**STATE OF NEW MEXICO**
**ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT**
**OIL CONSERVATION DIVISION**

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF A SALT WATER DISPOSAL WELL, LEA COUNTY NEW MEXICO**

**CASE NO. 20985**
**ORDER NO. R-21608**

## ORDER OF THE DIVISION

This case came in for hearing before the Oil Conservation Division ("OCD") at 8:15 a.m. on January 09, 2020, in Santa Fe, New Mexico.

The OCD Director, having considered the testimony, the record, the recommendations of Hearing Examiner Dylan Rose-Coss, these findings of fact, and conclusions of law issues this Order.

## FINDINGS OF FACT

(1) Due notice has been given, and the OCD has jurisdiction of the subject matter of this case.

(2) NGL Water Solutions Permian, LLC ("NGL" or "Applicant") seeks approval of injection authority for its proposed Striker 4 SWD No. 1 ("subject well"; API No. 30-025-Pending) with a surface location 850 feet from the South line and 174 feet from the West line (Unit M) in Section 24, Township 24 South, Range 34 East, NMPM in Lea County, New Mexico.

(3) The subject well is proposed for the support in processing of oilfield waste at a surface waste management facility producing a waste stream identified as "slurry" with an estimated total dissolved solids ("TDS") concentration of 75,065 milligrams per liter (mg/L) and an estimated total suspended solids ("TSS") concentration of 98,800 mg/L.

(4) NGL will inject the slurry into the Bell Canyon and Cherry Canyon formations through perforations from 5,489 feet to 7,200 feet with a surface injection pressure not to exceed 1,098 pounds per square inch ("psi").

(5) Entry of appearances were filed through counsel for The New Mexico Oil Conservation Division (OCD).

(6) NGL appeared through counsel and presented testimony and exhibits that support the following findings of fact:

(a) NGL has proposed a surface waste management facility that will receive exempt oil and gas exploration and production waste from multiple operators in the Delaware Basin.

(b) The subject well is to receive a slurry that is the result of dewatering and filtering of the various waste stream sources such as flowback water, drill cuttings, spent drilling fluids and tank bottoms from storage facilities.

(c) NGL will inject the slurry with an estimated average injection pressure of 800 psi and maximum surface injection pressure ("MSIP") which would not exceed 1,098 psi calculated using the 0.2 psi per foot ("psi/ft") gradient applied by OCD to administratively approved disposal permits.

(d) The subject well is to be constructed with $13^{3}/_{8}$-inch surface casing set at a depth of 1,450 feet and $9^{5}/_{8}$-inch production casing set at a depth of 7,200 feet. Cement for each casing string is to be circulated to the surface.

(e) The tubing will be 5½-inch diameter with a packer set at 5,390 feet and perforations are to be within the proposed disposal injection interval from 5,489 feet to 7,200 feet.

(f) The proposed injection interval is to include the entire Bell Canyon formation and the upper portion of the Cherry Canyon formation while the remaining portion of the Cherry Canyon formation, approximately 475 feet, will provided an additional buffer from injection fluids migrating to the Brushy Canyon formation and the deeper Bone Spring formation.

(g) NGL stated that a thick anhydrite sequence at the top of the Bell Canyon formation will provide an upper confining layer to protect injection fluids from migrating into USDWs, while a measurable decrease in porosity can be found in the lower Cherry Canyon formation producing a lower confining layer.

(h) NGL provided an analysis of a slurry from a similar processing facility in Orla, Texas. This analysis and testimony stated that the sources are similar, and the process yielded a slurry for disposal by injection with a TDS concentration of 75,000 mg/L and Total Suspended Solids ("TSS") concentrations of 20,000 mg/L.

(i) Applicant stated the slurry would be compatible with the formation fluids found within the proposed injection interval and would not degrade the reservoir's characteristics, including permeability.

(j) NGL conducted a search of the area of review ("AOR") for the subject well using a one-half mile radius. The results showed that there are 4 active wells and 9 pending wells in the AOR. All the wells either penetrate or will penetrate the injection interval and are horizontal completions in deeper formations and have been or will be cemented across the proposed injection interval.

