Delaware Energy, LLC

Application for Injection/SWD

Bear Trap SWD #1

16258

UL L, Sec. 3, T-24-S, R-27-E, 660' FWL & 1,470' FSL, Eddy Co., NM

May 9, 2018

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5. Chemical Analysis of Bone Spring Formation Water Sample
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7. Chemical Analysis of Delaware Formation Water Sample
8. Planned wellbore diagram for the Bear Trap SWD #1
9. ~~Tabular Data on All Wells of Public Record within the Area of Review which Penetrate the Proposed Injection Zone~~ (No applicable wells)
10. Map Identifying all Wells and Leases within Two Miles of Any Proposed Injection Well with a One Mile Radius Circle Drawn Around the Proposed Injection Well
11. Sample of Letter Sent with This Application Packet to Owner of Surface of the Land on Which the Well is to be Located and to each Leasehold Operator within One Mile of the Well Location
12. Legal Notice that was run as required in the Carlsbad Current-ARGUS
13. Formation Tops
14. Certified Mailers
15. Seismicity Assessment
16. Carlsbad Current-ARGUS Affidavit of publication

Case 16258

Revised March 23, 2017

MAY 29 2018 PM04:22

RECEIVED:	REVIEWER:	TYPE:	APP NO:

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: Delaware Energy, LLC **OGRID Number:** 371195
Well Name: Bear Trap SWD #1 **API:** Pending
Pool: SWD; Devonian **Pool Code:** 96101

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.

Mike McCurdy
Print or Type Name

Signature

5/9/2018
Date

432-685-7005
Phone Number

m.mccurdy@delawareenergy.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 __XXX___Disposal _____Storage
Application qualifies for administrative approval? ___XX___Yes _____No

II. OPERATOR: _____Delaware Energy, LLC_____

ADDRESS: _____405 North Marienfeld, Suite 250, Midland TX 79701_____

CONTACT PARTY: _____Mike McCurdy_____PHONE: __432-312-5251__

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 ___XXXX_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: _____Mike McCurdy_____TITLE: _____Vice-President_____

SIGNATURE:  DATE: __05/09/2018____

E-MAIL ADDRESS: ___m.mccurdy@delawareenergy.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.

Side 1

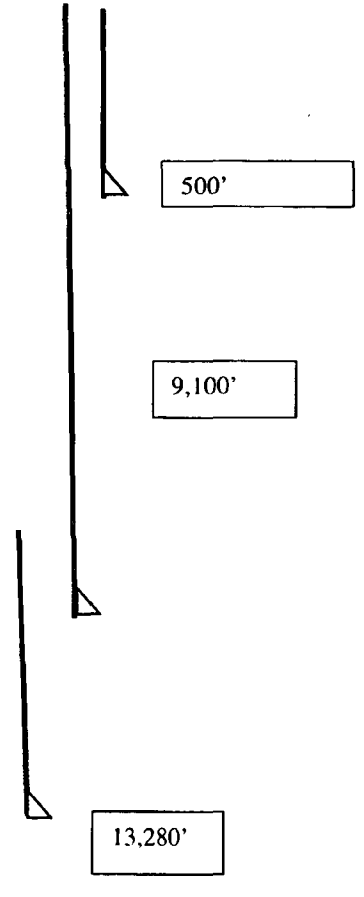
INJECTION WELL DATA SHEET

OPERATOR: Delaware Energy, LLC

WELL NAME & NUMBER: Bear Trap SWD # 1

WELL LOCATION:	660' FWL & 1,470'FSL	L	3	24S	27E
	FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC *see attached wellbore sketch*



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5" Casing Size: 13-3/8", 54.5#

Cemented with: 500 sx. *or* _____ ft³

Top of Cement: surface Method Determined: Plan to Circulate

Intermediate Casing

Hole Size: 12-1/4" Casing Size: 9-5/8", 47#, L-80

Cemented with: 2,500' sx. *or* _____ ft³

Top of Cement: surface Method Determined: Plan to Circulate

Production Casing

Hole Size: 8-1/2" Casing Size: 7-5/8", 39#, P-110

Cemented with: 650 sx. *or* _____ ft³

Top of Cement: Top of Liner Method Determined: Plan to Circulate to liner top

Total Depth: 13,280'

Injection Interval

13,280' feet to 14,280'

(OPEN HOLE)

INJECTION WELL DATA SHEET

Tubing Size: 5.5" BTC x 5.5" Flush Joint Lining Material: Fiber Glass

Type of Packer: Weatherford Arrow Set 1X

Packer Setting Depth: 13,230'

Other Type of Tubing/Casing Seal (if applicable): none

Additional Data

1. Is this a new well drilled for injection? XXXXX Yes No

   If no, for what purpose was the well originally drilled? N/A

2. Name of the Injection Formation: Devonian

3. Name of Field or Pool (if applicable): SWD; Devonian

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. N/A

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

   Below: none

Next Higher: Delaware 4,200' – 5,605'; Bone Springs 5,605'-8,980'; Wolfcamp 8,980'- 10,805'; Strawn 10,805-10,965', Atoka 10,965'-11,665'; Morrow 11,665' – 12,830'

Additional Questions on C-108

VII.

1. Proposed average and maximum daily rate and volume of fluids to be injected;

Average 15,000-20,000 BWPD, Max 25,000 BWPD

2. Whether the system is open or closed;

Open System, Commercial SWD

3. Proposed average and maximum injection pressure;

Average 1,500-2,500 PSI, Max 2,656 PSI

4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,

Bone Spring, Delaware, and Wolfcamp produced water. No known incompatibility exists with these produced water types and the Devonian. Devonian formation is used as a disposal interval throughout the Delaware Basin for Wolfcamp, Bone Springs, and Delaware produced water. See attached water analysis from Bone Spring, Wolfcamp, and Delaware produced water.

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.).

Disposal zone produces water and no hydrocarbons, nearby Devonian test wells have only tested water in DST's. Nearby Top Gun SWD tested Sulphur water.

***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.**

The proposed disposal interval is in the Devonian formation 13,280'-14,280'. Devonian is an impermeable organic Shale at the very top (13,180 ft, Woodford Shale) 100ft thick followed by permeable lime, dolomite, and small amount of shale 1000ft thick. There are no fresh water zones underlying the proposed injection zone. Usable water depth is from surface to +/- 150', the water source is older alluvium (Quaternary). All the fresh water wells in the area have an average depth to water of 150ft per State Engineer.

