Initial Application Part I

Received: **12/11/2019**

This application is placed in file for record. It MAY or MAY NOT have been reviewed to be determined Administratively Complete

56YW5-191211-C-1080

Revised March 23, 2017

RECEIVED: 12/11/19	REVIEWER: BLL	TYPE: SWD	APP NO: pBL1934549972

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: V-F Petroleum Inc. **OGRID Number:** 24010
Well Name: State 19 #2 **API:** 30-015-22625
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 SWD-2351

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.

Brian Wood
Print or Type Name

R. Wood
Signature

12-10-19
Date

505 466-8120
Phone Number

brian@permitswest.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? XXX Yes _____ No

II. OPERATOR: V-F PETROLEUM INC.

ADDRESS: PO BOX 1889, MIDLAND TX 79702

CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: 505 466-8120

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 XXX 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:

State 19 #2
30-015-22625
SWD; Devonian

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: BRIAN WOOD TITLE: CONSULTANT

SIGNATURE: B. Wood DATE: DEC. 9, 2019

E-MAIL ADDRESS: brian@permitswest.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

Side 2

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

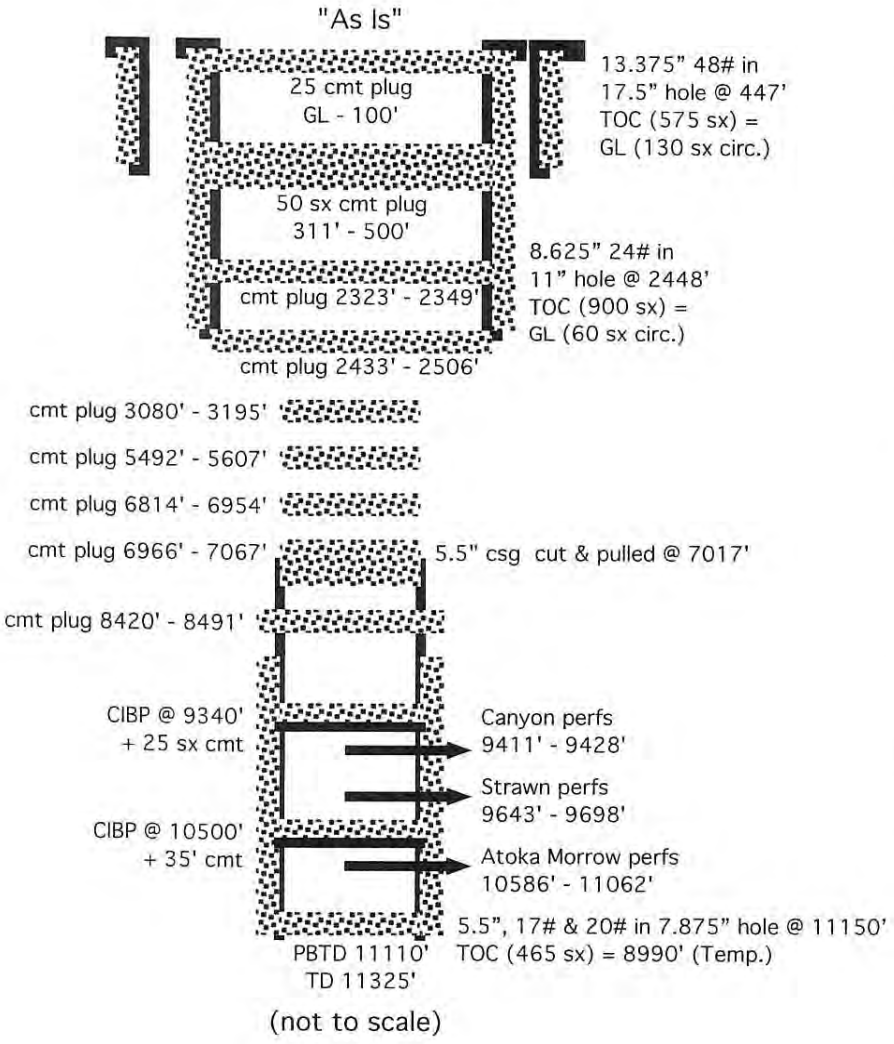
OPERATOR: V-F PETROLEUM INC.

WELL NAME & NUMBER: STATE 19 #2

WELL LOCATION: SHL: 860 FSL & 2057 FWL / BHL: 860 FSL & 1907 FWL | N | 19 | 19 S | 28 E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC



(not to scale)

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5" Casing Size: 13.375"

Cemented with: 575 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC. 130 SX

Intermediate Casing

Hole Size: 11" Casing Size: 8.625"

Cemented with: 900 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC. 60 SX

Production Casing

Hole Size: 7.875" Casing Size: 5.5"

Cemented with: 465 sx now & 1270 sx plan sx. *or* _____ ft³

Top of Cement: 8990' now & GL plan Method Determined: TS now & CBL plan

Total Depth: 11,150'(now) & 14,000'(plan TVD)

Injection Interval

4.375" 12,100 feet to 14,000'

~~(Perforated~~ or Open Hole; indicate which)

Side 1

INJECTION WELL DATA SHEET

OPERATOR: V-F PETROLEUM INC.

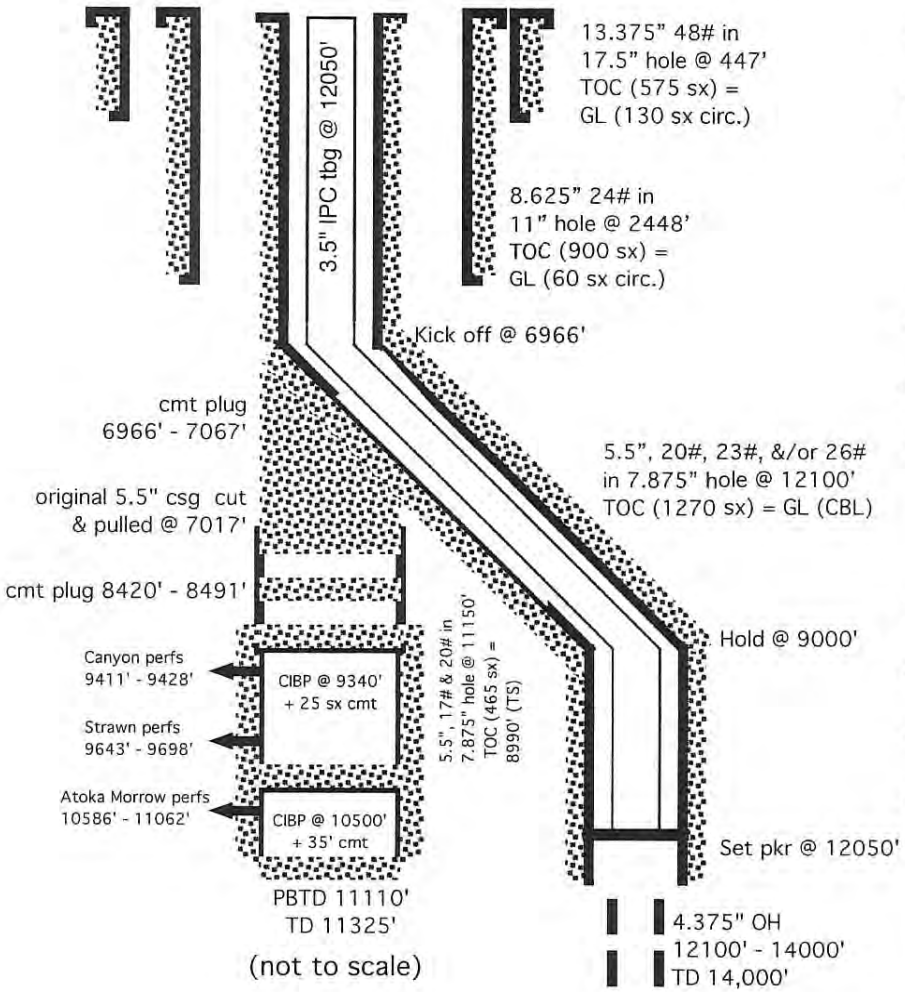
WELL NAME & NUMBER: STATE 19 #2

WELL LOCATION: SHL: 860 FSL & 2057 FWL / BHL: 860 FSL & 1907 FWL | N | 19 | 19 S | 28 E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

"Proposed"



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5" Casing Size: 13.375"

Cemented with: 575 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC. 130 SX

Intermediate Casing

Hole Size: 11" Casing Size: 8.625"

Cemented with: 900 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC. 60 SX

Production Casing

Hole Size: 7.875" Casing Size: 5.5"

Cemented with: 465 sx now & 1270 sx plan sx. *or* _____ ft³

Top of Cement: 8990' now & GL plan Method Determined: TS now & CBL plan

Total Depth: 11,150'(now) & 14,000'(plan TVD)

Injection Interval

4.375" 12,100 feet to 14,000'

~~(Perforated~~ or Open Hole; indicate which)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 3.5" Lining Material: IPC

Type of Packer: ARROW NICKEL PLATED 10,000# WP

Packer Setting Depth: 12,000' - 12,100'

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

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

   If no, for what purpose was the well originally drilled? _____

2. Name of the Injection Formation: DEVONIAN

3. Name of Field or Pool (if applicable): SWD;DEVONIAN (96101)

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. YES

   CANYON (9411' - 9428'), STRAWN (9643' - 9698'), ATOKA & MORROW (10586 - 11062')
   NINE CEMENT PLUGS & TWO CIBPs

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

   OVER: GRAYBURG (2000'), BONE SPRING (6930'), WOLFCAMP (8565'),
   UP PENN (8900'), ATOKA (10,200'), & MORROW (10,590')

   UNDER: NONE

V-F PETROLEUM INC. PAGE 1
STATE 19 #2
SHL: 860' FSL & 2057' FWL
BHL: 860' FSL & 1907' FWL
SEC. 19, T. 19 S., R. 28 E., EDDY COUNTY, NM 30-015-22625

I. Plan is to re-enter a 11,340' P&A well, drill out 8 plugs, kick-off at 6966', and directionally drill a 14,000' TVD (14,006' MD) SWD; Devonian (96101) commercial saltwater disposal well. Disposal will be from 12,100' to 14,000' in the Devonian. Well is on NMSLO surface and minerals. Well was formerly known as State 19 Com 2. See Exhibit A for a USGS map and C-102 form.

II. Operator: V-F Petroleum Inc. (OGRID 24010)
Operator phone number: (432) 683-3344
Operator address: PO Box 1889, Midland TX 79702
Contact for Application: Brian Wood (Permits West, Inc.)
Phone: (505) 466-8120

III. A. (1) Lease: NMSLO lease L0-6654-0002
Lease Size: 332.24 acres
Closest Lease Line: 583'
Lease: Lots 1-4 & E2W2 Section 19, T. 19 S., R. 28 E.

A. (2) Surface casing (13.375", 48#, H-40, ST&C) is set at 447' in a 17.5" hole and cemented to GL with 575 sacks. Circulated 130 sacks.

Intermediate casing (8.625", 24#, K-55, ST&C) is set at 2,448' in an 11" hole and cemented to GL with 900 sacks. Circulated 60 sacks.

Production casing (5.5", 17# (MN-80, Butt; K-55, LT&C; N-80, LT&C) and 20#, N-80, LT&C) is set at 11,150' in a 7.875" hole and cemented to 8,990' (temperature) with 465 sacks in 1978. Casing was later cut at 7017' and removed. Well was P&A in 2014.

V-F will drill out 8 plugs, kick-off at 6966', and drill a 7.875" hole to 12,100'. Casing (5.5", 20#, 23# &/or 26#) will be set there and cemented to GL with 1270 sacks.

A 4.375" hole will be drilled to 14,000' TVD (14,006' MD) and completed open hole in the Devonian from 12,100' to 14,000' TVD.

A. (3) Tubing (3.5", 9.3#, N-80, IPC) will be set @ ≈12,050'. (Disposal interval will be 12,100' - 14,000' TVD.)

A. (4) An Arrow 10,000# WP nickel-plated packer will be set @ ≈12,050' (or in any event, ≤100' above the top (12,100') of the open-hole.

B. (1) Disposal zone will be carbonates in the SWD; Devonian (NMOCD pool 96101). Estimated fracture gradient is ≈0.7 psi per foot.

B. (2) Disposal interval (12,100' to 14,000' TVD) will be open hole.

B. (3) Well was originally drilled and completed as a Morrow gas well.

B. (4) Perforated intervals are 9411' - 9428' (Canyon), 9643' - 9698' (Strawn), 10586' - 11062' (Atoka & Morrow). Depending on depth, those perforations are isolated behind cement plugs (GL - 100', 311' - 500', 2323' - 2349', 2433' - 2506', 3080' - 3195', 5492' - 5607', 6814' - 6954', 6966' - 7067', & 8420' - 8491') and CIBPs (9340' & 10,500').

B. (5) Next higher oil or gas zone in the area of review is the Morrow. Deepest Morrow (or other) well in a 1-mile radius is 11,400'. Top of open hole will be 12,100'. There is no lower producing oil or gas zone in the area of review. Closest Devonian producer is >6 miles distant. Closest SWD; Devonian APD (30-015-30366) is 4-1/2 miles northeast in M-34-18s-28e. C-108 approval is pending.

IV. This is not an expansion of an existing injection project. It is disposal only.

V. Exhibit B shows and tabulates 19 wells (11 producers + 8 P&A) within a 1-mile radius. Exhibit C shows 101 existing wells (47 oil or gas + 50 P&A + 2 SWDs (both Canyon) + 2 water) within a 2-mile radius.

Exhibit D maps and tabulates all operators (regardless of depth), leases, and lessors (only NMSLO) within a 1-mile radius. Exhibit E shows all leases (only BLM & NMSLO) within a 2-mile radius.

VI. None of the 19 wells within 1-mile penetrated the Devonian (≈12,060'). Deepest well (30-015-30395) within 1-mile went to 11,400' in the Morrow. It is 4,234' southeast in J-30-19s-28e.

