APR 02 2019 PM01:48

Revised March 23, 2017

| RECEIVED: | REVIEWER: | TYPE: | APP NO: |
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| MM 04/02/2019 | | SWD | pMAM1910040076 |

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:** Key Energy Services, LLC **OGRID Number:** 19797
**Well Name:** Queen Lake Federal 19 No. 1 **API:** 30-015-24292
**Pool:** Pierce Crossing Bone Spring **Pool Code:** 50731

**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.**

Turner Phipps
Print or Type Name

Signature

3/28/19
Date

432-571-7216
Phone Number

tphipps@keyenergy.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 ___X_____Disposal _____Storage
Application qualifies for administrative approval? ____X_____Yes _____No

II. OPERATOR: ___KEY ENERGY SERVICES, LLC (Operator No. 19797)

ADDRESS: ____1301 MCKINNEY ST.; HOUSTON, TX 77010

CONTACT PARTY: ____RENE AQUERON / MIKE JOHNSON PHONE: 409-370-6353 / 512-914-8590

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 _____**X**___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. **(See attached)**

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail. **(See attached; no wells penetrate the proposed injection zone)**

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected; **avg- 10,000 bpd; max- 15,000 bpd**
2. Whether the system is open or closed; **closed annulus**
3. Proposed average and maximum injection pressure; **avg- 1,000 psig; max- 2,900 psig**
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; **produced saltwater and produced water from area oil and gas exploration and production well** 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.). **(See attached Geologic Study)**

*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. **(See attached Geologic Study)**

IX. Describe the proposed stimulation program, if any. **10,000 gallons- Hydrochloric Acid**

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

*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. **N/A**

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. **USDS (See attached- "Geology Report").**

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 JOHNSON TITLE: TECHNICAL MANAGER

SIGNATURE: Mike Johnson DATE: 03/28/2019

E-MAIL ADDRESS: stratatech@austin.rr.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 **(See attached)**

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.

# INJECTION WELL DATA SHEET

OPERATOR: KEY ENERGY SERVICES, LLC

WELL NAME & NUMBER: QUEEN LAKE FEDERAL 19 No. 1

| WELL LOCATION: | 1950' FNL & 1980' FEL | G | 19 | 24S | 29E |
|---|---|---|---|---|---|
| | FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE |

***WELLBORE SCHEMATIC*** ***WELL CONSTRUCTION DATA***

**(SEE ATTACH CURRENT AND PROPOSED WELLBORE DIAGRAMS)**

Surface Casing

Hole Size: 17-1/2" Casing Size: 13-3/8"

Cemented with: 810 sx. *or* _____ $ft^3$

Top of Cement: Surface Method Determined: Circulation

Intermediate Casing

Hole Size: 12-1/4" Casing Size: 9-5/8"

Cemented with: 1890 sx. *or* _____ $ft^3$

Top of Cement: Surface Method Determined: Circulation

Production Casing

Hole Size: 8-1/2" Casing Size: 7"

Cemented with: 1275 sx. *or* _____ $ft^3$

Top of Cement: 4412 Method Determined: CBL (11/26/10)

Total Depth: _____

Injection Interval

14,500 feet to 16,000 feet (perforated)

(Perforated or Open Hole; indicate which)

## INJECTION WELL DATA SHEET (CONTINUED)

OPERATOR: KEY ENERGY SERVICES, LLC

WELL NAME & NUMBER: QUEEN LAKE FEDERAL 19

| WELL LOCATION: 1950' FNL & 1980' FEL | G | 19 | 24S | 29E |
|---|---|---|---|---|
| FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE |

***WELLBORE SCHEMATIC*** ***WELL CONSTRUCTION DATA***

**(SEE ATTACH CURRENT AND PROPOSED WELLBORE DIAGRAMS)**

Surface Casing

Hole Size: _____ Casing Size: _____

Cemented with: _____ sx. ***or*** _____ $ft^3$

Top of Cement: Surface Method Determined: Circulation

Intermediate Casing

Hole Size: _____ Casing Size: _____

Cemented with: _____ sx. ***or*** _____ $ft^3$

Top of Cement: _____ Method Determined: Circulation

***Injection Liner (Proposed)***

Hole Size: 6-1/4" Casing Size: 5"