IX. Describe the proposed stimulation program, if any.

60,000 gallons 20% HCL acid job with packer

X. Attach appropriate logging and test data on the well

Mud log will be filed after the well has been drilled. All cased hole and open hole Logs will be filed following drilling operations.

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.

No active water wells are in section 3, one water well is in section 9 within 1 mile. Was not able to locate well to obtain a sample.

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.

Delaware Energy, L.L.C. has reviewed and examined available geologic and engineering data in the area of interest for the Bear Trap SWD #1 and have found no evidence of faults or other hydrologic connections between Devonian disposal zone and the underground sources of drinking water. Furthermore, there exist many impermeable intervals between the injection interval and the fresh ground water from the top of the Devonian Carbonate and the base of the ground water.

Mike McCurdy **Vice President** **5/9/2018**
_____ **Title** _____ **Date** _____

III. WELL DATA

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
Bear Trap SWD #1, Sec. 3-T24S-R27E, 660' FWL & 1470' FSL, UL L, Eddy County, New Mexico

(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.

Casing Size	Setting Depth	Sacks of Cement	Hole Size	Top of Cement	Determined
13-3/8"	500'	500	17-1/2"	Surface	CIRC
9-5/8"	9,100'	2500	12-1/4"	Surface	CIRC
7-5/8"	8,900'-13,280'	650	8-1/2"	Surface	CIRC

(3) A description of the tubing to be used including its size, lining material, and setting depth.
5-1/2" BTC X 5-1/2" Flush Joint, Internally Fiber Glass Coated Tubing set 50 to 100ft above open hole

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.
Weatherford Arrow Set 1X injection packer, nickel plated with on/off tool

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.
Devonian Formation
Pool Name: SWD (Devonian)

(2) The injection interval and whether it is perforated or open-hole.
13,280' to 14,280' (Open hole)

(3) State if the well was drilled for injection or, if not, the original purpose of the well.
Well is a planned new drill for SWD

(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.

None, well is a planned new drill

(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.

Next Higher: Delaware 4,200' – 5,605'; Bone Springs 5,605'-8,980'; Wolfcamp 8,980'- 10,805'; Strawn 10,805-10,965', Atoka 10,965'-11,665'; Morrow 11,665' – 12,830'.

Next Lower: None

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

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

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

Form C-102
Revised August 1, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name

Property Code	Property Name	Well Number
	BEAR TRAP SWD	1
OGRID No.	**Operator Name**	**Elevation**
	DELAWARE ENERGY	3153'

Surface Location

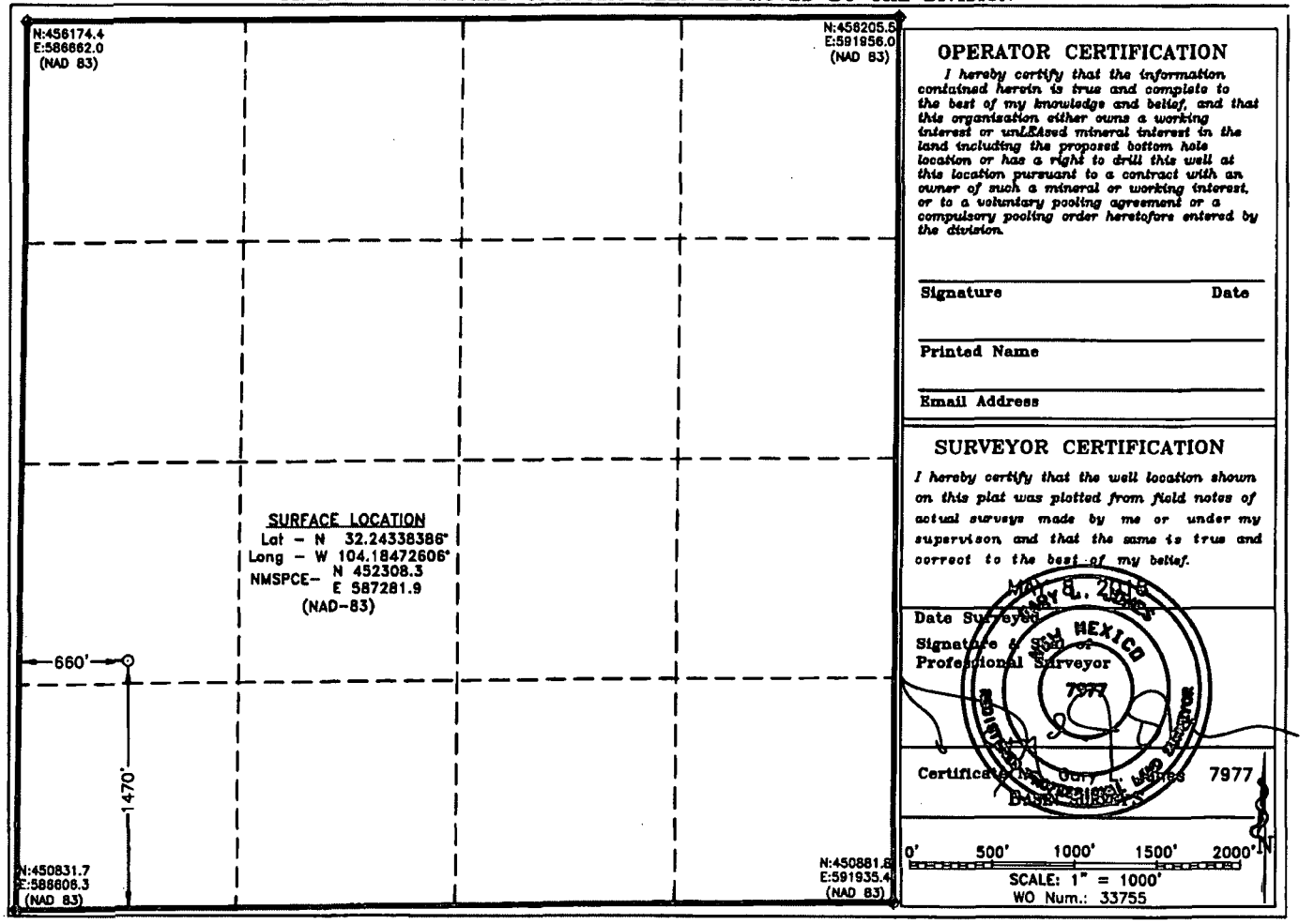
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	3	24 S	27 E		1470	SOUTH	660	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	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



OPERATOR CERTIFICATION

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

Signature Date

Printed Name

Email Address

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 supervison, and that the same is true and correct to the best of my belief.

