

State of New Mexico
Energy, Minerals and Natural Resources Department

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Adrienne Sandoval, Director
Oil Conservation Division



Administrative Order SWD-2066
July 28, 2020

**ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION**

Pursuant to the provisions of the Oil Conservation Division (OCD) Rule 19.15.26.8(B) NMAC, Trove Energy and Water, LLC ("the operator") seeks an administrative order for its WLC South Federal SWD No.1 ("the well") with a location of 1340 feet from the North line and 220 feet from the East line, Unit letter H of Section 15, Township 26 South, Range 33 East, NMPM, Lea County, New Mexico, for the purpose of commercial disposal of produced water.

THE OCD DIRECTOR FINDS THAT:

The application has been duly filed under the provisions of OCD Rule 19.15.26.8(B) NMAC and satisfactory information has been provided that affected parties have been notified and no objections have been received within the prescribed waiting period. The applicant has presented satisfactory evidence that all requirements prescribed in OCD Rule 19.15.26.8 NMAC have been met and the operator is in compliance with OCD Rule 19.15.5.9 NMAC.

Application for Disposal in Devonian and Silurian Formations: Due to the potential for the projected injection volume of the proposed well to impact an area greater than the one-half mile radius applied in OCD Form C-108 and OCD rule, the applicant has provided the following supplementary information:

1. Notification following OCD Rule 19.15.26.8(B) NMAC for a radius of one mile from the surface location of the proposed well;
2. An expanded Area of Review for wells penetrating the disposal interval for a radius of one mile from the surface location of the proposed well; and
3. A statement by a qualified person assessing the potential of induced-seismic events associated with the disposal activities for the predicted service life of the proposed well.

IT IS THEREFORE ORDERED THAT:

The applicant, Trove Energy and Water, LLC (OGRID 372488), is hereby authorized to utilize its WLC South Federal SWD No.1 (API 30-025-Pending) with a location of 1340 feet from the North line and 220 feet from the East line, Unit letter H of Section 15, Township 26 South, Range 33 East, NMPM, Lea County, for disposal of oil field produced water (UIC Class II only) through open-hole completion into an interval consisting of the Devonian and Silurian formations

from approximately 17,550 feet to approximately 18,800 feet. Injection will occur through internally-coated, 7-inch or smaller tubing within the 9 $\frac{5}{8}$ -inch production casing and 5 $\frac{1}{2}$ -inch or smaller tubing within the 7 $\frac{5}{8}$ -inch (39#) liner with a packer set within 100 feet of the top of the disposal interval. This permit does not allow disposal into:

1. The Woodford Shale and formations above the lower contact of the Woodford Shale;
2. Formations below the Silurian formations including the Montoya formation and the Ellenburger formation (lower Ordovician); and
3. Any lost circulation intervals directly on top and obviously connected to these formations.

Prior to commencing disposal, the operator shall submit mudlog and geophysical logs information (Triple Combo; Gamma Ray, Resistivity, Density/Porosity), to the OCD District geologist and Santa Fe Engineering Bureau, showing evidence agreeable that only the permitted formation is open for disposal including a summary of depths (picks) for contacts of the formations which the OCD shall use to amend this order for a final description of the depth for the injection interval. If significant hydrocarbon shows occur while drilling, the operator shall notify the OCD's District office and the operator shall be required to receive written permission prior to commencing disposal.

The operator shall set surface casing 25 feet below the top of the Rustler anhydrite in order to seal off protectable water.

The operator shall circulate to surface the cement for the 9 $\frac{5}{8}$ -inch production casing.

If cement does not circulate on any casing string, the operator shall run a cement bond log ("CBL") or other log to determine top of cement and shall notify the Hobbs District with the top of cement on the emergency phone number prior to continuing with any further cement activity with the proposed well. If cement did not tie back into the next higher casing shoe, the operator shall perform remedial cement job to bring cement, at a minimum, 200 feet above the next higher casing shoe.

The operator shall run a CBL (or equivalent) for the 7 $\frac{5}{8}$ -inch liner to demonstrate the placement of cement and the cement bond with the tie-in with 9 $\frac{5}{8}$ -inch production casing string. The operator shall provide a copy of the CBL to the OCD's District office prior to commencing disposal.

Prior to commencing disposal, the operator shall obtain a bottom-hole pressure measurement representative of the open-hole completion. This information shall be provided with the written notice of the date of commencement of disposal.

IT IS FURTHER ORDERED THAT:

The operator shall take all steps necessary to ensure that the disposed water enters only the approved disposal interval and is not permitted to escape to other formations or onto the surface. This includes the completion and construction of the well as described in the application and, if

necessary, as modified by the District Supervisor, or the Bureau of Land Management.

After installing tubing, the casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or an approved leak detection device in order to determine leakage in the casing, tubing, or packer. The casing shall be pressure tested from the surface to the packer setting depth to assure casing integrity.

The well shall pass an initial mechanical integrity test ("MIT") prior to initially commencing disposal and prior to resuming disposal each time the disposal packer is unseated. All MIT procedures and schedules shall follow the requirements in OCD Rule 19.15.26.11(A) NMAC. The OCD Director retains the right to require at any time wireline verification of completion and packer setting depths in this well.