(k) Review for freshwater wells found one well (POD No. C-03580) within one mile of the subject well. The well was not locatable. Therefore, no freshwater samples were obtained.

(l) NGL provided testimony and submitted reservoir modeling indicating that the proposed injection interval will be satisfactory to support an injection operation estimated at 6,000 barrels of water per day ("BWPD") at the proposed MSIP. The Applicant requested that the well be approved for 20,000 BWPD even though the proposed average rate would be less.

(m) NGL stated that the well bore would regularly be flushed with 2,000 barrels of non-slurry produced water following periods of slurry injection as standard procedure in operating the subject well.

(n) NGL investigated the hydrocarbon potential for the proposed injection interval and concluded that there is a very low potential for existing resources to be impacted by the disposal operation.

(o) Applicant stated that the project will have the beneficial effect of increasing the capacity of the surface waste facility which prevents waste and protects correlative rights, public health, and the environment.

(7) The OCD appeared at hearing. No other party appeared at hearing or opposed the application.

(8) OCD presented through legal counsel a statement regarding the proposed subject well and disposal operation. The OCD noted that the Delaware Mountain Group and the respective sub-members of the formation potentially have a parting pressure which can be reached below a surface pressure calculated using the 0.2 psi per foot ("psi/ft") gradient; that injection into the formation can cause increased pressure leading to drilling complications and may potentially communicate with protectable water

sources. For these reasons, the OCD requested the following proposed conditions be imposed on any order issued:

(a) That a step-rate test (SRT) be performed prior to injection to determine the formations parting pressure;

(b) The MSIP be limited to the administratively approved gradient of 0.2 psi per foot of depth, unless the SRT demonstrates a lower pressure gradient;

(c) The maximum daily injection rate for the subject well be 10,000 BWPD until the step rate test is conducted;

(d) The well only be stimulated by acidization without the use of proppants;

(e) The injection authority for the proposed well be active only as long as the facility that supports it is operating under an approved permit;

(f) The injection authority be limited to a ten-year period, at which point renewal could be applied for before expiration, and with the application would come a step-rate-test to reassess the formation parting pressure;

(g) That monitoring the well include a Supervisory Control and Data Acquisition (SCADA) system

(h) The operator provide copies of all subsurface logs for correlation of stratigraphy and a reassessment of the economic evaluation for hydrocarbon potential to the OCD prior to initial injection;

(i) That modifications to the order be able to be considered administratively; and

(j) When the maximum surface pressure is reached due to reservoir pressure increases, the injection authority be terminated and the well be plugged and abandoned.

## CONCLUSIONS OF LAW

(9) Applicant has presented satisfactory evidence that all requirements prescribed in Rule 19.15.26.8 NMAC have been met.

(10) OCD records indicate NGL Water Solutions Permian, LLC (OGRID No. 372338) as of the date of this order is in compliance with Rule 19.15.5.9 NMAC.

(11) The proposed well construction provided in the application is protective of USDWs.

(12) The OCD conducted a review of the AOR for the wells identified at the time of the hearing as proposed to confirm current status. The review identified three active wells that penetrate the proposed injection interval:

(a) Baseball Cap Federal Com #707H (API No. 30-025-45790)
(b) Baseball Cap Federal Com #607H (API No. 30-025-45786)
(c) Baseball Cap Federal Com #705H (API No. 30-025-45789)

Additionally, the review identified three proposed AOR wells that have been canceled:

(a) Super Fee WCA #001C (API No. 30-025-44029)
(b) Super Fee WCA #002C (API No. 30-025-44030)
(c) Super Fee WCXY #001C (API No. 30-025-44031)

(13) The proposed MSIP of 1,098 psi is based on the administrative pressure gradient of 0.2 psi per foot developed from the historic data from the disposal of produced water. Additional requirements for testing of the slurry injection fluid should be included to confirm that this this gradient will not propagate fracturing of the proposed injection interval.

(14) There is no indication that proposed disposal activity will result in any potential for induced seismicity in this area.