VII. 1. Average injection rate will be ≈10,000 bwpd.
Maximum injection rate will be 20,000 bwpd.
2. System will be closed and open.
3. Average injection pressure will be ≈2000 psi. Maximum injection pressure will be 2420 psi (= 0.2 psi/foot x 12,100' (top of open hole)).
4. Water source will be produced water from Permian Basin wells. Exhibit F tabulates T. 18 S., R. 28 E. and T. 19 S., R. 28 & 29 E. analyses from New Mexico Produced Water Quality Database v.2. Sample from a Devonian P&A wildcat oil well (30-015-03537) well 12 miles NE in M-1-19s-29e showed TDS at 29,011 mg/l. No compatibility problems have been reported from the closest (≈5.3 miles north-northwest) active SWD; Devonian well (30-015-32422). A minimum 5,386,398 barrels have been disposed to date in 5 years of operation.
5. Closest Devonian producer (30-015-05614) is >20 miles east-northeast. Devonian water samples from Lea Unit 8 (30-025-02431) and Lea Unit 9 (30-025-02432) show:

Lea Unit Well	TDS (mg/L)	Chlorides (mg/L)	Sulfate (mg/L)
8	33,414	18,570	1,961
9	45,778	26,440	729

VIII. The Devonian is comprised of carbonates and is an estimated 1940' thick in this well. Closest possible underground source of drinking water above the proposed disposal interval are the red beds from GL to ≈250'. Salt and anhydrite are below the red beds and >2 miles of separation between the bottom of the red beds and the top of the Devonian.

According to State Engineer records (Exhibit G), no water well is within a mile radius. No water well was found during a June 4, 2019 field inspection. State 19 #2 is 4 miles northwest of the Capitan Reef.

No underground source of drinking water is below the proposed disposal interval. Produced water is currently being injected in 24 wells (Yates, Seven Rivers, Grayburg, Queen, San Andres) and disposed in 3 wells (Canyon, Cisco, Grayburg) within 19s-28e.

Formation tops are:

Quaternary = 0'
Base salt = 660'
Seven Rivers = 750'
Queen = 1400'
Grayburg = 2000'
San Andres = 2300'
2nd Bone Spring = 6930'
3rd Bone Spring: 8080'
Wolfcamp = 8565'
Cisco: 8970'
Canyon = 9320'
Strawn = 9576'
Atoka = 10,200'
Morrow = 10,590'
Devonian = 12,060'
Proposed Disposal Zone = 12100' - 14,000'
TD: 14,000'

IX. The well will be stimulated with acid to clean out scale or fill.

X. One log is on file with NMOCD. CNL/FDC DLL logs were run. CBL will be run if cement does not circulate to surface on the 5.5" in the directional portion of the well.

XI. According to State Engineer records, no water well is within 1-mile. No water well was found during a June 4, 2019 field inspection.

XII. V-F Petroleum Inc. is not aware of any geologic or engineering data that may indicate the Devonian is in hydrologic connection with any underground source of water. One-hundred fifty-six Devonian saltwater disposal wells and nine Devonian injection wells are active in New Mexico. Closest Quaternary fault (Guadalupe) is ≈54 miles west (Exhibit H).

XIII. Legal ad (Exhibit I) was published in the Artesia newspaper on August 27, 2019. Notice (this application) is being sent to the surface owner (NMSLO), only lessor (NMSLO), all oil and gas lessees (Cimarex, COG, Concho, Devon, EOG, Faulconer, Federal Abstract, Harvard, Marathon, North Central, WPX, XTO), and all well operators regardless of depth (BC Operating, CFM, Chi, COG, Denton, Harvard, Mewbourne), and other owners (Apache, Brazos LP, Maynard Oil, McCombs Energy, NM Ventures, Patterson Petroleum, Permian Resources Holdings, Smith and Marrs Inc.) within 1-mile (Exhibit J).

EXHIBIT A

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 Road, 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 & 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

X AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-22625	96101	SWD; Devonian

Property Code	Property Name	Well Number
	STATE 19	2

OGRID No.	Operator Name	Elevation
24010	V-F PETROLEUM INC.	3495'

Surface Location

UL or lot No	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	19	19-S	28-E		859.5	SOUTH	2057.8	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
N	19	19-S	28-E		860	SOUTH	1907	WEST	EDDY

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

GEODETIC COORDINATES
NAD 27 NME
BOTTOM HOLE LOCATION
Y= 596834.0 N
X= 535784.4 E
LAT.=32.640745° N
LONG.=104.217082° W

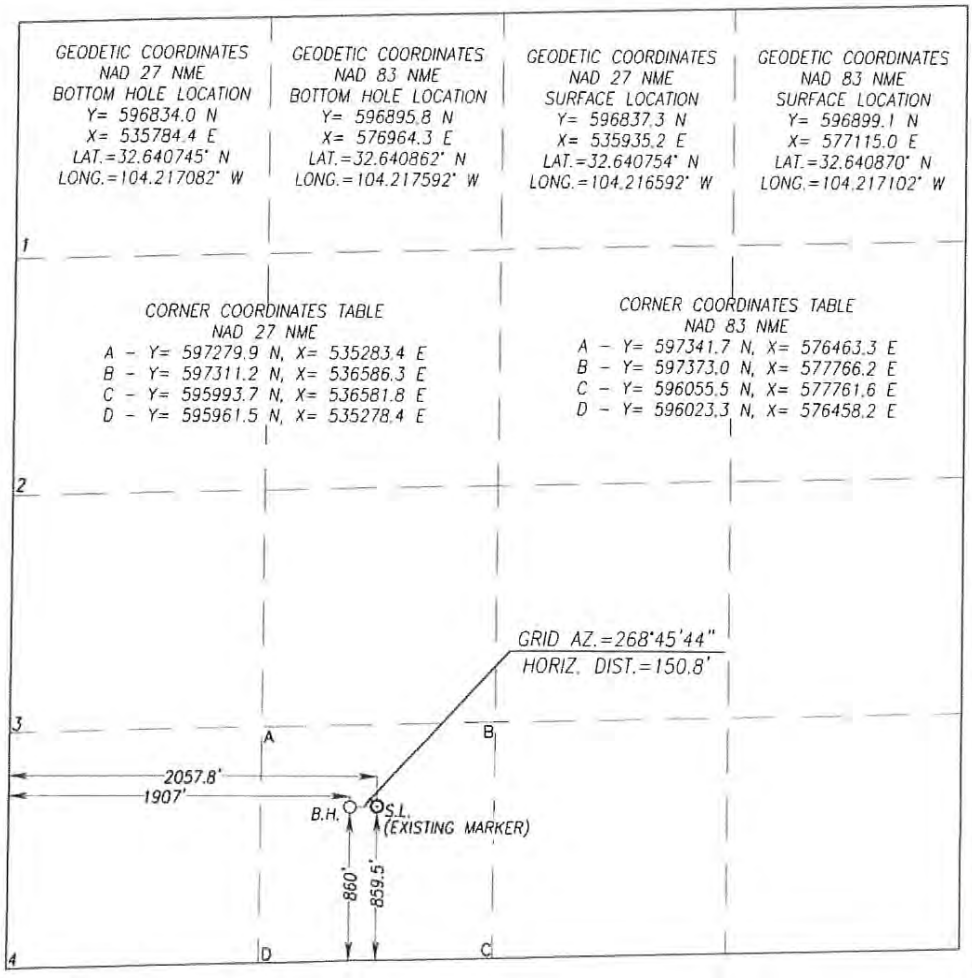
GEODETIC COORDINATES
NAD 83 NME
BOTTOM HOLE LOCATION
Y= 596895.8 N
X= 576964.3 E
LAT.=32.640862° N
LONG.=104.217592° W

GEODETIC COORDINATES
NAD 27 NME
SURFACE LOCATION
Y= 596837.3 N
X= 535935.2 E
LAT.=32.640754° N
LONG.=104.216592° W

GEODETIC COORDINATES
NAD 83 NME
SURFACE LOCATION
Y= 596899.1 N
X= 577115.0 E
LAT.=32.640870° N
LONG.=104.217102° W

CORNER COORDINATES TABLE
NAD 27 NME
A - Y= 597279.9 N, X= 535283.4 E
B - Y= 597311.2 N, X= 536586.3 E
C - Y= 595993.7 N, X= 536581.8 E
D - Y= 595961.5 N, X= 535278.4 E

CORNER COORDINATES TABLE
NAD 83 NME
A - Y= 597341.7 N, X= 576463.3 E
B - Y= 597373.0 N, X= 577766.2 E
C - Y= 596055.5 N, X= 577761.6 E
D - Y= 596023.3 N, X= 576458.2 E



OPERATOR CERTIFICATION

I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division

Eric Sprinkle 4/26/2019
Signature Date

Eric Sprinkle
Printed Name

eric@vfpetroleum.com
E-mail 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 supervision, and that the same is true and correct to the best of my belief.

APRIL 8, 2019
Date of Survey

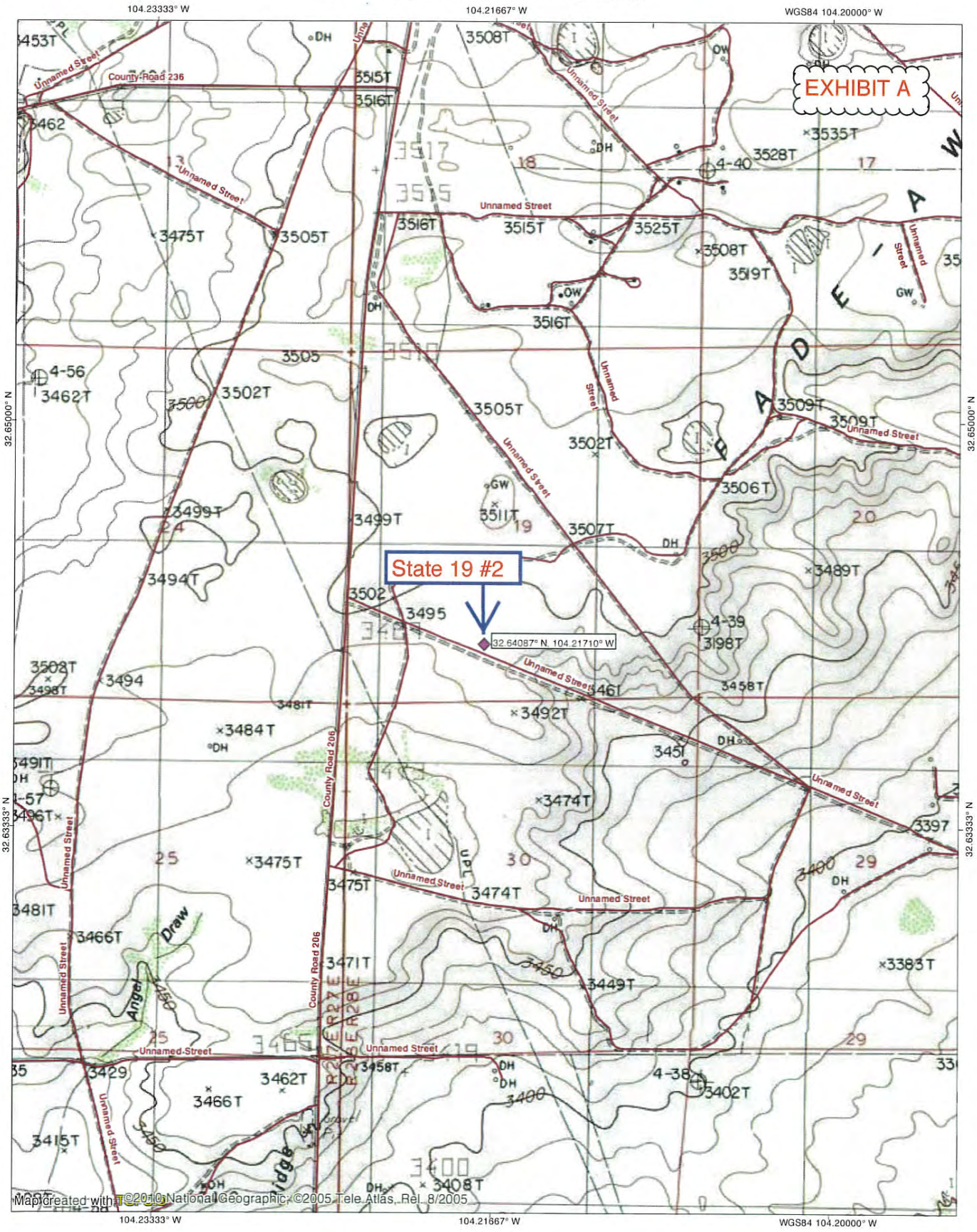
Signature & Seal of Professional Surveyor

RONALD J. EIDSON
NEW MEXICO
3239
REGISTERED PROFESSIONAL SURVEYOR

Ronald J Eidson 04/25/2019
Certificate Number Gary G. Eidson 12641
Ronald J. Eidson 3239

LSL JWSC W.O. 19 11 0537

TOPO! map printed on 08/23/19 from "Untitled.tpo"



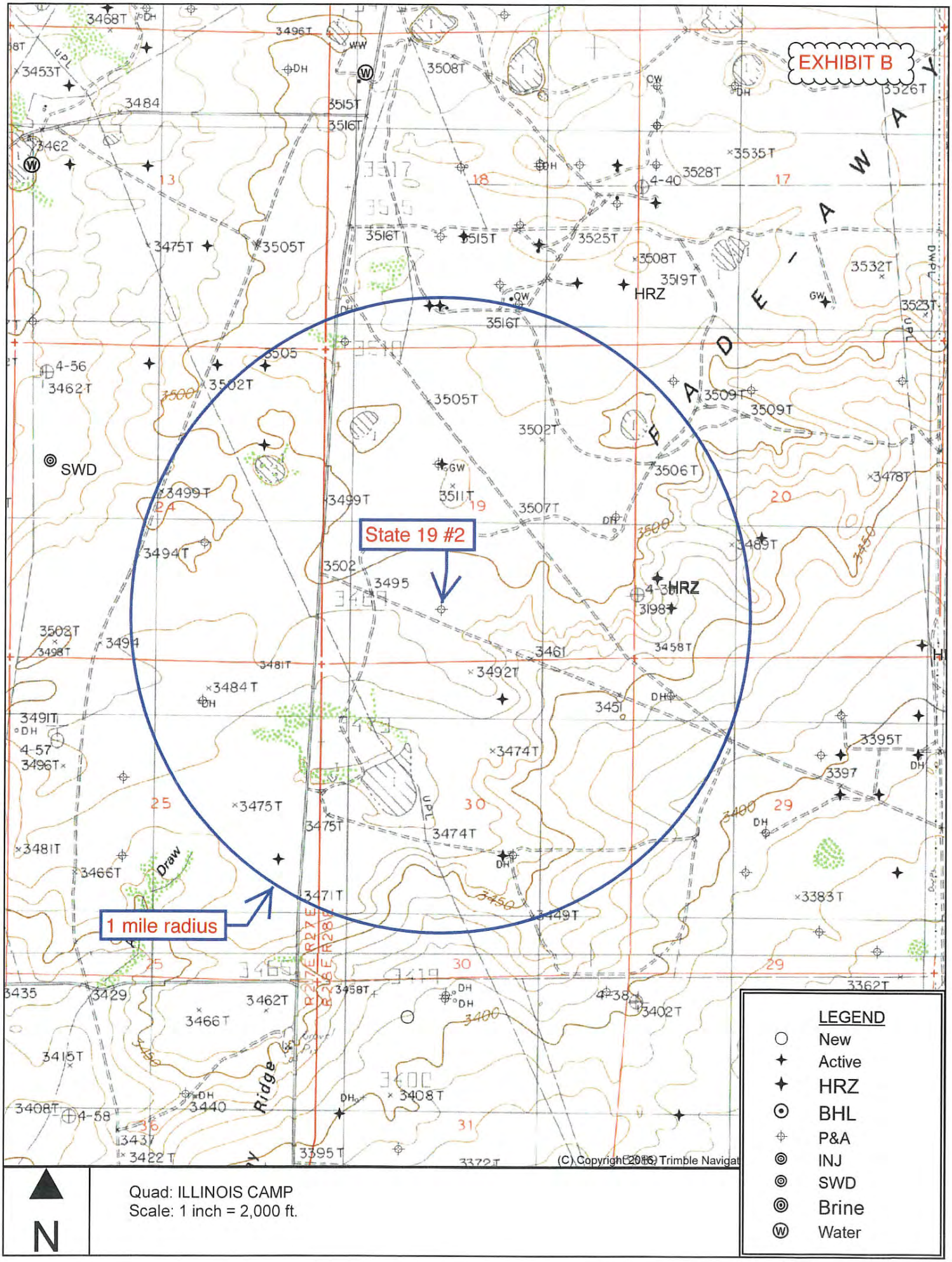


EXHIBIT B
State 19 #2
1 mile radius
SWD
HRZ
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Brine
Water
N
Quad: ILLINOIS CAMP
Scale: 1 inch = 2,000 ft.
(C) Copyright 2016 Trimble Navigat

