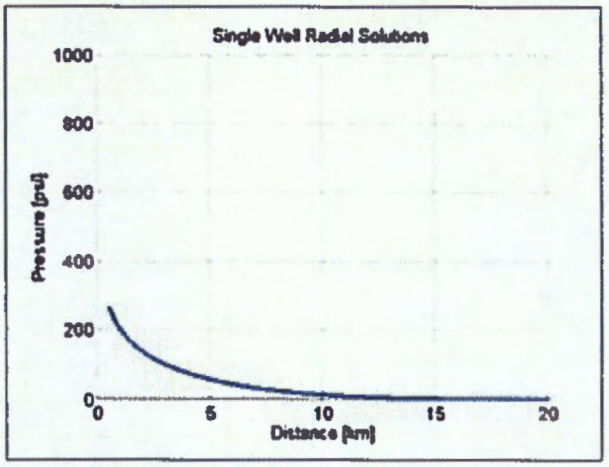
2025 Snapshot

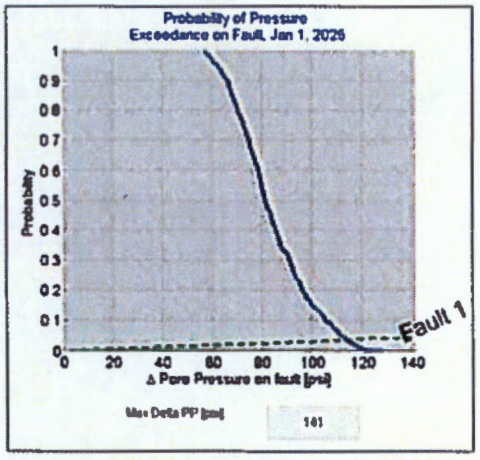


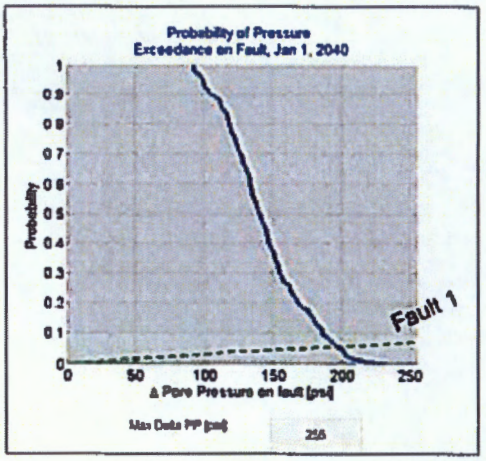
2040 Snapshot











Uncertainty Ranges

	Previous
Aquifer Thickness [1000 ft]	250
Porosity [10 %]	3
Perm [41 mD]	15

Figure 3b

Big Eddy Unit 29 Federal 1 SWD Well
Geomechanical / Pore Pressure Integration
Shmax 38 degrees