MAY 8, 2018

Date Surveyed

Signature & Seal of Professional Surveyor

NEW MEXICO 7977 REGISTERED PROFESSIONAL LAND SURVEYOR

Certificate No. GARY L. JONES 7977

Sec 22, T25S, R28E

North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 229-8121
Lab Team Leader - Sheila Hernandez
(432) 495-7240

Bone Spring

Water Analysis Report by Baker Petrolite

Company:		Sales RDT:	33514.1
Region:	PERMIAN BASIN	Account Manager:	TONY HERNANDEZ (575) 910-7135
Area:	ARTESIA, NM	Sample #:	534665
Lease/Platform:	PINOCHLE 'BPN' STATE COM	Analysis ID #:	106795
Entity (or well #):	2 H	Analysis Cost:	$90.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary	
Sampling Date:	03/10/11
Analysis Date:	03/18/11
Analyst:	SANDRA GOMEZ
TDS (mg/l or g/m3):	184911.1
Density (g/cm3, tonne/m3):	1.113
Anion/Cation Ratio:	1
Carbon Dioxide:	0 50 PPM
Oxygen:	
Comments:	

Analysis of Sample 534665 @ 75 °F					
Anions	mg/l	meq/l	Cations	mg/l	meq/l
Chloride:	109618.0	3091.92	Sodium:	70275.7	3056.82
Bicarbonate:	2135.0	34.99	Magnesium:	195.0	16.04
Carbonate:	0.0	0.	Calcium:	844.0	42.12
Sulfate:	747.0	15.55	Strontium:	220.0	5.02
Phosphate:			Barium:	0.8	0.01
Borate:			Iron:	6.5	0.23
Silicate:			Potassium:	869.0	22.22
			Aluminum:		
Hydrogen Sulfide:		0 PPM	Chromium:		
pH at time of sampling:		7	Copper:		
pH at time of analysis:			Lead:		
pH used in Calculation:		7	Manganese:	0.100	0.
			Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	1.08	188.52	-1.20	0.00	-1.18	0.00	-0.11	0.00	0.58	0.29	1.72
100	0	1.10	208.05	-1.29	0.00	-1.20	0.00	-0.15	0.00	0.35	0.29	2.35
120	0	1.12	224.17	-1.36	0.00	-1.19	0.00	-0.17	0.00	0.16	0.00	3.17
140	0	1.13	243.17	-1.42	0.00	-1.18	0.00	-0.18	0.00	0.00	0.00	4.21

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

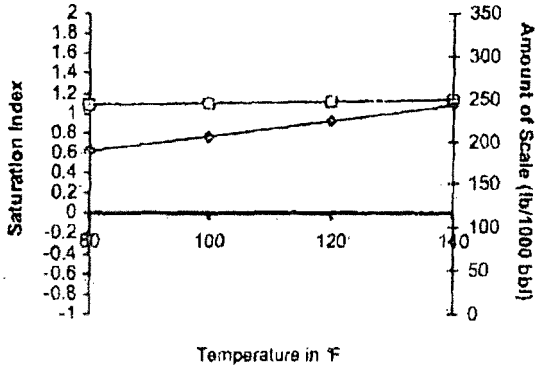
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