SORTED BY DISTANCE FROM STATE 19 #2

API	OPERATOR	WELL	TYPE	UNIT-SECTION	TVD	ZONE @ TD	FEET FROM STATE 19 #2
3001523460	V-F Petro	State 30 A Com 001	G	B-30	11270	Morrow	1807
3001502274	Kersey	State 015	P&A	F-19	2676	San Andres	2441
3001522380	V-F Petro	State 19 Com 001	G	F-19	11100	Morrow	2442
3001502275	Malco Resler Yates	State 057	P&A	E-19	3402	San Andres	3346
3001545705	COG	Bigfoot State Com 501H	O	M-20	7523 plan	Bone Spring	3723
3001545706	COG	Bigfoot State Com 502H	O	L-20	7473 plan	Bone Spring	3727
3001530247	V-F Petro	Lightfoot 20 State 001	O	M-20	10000	Strawn	3917
3001533052	Chi	Running Shoe State 001	G	H-24	11073	Morrow	4095
3001502313	Simms & Reese	T & P ST 002	P&A	D-29	2480	San Andres	4158
3001522649	Harvard	H&S State 001	P&A	J-24	11090	Morrow	4193
3001522884	V-F Petro	State 30 Com 001	G	J-30	11400	Morrow	4234
3001502320	Simms & Reese	T & P ST 001	P&A	J-30	2028	Yates	4276
3001501004	Western Dev Delaware	State E-4202 001	P&A	B-25	2650	San Andres	4332
3001502270	Kersey	State 016	P&A	M-18	1900	Yates	4769
3001522412	Vernon E. Faulconer	Eddy GL State Com 001	G	I-25	11150	Morrow	5000
3001526688	Harvard	H&S State 003	O	A-24	2235	San Andres	5071
3001502267	CFM	State 4-5 004	O	N-18	2733	San Andres	5081
3001535881	Mewbourne	Mossberg 18 State Com 001	G	N-18	11145	Morrow	5082
3001502268	Flynn	Featherstone Service 001	P&A	O-18	1909	Yates	5267
3.002E+09	*Mewbourne*	*Mossberg 18 State Com 002*	*G*	*O-18*	*11200 plan*	*Morrow*	*5323*

EXHIBIT B

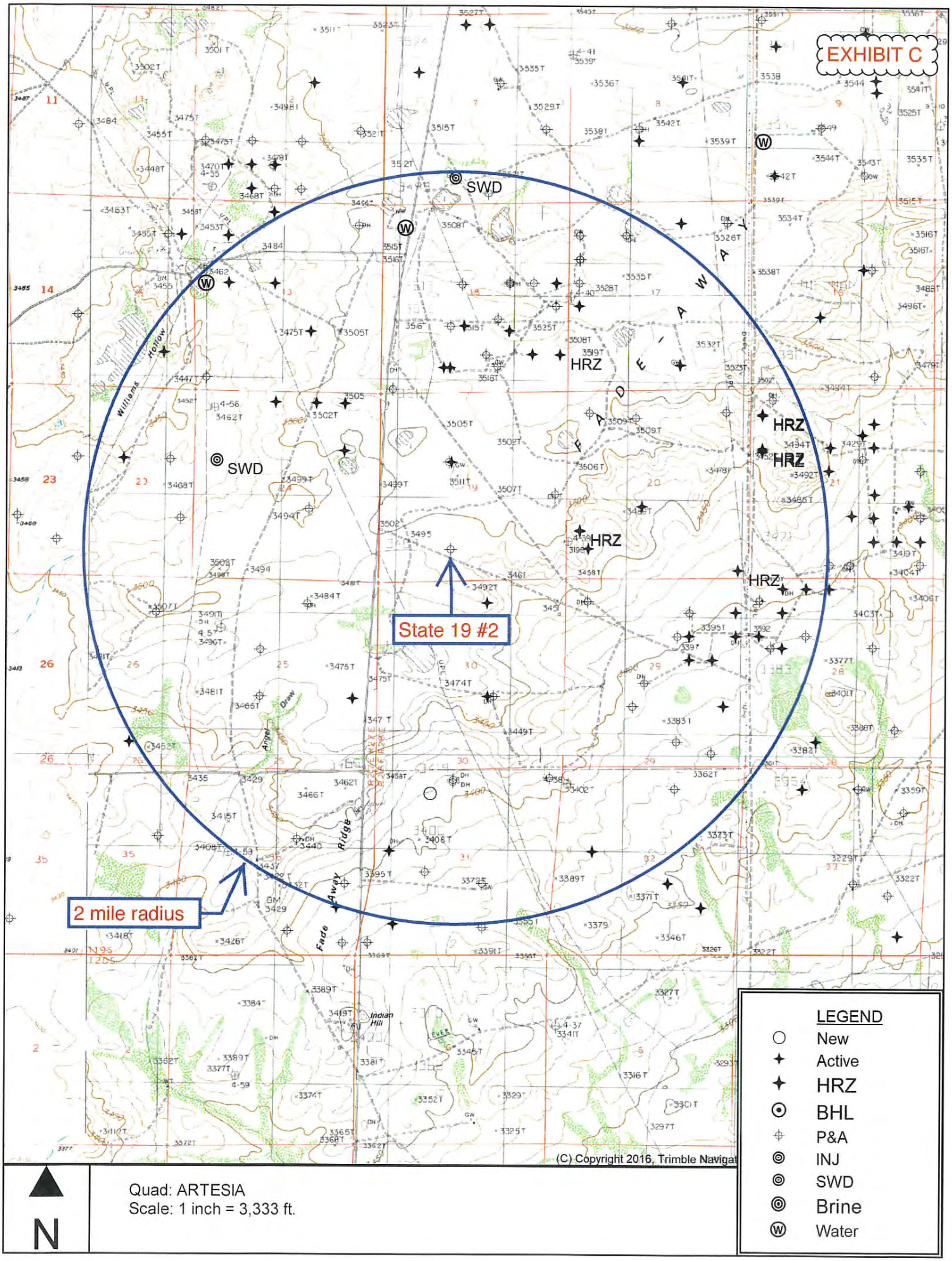


EXHIBIT C
SWD
SWD
HRZ
HRZ
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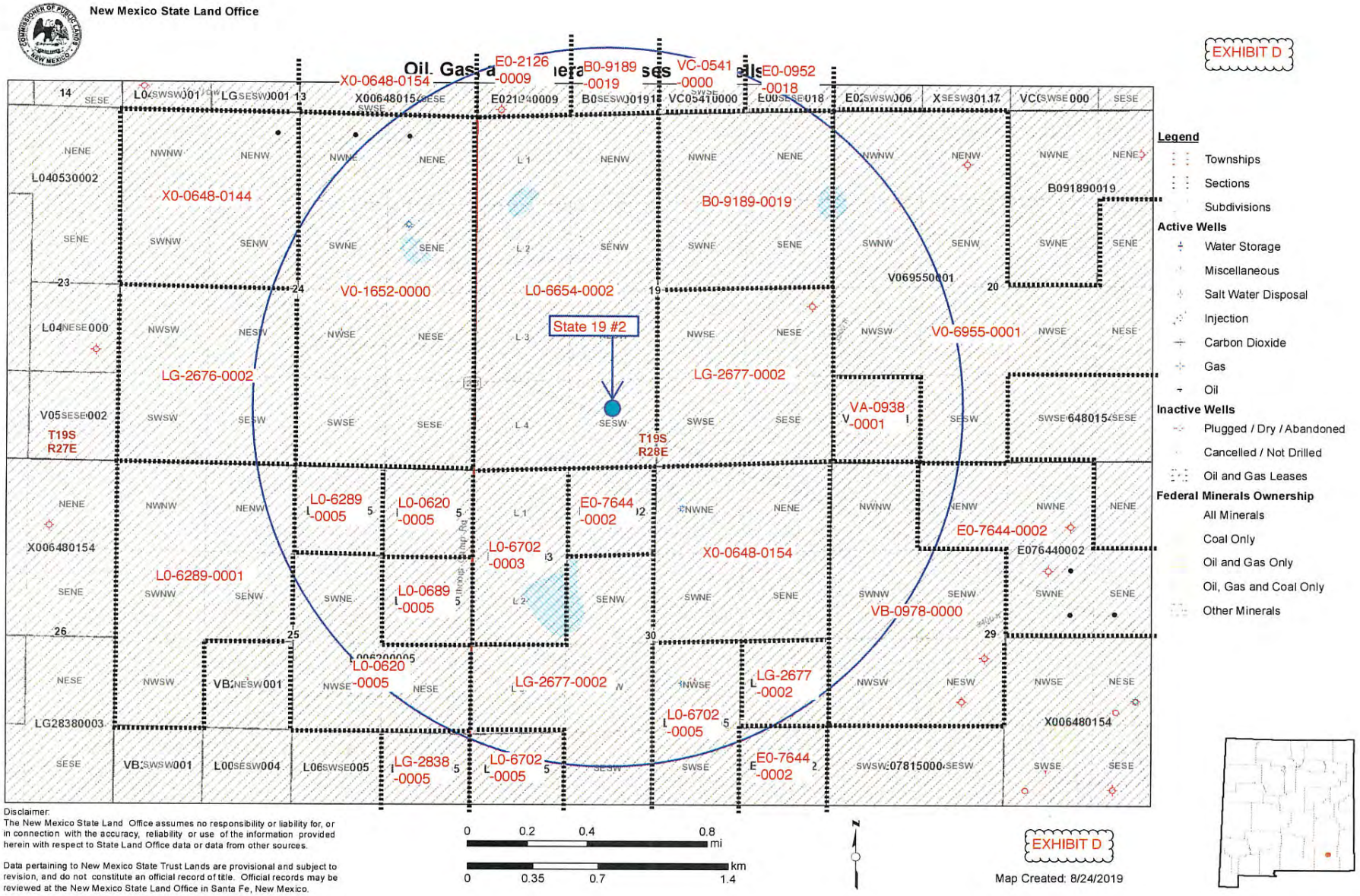
HRZ
State 19 #2
2 mile radius
Quad: ARTESIA
Scale: 1 inch = 3,333 ft.
N
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Brine
Water
(C) Copyright 2016, Trimble Navigat



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STATE 19 #2 AREA OF REVIEW LEASES

Aliquot Parts in Area of Review	Lease (all NMSLO)	Lessee of Record	Well Operators (all shallower than Devonian)
T. 19 S., R 27 E.			
SESE Sec. 13	X0-0648-0154	WPX Energy Permian	Harvard Petroleum
E2 Sec. 24	V0-1652-0000	Harvard Petroleum	Chi Operating & Harvard Petroleum
SENW Sec. 24	X0-0648-0144	Harvard Petroleum	none
E2SW4 Sec. 24	LG-2676-0002	EOG Resources	none
NENE Sec. 25	L0-0620-0005	Faulconer Resources	BC Operating
NWNE Sec. 25	L0-6289-0005	Marathon Oil Permian	BC Operating
E2NW4 Sec. 25	L0-6289-0001	Devon Energy	none
SWNE & N2SE4 Sec. 25	L0-0620-0005	Faulconer Resources	BC Operating
SESE Sec. 25	LG-2838-0005	Faulconer Resources	BC Operating
T. 19 S., R 28 E.			
SWSW Sec. 18	E0-2126-0009	Marathon Oil Permian	Mewbourne
SESW Sec. 18	B0-9189-0019	EOG Resources	CFM & Mewbourne
SWSE Sec. 18	VC-0541-0000	Federal Abstract	Mewbourne
SESE Sec. 18	E0-0952-0018	North Central Operating	Geo. Denton & Mewbourne
NE4 Sec. 19	B0-9189-0019	EOG Resources	V-F Petroleum
W2 Sec. 19	L0-6654-0002	EOG Resources	V-F Petroleum
SE4 Sec. 19	LG-2677-0002	EOG Resources	none
W2NW4, SENW, N2SW4, & SESW Sec. 20	V0-6955-0001	Concho	COG Operating
SWSW Sec. 20	VA-0938-0001	Marathon Oil Co.	V-F Petrroleum & COG Operating
NENW Sec. 29	E0-7644-0002	XTO	none
W2NW4, SENW, & NWSW Sec. 29	VB-0978-0000	Cimarex Energy	none
NE4 Sec. 30	X0-0648-0154	WPX Energy Permian	V-F Petroleum
NENW Sec. 30	E0-7644-0002	XTO	V-F Petroleum
W2NW4 Sec. 30	L0-6702-0003	EOG Resources	V-F Petroleum
SENW, N2SW4, & SESW Sec. 30	LG-2677-0002	EOG Resources	V-F Petroleum
NESE Sec. 30	LG-2677-0002	EOG Resources	V-F Petroleum