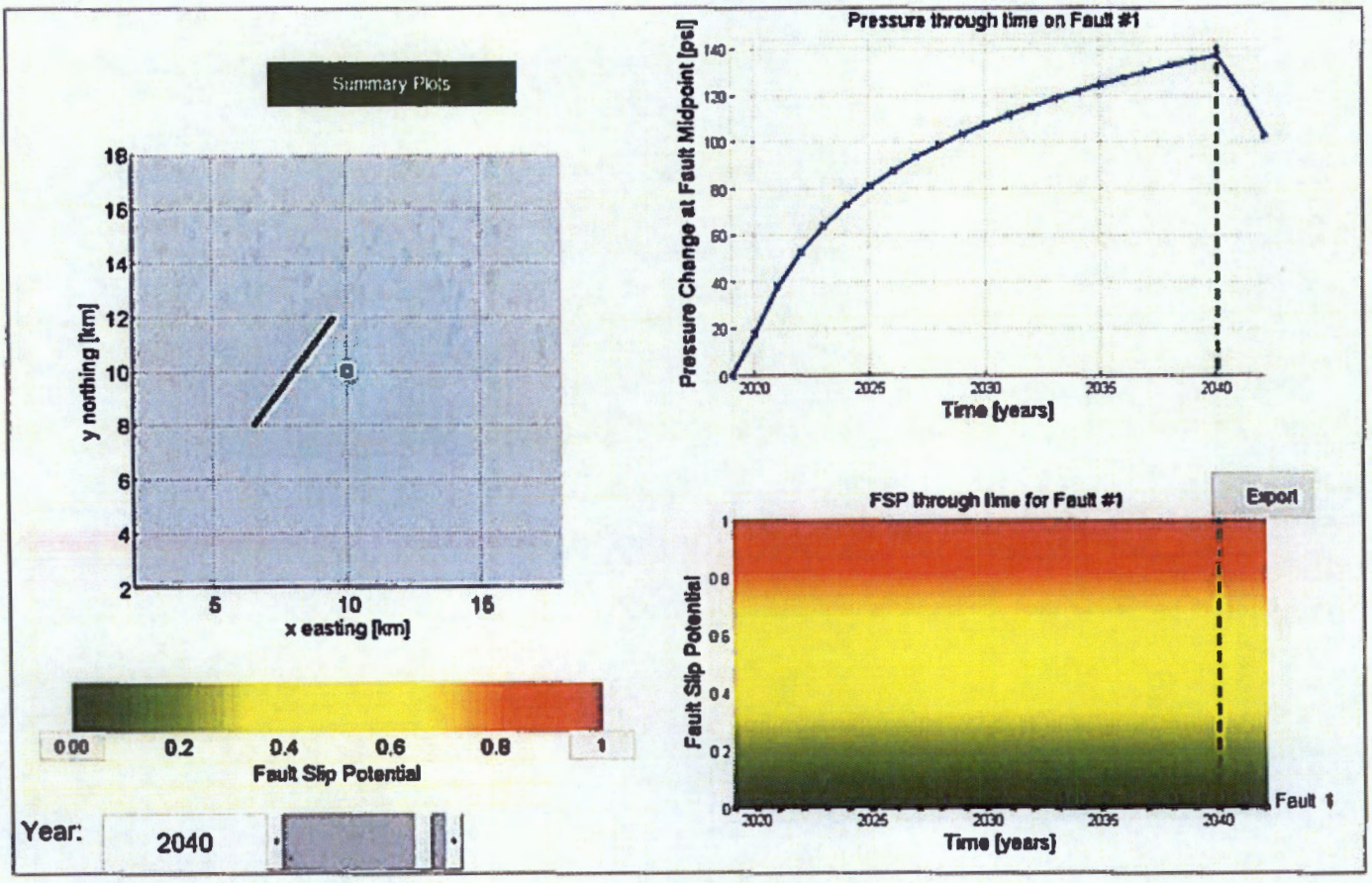


Figure 4a

Big Eddy Unit 29 Federal 1 SWD Well
Geomechanical / Pore Pressure Integration
Shmax 75 degrees