Cemented with: 425 sx. ***or*** 450 $ft^3$

Top of Cement: 10700 ft (liner top) Method Determined: CBL (proposed)

Total Depth: 16000 ft

Injection Interval

14,500 feet to 16,000 feet (perforated)

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

Side 2

## INJECTION WELL DATA SHEET

Tubing Size: 4-1/2 x 2-7/8" Lining Material: NOV Tuboscope TK15XT(IPC )

Type of Packer: D&L Retrievable Seal Bore

Packer Setting Depth: 14,400 ft

Other Type of Tubing/Casing Seal (if applicable): 5" Injection liner from 10,700 to 16,000 feet

### Additional Data

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

   If no, for what purpose was the well originally drilled? Oil & Gas Exploration

2. Name of the Injection Formation: Devonian

3. Name of Field or Pool (if applicable): Pierce Crossing

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.

   (See attached Current Wellbore Diagram)

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
   Ramsey, Cherry Canyon, Delaware, Bone Spring, Atoka

NM OCD OIL AND GAS MAP New Mexico Oil Conservation Division

NM OCD Oil and Gas Map User Guide

3

Screening

AOI

Placename Draw Coordinates

Search for a location

QUEEN LAKE 19 FEDERAL #0

Buffer distance (optional)

Show results within

0.5 Miles

Report Start Over

Find address or place

30-015-25073
30-015-44422
30-015-02499
30-015-02493
30-015-02504
30-015-25451
30-015-26453
30-015-25849
30-015-26842
30-015-36121
30-015-42799
30-015-37491
30-015-42800
30-015-45084
30-015-45081
30-015-45082
30-015-45080
30-015-03710
30-015-03708
30-015-45367
30-015-25829
30-015-24292
30-015-35575
30-015-35604
30-015-43286
30-015-43288
30-015-43311
30-015-42593

2990 ft

746

McDonald Rd

Sims Rd

788A

Bureau of Land Management, Texas Parks & Wildlife, Esri, HERE

QUEEN LAKE 19 FEDERAL #1

SECTION 19

TOWNSHIP 24S

RANGE 29E

30-015-24292

-104.02155° 32.20503°

0.5 MILE RADIUS

0.4km
0.3mi

-104.04140 32.21376 Degrees

All rights reserved

NM OCD OIL AND GAS MAP New Mexico Oil Conservation Division NM OCD Oil and Gas Map User Guide