EXHIBIT D

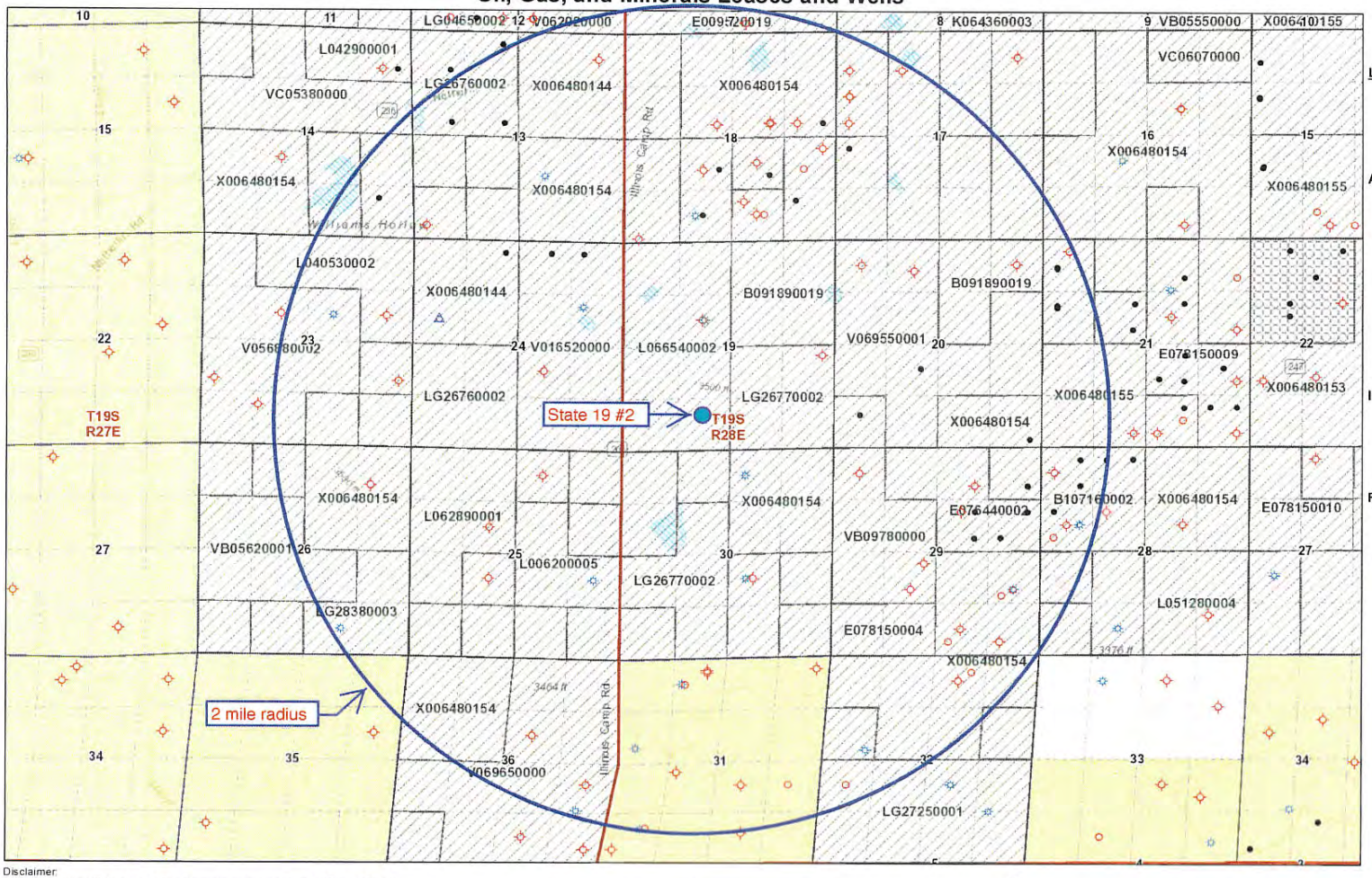
STATE 19 #2 AREA OF REVIEW LEASES

Aliquot Parts in Area of Review	Lease (all NMSLO)	Lessee of Record	Well Operators (all shallower than Devonian)
SESE Sec. 30	E0-7644-0002	XTO	V-F Petroleum
SWSW Sec. 30	L0-6702-0005	Marathon Oil Permian	V-F Petroleum

New Mexico State Land Office

EXHIBIT E

Oil, Gas, and Minerals Leases and Wells



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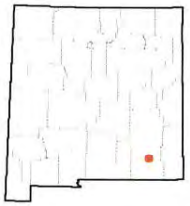
0 0.4 0.8 1.6 mi

0 0.5 1 2 km

N

EXHIBIT E

Map Created: 8/24/2019



All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001502587	4	18S	28E	Abo	30713					15340	1882	2148
3001502587	4	18S	28E	Abo	31644					15780	1988	2214
3001502587	4	18S	28E	Abo	30668					15370	1873	2138
3001502588	4	18S	28E	Abo	31951					16990	2007	2140
3001502627	6	18S	28E	Abo	57541					30850	2192	2899
3001501767	1	18S	28E	Artesia	263556					163000	195	750
3001502638	8	18S	28E	Artesia	202816					125400	71	798
3001528247	10	18S	28E	Artesia	127116	45317	4842	5	1826	82349	339	2810
3001501815	10	18S	28E	Artesia	118021	40427	5272	5	1930	76031	381	2580
3001523225	10	18S	28E	Artesia	117316	45547	2198	5	509	71949	896	4933
3001528244	10	18S	28E	Artesia	25243	7612	1394	5	419	14356	317	1435
3001528010	11	18S	28E	Artesia	142761	54662	3684	14	1229	91856	273	4149
3001528010	11	18S	28E	Artesia	136939	50918	4398	5	1464	88451	206	3698
3001501946	19	18S	28E	Artesia	54350	25400	820	0	1230	49600	355	4210
3001501947	19	18S	28E	Artesia	30610	6049	380		576	29600	520	490
3001501940	19	18S	28E	Artesia	127650	2850	4000	0	7500	115000		
3001501940	19	18S	28E	Artesia	117200	2800	4000	0	9200	103800	48	160
3001501946	19	18S	28E	Artesia	180950	108123	770	1	4080	175000	56	600
3001501941	19	18S	28E	Artesia	12900	7222	240	0	440	12000	200	150
3001501965	19	18S	28E	Artesia	19950	11684	336	0	464	19500	344	175
3001501965	19	18S	28E	Artesia	15275	8464	288	1	552	15000	252	18
3001501942	19	18S	28E	Artesia	249200					146800	0	5974
3001501965	19	18S	28E	Artesia	17650	10695	208	1	192	17000	160	140
3001501943	19	18S	28E	Artesia	113668	69644	2080	0	0	108000	836	3600
3001501946	19	18S	28E	Artesia	89448	26772	2040	0	0	42500	344	2880
3001501951	19	18S	28E	Artesia	52225	30159	2100	0	0	48000	310	2750
3001501954	19	18S	28E	Artesia	132104	81714	2440	0	0	128000	240	2400
3001501964	19	18S	28E	Artesia	97692	59340	2160	0	0	92000	952	3840
3001509142	19	18S	28E	Artesia	59540	34983	1920	0	0	54500	460	3360
3001502022	23	18S	28E	Artesia	100680	29466	2765	525	4671	66957	255	193

EXHIBIT F

All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001502113	29	18S	28E	Artesia	38950		13620	###	8750	12400	400	3750
3001502142	30	18S	28E	Artesia						44000		
3001502138	30	18S	28E	Artesia	28300	2100	2960	0	7640	17400	650	1750
3001502139	30	18S	28E	Artesia	14975		2400	0	5400	7000	48	150
3001502138	30	18S	28E	Artesia	16500		440	0	760	15000	300	175
3001502138	30	18S	28E	Artesia	12175	6049	336	0	524	11000	520	192
3001502142	30	18S	28E	Artesia	43700	25530	450	2	1110	43000	160	450
3001502142	30	18S	28E	Artesia	43700	25530	448	2	1112	43000	140	450
3001502142	30	18S	28E	Artesia	17750	7890	376		664	17500	112	450
3001502142	30	18S	28E	Artesia	10650	5819	340	0	460	10000	160	450
3001502142	30	18S	28E	Artesia	9750	5037	360	2	520	9500	160	375
3001502132	30	18S	28E	Artesia	12850	7084	480	0	420	12600	420	200
3001502142	30	18S	28E	Artesia	12750	6417	440	0	500	11750	420	250
3001521866	30	18S	28E	Artesia	38950	21321	480	0	1260	37000	316	325
3001502135	30	18S	28E	Artesia	126534		10880	0	34320	79000	284	2250
3001502132	30	18S	28E	Artesia	22220	11477	1720	0	0	18500	488	2520
3001502139	30	18S	28E	Artesia	30128	16698	1520	0	0	26000	452	2880
3001502166	33	18S	28E	Artesia	80632					45800	610	3750
3001502178	4	19S	28E	Artesia	140946					85640	450	2229
3001502226	12	19S	28E	Artesia	100179					59426	1088	1050
3001502239	13	19S	28E	Artesia	122436					71810	1000	2404
3001510105	13	19S	28E	Artesia	113098					64800	1728	4104
3001502302	25	19S	28E	Artesia	66858					39750	1154	262
3001503554	3	19S	29E	Artesia	6605					1933	246	2296
3001503555	3	19S	29E	Artesia	5776					1926	184	1846
3001503563	5	19S	29E	Artesia	200307					118800	1641	2853
3001503597	18	19S	29E	Artesia	76473					43850	1260	2424
3001503615	34	19S	29E	Artesia	51629					25250	1964	6000
3001503615	34	19S	29E	Artesia	152978					82800	183	11900
3001503615	34	19S	29E	Artesia	66591					35200	1365	5200

EXHIBIT F

All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001510329	36	19S	29E	Artesia	43392					20700	1428	5589
3001503612	32	19S	29E	Bone Spring	33760					15600	290	5500
3001540781	12	19S	29E	Bone Spring 1 Ss	213636	79761	3295	22	662	127089		481
3001540779	12	19S	29E	Bone Spring 1 Ss	210479	78858	3619	17	723	124000	488	639
3001540780	12	19S	29E	Bone Spring 1 Ss		93423	5621	0	1224	157841	415	470
3001540779	12	19S	29E	Bone Spring 1 Ss		94968	3407	3	730	155973	659	480
3001540780	12	19S	29E	Bone Spring 1 Ss		90194	3568	0	718	149598	244	420
3001540781	12	19S	29E	Bone Spring 1 Ss	208284	75251	3375	18	677	126406		488
3001540587	20	19S	29E	Bone Spring 1 Ss	220041	82296	3071	19	678	131023		709
3001540511	20	19S	29E	Bone Spring 1 Ss		79272	3440	21	664	131794	366	500
3001540591	20	19S	29E	Bone Spring 1 Ss		68603	10342	23	1757	130837	73	800
3001540591	20	19S	29E	Bone Spring 1 Ss		104490	5604	21	1237	175022	964	490
3001540511	20	19S	29E	Bone Spring 1 Ss		91931	5555	20	1182	155717	439	470
3001540512	21	19S	29E	Bone Spring 1 Ss		101408	3045	12	671	162925	549	290
3001540512	21	19S	29E	Bone Spring 1 Ss	167727	59396	2871	16	546	102000	317	748
3001540513	21	19S	29E	Bone Spring 1 Ss	214315	74061	3014	60	687	133469	366	0
3001541014	21	19S	29E	Bone Spring 1 Ss		86063	5256	27	1154	145983	488	490
3001540512	21	19S	29E	Bone Spring 1 Ss		85156	5652	21	1173	145584	476	510
3001541007	21	19S	29E	Bone Spring 1 Ss	202394	71386	3167	66	688	124677		552
3001541014	21	19S	29E	Bone Spring 1 Ss	204994	71291	3070	33	665	127550		545
3001540822	22	19S	29E	Bone Spring 1 Ss	208209	71859	3449	40	701	129492		622
3001540822	22	19S	29E	Bone Spring 1 Ss	209470	75384	3145	35	658	127594		557
3001541008	22	19S	29E	Bone Spring 1 Ss		86589	5601	51	1217	147547	537	510
3001540822	22	19S	29E	Bone Spring 1 Ss		95292	3405	14	671	156438	342	440
3001541008	22	19S	29E	Bone Spring 1 Ss		96553	3472	11	698	158477	550	440
3001540289	27	19S	29E	Bone Spring 1 Ss	205841	75826	2827	98	580	123798		504
3001540508	27	19S	29E	Bone Spring 1 Ss	209710	72736	3012	71	575	130499	305	0
3001540289	27	19S	29E	Bone Spring 1 Ss		103455	3590	21	706	170216	378	400
3001540508	27	19S	29E	Bone Spring 1 Ss		85353	3256	28	620	141209	366	360
3001540583	27	19S	29E	Bone Spring 1 Ss		94174	3444	25	695	155343	305	420

EXHIBIT F

All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001540507	27	19S	29E	Bone Spring 1 Ss	194044	69009	2891	47	594	119143		546
3001540583	27	19S	29E	Bone Spring 1 Ss	207101	72181	3108	45	663	128420		785
3001540509	28	19S	29E	Bone Spring 1 Ss	208768	75798	3376	73	684	126019		536
3001540135	28	19S	29E	Bone Spring 1 Ss	216803	79610	2917	15	650	130755		662
3001540135	28	19S	29E	Bone Spring 1 Ss	79317	27817	1901	23	288	46791	573	1057
3001540135	28	19S	29E	Bone Spring 1 Ss	204699	70858	2959	31	647	127420	268	0
3001540135	28	19S	29E	Bone Spring 1 Ss		92567	3277	21	696	152161	366	460
3001540509	28	19S	29E	Bone Spring 1 Ss		93253	3591	16	683	153680	366	480
3001540509	28	19S	29E	Bone Spring 1 Ss		78139	5701	122	1195	134723	476	490
3001540592	28	19S	29E	Bone Spring 1 Ss		94735	3617	15	717	156241	231	480
3001540515	29	19S	29E	Bone Spring 1 Ss		97526	2676	0	586	155601	927	310
3001540514	29	19S	29E	Bone Spring 1 Ss	203297	76713	3056	29	651	119809	390	0
3001540516	29	19S	29E	Bone Spring 1 Ss	210488	74730	3363	39	728	129027		548
3001541380	30	19S	29E	Bone Spring 1 Ss		109466	2731	0	609	174338	549	440
3001540584	32	19S	29E	Bone Spring 1 Ss	213293	72011	3096	26	608	134925		603
3001540606	32	19S	29E	Bone Spring 1 Ss	243754	81606	2589	36	973	152761		3578
3001540584	32	19S	29E	Bone Spring 1 Ss	214766	78221	3072	15	673	129950		680
3001540606	32	19S	29E	Bone Spring 1 Ss		78663	3352	0	651	130698	366	540
3001540584	32	19S	29E	Bone Spring 1 Ss	195749	70891	3422	17	683	117441		964
3001540777	12	19S	29E	Bone Spring 2 Ss	211237	62106	11194	88	1452	133575		789
3001540778	12	19S	29E	Bone Spring 2 Ss	220688	66570	12206	66	1590	137383		732
3001540778	12	19S	29E	Bone Spring 2 Ss	210922	63737	10725	60	1439	132273		617
3001540782	12	19S	29E	Bone Spring 2 Ss	196138	62689	10129	36	1390	118800	98	929
3001540782	12	19S	29E	Bone Spring 2 Ss		72789	11481	40	1699	139551	61	620
3001540782	12	19S	29E	Bone Spring 2 Ss		87943	20188	99	2702	179698	183	600
3001540777	12	19S	29E	Bone Spring 2 Ss		77378	11310	33	1609	145992	171	660
3001540782	12	19S	29E	Bone Spring 2 Ss		77810	13519	232	1752	151421	183	540
3001538338	20	19S	29E	Bone Spring 2 Ss	214079	68545	11436	36	1947	129500	110	0
3001538421	20	19S	29E	Bone Spring 2 Ss	212073	68607	11378	31	2164	127200	122	0
3001539365	20	19S	29E	Bone Spring 2 Ss	204892	66120	11033	41	1821	123300	134	0