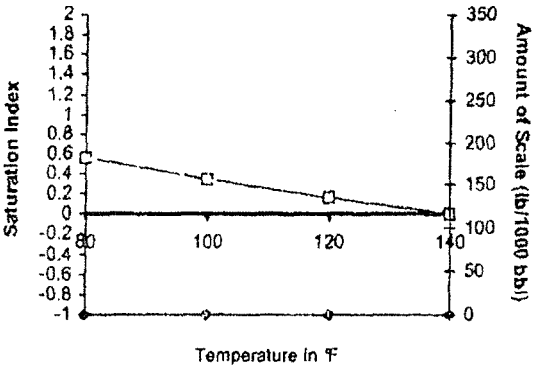
Scale Predictions from Baker Petrolite

Analysis of Sample 534665 @ 75 °F for 03/18/11

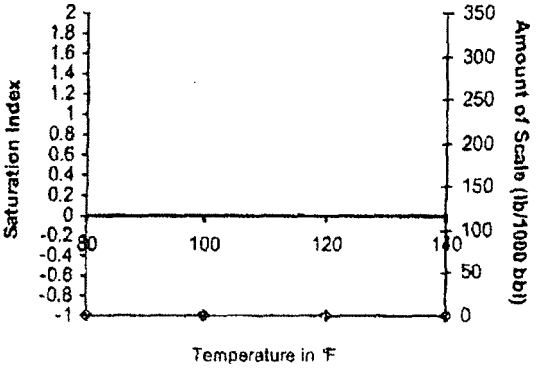
Calcite - CaCO3



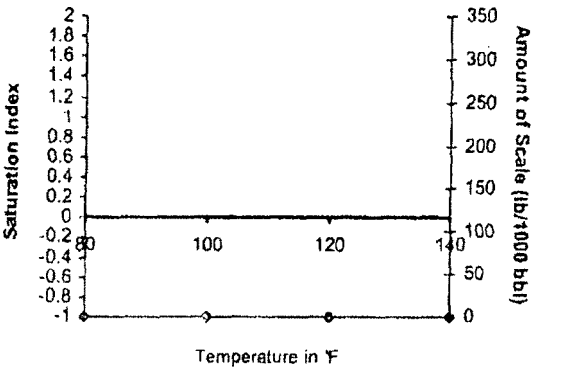
Barite - BaSO4



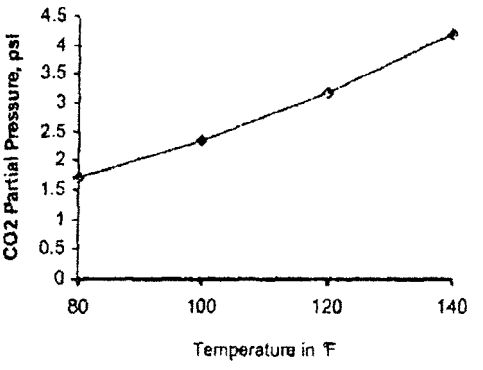
Gypsum - CaSO4*2H20



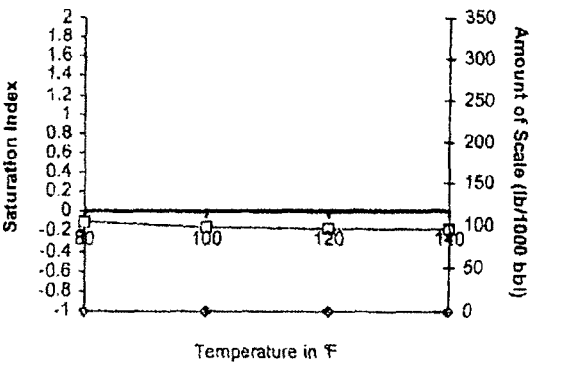
Anhydrite - CaSO4



Carbon Dioxide Partial Pressure



Celestite - SrSO4



Wolfcamp

BAKER HUGHES

Water Analysis

Date: 23-Aug-11

2708 West County Road, Hobbs NM 88240
Phone (575) 392-5556 Fax (575) 392-7307

Analyzed For Brushy Draw 1#1

Company	Well Name	County	State
	BD	~~Lea~~ Eddy	New Mexico 1-26S-29E

Sample Source	Swab Sample	***Sample #***	1
Formation		***Depth***	

Specific Gravity	1.170	*SG @ 60 °F*	1.172
pH	6.30	*Sulfides*	Absent
Temperature (°F)	70	*Reducing Agents*	

Cations

Sodium (Calc)	*in Mg/L*	77,962	*in PPM*	66,520
Calcium	*in Mg/L*	4,000	*in PPM*	3,413
Magnesium	*in Mg/L*	1,200	*in PPM*	1,024
Soluable Iron (FE2)	*in Mg/L*	10.0	*in PPM*	9

Anions

Chlorides	*in Mg/L*	130,000	*in PPM*	110,922
Sulfates	*in Mg/L*	250	*in PPM*	213
Bicarbonates	*in Mg/L*	127	*in PPM*	108
Total Hardness (as CaCO3)	*in Mg/L*	15,000	*in PPM*	12,799
Total Dissolved Solids (Calc)	*in Mg/L*	213,549	*in PPM*	182,209
Equivalent NaCl Concentration	*in Mg/L*	182,868	*in PPM*	156,031

Scaling Tendencies

*Calcium Carbonate Index 507,520

Below 500,000 Remote / 500,000 - 1,000,000 Possible / Above 1,000,000 Probable

*Calcium Sulfate (Gyp) Index 1,000,000

Below 500,000 Remote / 500,000 - 10,000,00 Possible / Above 10,000,000 Probable

**This Calculation is only an approximation and is only valid before treatment of a well or several weeks after treatment.*

Remarks RW=.048@70F

Report # 3188

Sec 16, T23S R28E

M C I
CHEMICALS and CONSULTING

PRODUCTION DEPARTMENT

MILLER CHEMICALS, INC.
Post Office Box 298
Artesia, N.M. 88211-0298
(505) 746-1919 Artesia Office
(505) 392-2893 Hobbs Office
(505) 746-1918 Fax
mci@plateautel.net

Delaware Brushy Canyon

WATER ANALYSIS REPORT

Company :
Address :
Lease : LOVING "AIB"
Well : #15
Sample Pt. : WELLHEAD

Date : MARCH 17, 2008
Date Sampled : MARCH 17, 2008
Analysis No. :

	ANALYSIS		mg/L		* meq/L
1.	pH	6.0			
2.	H2S	0			
3.	Specific Gravity	1.070			
4.	Total Dissolved Solids		304684.9		
5.	Suspended Solids		NR		
6.	Dissolved Oxygen		NR		
7.	Dissolved CO2		NR		
8.	Oil In Water		NR		
9.	Phenolphthalein Alkalinity (CaCO3)				
10.	Methyl Orange Alkalinity (CaCO3)				
11.	Bicarbonate	HCO3	927.0	HCO3	15.2
12.	Chloride	Cl	187440.0	Cl	5287.4
13.	Sulfate	SO4	500.0	SO4	10.4
14.	Calcium	Ca	37200.0	Ca	1856.3
15.	Magnesium	Mg	996.3	Mg	82.0
16.	Sodium (calculated)	Na	77586.6	Na	3374.8
17.	Iron	Fe	35.0		
18.	Barium	Ba	NR		
19.	Strontium	Sr	NR		
20.	Total Hardness (CaCO3)		97000.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter

1856	*Ca <----- *HCO3	15
82	*Mg -----> *SO4	10
3375	*Na -----> *Cl	5287

Saturation Values Dist. Water 20 C

CaCO3	13 mg/L
CaSO4 * 2H2O	2090 mg/L
BaSO4	2.4 mg/L

Compound	Equiv wt	X meq/L	= mg/L
Ca(HCO3)2	81.0	15.2	1231
CaSO4	68.1	10.4	709
CaCl2	55.5	1830.7	101584
Mg(HCO3)2	73.2		
MgSO4	60.2		
MgCl2	47.6	82.0	3902
NaHCO3	84.0		
Na2SO4	71.0		
NaCl	58.4	3374.8	197223

REMARKS:

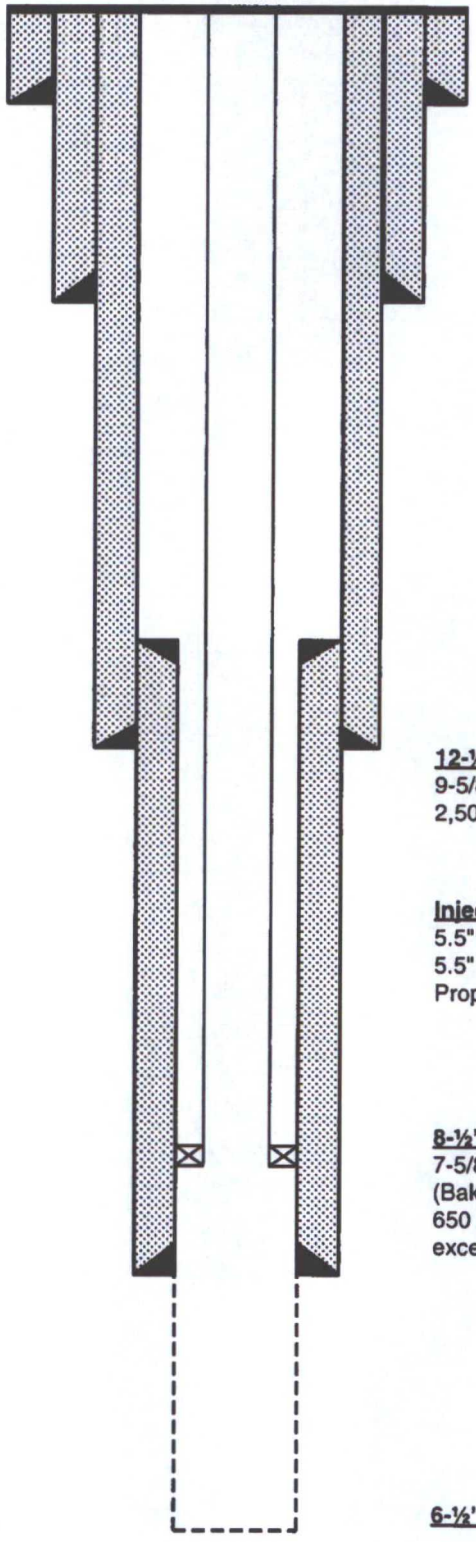
DELAWARE ENERGY SERVICES

Bear Trap SWD # 1

API # PENDING
660' FWL & 1,470' FSL, Sec. 3, T24S, R27E
EDDY COUNTY, NEW MEXICO

PROPOSED WELLBORE

ELEVATION:
GL: 3,081'



20" Conductor @ 80'

17-½" Hole:
13-3/8", 54.5# J-55 BTC @ 500'
500 sx cmt, will circulate

500'

9,100'

12-¼" Hole:
9-5/8" 47#, L-80, BTC to 9,100'
2,500 sx cmt, will circulate, 75% excess

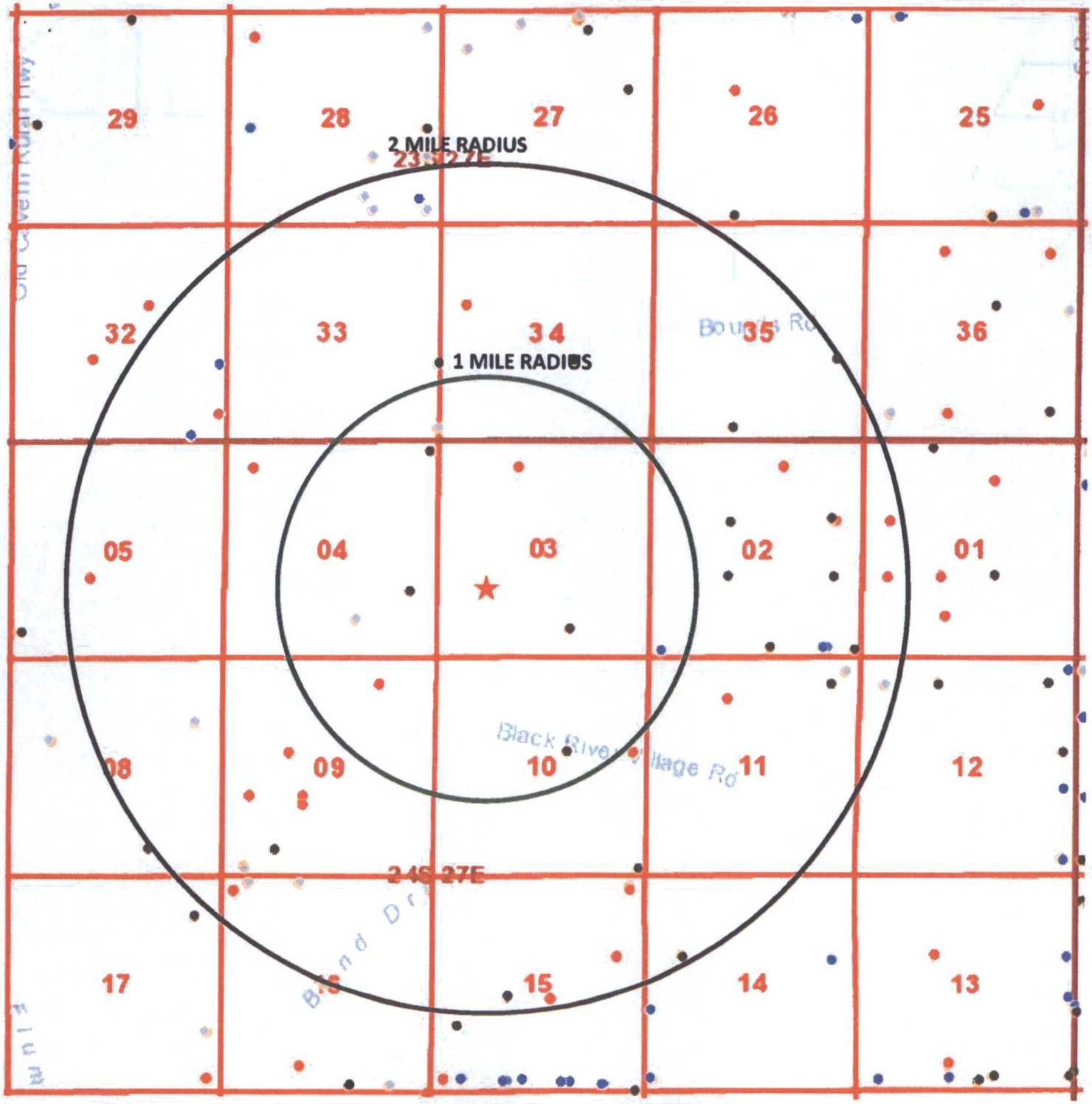
Injection String & Packer:
5.5" FG Casing to 9,100' (20#/ft, P-110, BTC)
5.5" FG Casing 9,100' – 13,230' (20#/ft, P-110, Flush Joint)
Proposed packer @ 13,230' Weatherford Arrow Set 1X

8-½" Hole:
7-5/8" 39#, P-110, UFJ, 13,280' to 9,100'
(Baker ZXP Liner Hanger) Drift ID 6.5"
650 sx cmt, will circulate to liner top, 50% excess

13,280'