Screening

AOI

Placename Draw Coordinates

Search for a location

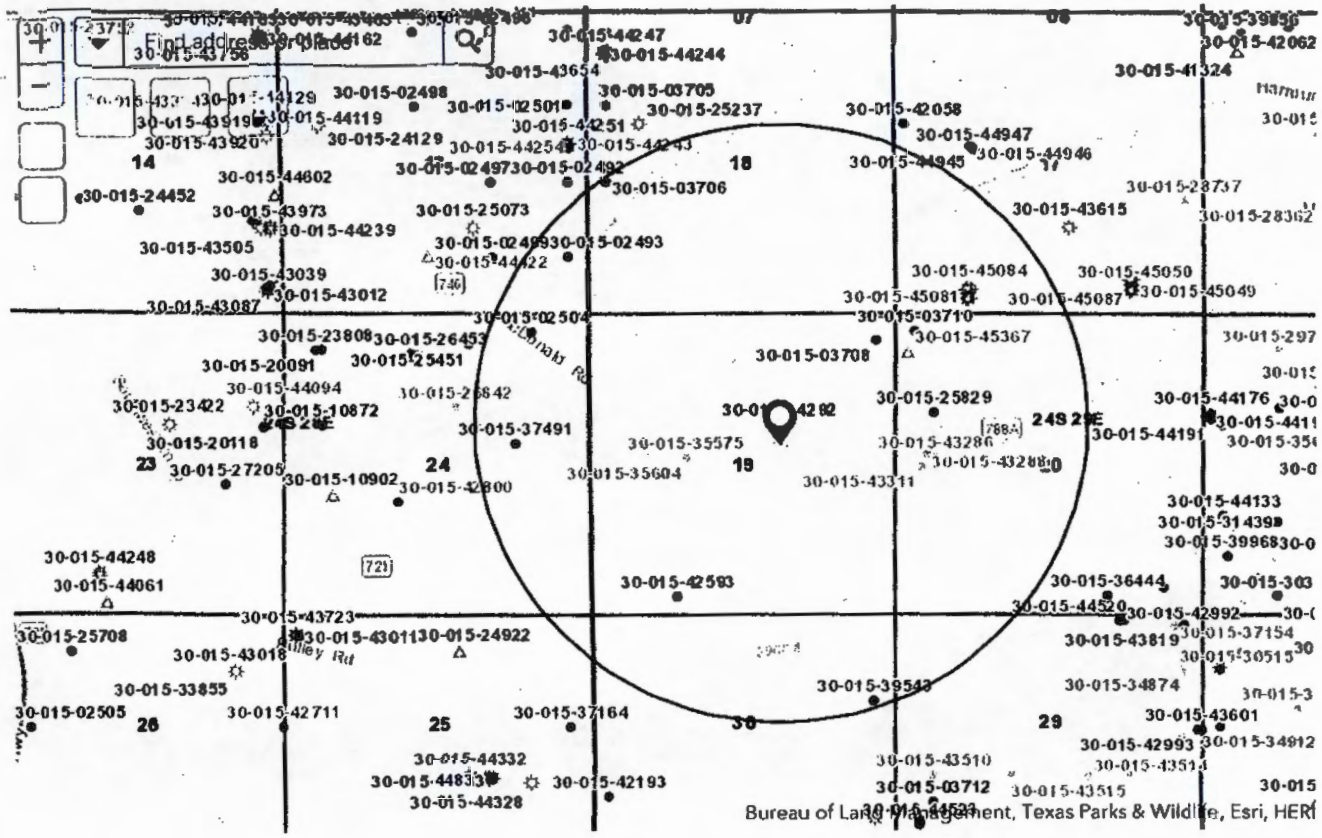
QUEEN LAKE 19 FEDERAL #0

Buffer distance (optional)