EXHIBIT F

All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001540037	20	19S	29E	Bone Spring 2 Ss	206939	68708	11434	41	1886	122200	146	0
3001538421	20	19S	29E	Bone Spring 2 Ss	218593	71348	11431	44	2171	130625		593
3001540037	20	19S	29E	Bone Spring 2 Ss	188897	58687	10476	29	1659	114294	49	1768
3001538338	20	19S	29E	Bone Spring 2 Ss		57466	11211	23	2455	117396	110	540
3001538421	20	19S	29E	Bone Spring 2 Ss		59008	11203	17	2524	119999	146	480
3001540037	20	19S	29E	Bone Spring 2 Ss		88453	11171	27	2368	164953	122	440
3001540037	20	19S	29E	Bone Spring 2 Ss	212555	61902	10789	34	1765	135296		786
3001538338	20	19S	29E	Bone Spring 2 Ss	215251	67241	11580	33	1943	130663	49	1549
3001538421	20	19S	29E	Bone Spring 2 Ss	222698	70153	11230	23	2195	135411	49	1399
3001539365	20	19S	29E	Bone Spring 2 Ss	192416	60668	10063	40	1543	116201	98	1863
3001538605	21	19S	29E	Bone Spring 2 Ss	187069	59558	9295	39	1457	112389	73	2422
3001539372	21	19S	29E	Bone Spring 2 Ss	179727	56773	9354	42	1408	108290	73	2022
3001538605	21	19S	29E	Bone Spring 2 Ss	212439	70396	10624	35	1653	126800	49	777
3001540134	21	19S	29E	Bone Spring 2 Ss	221551	66995	10754	24	2054	138800	37	652
3001538335	21	19S	29E	Bone Spring 2 Ss	207620	63676	10340	38	1579	129265	24	0
3001538605	21	19S	29E	Bone Spring 2 Ss		68390	10388	61	1720	130427	110	820
3001539374	21	19S	29E	Bone Spring 2 Ss		69882	10737	28	1836	133839	49	760
3001540134	21	19S	29E	Bone Spring 2 Ss		71254	10986	12	2354	138115	122	540
3001539372	21	19S	29E	Bone Spring 2 Ss		58456	10738	40	1975	116569	110	640
3001540036	21	19S	29E	Bone Spring 2 Ss		83934	10820	39	1849	155753	122	600
3001538335	21	19S	29E	Bone Spring 2 Ss	18243	5584	971	15	165	10069	220	1055
3001538335	21	19S	29E	Bone Spring 2 Ss	172529	55589	8279	37	1270	104676	24	1100
3001540036	21	19S	29E	Bone Spring 2 Ss	179518	56819	9252	57	1394	108013	98	2157
3001540134	21	19S	29E	Bone Spring 2 Ss	158405	49315	8392	23	1577	95620	122	1731
3001538334	22	19S	29E	Bone Spring 2 Ss	209176	74633	3152	32	653	127957		559
3001538334	22	19S	29E	Bone Spring 2 Ss	142243	45640	6959	44	989	85871	37	1319
3001540216	27	19S	29E	Bone Spring 2 Ss	205198	76060	2957	69	598	122742		502
3001538333	27	19S	29E	Bone Spring 2 Ss		56874	10448	40	1708	112925	146	540
3001538333	27	19S	29E	Bone Spring 2 Ss		78323	9979	32	1800	145351	98	640
3001540501	27	19S	29E	Bone Spring 2 Ss		86090	13546	25	1952	164708	171	580

EXHIBIT F

All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001540506	27	19S	29E	Bone Spring 2 Ss		84563	13920	39	2008	163345	98	740
3001539328	28	19S	29E	Bone Spring 2 Ss	209249	63419	10816	27	1939	130309	61	0
3001540206	28	19S	29E	Bone Spring 2 Ss	210487	63900	10990	45	1916	130880	61	0
3001540217	28	19S	29E	Bone Spring 2 Ss	200099	62122	10663	30	1899	122620	85	0
3001540207	28	19S	29E	Bone Spring 2 Ss		76325	13728	0	2631	152008	122	640
3001540217	28	19S	29E	Bone Spring 2 Ss		84893	11130	15	2281	159026	110	740
3001540217	28	19S	29E	Bone Spring 2 Ss	211734	70916	11464	16	2278	123941	98	0
3001539373	29	19S	29E	Bone Spring 2 Ss	204175	66112	11002	43	1752	122800	98	0
3001540423	29	19S	29E	Bone Spring 2 Ss	202518	66051	11044	45	1871	121000	134	0
3001540424	29	19S	29E	Bone Spring 2 Ss	199175	65110	10607	27	1713	119200	134	0
3001539373	29	19S	29E	Bone Spring 2 Ss	207229	72432	7735	62	1304	122859		588
3001539386	29	19S	29E	Bone Spring 2 Ss	210082	79107	2905	16	645	124634		624
3001539373	29	19S	29E	Bone Spring 2 Ss	207257	64962	11127	37	1762	125792	61	1442
3001539386	29	19S	29E	Bone Spring 2 Ss	207902	67569	9690	27	1472	126295	49	1128
3001540423	29	19S	29E	Bone Spring 2 Ss	191835	60132	10463	55	1576	116618	73	1132
3001539386	29	19S	29E	Bone Spring 2 Ss	210714	64075	11182	47	1749	130950	37	0
3001539373	29	19S	29E	Bone Spring 2 Ss		76748	10831	41	2005	145145	244	460
3001539386	29	19S	29E	Bone Spring 2 Ss		82889	11278	58	2174	156139	134	520
3001540423	29	19S	29E	Bone Spring 2 Ss	213597	61082	10818	31	1979	137006		753
3001540424	29	19S	29E	Bone Spring 2 Ss	206242	59619	10150	26	1615	132172		701
3001539386	29	19S	29E	Bone Spring 2 Ss	192324	60013	10466	27	1697	116431	61	1722
3001540035	32	19S	29E	Bone Spring 2 Ss	204442	69490	2892	17	616	128687		738
3001538476	32	19S	29E	Bone Spring 2 Ss	203063	60960	10276	46	1680	127495		669
3001538476	32	19S	29E	Bone Spring 2 Ss	197878	63015	9639	55	1655	119391	110	1990
3001539790	33	19S	29E	Bone Spring 2 Ss	194362	62735	10730	33	1733	116600	134	0
3001539806	33	19S	29E	Bone Spring 2 Ss	212965	67869	11454	40	2204	128700	146	0
3001539806	33	19S	29E	Bone Spring 2 Ss	211695	65999	10786	37	2077	129142		629
3001539806	33	19S	29E	Bone Spring 2 Ss	216504	62855	10959	36	2056	137871		647
3001539790	33	19S	29E	Bone Spring 2 Ss	168771	52934	9017	37	1376	102210	98	1308
3001540025	20	19S	29E	Bone Spring 3 Ss	103835	32098	6912	84	1008	62300	281	0

EXHIBIT F

All Constituents in mg/l

API	Section	Township	Range	Formation	TDS	Na	Ca	Fe	Mg	CL	HCO3	SO4
3001540025	20	19S	29E	Bone Spring 3 Ss	76582	25463	2775	38	498	45756		930
3001542946	20	19S	29E	Bone Spring 3 Ss	106366	34602	4236	19	736	64935		703
3001542809	21	19S	29E	Bone Spring 3 Ss	117585	38613	4526	39	774	71782		550
3001542809	21	19S	29E	Bone Spring 3 Ss	115850	36308	4673	12	801	72335		564
3001543321	28	19S	29E	Bone Spring 3 Ss	105001	35624	3951	18	690	62695		685
3001502301	25	19S	28E	Delaware	55498					32420	601	984
3001503537	1	19S	29E	Devonian	29011					16000	520	1500
3001529331	21	18S	28E	Morrow	33151	11660	441	876	73	20051	516	5
3001523998	16	19S	28E	Morrow	56555		1680	60	730	34080	866	13
3001503612	32	19S	29E	Pennsylvanian	6420							
3001502638	8	18S	28E	Premier		65664	7000		3887	125400	71	798
3001502302	25	19S	28E	Queen	66874	23288	1804		608	39757	1154	262
3001502301	25	19S	28E	Queen								
3001502301	25	19S	28E	Queen								
3001501965	19	18S	28E	Queen/Grayburg	15275	8786	160	2	484	15000	280	98
3001501965	19	18S	28E	Queen/Grayburg	15275	8832	390	2	410	15000	140	600
3001501944	19	18S	28E	Queen/Grayburg	105912	19711	1360	0	0	101500	444	2640
3001501942	19	18S	28E	San Andres		90699	3277	0	1878	146802	14	5974
3001502303	26	19S	28E	Seven Rivers								
3001502280	21	19S	28E	Wolfcamp	118720					70200	2700	1080

EXHIBIT F

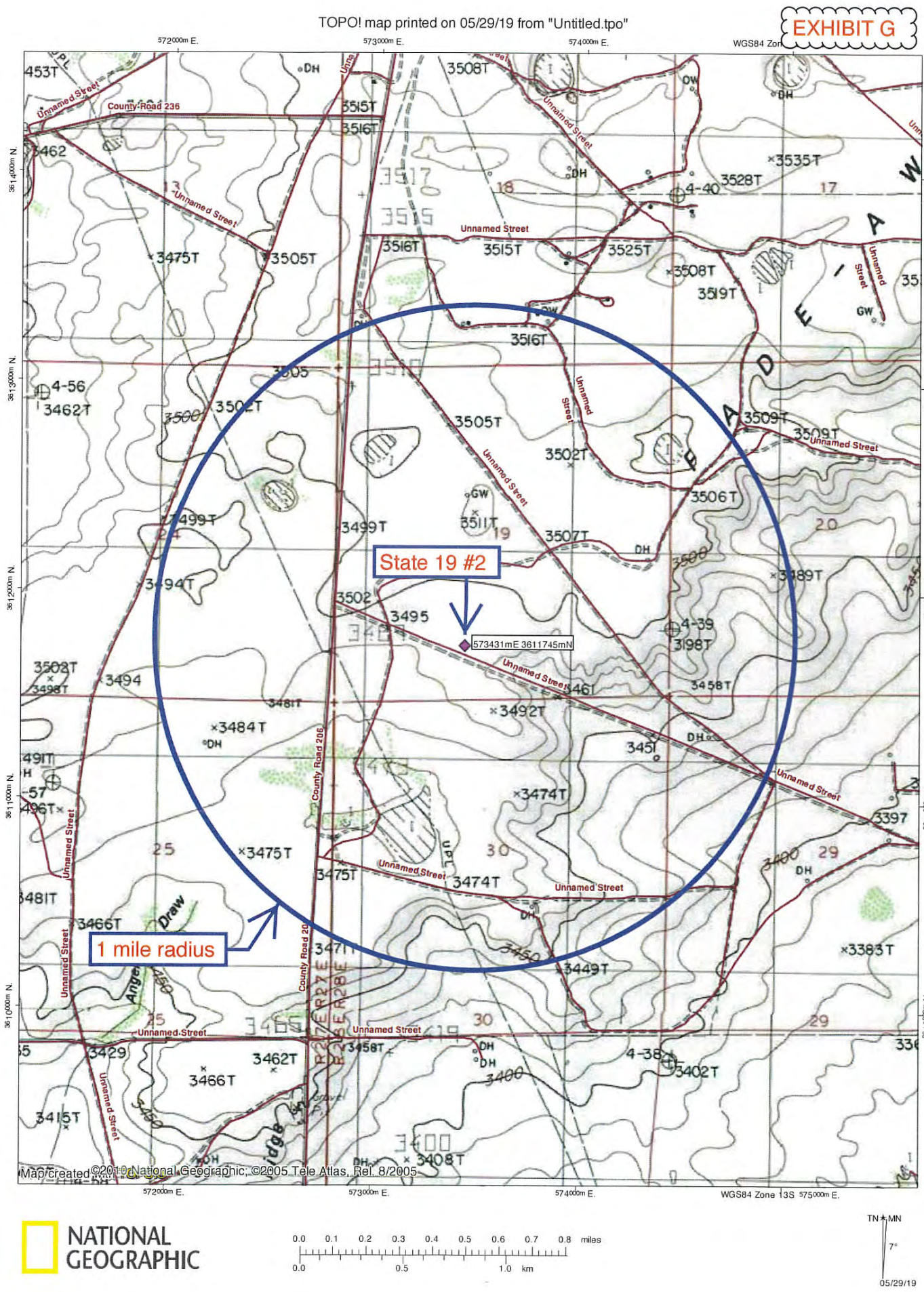

TOPO! map printed on 05/29/19 from "Untitled.tpo"
EXHIBIT G
State 19 #2
573431mE 3611745mN
1 mile radius
County Road 236
County Road 206
Unnamed Street
Draw
Ridge
Map created ©2010 National Geographic, ©2005 Tele Atlas, Rel. 8/2005
NATIONAL GEOGRAPHIC
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 miles
0.0 0.5 1.0 km
TN MN
7°
05/29/19