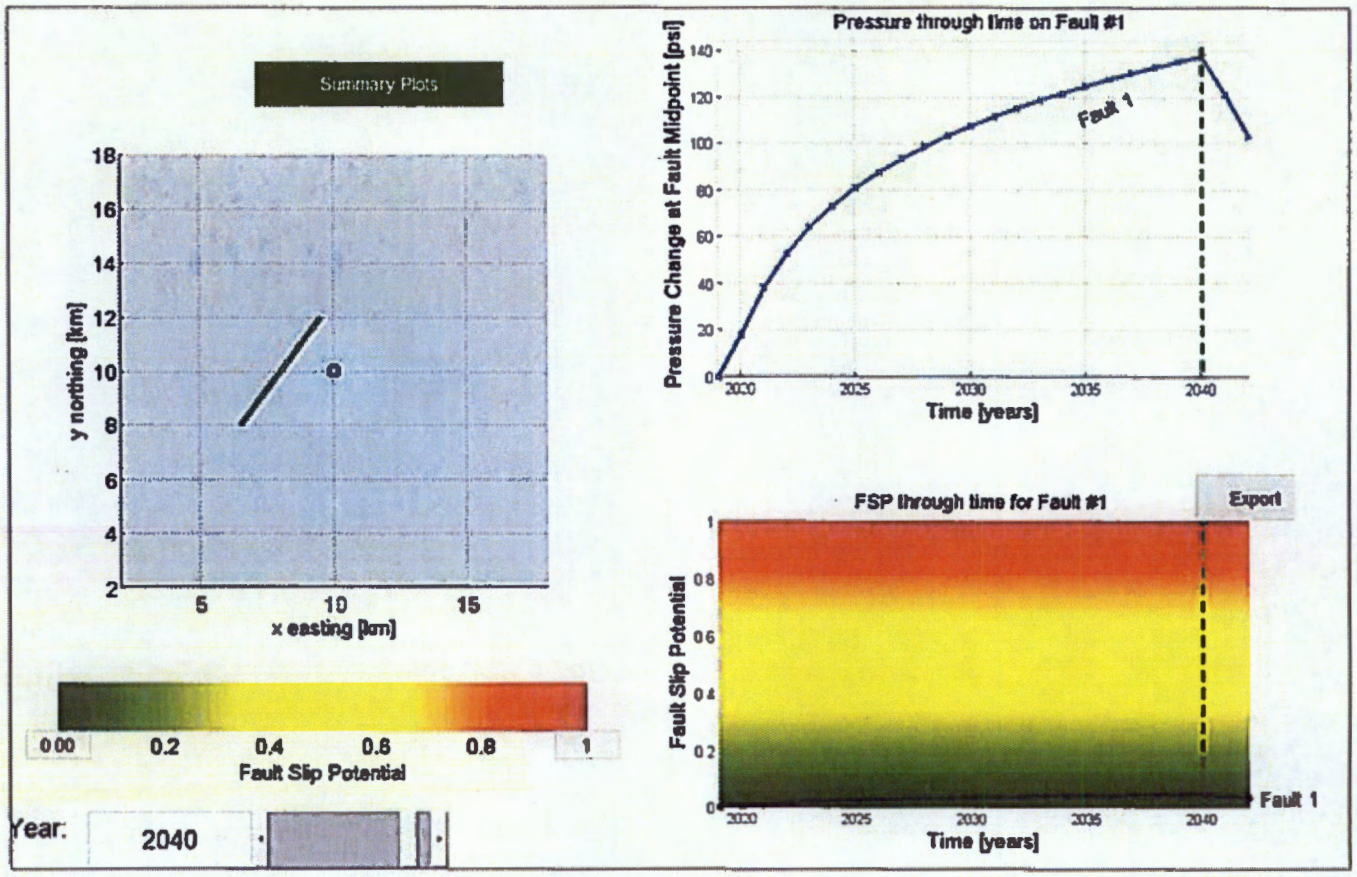