Show results within

1 Miles

Report Start Over




QUEEN LAKE FEDERAL 19 # 1

SECTION 19

TOWNSHIP 24S

RANGE 29E

30-015-24292

1.0 MILE RADIUS

1km

0.6mi

-104.04597 32.21930 Degrees

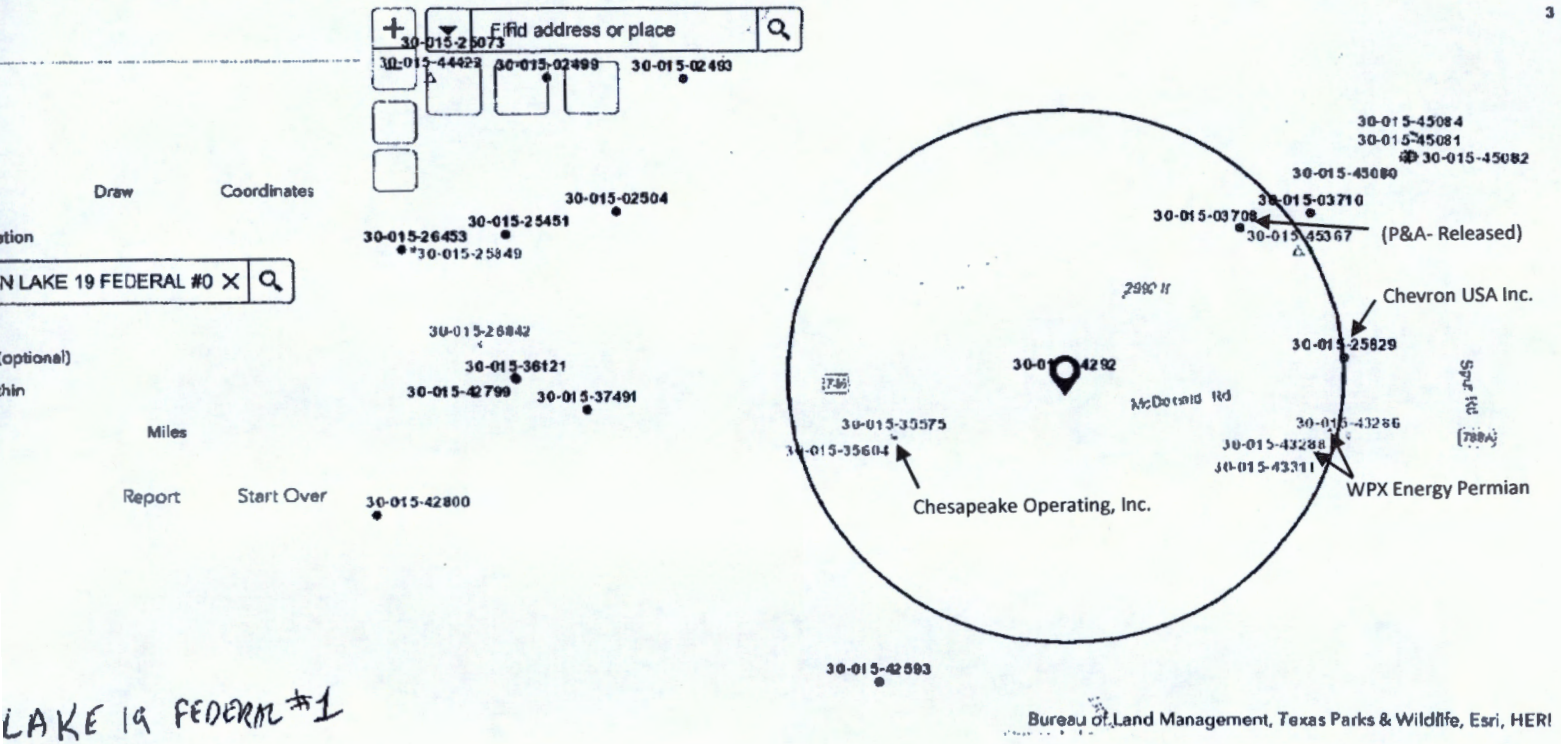
-104.02155° 32.20503°

All rights reserved

OCD OIL AND GAS MAP New Mexico Oil Conservation Division

NM OCD Oil and Gas Map User Guide

3




LAKE 19 FEDERAL #1

J 19

P 24S

E 29E

-24292

155° 32.20503°

0.4km

0.3mi

-104.04140 32.21376 Degrees

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Ø.5 MILE RADIUS

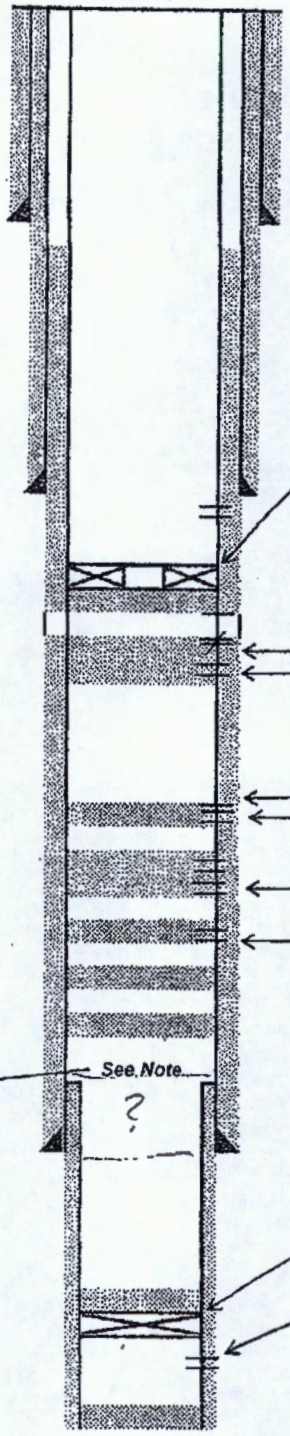
Well: **Queen Lake 19 Fed #1** Field: **Pierce Crossing** Reservoir:

**Location:**
GPS: 32.20492 -104.02115
1950' FNL & 1980' FEL
Unit Letter: G
Section No: 19
Twp: 24S Range: 29E
County: Eddy State: NM

**Elevations:**
GL: 2,956'
KB: 2,976'
DF:

## Wellbore Diagram

CURRENT



**Well ID Info:**
Chevno: DQ1372
API No: 30-015-24292
Spud Date: 10/20/1982
Drill End Date: 12/20/1982
Compl. Date: 12/28/1982
Last Prod:

**Surface Csg:** 13-3/8" 48# H-40
**Set:** @ 530' w/ 810 sx cmt
**Hole Size:** 17-1/2"
**Circ:** Yes **TOC:** Surface
**TOC By:** Circulation