EXHIBIT G

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 00502		CP	ED		1	1	18	19S	28E	573001	3614478*	2766	100	91	9
CP 00836 POD1		CP	ED		1	1	18	19S	28E	573001	3614478*	2766	110		
CP 00837 POD1		CP	ED		1	1	18	19S	28E	573001	3614478*	2766	110		
CP 00838 POD1		CP	ED		1	1	18	19S	28E	573001	3614478*	2766	110		
RA 08929		RA	ED	3	3	1	13	19S	27E	571282	3613992*	3109	185		

Average Depth to Water: **91 feet**

Minimum Depth: **91 feet**

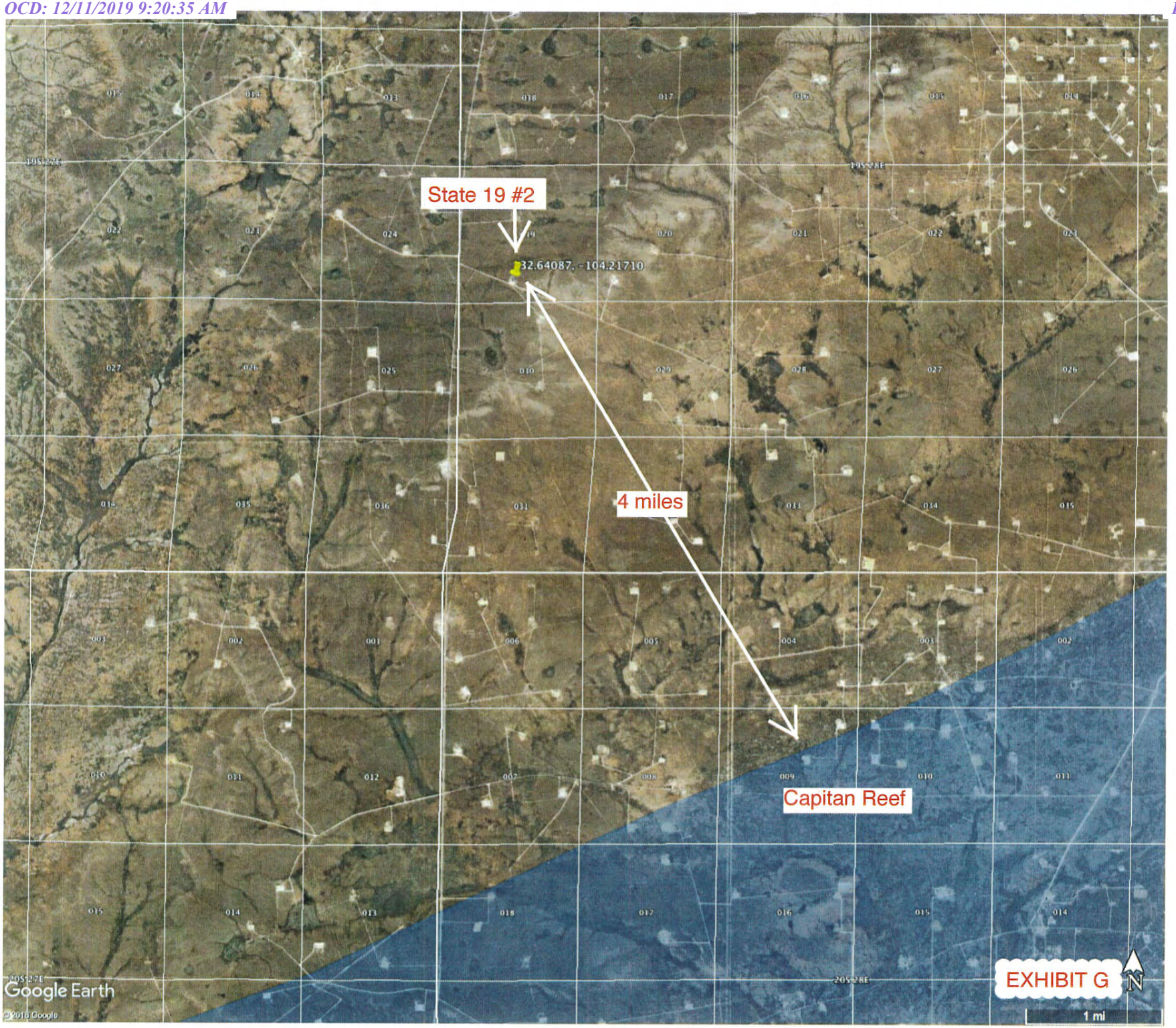
Maximum Depth: **91 feet**

Record Count: 5

UTMNAD83 Radius Search (in meters): (1 mile = 1610 meters)

Easting (X): 573431 **Northing (Y):** 3611745 **Radius:** 3220

***UTM location was derived from PLSS - see Help**


State 19 #2
32.64087, -104.21710
4 miles
Capitan Reef
EXHIBIT G
N
1 mi
Google Earth
© 2018 Google

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PROVIDING PERMITS for LAND USERS
37 Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

EXHIBIT H

Seismic Risk Assessment

V-F Petroleum Inc.

State 19 SWD No. 2

Section 19, Township 19 South, Range 28 East

Eddy County, New Mexico

Cory Walk

Cory Walk

B.S., M.S.

Geologist

Permits West Inc.

August 26, 2019

EXHIBIT H

GENERAL INFORMATION

State 19 SWD #2 is located in the SW ¼, section 19, T19S, R28E, about 15 miles north of Carlsbad, NM in the Permian Basin. V-F Petroleum Inc. proposes the injection zone to be within the Devonian formation through an open hole from 12,100'-14,000' below ground surface. This report assesses any potential concerns relating to induced seismicity along deep penetrating Precambrian faults or the connection between the injection zone and known underground potable water sources.

SEISMIC RISK ASSESSMENT

Historical Seismicity

Searching the USGS earthquake catalog resulted in no (0) earthquakes above a magnitude 2.5 within 6 miles (9.7 km) of the proposed deep disposal site since 1970 (Fig 1). According to this dataset, the nearest historical earthquake occurred in 2004 about 16 miles (~26 km) west and had a magnitude of 3.0.

Basement Faults and Subsurface Conditions

A structure contour map (Fig. 1) of the Precambrian basement shows the State 19 SWD #2 is approximately 18 miles from the nearest basement-penetrating fault inferred by Ewing (1990). **Basic information about these faults based on GIS data from Jackson and Jackson (2008) is listed in Table 1.**

Snee and Zoback (2018) state, "In the western part of Eddy County, New Mexico, S_{Hmax} is ~north–south (consistent with the state of stress in the Rio Grande Rift; Zoback and Zoback, 1980) but rotates to ~east-northeast–west-southwest in southern Lea County, New Mexico, and the northernmost parts of Culberson and Reeves counties, Texas." Around the State 19 SWD #2 site, Snee and Zoback indicate a **S_{Hmax} direction of N010°E and an A_φ of 0.57, indicating a normal and strike-slip faulting stress regime.**

Induced seismicity is a growing concern of deep SWD wells. Relatively new software developed by the Stanford Center for Induced and Triggered Seismicity allows for the probabilistic screening of deeply penetrating faults near the proposed injection zone (Walsh et al., 2016; Walsh et al., 2017). This software uses parameters such as stress orientations, fault strike/dip, injection rates, fault friction coefficients, etc. to estimate the potential for fault slip. Using the best available data as input parameters (Table 2) the Fault Slip Potential (FSP) model suggests the fault with the highest risk is fault 24 (Fig 2; Table 1). Fault 24 has a seven (0.07) percent chance of slip through the year 2045. **This model also suggests a pore pressure increase of 0.08 psi on fault 24 (Fig. 3; Table 1) due to the proposed SWD well.** A pressure increase of 1595 psi on this fault would result in a 100% probability of fault slip while an increase of 425 psi results in a 50% probability of fault slip.

EXHIBIT H

GROUNDWATER SOURCES

Quaternary Alluvium acts as the principal aquifer used for potable ground water near the State 19 SWD #2 location (Hendrickson and Jones, 1952). Nicholson and Clebsch (1961) state, "Potable ground water is not available below the Permian and Triassic unconformity but, because this boundary is not easily defined, the top of the Rustler anhydrite formation is regarded as the effective lower limit of 'potable' ground water." Around the State 19 SWD #2 well, the top of a thick anhydrite unit interpreted to represent the Rustler Formation lies at a depth of ~375 feet bgs.

STRATIGRAPHY

Thick permeability barriers exist above (Woodford shale; 45 ft thick) and below (Simpson Group; 75 ft thick) the targeted Devonian injection zone (Plate 2, Comer et al., 1991; Fig. 8, Frenzel et al., 1988). Well data indicates ~11,700 ft of rock separating the top of the Devonian from the previously stated lower limit of potable water at the top of the Rustler anhydrite formation.

CONCLUDING STATEMENT

Available geologic and engineering data evaluated around the State 19 SWD #2 well show no potential structural or stratigraphic connection between the Devonian injection zone and any subsurface potable water sources. Based on Fault Slip Potential modeling there is a 7% probability (0.07) of inducing seismic activity along nearby deeply penetrating Precambrian faults.

V-F Petroleum Inc.
State 19 SWD No. 2

SEISMIC RISK ASSESSMENT PAGE 3

EXHIBIT H

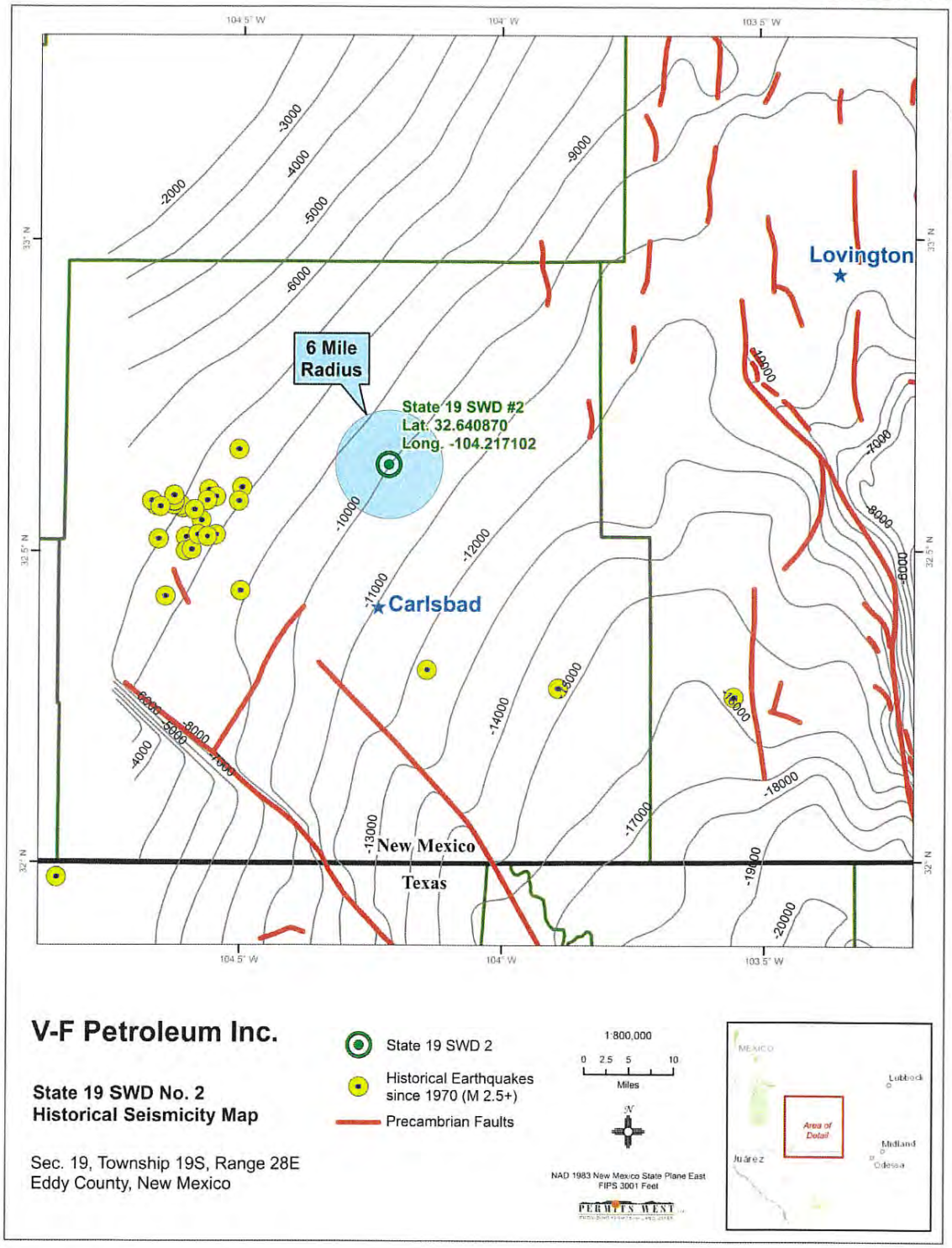

Figure 1. Structural contour map of the Precambrian basement in feet below sea level. Red lines represent the locations of Precambrian basement-penetrating faults (Ewing et al., 1990). The State 19 SWD #2 well lies ~18 miles northeast of the closest deeply penetrating fault and 16 miles from the closest historic earthquake.