Without limitation on the duties of the operator as provided in OCD Rules 19.15.29 and 19.15.30 NMAC, or otherwise, the operator shall immediately notify the OCD's District I office of any failure of the tubing, casing or packer in the well, or of any leakage or release of water, oil or gas from around any produced or plugged and abandoned well in the area, and shall take such measures as may be timely and necessary to correct such failure or leakage.

If the disposal well fails a MIT or if there is evidence that the mechanical integrity of said well is impacting correlative rights, the public health, any underground sources of fresh water, or the environment, the OCD Director shall require the well to be shut-in within 24 hours of discovery and the operator shall redirect all disposal waters to another facility. The operator shall take the necessary actions to address the impacts resulting from the mechanical integrity issues in accordance with OCD Rule 19.15.26.10 NMAC, and the well shall be tested pursuant to Rule 19.15.26.11 NMAC prior to returning to injection.

The wellhead injection pressure on the well shall be limited to **no more than 3,510 psi**. In addition, the disposal well or system shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface tubing pressure to the maximum allowable pressure for this well.

The Director of the OCD may authorize an increase in tubing pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the disposed fluid from the target formations. Such proper showing shall be demonstrated by sufficient evidence including but not limited to an acceptable step-rate test.

The operator shall notify the supervisor of the OCD's District I office of the date and time of the installation of disposal equipment and of any MIT so that the same may be inspected and witnessed. The operator shall provide written notice of the date of commencement of disposal to the OCD's District I office. The operator shall submit monthly reports of the disposal operations that includes number of days of operation, injection volume, and injection pressure on OCD Form C-115, in accordance with OCD Rules 19.15.26.13 and 19.15.7.24 NMAC.

The injection authority granted under this order is not transferable except upon OCD approval. The OCD may require the operator to demonstrate mechanical integrity of any injection well that will be transferred prior to approving transfer of authority to inject.

The OCD may revoke this injection order after notice and hearing if the operator is in violation of Rule 19.15.5.9 NMAC.

The disposal authority granted herein shall terminate one (1) year after the effective date of this Order if the operator has not commenced injection operations into the subject well. One year after the last date of reported disposal into this well, the OCD shall consider the well abandoned, and the authority to dispose will terminate *ipso facto*. The OCD, upon written request mailed by the operator prior to the termination date, may grant an extension thereof for good cause.

Compliance with this Order does not relieve the operator of the obligation to comply with other applicable federal, state or local laws or rules, or to exercise due care for the protection of fresh water, public health and safety and the environment.

Jurisdiction is retained by the OCD for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh or protectable waters or (2) consistent with the requirements in this order, whereupon the OCD may, after notice and hearing, terminate the disposal authority granted herein.



ADRIENNE SANDOVAL
Director

AS/bl

cc: Oil Conservation Division – Hobbs District Office
Bureau of Land Management – Carlsbad Field Office

Attachment: C-108 well completion diagram



WLC South Federal SWD #1
Lea County, NM
900' FNL & 100' FEL
SEC. 15-T26S-R33E

AFE # - TBD
Drilling Contractor: McKay Drilling
Safety:
Trucking:

Directions / Vicinity
Site - Lat: 32.048254, Long: -103.551973
21.7 miles W/SW of Jal, NM
Drawn by B. Stone, 10/16/2019