**Intermediate Csg:** 9-5/8" 47#
P-110 & 40# K-55
**Set:** @ 2630' w/ 1890 sx cmt
**Hole Size:** 12-1/4"
**Circ:** Yes **TOC:** Surface
**TOC By:** Circulation

***Open Perfs:***
***2,788' - 2,821' (Ramsey)***

***November 9-10, 2010***
***Squeeze 350 sx Class C cement under retainer set @ 4,235'. TOC in annulus @ 950' by CBL.***

***Plugs described in work 10/28/2010 - 11/16/2010***

***40 sx Class C cement***
***4,700' (tagged) - 5,016'***

***40 sx Class C cement***
***6,380' (tagged) - 6,608'***

***55 sx cement***
***7,412' (tagged) - 7,717'***

***8,762' (tagged) - 9,016'***

***9,496' - 9,736'*** WC

***10,557' - 10,798'***

***4,300' - Squeeze perf***
***4,670' - Could not squeeze.***
***4,721' (Sqz'd 100 sx cmt 7/13/06)***
***4,921' - 4,935' (Cherry Canyon)***

***6,420' (Unused Squeeze Hole)***
***6,503' - 6,513' (Delaware)***

***7,520' - 7,636' (1st Bone Spring)***

***8,856' - 8,884' (3rd Bone Spring)***
***8,900' - 8,910' (3rd Bone Spring)***

**Production Csg:** 7" 23# N-80 & K-55
**Set:** @ 11,190' w/ 1275 sx cmt
**Hole Size:** 8-1/2"
**Circ:** No **TOC:** 4,412'
**TOC By:** CBL ran 11/6/2010

***See Note***

**FISH LEFT IN HOLE**
**April 1 - 2, 2010 Workover Report**

Tag @ 10618'.
RIH w/ downhole camera to 10509'. Found junk. Bit bottom side up wedges between 2 3/8" tbg & 7" csg.

***TOC @ 12,005'***
***CIBP @ 12,040' w/ 35' cmt***

***12,154' - 12,163' (Atoka)***

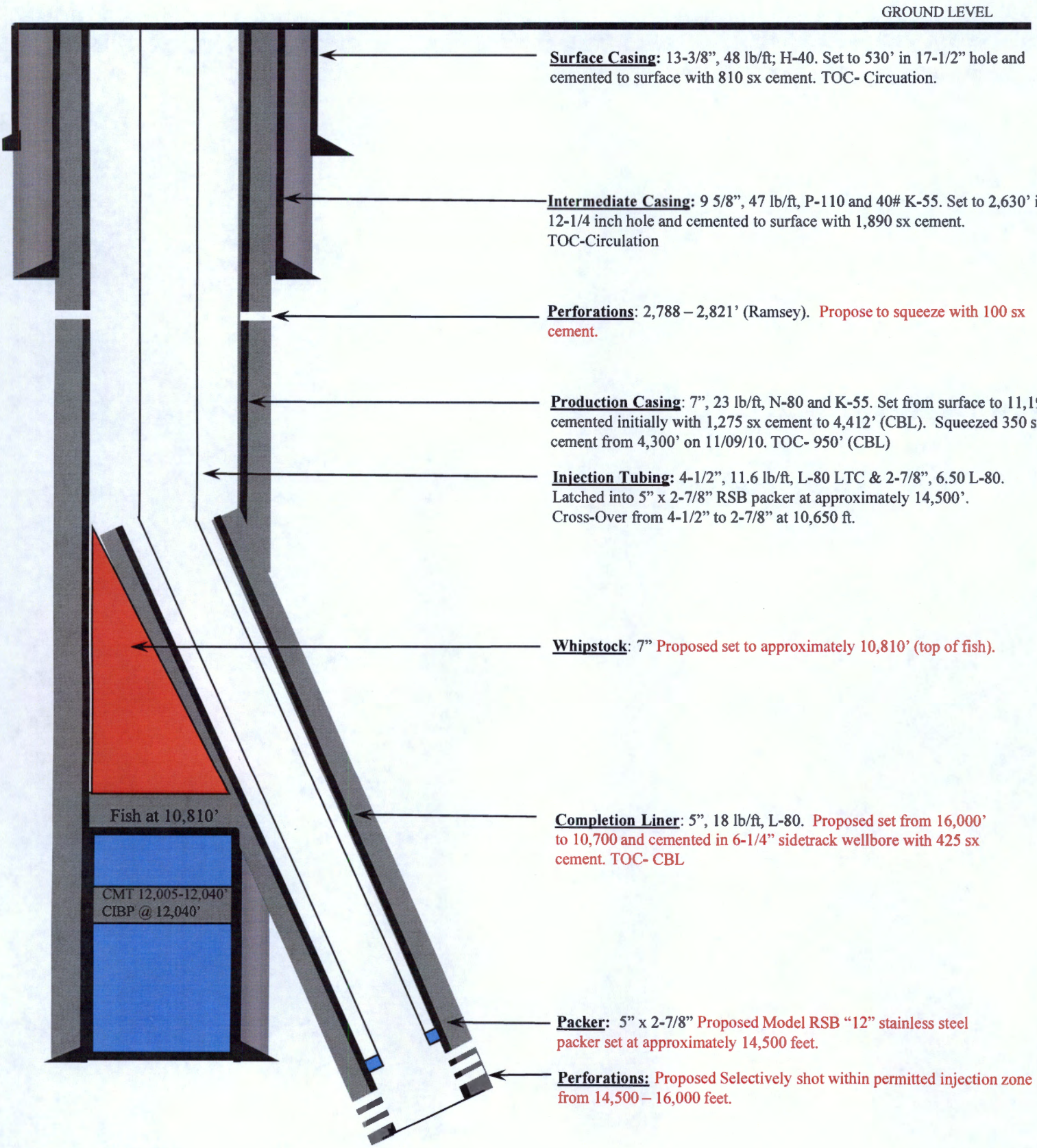
**Liner:** 4-1/2" 13.5# N-80
**Set:** @ 13,500' w/ 400 sx cmt
**TOL:** @ 10,987'
**Hole Size:** 6-1/8"