EXHIBIT H

Table 1: Nearby Basement Fault Information

ID	Distance from State 19 SWD #1 (mi)	Strike (°)	Dip (°)	FSP	Pore Pressure change after 25 years (psi)
Fault 24	23.0	350	70	0.07	0.08
Fault 25	25.1	350	70	0.07	0.02
Fault 2	18.4	33	70	0.05	0.02

Table 2: Fault Slip Potential model input parameters

Faults	Value	Variability (+/-)	Notes
Friction Coefficient	0.58	0.05	Ikari et al. (2011)
Dip Angle (deg)	70	20	Snee and Zoback (2018)
Stress			
Vertical stress gradient (psi/ft)	1.1	0.05	Hurd and Zoback (2012)
Max Horizontal Stress Direction (deg)	10	5	Snee and Zoback (2018)
Depth for calculations (ft)	14000	0	Proposed injection zone
Initial Reservoir Pressure Gradient (psi/ft)	0.7	0.05	calculated from mud wt (ppg)
A Phi Parameter	0.57	0.15	Snee and Zoback (2018)
Reference Friction Coefficient	0.58	0.05	Ikari et al. (2011)
Hydrology			
Aquifer thickness (ft)	2000	50	Proposed injection zone
Porosity (%)	5	3	
Permeability (mD)	150	30	
Injection Rate (bbl/day)	25000	0	Maximum proposed injection rate

V-F Petroleum Inc.
State 19 SWD No. 2

SEISMIC RISK ASSESSMENT PAGE 5

EXHIBIT H

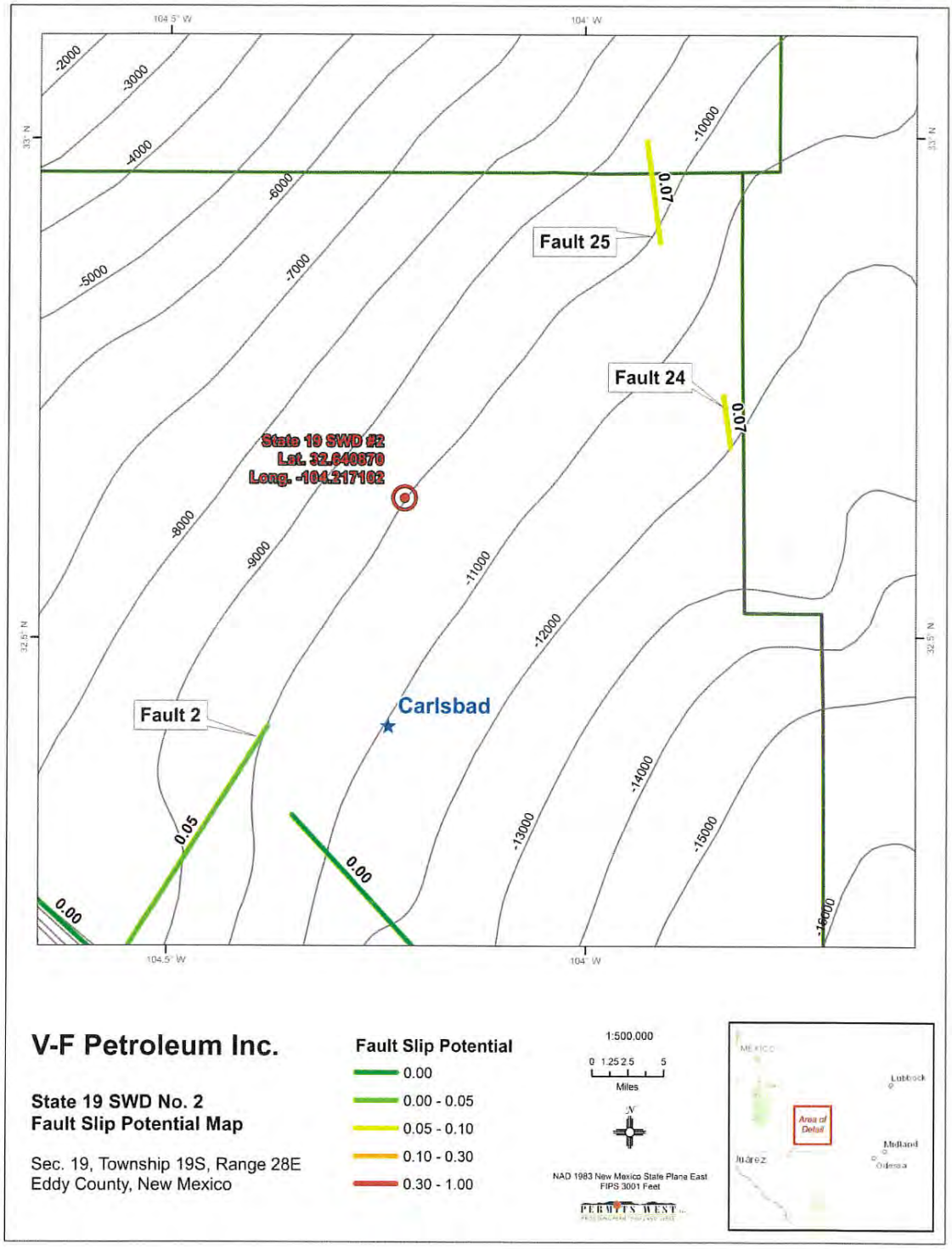

Figure 2. Detail Precambrian fault map of State 19 SWD #2 area as mapped by Ewing (1990). Faults are colored based on probability of fault slip as modeled using Fault Slip Potential software (Walsh and Zoback, 2016). Labeled values represent the calculated fault slip potential using the parameters indicated in Table 1. Contours show the top of the Precambrian basement in feet below sea level.

EXHIBIT H

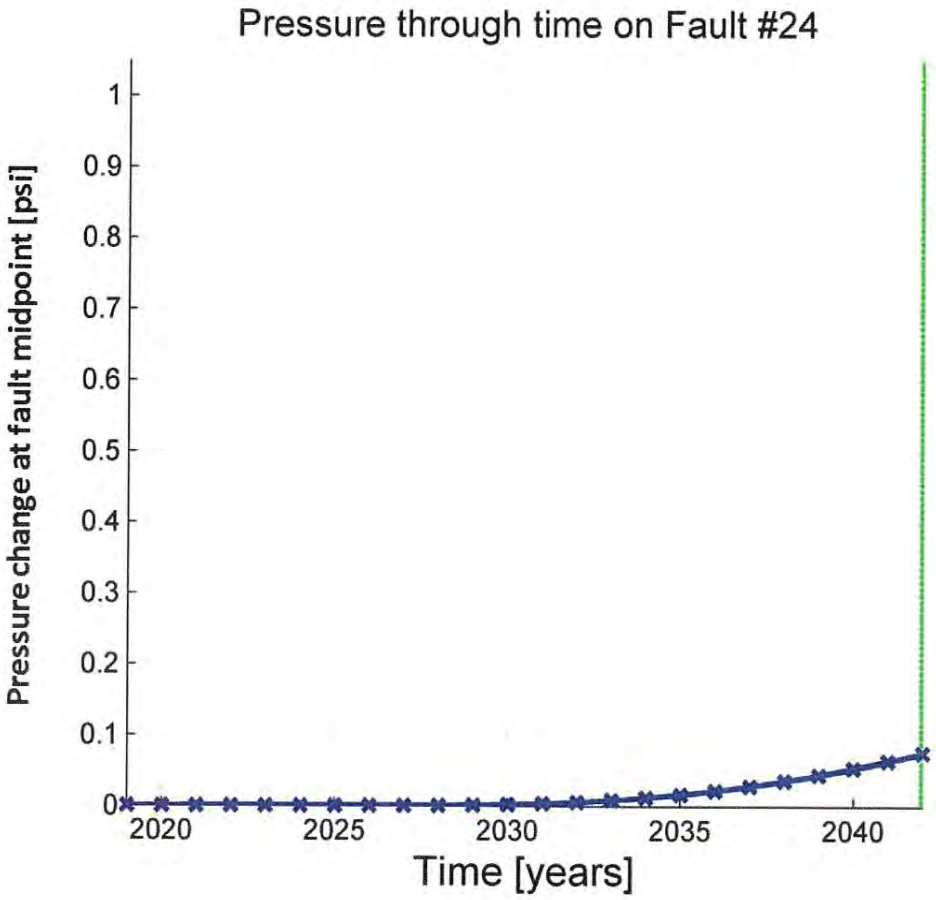

Figure 3. A scatter plot showing the modeled change of pore pressure on fault 24 through time, as a response to the addition of the proposed SWD well.

EXHIBIT H

References Cited

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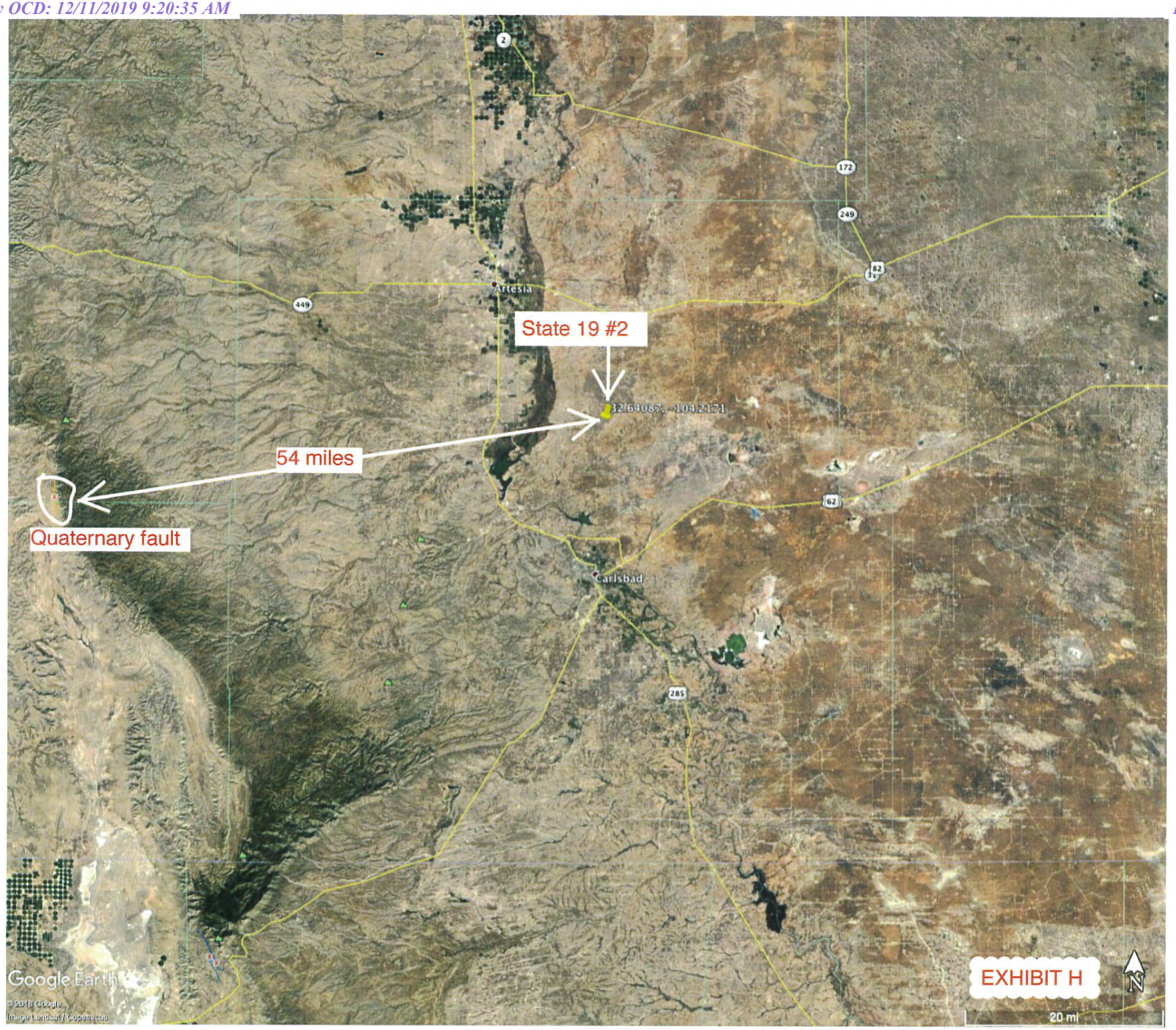
Walsh, F. R., Zoback, M. D., Pais, D., Weingarten, M., and Tyrrell, T. (2017) FSP 1.0: A Program for Probabilistic Estimation of Fault Slip Potential Resulting From Fluid Injection, User Guide from the Stanford Center for Induced and Triggered Seismicity, available at SCITS.Stanford.edu/software


State 19 #2
32.64087, -104.2171
54 miles
Quaternary fault
Artesia
Carlsbad
EXHIBIT H
20 mi
Google Earth

Affidavit of Publication

No. 25223

State of New Mexico

County of Eddy:

Danny Scott

being duly sworn says that he is the **Publisher**

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

Legal Ad

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for

1 Consecutive weeks/day on the same day as follows:

First Publication	August 27, 2019
Second Publication	
Third Publication	
Fourth Publication	
Fifth Publication	
Sixth Publication	
Seventh Publication	

Subscribed and sworn before me this 27th day of August 2019

OFFICIAL SEAL
Latisha Romine
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 5/12/2023

Latisha Romine

Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication:

EXHIBIT I

Legal Notice

V-F Petroleum Inc. will apply to re-enter, directionally drill, deepen, and convert the State 19 #2 to a saltwater disposal well. The well will dispose into the Devonian formation from 12,100' to 14,000' (TVD). It is 16 miles southeast of Artesia, NM and 15 miles north of Carlsbad, NM. SHL is at 860 FSL & 2057 FWL Sec. 19, T. 19 S., R. 28 E., Eddy County, NM. BHL will be at 860 FSL & 1907 FWL Sec. 19, T. 19 S., R. 28 E., Eddy County, NM. Maximum disposal rate will be 20,000 bwpd. Maximum injection pressure will be 2,420 psi. Interested parties must file objections or requests for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 within 15 days. Additional information can be obtained by contacting: Brian Wood, Permits West, Inc., 37 Verano Loop, Santa Fe, NM 87508. Phone number is (505) 466-8120.

Published in the Artesia Daily Press, Artesia, N.M., Aug 27, 2019 Legal No. 25223.