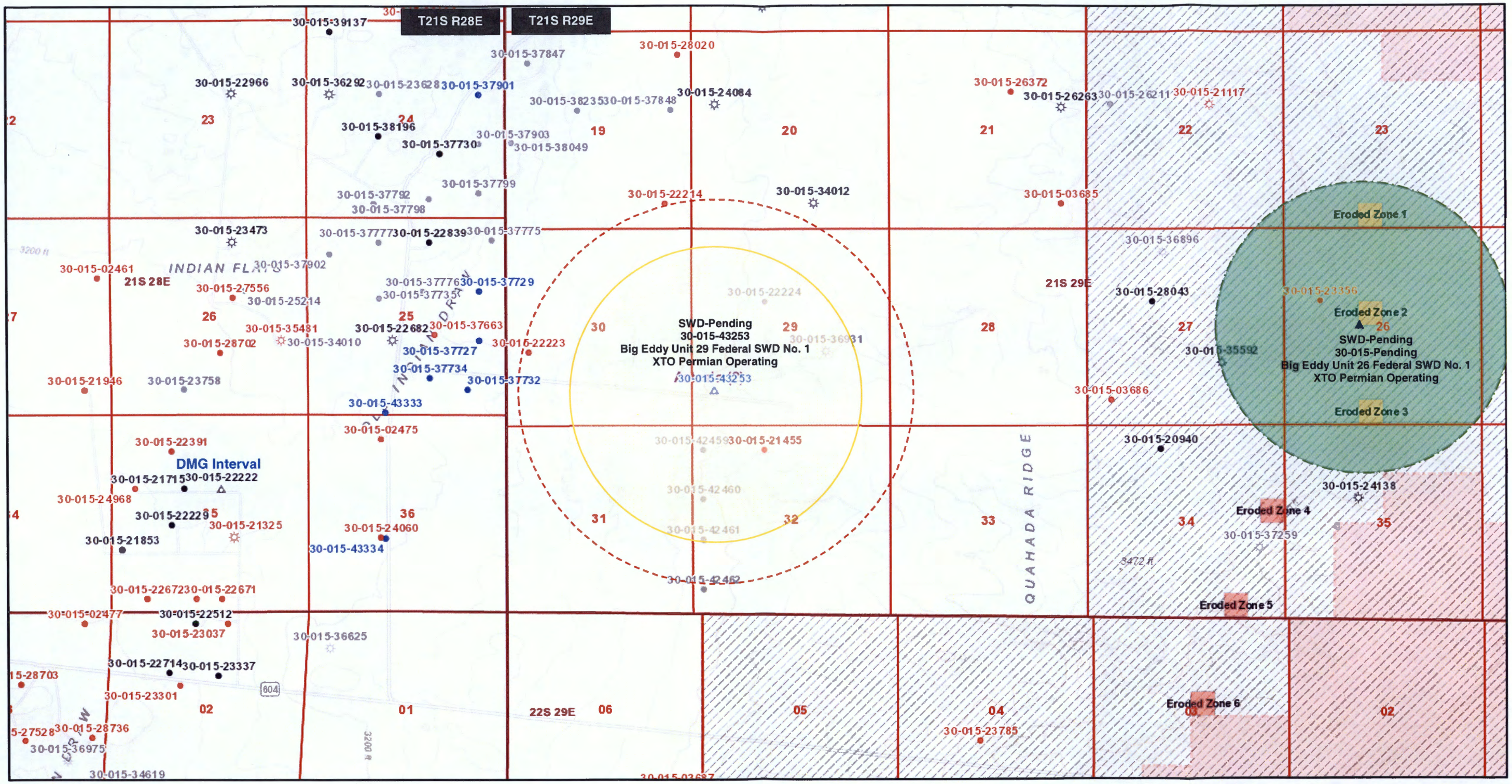