**PBTD:** 4,235'
**TD:** 13,500'

**Updated:** 10/24/2013

**By:** Bob Hall

# QUEEN LAKE 19 FEDERAL NO. 1
## PROPOSED




| DRAWN BY: WMJ | CHECKED BY: WMJ | FILE: Queen Lake Federal 19 #1 | DATE:03/27/19 | REV.: 1 |
|---|---|---|---|---|

**GEOLOGIC STUDY**
**QUEEN LAKE FEDERAL 19 #1**

The proposed SWD Conversion Well is the Queen Lake Federal 19, #1 (API #: 015-24292) located in Section 19, T24S, R29E, in Eddy County, New Mexico approximately 19 miles southeast of Carlsbad, New Mexico (Figure 1). The well was originally drilled in 1982 to a total depth of 13,500 feet and was plugged in 2013. Key Energy Services, LLC plans to sidetrack the well and convert it to a commercial Class II salt water disposal well (SWD), completed in the undivided Silurian-Devonian section between the approximate depths of 14,500 to 16,000 ft. total vertical depth (TVD) relative to Kelly bushing (KB). The expected formation tops and lithologies are summarized in the following table.

*Tops From Well Completion Report Received by NMOCD on 1/14/83.*

| Stratigraphic Unit | Geological System | Formation Tops (Log Depth ft. RKB) | Lithology |
|---|---|---|---|
| Base Lowermost USDW – Permian Redbeds | Permian | ~500 | Clastics |
| Delaware Mtn. Group (Guadalupian) | Permian | 2,735 | Clastics |
| Cherry Canyon Formation (Guadalupian) | Permian | 3,638 | Clastics |
| Brushy Canyon Formation (Guadalupian) | Permian | 4,400 | Clastics |
| Bone Spring Formation (Leonardian) | Permian | 6,473 | Carbonates and Clastics |
| Wolfcamp (Wolfcampian) | Permian | 9,698 | Carbonates and Shale |
| Strawn Group | Pennsylvanian | 11,852 | Carbonates and Shale |
| Atoka Group | Pennsylvanian | 12,038 | Carbonates and Shale |
| Morrow Group | Pennsylvanian | 12,657 | Carbonates and Shale |
| Undivided Mississippian | Mississippian | 13,600 ((Estimate) | Carbonates and Shale |
| Woodford Formation –Upper Devonian (Proposed Confining Zone) | Devonian | 14,300 (Estimate) | Shale |
| Undivided Devonian/Silurian (Proposed Injection Zone) | Devonian/Silurian | 14,500 (Estimate) | Carbonates |
| Ellenburger Fm. | Ordovician | 16,500 (Estimate) | Carbonates |
| Basement | Precambrian | 17,000 (Estimate) | Crystalline Rock |