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37 Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

EXHIBIT J

December 9, 2018

NM State Land Office
PO Box 1148
Santa Fe NM 87504

TYPICAL NOTICE

V-F Petroleum Inc. is applying (see attached application) to re-enter, directionally drill, deepen, and convert the State 19 #2 to a saltwater disposal well. As required by NM Oil Conservation Division (NMOCD) rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

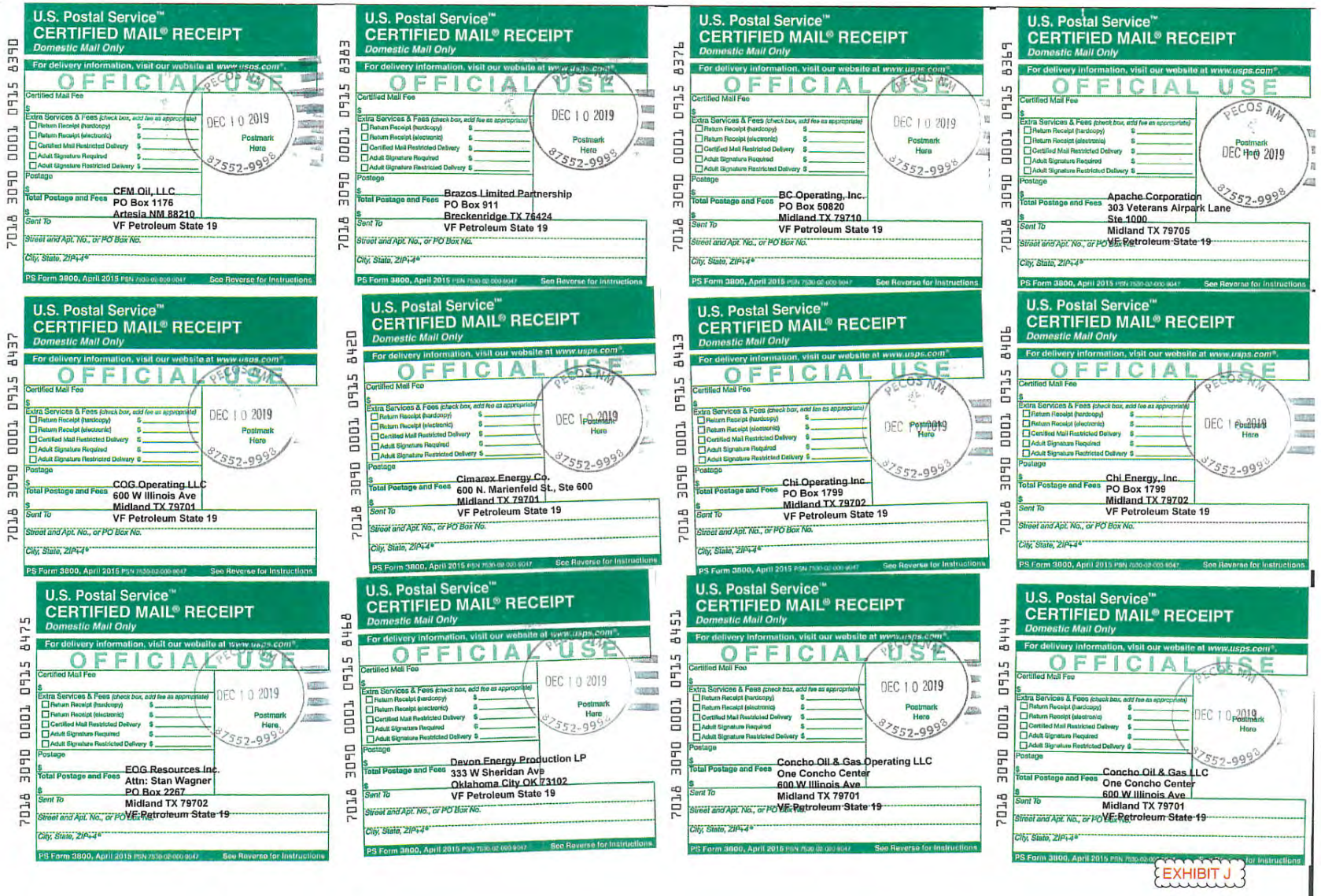
Well: State 19 #2 TVD = 14,000'
Proposed Disposal Zone: Devonian (12,100' - 14,000')
Surface Hole Location: 860' FSL & 2057' FWL Sec. 19, T. 19 S., R. 28 E.
Bottom Hole Location: 860' FSL & 1907' FWL Sec. 19, T. 19 S., R. 28 E.
Approximate Location: in Eddy County 16 miles southeast of Artesia, NM
Applicant Name: V-F Petroleum Inc. (432) 683-3344
Applicant's Address: PO Box 1889, Midland TX 79702

Submittal Information: Application for a saltwater disposal well will be filed with the NMOCD. If you have an objection, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr., Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.

Sincerely,

Brian Wood



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Postage
Total Postage and Fees
Sent To
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PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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87552-9998

7018 3090 0001 0915 8390
CEM Oil, LLC
PO Box 1176
Artesia NM 88210
VF Petroleum State 19

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Brazos Limited Partnership
PO Box 911
Breckenridge TX 76424
VF Petroleum State 19

7018 3090 0001 0915 8376
BC Operating, Inc.
PO Box 50820
Midland TX 79710
VF Petroleum State 19

7018 3090 0001 0915 8369
Apache Corporation
303 Veterans Airpark Lane
Ste 1000
Midland TX 79705
VF Petroleum State 19

7018 3090 0001 0915 8437
COG Operating LLC
600 W Illinois Ave
Midland TX 79701
VF Petroleum State 19

7018 3090 0001 0915 8420
Cimarex Energy Co.
600 N. Marienfeld St., Ste 600
Midland TX 79701
VF Petroleum State 19

7018 3090 0001 0915 8413
Chi Operating Inc
PO Box 1799
Midland TX 79702
VF Petroleum State 19

7018 3090 0001 0915 8406
Chi Energy, Inc.
PO Box 1799
Midland TX 79702
VF Petroleum State 19

7018 3090 0001 0915 8475
EOG Resources Inc.
Attn: Stan Wagner
PO Box 2267
Midland TX 79702
VF Petroleum State 19

7018 3090 0001 0915 8468
Devon Energy Production LP
333 W Sheridan Ave
Oklahoma City OK 73102
VF Petroleum State 19

7018 3090 0001 0915 8451
Concho Oil & Gas Operating LLC
One Concho Center
600 W Illinois Ave
Midland TX 79701
VF Petroleum State 19

7018 3090 0001 0915 8444
Concho Oil & Gas LLC
One Concho Center
600 W Illinois Ave
Midland TX 79701
VF Petroleum State 19

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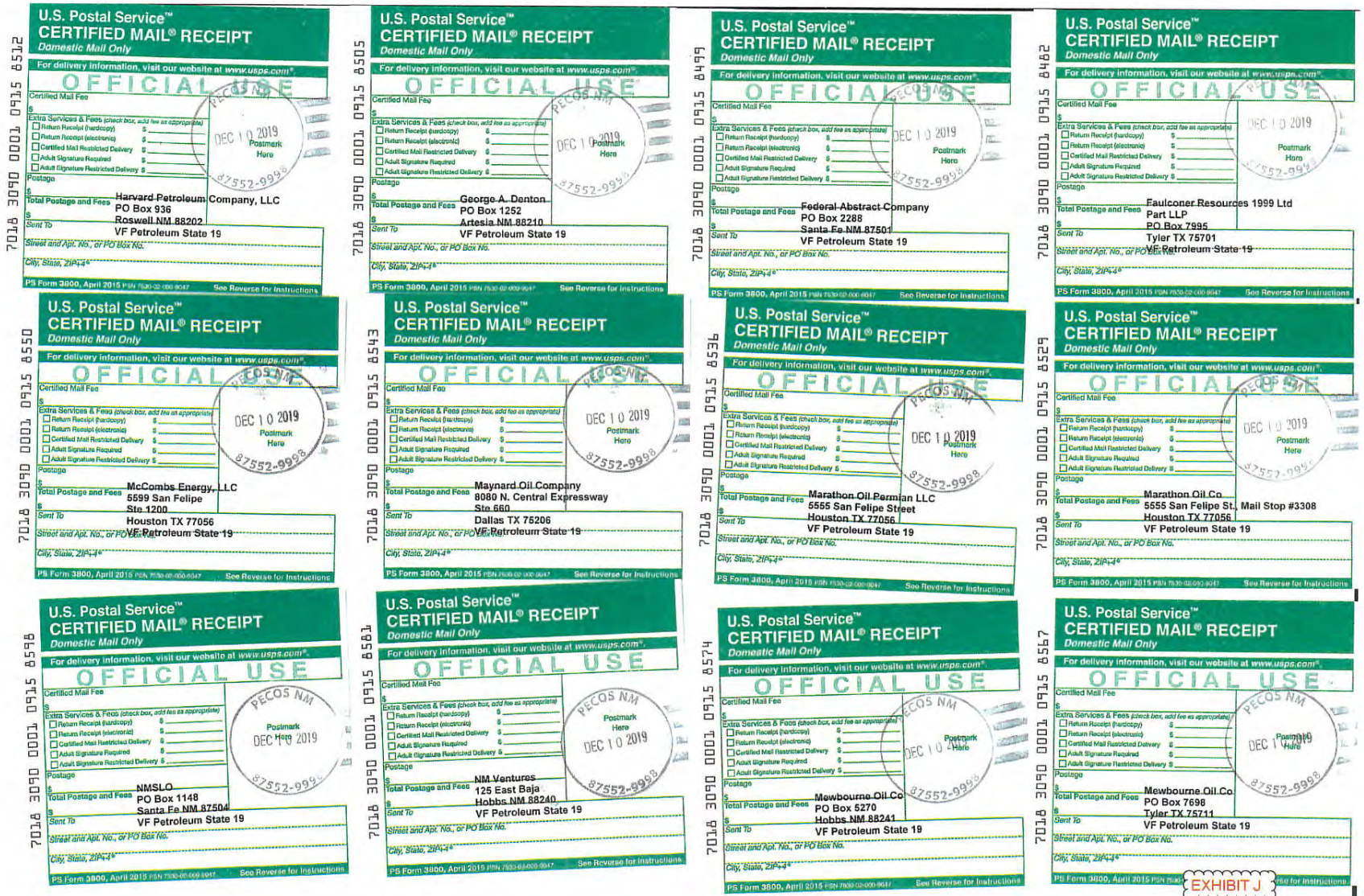

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Harvard Petroleum Company, LLC
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PO Box 1252
Artesia NM 88210
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7018 3090 0001 0915 8499
Federal Abstract Company
PO Box 2288
Santa Fe NM 87501
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7018 3090 0001 0915 8482
Faulconer Resources 1999 Ltd
Part LLP
PO Box 7995
Tyler TX 75701
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7018 3090 0001 0915 8550
McCombs Energy, LLC
5599 San Felipe
Ste 1200
Houston TX 77056
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7018 3090 0001 0915 8543
Maynard Oil Company
8080 N. Central Expressway
Ste 660
Dallas TX 75206
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7018 3090 0001 0915 8536
Marathon Oil Permian LLC
5555 San Felipe Street
Houston TX 77056
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7018 3090 0001 0915 8529
Marathon Oil Co
5555 San Felipe St, Mail Stop #3308
Houston TX 77056
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7018 3090 0001 0915 8598
NMSLO
PO Box 1148
Santa Fe NM 87504
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7018 3090 0001 0915 8581
NM Ventures
125 East Baja
Hobbs NM 88240
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7018 3090 0001 0915 8574
Mewbourne Oil Co
PO Box 5270
Hobbs NM 88241
VF Petroleum State 19

7018 3090 0001 0915 8567
Mewbourne Oil Co
PO Box 7698
Tyler TX 75711
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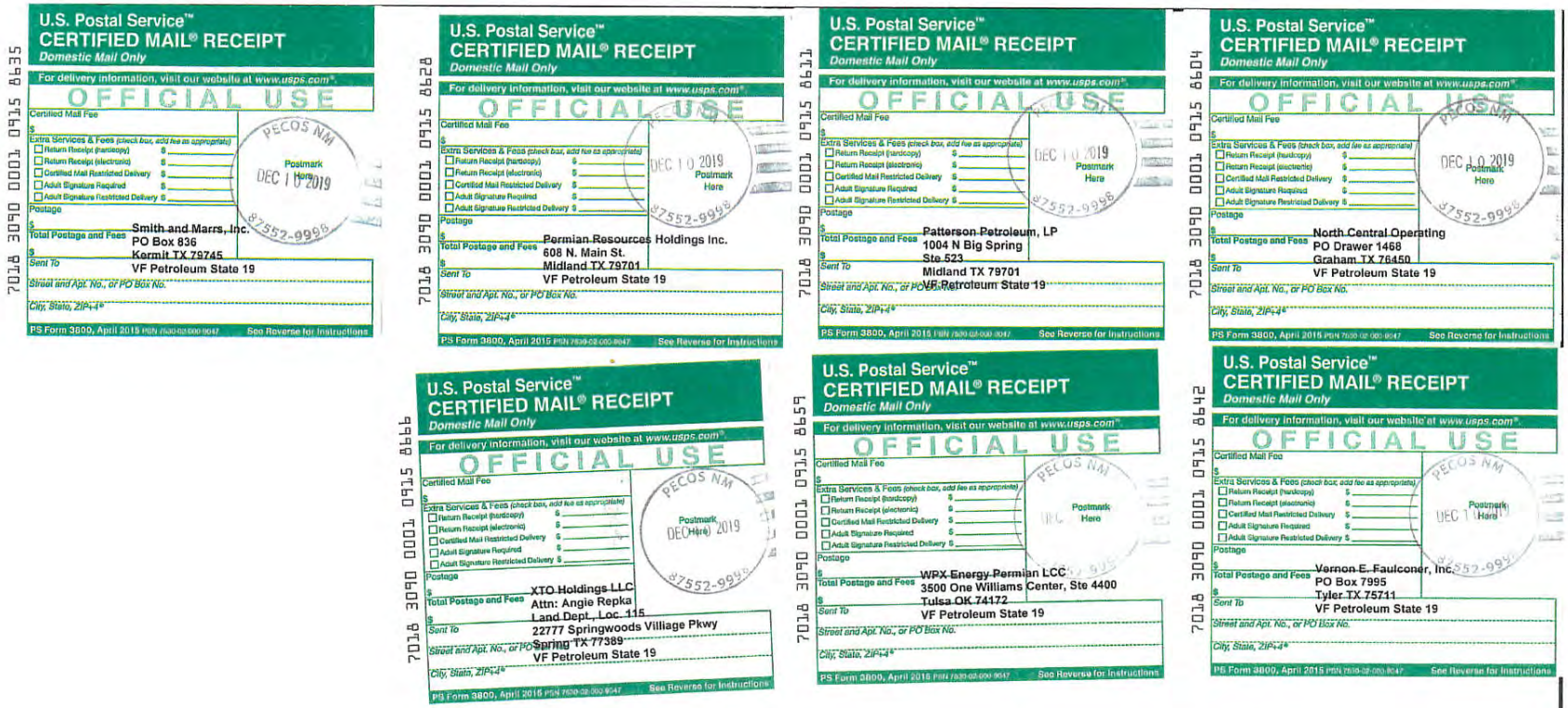

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Smith and Marrs, Inc.
PO Box 836
Kermit TX 79745

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Permian Resources Holdings Inc.
608 N. Main St.
Midland TX 79701

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Patterson Petroleum, LP
1004 N Big Spring
Ste 523
Midland TX 79701

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North Central Operating
PO Drawer 1468
Graham TX 76450

7018 3090 0001 0915 8666

Sent To: VF Petroleum State 19
XTO Holdings LLC
Attn: Angie Repka
Land Dept., Loc. 115
22777 Springwoods Villiage Pkwy
Spring TX 77389

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Sent To: VF Petroleum State 19
WPX Energy Permian LLC
3500 One Williams Center, Ste 4400
Tulsa OK 74172

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Sent To: VF Petroleum State 19
Vernon E. Faulconer, Inc.
PO Box 7995
Tyler TX 75711

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