Figure 4b

Pending Application for High-Volume Devonian Disposal Well
C-108 Application for Big Eddy Unit 29 Federal SWD No. 1 – XTO Permian [BOPCO LP]



Big Eddy Unit 29 Federal SWD No. 1; XTO Permian Operating
API 30-015-43253; APD modified February 2019; last well file entry.

Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018

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.

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMLC069144

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.
891000326X

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other: INJECTION

8. Well Name and No.
BIG EDDY UNIT 29 FEDERAL SWD 1

2. Name of Operator
XTO PERMIAN OPERATING LLC
Contact: CHERYL ROWELL
E-Mail: Cheryl_rowell@xtoenergy.com

9. API Well No.
30-015-43253-00-X1

3a. Address
6401 HOLIDAY HILL ROAD BLDG 5
MIDLAND, TX 79707

3b. Phone No. (include area code)
Ph: 432-571-8205

10. Field and Pool or Exploratory Area
WILDCAT

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 29 T21S R29E SWSW 980FSL 450FWL

11. County or Parish, State
EDDY COUNTY, NM

12. CHECK THE 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	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Drilling Operations
	☐ 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 recomplete 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 must 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 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

XTO respectfully submits this sundry notice to report the drilling operations of the referenced well.

02/16/2019 to 02/19/2019
Spud well 02/16/2019. Drill 24 inch hole, TD at 375 ft. Run 18 5/8?, 87.5#, J-55 casing set at 375 ft. Cement casing with 100 sxs Class C cmt. Bump plug. Cement to surface. WOC. Test csg 1500 psi, 30 mins (good).

02/20/2019 to 02/24/2019
Drill 17 1/2 inch hole to 2870 ft. Run 13-3/8, 68#, HCL-80 casing set at 2870 ft. Cement casing with 2625 sxs Class POZC/C cement. Bump Plug. Circulate cement to surface. WOC. Test casing 1500 psi, 30 mins (good).

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #462280 verified by the BLM Well Information System
For XTO PERMIAN OPERATING LLC, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 04/23/2019 (19PP1755SE)

Name *(Printed/Typed)* CHERYL ROWELL — Title REGULATORY COORDINATOR

Signature (Electronic Submission) — Date 04/22/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ACCEPTED — Title JONATHON SHEPARD PETROLEUM ENGINEER — Date 04/25/2019

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 Carlsbad

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

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Additional data for EC transaction #462280 that would not fit on the form

32. Additional remarks, continued

02/25/2019 to 03/13/2019
Drill 12 1/4 inch hole to 10245 ft, Run 9-5/8 inch, 53.5#, HCP-110 casing set @ 10240?. Cement casing with 2950 POZC/Class C Blend. Bump plug. Circulate cement to surface. WOC. Test casing 2260 psi, 30 mins (good).

03/14/2019 to 30/30/2019
Drill 8-1/2 inch hole to 14,020 ft. Run 7 inch, 32 #, P-110 casing set @ 14020?. Cement casing with 835 sxs Class H cement. Bump plug. Circulate cement to surface.

3/31/2019 to 4/13/19
Drill 6 inch hole to 14900 ft. Set packer at 13,950?. Run 5-1/2 tbg to 9286 and 4-1/2? tbg set at 13,950?. Test annulus to 500 psi for 30 mins (good).

Rig Release 04/13/19

Revisions to Operator-Submitted EC Data for Sundry Notice #462280

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	DRG SR	DRG SR
Lease:	NMLC069144	NMLC069144
Agreement:		891000326X (NMNM68294X)
Operator:	XTO PERMIAN OPERATING, LLC 6401 HOLIDAY HILL, BLDG 5 MIDLAND, TX 79707 Ph: 432-571-8205	XTO PERMIAN OPERATING LLC 6401 HOLIDAY HILL ROAD BLDG 5 MIDLAND, TX 79707 Ph: 432.683 2277
Admin Contact:	CHERYL ROWELL REGULATORY COORDINATOR E-Mail: Cheryl_rowell@xtoenergy.com Cell: 713-542-0648 Ph: 432-571-8205	CHERYL ROWELL REGULATORY COORDINATOR E-Mail: Cheryl_rowell@xtoenergy.com Cell: 713-542-0648 Ph: 432-571-8205
Tech Contact:	CHERYL ROWELL REGULATORY COORDINATOR E-Mail: Cheryl_rowell@xtoenergy.com Cell: 713-542-0648 Ph: 432-571-8205	CHERYL ROWELL REGULATORY COORDINATOR E-Mail: Cheryl_rowell@xtoenergy.com Cell: 713-542-0648 Ph: 432-571-8205
Location: State: County:	 NM EDDY	 NM EDDY
Field/Pool:	WILDCAT	WILDCAT
Well/Facility:	BIG EDDY UNIT 29 FEDERAL SWD 1 Sec 29 T21S R29E Mer NMP SWSW 980FSL 450FWL	BIG EDDY UNIT 29 FEDERAL SWD 1 Sec 29 T21S R29E SWSW 980FSL 450FWL