The base of the lowermost underground source of drinking water (USDW) is expected to occur at relatively shallow depth based on a review of water well information for the area (Hendrickson and Jones, 1952) and records from the National Water Information System (USGS, 2019a). The base of the USDW is expected at a maximum depth of 500 feet below ground surface as usable groundwater in the area is associated with the Pecos River alluvium and the upper Permian redbeds (Hendrickson and Jones, 1952). Below these strata are evaporite deposits containing bedded salt, gypsum, and anhydrite associated with

the lower part of the Permian Ochoan Series. The expected depth to the proposed injection zone is approximately 14,500 feet. As such, approximately 14,000 feet of sediment is present providing containment between the expected base of the USDW and the proposed injection zone.

Based on a review of commercial structure maps from Geomap® Company (2019), there are no faults located in the vicinity of the proposed injection well. Maps reviewed include Horizon A – Delaware Lime, Horizon B – Strawn Lime, and Horizon C – Siluro-Devonian. The maps reviewed are current as of February 19, 2019. Based on this review, there is no evidence of faults, including open faults, or any other hydrologic connection between the proposed disposal zone and any USDW.

The proposed injection zone consists of the undivided Silurian-Devonian age strata, which primarily consists of carbonates (limestone and dolomite) and possibly chert conglomerates. Porosity in the unit is expected to range from 3 to 15% and consists of both intergranular primary porosity and secondary dissolution porosity. The top of the injection zone will be below the base of the Upper Devonian Woodford Formation, which will be the upper confining zone and is expected to be encountered at a depth of approximately 14,300 ft. KB (TVD). The top of the injection zone is expected at a depth of approximately 14,500 ft. KB (TVD). The thickness of the injection zone is proposed to be 1,500 feet, which will allow selective perforation of zones indicating good porosity and additional rathole for full open-hole log data acquisition. Depths and thicknesses will be finalized upon evaluation of the logs.

The injection zone formation water is expected to be sodium chloride brine having a total dissolved solids (TDS) concentration ranging from approximately 50,000 to 230,000 mg/l based on data obtained from the USGS produced water database (2012). Water samples from the Devonian strata are summarized below.

| County | Formation | Depth (ft.) | TDS (mg/l) | Sample Source | Location | USGS Record No. | Proximity |
|---|---|---|---|---|---|---|---|
| Eddy | Devonian | 11,748 | 229,706 | Drill Stem Test | T24S, R25E, S24 | 30000642 | 20 miles west |
| Eddy | Devonian | 12,820 | 48,954 | Drill Stem Test | T17S, R31E, s17 | 30000528 | 40 miles NNE |
| Eddy | Devonian | 11,748 | 203,100 | Unknown | T24S, R25E, s24 | 30000549 | 20 miles west |
| Eddy | Devonian | 16,578 | 120,326 | Drill Stem Test | T24S, R31E, s28 | 30000310 | 14 miles East |
| Eddy | Devonian | 15,060 | 56,922 | SWAB | T23S, R29E, s24 | 30900416 | 7.7 miles East |
| Eddy | Devonian | 15,500 | 96,171 | Flowline | T22S, R30E, s36 | 30900462 | 14 miles NE |

*Source: USGS, 2012*

Analysis of the closest sample of Devonian formation fluid from USGS record number 30900416 indicated additional constituents consisting of calcium, magnesium and sulfate with approximately 85% of the total solids attributed to sodium and chloride.

In addition, TDS values for the Devonian strata taken from a separate USGS database (2019) are shown on Figure 1. These data indicate a range in TDS values from approximately 21,000 mg/L to 203,000 mg/L and indicate that the formation fluid is sodium chloride brine. Since this will be a produced water disposal well, no issues with injectate and formation fluid compatibility are apparent.

The proposed upper confining zone consists of the Upper Devonian Woodford Formation also known as the Woodford Shale. The Woodford Shale consists of low permeability black shale and siltstone containing abundant pyrite and organic carbon (Comer, 1991). The Woodford Formation is laterally continuous throughout the Permian Basin (Comer, 1991). In the site vicinity the Woodford Formation is expected to be 200 to 300 feet thick.