14,280' Total Depth

6-½" Open Hole

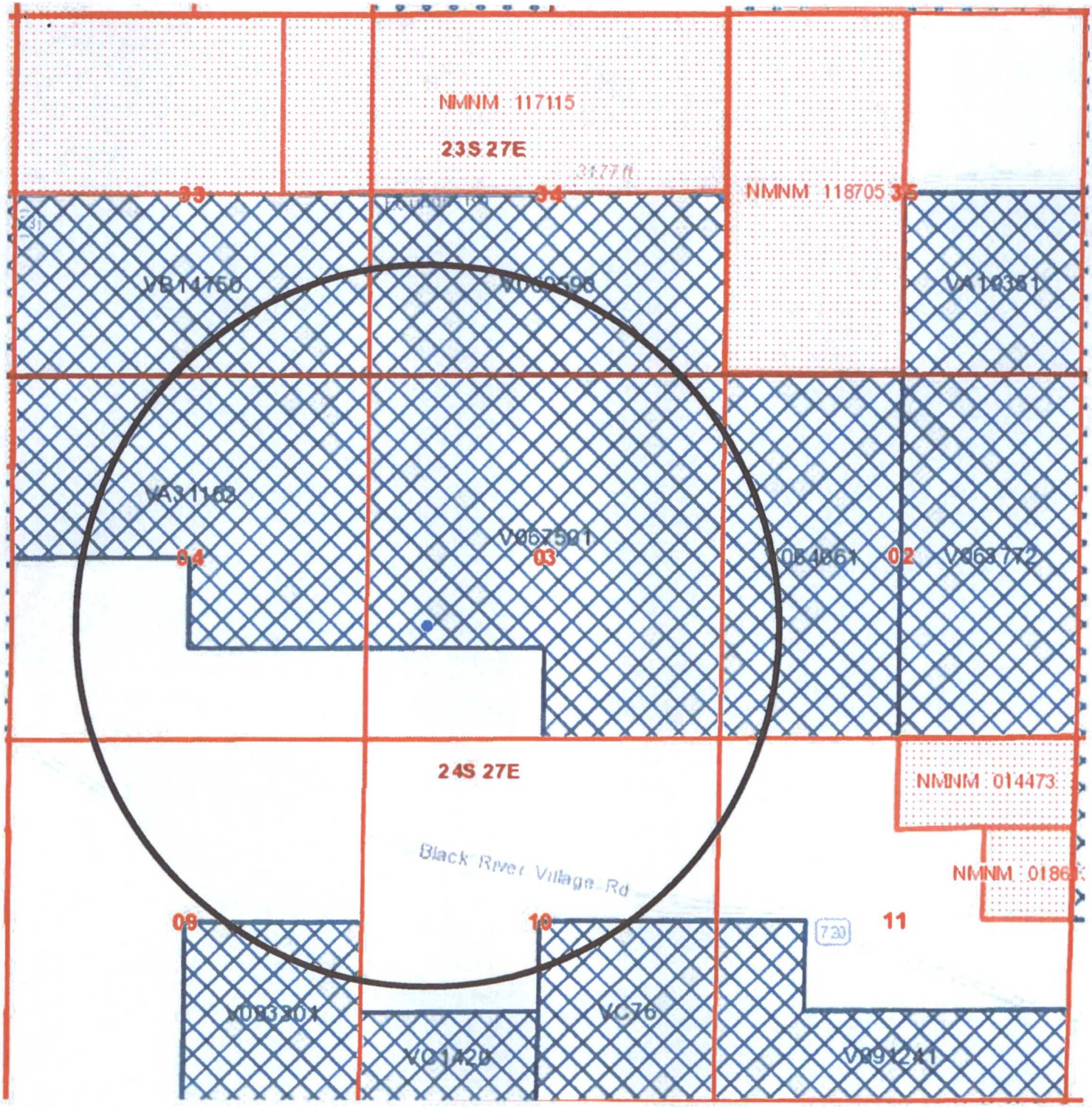


WELLS – ONE MILE RADIUS

NO WELLS PENETRATE THE DEVONIAN FORMATION IN THE AOR

SECTION 3-T24S-R27E

★ **Bear Trap SWD #1**
(Proposed Location)
Delaware Energy, LLC



LEASES – ONE MILE RADIUS

SECTION 2-T24S-R27E
- STATE

SECTION 3-T24S-R27E
- STATE & FEE

SECTION 4-T24S-R2E
- STATE & FEE

SECTION 9-T24S-R27E
- FEE & STATE

SECTION 10-T24S-R27E
- FEE & STATE

SECTION 11-T24S-R27E
- FEE

SECTION 2-T24S-R27E

- Mewbourne Oil Co.
  P.O. Box 7698
  Tyler, TX 75711

SECTION 3-T24S-R27E

- Concho Resources
  600 W. Illinois Ave
  Midland, TX 79701

- Featherstone Development Corp.
  601 N. Marienfeld, Suite 202
  Midland, TX 79701

SECTION 4-T24S-R27E

- Concho Resources
  600 W. Illinois Ave
  Midland, TX 79701

SECTION 9-T24S-R27E

- Concho Resources
  600 W. Illinois Ave
  Midland, TX 79701

SECTION 10-T24S-R27E

- EOG Resources, Inc.
  5509 Champions Dr.
  Midland, TX 79706

- Faulconer Resources 1999
  P.O. Box 7995
  Tyler, TX 75701

SECTION 11-T24S-R27E

- Read & Stevens Inc.
  400 N. Pennsylvania Ave.
  Roswell, NM 88201

Delaware Energy, L.L.C.
405 N. Marienfeld, Suite 250
Midland, TX 79701
Office: (432) 685-7005

May 9, 2018

Surface Owner / Offset Operators

Re: Notification of Application for Authorization to Inject
Bear Trap SWD #1 Well

Ladies and Gentlemen:

Delaware Energy, LLC is seeking administrative approval to utilize the proposed Bear Trap SWD #1 as a commercial Salt Water Disposal well. As required by the New Mexico Oil Conservation Division Rules, we are notifying you of the following proposed salt water disposal well. This letter is a notice only. No action is required unless you have questions or objections.

Well:	Bear Trap SWD #1
Proposed Disposal Zone:	Devonian Formation (from 13,280'- 14,280')
Location:	1,470' FSL & 660' FWL, UL L, Sec. 3, T24S, R27E, Eddy Co., NM
Applicants Name:	Delaware Energy, L.L.C.
Applicants Address:	405 N. Marienfeld, Suite 250, Midland, TX 79701

This application for water disposal well will be filed with the New Mexico Oil Conservation Division. If they determine the application complies with the applicable regulations, then it will be approved. The New Mexico Conservation Division address is 1220 South St. Francis Dr., Santa Fe, NM 87505. And their phone number is 505-476-3460.