Geologic Tops (MD)	Wellbore	Section	Issues	Bit & BHA	Mud	Casing	Logging	Cement	Injection String
Triassic - 450'		SURFACE CSG Drill 24" 0' - 1050' Set and Cement 20" Casing	Loss Circulation Hole Cleaning Wellbore stability in the Red Beds Anhydrite in Rustler	24" Tricone 9-5/8" x 8" MM 9 jnt - 8" DC 21 jnt - 5" HWDP 5" DP to surface	Spud Mud MW 8.5-9.2 ppg	1050' of 20" 94.0# J55 BTC Centralizers bottom 2 joints and then every 3rd jt Cement basket 5th jt from surface	No Logs	Thixotropic Cement 13.7 ppg 1600 sx Class C 3hr TT 25% Excess 1000 psi CSD after 10 hrs Circ. to Surface	12840' of 7.0" P110 26# TCPC Duoline Internally Coated Injection Tubing
Rustler - 1000'		INTERMEDIATE CSG Drill 3950' of 17-1/2" Hole 1050' - 5000' Set and Cement 13-3/8" Casing	Some leakage Possible H2S Anhydrite Salt Sections	17-1/2" PDC 9-5/8" x 8" MM 9 jnt - 8" DC 21 jnt - 5" HWDP 5" DP to surface	9.8 - 10.2 ppg Brine Water/ Mud	5000' 13-3/8" 68# BTC Centralizers - bottom jnt, every 3rd jnt in open hole and 2 jnt inside the surface casing	Mudlogger on site by 1200'	13.2 ppg lead/ 14.8 tail 3200 sx Class C 4hr TT 10% Excess 1000 psi CSD after 10 hrs Circ. to Surface	
Top Salt - 1150'									
Base of Silicates -									
Castile -									
Base Salt - 4745'		INTERMEDIATE 2 CSG Drill 8100' of 12-1/4" Hole 5000' -13100' Set 9-5/8" Intermediate Casing and Cement in 3 Stages	Hard Drilling thru Brushy Canyon Some leakage to complete loss Water flows Some Anhydrite H2S possible Production in the Bone Spring and Wolfcamp Ballooning is possible in Cherry Canyon and Brushy if broken down	12-1/4" PDC 8" MM 9 jnt - 8" DC 8" Drilling Jars 21 jnt - 5" HWDP 5" DP to Surface	8.5-10.5 ppg Oil Based Mud High Vis Sweeps UBD/MPD	10M Section 13100' of 9-5/8" 53.5# HCP110 BTC Special Drift to 8.535" Externally Coat 2820' Between DV Tools DV tool at at 7800' ECP DV Tool 15' Inside Previous Casing Centralizers - bottom jnt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the surface casing	MWD GR + CBL on 13-3/8" Casing	Stage 3 11.9 ppg lead/ 15.6 tail Class C 5hrTT 1455 sx - 25% xs 1000 psi CSD after 10 hrs Circ. to Surface	
Delaware Mtn Group - 4950'								Stage 2 11.9 ppg lead/ 15.6 tail Class H 5hrTT 700 sx - 10% XS 1000 psi CSD after 10 hrs Calc. to DV	
Lamar LS - 4950'								Stage 1 11.9 ppg lead/ 15.6 tail Class H 6hrTT 1245 sx - 10% XS 1000 psi CSD after 10 hrs Calc. to DV	
Bell Canyon - 4978'									
Cherry Canyon - 6050'									
Brushy Canyon -	LINER Drill 4450' of 8-1/2" Hole 13100' -17550' Set 7-5/8" Liner and Cement in Single Stage	High Pressure (up to 15 ppg) and wellbore instability anticipated in Atoka Production in the Wolfcamp Atoka and Morrow Hard Drilling in the Morrow Clastic	8-1/2" PDC 6-3/4" MM 21 jnt - 6" HWDP 5" DP to Surface	11-12.5 ppg Oil Based Mud UBD/MPD	4650' of 7-5/8" 39# P110 FJ (Gas Seal) VersaFlex Packer Hanger Centralizers on and 1 jnt above shoe jnt and then every 2nd jnt.	MWD GR Triple combo + CBL on 9-5/8" Casing	15.6 ppg 350 sx - Class H 8hrTT 10% Excess 1000 psi CSD after 10 hrs	4610' of 5-1/2" HCP110 17# TCPC Duoline Internally Coated Injection Tubing	
Bone Spring - 8980'									
3rd Bone Spring - 11750'									
Wolfcamp - 12310'									
Liner Top - 12,900' Intermeditate 2 Depth - 13,100'	Injection Interval Drill 1250' of 6-1/2" hole 17,550 to 18,800' BHP estimated 8000 psi BHT estimated 260 F	Chert is possible Loss of Circulation Anticipated H2S possible BHP estimated 8000 psi BHT estimated 260 F	6-1/2" PDC 4-3/4"MM 9 jnt - 4-3/4" DC 4-3/4" Drilling Jars 18 jts: 4" FH HWDP 4" FH DP to Surface	Fresh Water Mud 8.4-8.6 ppg (possible flows)	Openhole Completion Interval	MWD GR Triple Combo with FML, CBL on 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)	7-5/8" xT-17T TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim	
Penn -									
Strawn - 14342'									
Atoka - 14553'									
Morrow - 14855'		Injection Interval Drill 1250' of 6-1/2" hole 17,550 to 18,800'	Chert is possible Loss of Circulation Anticipated H2S possible BHP estimated 8000 psi BHT estimated 260 F	6-1/2" PDC 4-3/4"MM 9 jnt - 4-3/4" DC 4-3/4" Drilling Jars 18 jts: 4" FH HWDP 4" FH DP to Surface	Fresh Water Mud 8.4-8.6 ppg (possible flows)	Openhole Completion Interval	MWD GR Triple Combo with FML, CBL on 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)	7-5/8" xT-17T TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim
Miss LS - 16980'									
Woodford Sh - 17120'									
Packer - 17,450' Liner Bottom Depth - 17,550'									
Devonian - 17550'		Injection Interval Drill 1250' of 6-1/2" hole 17,550 to 18,800'	Chert is possible Loss of Circulation Anticipated H2S possible BHP estimated 8000 psi BHT estimated 260 F	6-1/2" PDC 4-3/4"MM 9 jnt - 4-3/4" DC 4-3/4" Drilling Jars 18 jts: 4" FH HWDP 4" FH DP to Surface	Fresh Water Mud 8.4-8.6 ppg (possible flows)	Openhole Completion Interval	MWD GR Triple Combo with FML, CBL on 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)	7-5/8" xT-17T TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim
Silurian -									
Fusselman - 18700'									
Driller's Total Depth - 18,800'									