**REFERENCES:**


Comer, J.B., 1991, Stratigraphic Anaysis of the Upper Devonian Woodford Formation, Permian Basin, West Texas and Southeastern New Mexico, The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations No. 201, 66 pp.

Hendrickson, G.E, and Jones, R.S., 1952, Geology and Ground-Water Resources of Eddy County, New Mexico, Ground-Water Report 3, prepared cooperatively by the United States Geological Survey, New Mexico Bureau of Mines & Mineral Resources, and the State Engineer of New Mexico, 179 pp.

Geomap® Company, 2019, Structure Map Plats for Horizon B – Delaware Lime, Horizon B – Strawn Lime, and Horizon C – Siluro-Devonian. Maps current as of February 19, 2019.

United States Geological Survey, 2012, Produced Water Database (Revised) from original database compiled by DOE Fossil Energy Research Center that was located in Bartlesville, Oklahoma. Downloaded at http://energy.cr.usgs.gov/prov/prodwat/data2.htm

United States Geological Survey, 2019a, National Water Information System: Web Interface, Groundwater Levels for New Mexico, Reviewed on 3/26/19 at https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?search_criteria=county_cd&submitted_form=introduction.

United States Geological Survey, 2019b, Energy Resources Program, Produced Water Geochemical Database v.2.3. Viewed on 3/24/19 at https://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822349-data

**Queen Lake Federal 19 #1**
**SWD Application Form C-108**
**Notification**
**Mailing List**

**OFFSET OPERATORS WITHIN ONE-HALF MILE:**

Chesapeake Operating, LLC
Attn: Regulatory Department
PO Box 18496
Oklahoma City, OK 73154

Chevron USA Inc.
Attn: Regulatory Department
6001 Bollinger Canyon Rd.
San Ramon, CA 94583

WPX Energy- Permian
5315 Buena Vista
Carlsbad, NM 88220

**LAND OWNER:**

Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220

APR 02 2019 PM01:48

STRATA TECHNOLOGIES, LLC

New Mexico Oil Conservation Division
1220 S. St. Frances
Santa Fe, NM 87505

March 29, 2019

Attn: Engineering

***Re: Application Submittal for Commercial SWD_Queen Lake Federal 19 #1***

To Whom it May Concern:

Please see the enclosed Form C108 "Application for Authorization to Inject", along with supporting documents, on behalf of Key Energy Services, LLC. The subject well, Queen Lake Federal 19 #1 is has been released and has no operator of record.

Thank you in advance for your time and review of the enclosed information. If you have any questions, please call me at (512) 914-8590, or email me at the address below.

Sincerely,

Mike Johnson
Technical Manager
Strata Technologies, LLC

stratatech@austin.rr.com

**McMillan, Michael, EMNRD**

**From:** McMillan, Michael, EMNRD
**Sent:** Wednesday, April 10, 2019 11:27 AM
**To:** 'tphipps@keyenergy.com'
**Cc:** Goetze, Phillip, EMNRD; Jones, William V, EMNRD
**Subject:** RE: Queen Lake Federal 19 Well No. 1

Also, I do not see proof of mailing to the affected parties. You must include the green cards

After all of this information is received, the 15-day clock will start

Mike

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**From:** McMillan, Michael, EMNRD
**Sent:** Wednesday, April 10, 2019 11:23 AM
**To:** 'tphipps@keyenergy.com' <tphipps@keyenergy.com>
**Cc:** Goetze, Phillip, EMNRD <Phillip.Goetze@state.nm.us>; Jones, William V, EMNRD <WilliamV.Jones@state.nm.us>
**Subject:** Queen Lake Federal 19 Well No. 1

Turner:
Your administrative application for the Queen Lake Federal 19 Well No. 1 was received on April 2, 2019

Your application is suspended on April 10, 2019

The OCD needs the following information:

- Affidavit of publication in the county in which the well is located
- Better tract map that shows the affected parties.
- TDS of injection formations.
- The OCD is also concerned because the bottom of the proposed injection interval is near the Ellenburger. Therefore, the OCD will require you to provide the projected top of Montoya
- Clarify the maximum injection rate

After the OCD receives the receives the required information, the 15-day clock will start

Mike

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