Please call Mike McCurdy with Delaware Energy, LLC if you have any questions at 432-685-7005.

Sincerely,

Mike McCurdy

DISTRIBUTION LIST

Surface Owner:

State of New Mexico
310 Old Santa Fe Trail
Santa Fe NM 87501

Offset Operators/Leasehold Owners:

COG Operating, LLC
600 W. Illinois
Midland, TX 79701

Marathon Oil Permian
5555 San Felipe Street
Houston, TX 77056-2723

Mewbourne Oil Co.
P.O. Box 7698
Tyler, TX 75711

Featherstone Development Corp.
601 N. Marienfeld, Suite 202
Midland, TX 79701

EOG Resources, Inc
5509 Champions Dr.
Midland, TX 79706

Faulconer Resources 1999
P.O. Box 7995
Tyler, TX 75701

Read & Stevens Inc.
400 N. Pennsylvania Ave.
Roswell, NM 88201

State of New Mexico Oil Conservation Division
District II
811 S. First St.
Artesia, NM 88210

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

CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001246247

DELAWARE ENERGY, L.L.C.
405 N. MARIENFELD
SUITE 250
MIDLAND TX 79701

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:

05/09/18

Legal Clerk

Subscribed and sworn before me this
10th of May 2018.

State of WI, County of Brown
NOTARY PUBLIC

9-19-21
My Commission Expires

LEGAL NOTICE

Delaware Energy, L.L.C., 405 N. Marienfeld St. Suite 250, Midland, TX 79701, has filed a form C-108 (Application for Authorization to Inject) with the Oil Conservation Division seeking administrative approval to drill the Bear Trap SWD #1 as a Commercial Salt Water Disposal well.

The Bear Trap SWD #1 is located at 660' FWL and 1470' FSL, Unit Letter L, Section 3, Township 24 South, Range 27 East, Eddy County, New Mexico.

The well will dispose of water produced from oil and gas wells into the Devonian Formation from 13,650' to 14,650' at a maximum rate of 25,000 barrels of water per day at a maximum pressure of 2,730 psi.

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

Additional information can be obtained by contacting Delaware Energy, L.L.C., at (432) 685-7005.

VICKY FELTY
NOTARY PUBLIC
STATE OF WISCONSIN

Ad#:0001246247
P O : 0001246247
# of Affidavits :0.00

Bear Trap SWD #1
Location: Sec. 3, T-24S, R-27E, UL L

Estimated Pre-Drill Formation Tops

Top of Salt	605'
Base Salt	1,905'
Delaware – Bell Canyon	2,185'
Bone Spring	5,605'
Wolfcamp	8,980'
Strawn	10,805'
Atoka	10,965'
Morrow	11,665'
Mississippian	12,830'
Woodford	13,180'
Devonian	13,280'

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Return Receipt (electronic) $0.00
Certified Mail Restricted Delivery $0.00
Adult Signature Required $0.00
Adult Signature Restricted Delivery $
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310 OLD SANTA FE TRAIL
City, State, ZIP+4®
SANTA FE, NM 87501
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions
BEAR TRAP SND # 1
08
MIDDLETOWN, TA DOWNTOWN STA 19701
MAY 10 2018
Postmark Here
05/10/2018
7018 0040 0000 7726 7029

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ARTESIA, NM 88210
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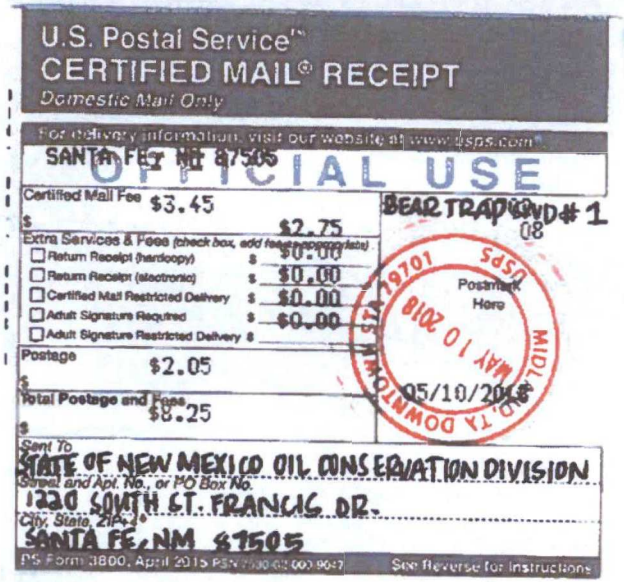

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STATE OF NEW MEXICO OIL CONSERVATION DIVISION
Street and Apt. No., or PO Box No.
1220 SOUTH ST. FRANCIS DR.
City, State, ZIP+4®
SANTA FE, NM 87505
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions
BEAR TRAP SND # 1
08
MIDDLETOWN, TA DOWNTOWN STA 19701
MAY 10 2018
Postmark Here
05/10/2018
USPS

7018 0040 0000 7726 7029

Statement Regarding Seismicity and Well Location (Bear Trap SWD #1)

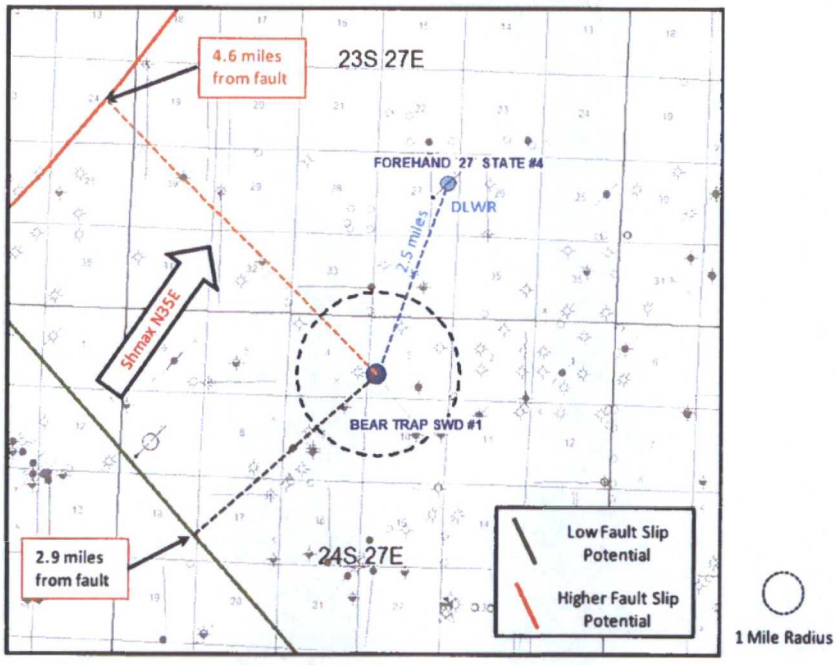
Historically, the area near the proposed Bear Trap SWD #1 has seen some nearby seismic activity. There have been two seismic events (as per public data available on the USGS database) in the area. All events are over 4.0 miles from the proposed SWD location. The most recent event is 17.2 miles east, measuring 3.1, and the closest is 4.2 miles to the NNE which measured 3.9 on November 24, 1978