(15) The subject well will provide a process to dispose of exempt oilfield waste while protecting correlative rights and preventing waste in a manner that safeguards public health and the environment. Therefore, this application should be approved.

**ORDER**

(1) NGL Water Solutions Permian, LLC ("NGL" or "Operator") is hereby authorized to utilize its Striker 4 SWD No. 1 (API No. 30-025-Pending; the "subject well") with a surface location 850 feet from the South line and 174 feet from the West line (Unit M) in Section 24, Township 24 South, Range 34 East, NMPM in Lea County, New Mexico as a commercial disposal well for UIC Class II fluid (slurry) or similar fluids received from an approved surface waste management facility.

(2) Disposal shall be through perforations within the Bell Canyon and Cherry Canyon formations (of the Delaware Mountain Group) from approximately 5,489 feet to 7,200 feet below surface (the "permitted injection interval"). Injection shall be through plastic-lined, 5½-inch (OD) or smaller tubing set with a packer placed within 100 feet above the top perforation of the permitted injection interval.

(3) The Operator shall take all steps necessary to ensure that the disposed fluid enters only the permitted injection interval and is not allowed to escape to other formations or onto the surface. This order does not authorize disposal into the Brushy Canyon formation below the injection interval or lost circulation intervals directly on top and obviously connected to these formations.

(4) The injection authority granted under this Order is subject to the conditions of OCD Surface Waste Management Facility Permit NM1-66 tentatively approved October 30, 2020. The injection authority granted under this order is transferable only to any new operator of the Permit NM1-66 with the approval of OCD.

(5) The injection of produced water shall be approved as a component for the standard operation of the subject well and not as the only UIC Class II fluid disposed into the subject well.

(6) The Operator shall conduct baseline freshwater sampling by either collecting water from:

(1) The wells permitted by the New Mexico Office of the State Engineer (NMOSE) as. C-03580 POD 1 and C-03580 POD 2, both located in Section 23, Township 24 South, Range 34 East, NMPM; or

(2) If the NMOSE wells are not available, by installing a groundwater monitoring well that is hydrologically downgradient of the - subject well and has been approved by the Engineering Bureau prior to installation. The monitoring well shall be maintained and available for sampling until such time as the subject well is plugged.

(3) If during the installation of a monitoring well no ground water is encountered within 500 feet of the surface, the boring shall be plugged and the requirement of Ordering Paragraph (6) satisfied.

The analysis for these sources shall be a general chemistry suite conducted by a NELAP-certified analytical laboratory that includes major anion-cation, TSS and TDS analyses. Copies of the results shall be provided to the OCD's District office (attached to a Form C-103) prior to the commencement of injection.

(7) The Operator shall complete a mudlog and geophysical logging (Triple Combo suite) over the permitted disposal interval sufficient to demonstrate the hydrocarbon potential. The Operator shall notify the OCD's District office and the Santa Fe Engineering Bureau of significant hydrocarbon shows that are observed during drilling of the permitted injection interval. Prior to commencing disposal, the Operator shall submit the mudlog and geophysical logs information to the OCD's District geologist, and the 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 and any corresponding change in the wellhead injection pressure.

(8) Within a year after commencing injection, the Operator shall compile and submit an updated version of the cross section initially submitted as NGL's Exhibit 2. The revised cross section shall include the subsurface information obtained from geophysical and mudlog results to correlate formation tops and confining layers of the permitted injection interval for the subject well and offsetting wells. A copy of this interpretation shall be provided electronically to the Santa Fe Engineering Bureau e-mail address and to the BLM field office in Carlsbad.

(9) The Operator shall conduct and document the casing testing requirements for the subject well in accordance with Rule 19.15.16 NMAC.

(10) If cement does not circulate to surface 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 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 submit a written remedial plan of Form C-103 and shall perform the remedial cement job only with the approval of the plan.*

(11) The Operator shall run a CBL for the 9⅝-inch production casing from the shoe to at least 200 feet above the shoe of the 13 3/8-inch surface casing. Copies of the CBL shall be provided to the OCD's District office and the BLM prior to the commencement of injection.