Delaware Energy does not own 2D or 3D seismic data near the proposed SWD location therefore the fault interpretations are based on data obtained from the USGS New Mexico Faults Database (2005) and other published data. Based on these sources the closest faults would be approximately 4.6 miles northwest of the location and 2.9 miles southwest of the location. A recent technical paper written by Snee and Zoback, "State of Stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity", was published in the February 2018 edition of The Leading Edge. The study evaluates the strike-slip probability of known faults using FSP analysis. The study predicts that the NW-SE trending fault NE of the location (green) should have a very low probability of being critically stressed resulting in an induced seismicity event. The SW-NE trending fault NW and closest to the location (orange) would have a higher probability of being critically stressed, resulting in potential slip, due to the relationship of the strike of the fault and the regional Shmax orientation (approx. N 35 deg E) in the area. The exact position of this fault relative to the proposed location, and depth of the target formation, is unknown. Risk of contact with this fault should be reduced due to the distance of the proposed SWD well from the fault (4.6 miles).

The proposed Bear Trap SWD #1 location is located 2.5 miles away from the nearest active injector which is in the Delaware (see map below). The well should meet current OCD and Industry recommended practices.

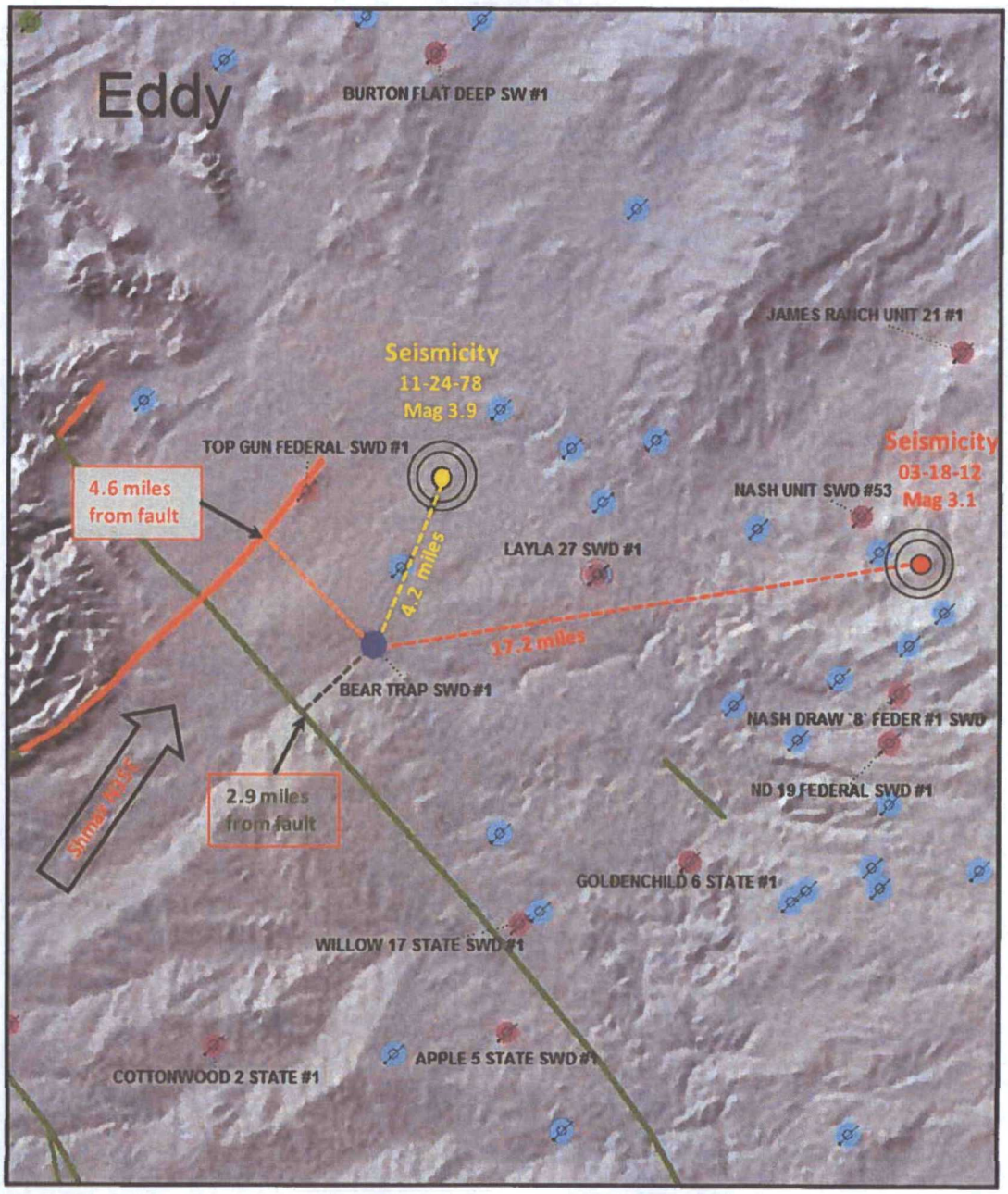
Kevin J. Schepel
Petrophysical Advisor
kevin.schepel@att.net
214-212-6540

Well Activity, Faulting, and Closest SWD



Modeled After Snee and Zoback (Febuary 2018)

Proximity to Historic Earthquake Activity and Faults



Modeled After Snee and Zoback (Febuary 2018)

Devonian SWD | Delaware SWD | Proposed Location

USGS Earthquake | Low Fault Slip Potential | Higher Fault Slip Potential