(12) After installation of 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.

(13) The subject well shall be limited to a maximum injection rate of **no more than 10,000 barrels of water and or slurry per day.** The Director may authorize an increase in the injection rate upon a proper showing by the Operator of the subject well that such an increase in injection rate shall not result in a pressure that exceeds the formation parting pressure nor result in migration of the disposed fluid from the approved injection interval.

(14) The maximum surface injection pressure ("MSIP") for the subject well shall not exceed **1,098 psi for the initial operation following the commencement of injection. Prior to commencing the second year of injection,** the Operator shall conduct a step-rate test ("SRT") acceptable to the OCD and provide an assessment (inclusive of data) of the results of the SRT. The OCD shall review the administratively approved MSIP and the sampling data of the slurry injection fluid provided in Ordering Paragraph (15) to confirm that current MSIP does not exceed the formation parting pressure of the approved injection interval. The Director retains the authority to amend the MSIP should there be a finding that the current MSIP exceeds the formation parting pressure.

(15) The Operator shall conduct analytical testing of the slurry injection fluid at least four times a year (quarterly monitoring). Analysis shall be a general chemistry suite that includes major anion-cation analysis, specific gravity, TSS and TDS. The Operator shall submit the results annually in a single submission to the District office attached to Form C-103.

(16) The subject well shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface tubing pressure to the maximum surface injection pressure for this well.

(17) The Director may authorize an increase in tubing pressure upon a proper showing by the Operator that such higher pressure will not result in migration of the disposed fluid from the approved injection interval. Such proper showing shall be demonstrated by sufficient evidence including but not limited to an acceptable SRT.

(18) The subject well shall pass an initial mechanical integrity test ("MIT") prior to commencing disposal and prior to resuming disposal each time the well has significant equipment changes including, but not limited to, the packer being unseated, tubing being pulled, or when casing repairs have occurred. The Operator shall notify the OCD's District office a minimum of 48 hours in advance of the proposed date and time of the modification of disposal equipment and of any MIT test so that the same may be inspected and witnessed. All MIT procedures and schedules shall follow the requirements

in Rule 19.15.26.11(A) NMAC.

(19) The Operator shall provide copies of Notice of Intents and Subsequent Reports with the OCD's District office for any testing of the well or for any activities that shall modify the well construction or operation.

(20) Prior to commencing disposal, the Operator shall obtain a **static bottom-hole pressure measurement** representative of the injection interval and submit this data with the information required in Ordering Paragraph (21).

The Operator shall provide written notice to the District office on a Form C-103 of the date injection commenced. The Operator shall submit monthly reports of the disposal operations (injection volume, pressure and days of operation) on OCD Form C-115, in accordance with Rules 19.15.26.13 NMAC and 19.15.7.24 NMAC. Further, the Operator shall differentiate in the C-115 the type of UIC Class II fluids injected by utilizing the code for W-Water for produced water injected and the code for O-Other for all remaining types of UIC Class II fluids injected.

(21) If the subject well fails a MIT or if there is evidence that the mechanical integrity of said well is impacting correlative rights, the public health, any USDWs, or the environment, the Director shall require the subject 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 Rule 19.15.26.10 NMAC, and the subject well shall be tested pursuant to Rule 19.15.26.11 NMAC prior to returning to injection.

(22) Without limitation on the duties of the Operator as provided in Rules 19.15.29 NMAC and 19.15.30 NMAC, or otherwise, the Operator shall immediately notify the OCD's District office of any failure of the tubing, casing or packer in the subject 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.

(23) The OCD further stipulates the following "best management practices" shall be included as conditions of the approved application:

(1) The subject well shall be included in a Supervisory Control and Data Acquisition (SCADA) system for operation as an injection well.

(2) The Operator shall first contact the OCD's District supervisor for approval of proposed remedial actions <u>prior to initiating any recovery attempts</u> should a failure of tubing occur with a loss of a tubing section within the subject well.

(24) The OCD may revoke this injection permit after notice and hearing if the Operator is in violation of Rule 19.15.5.9 NMAC.

(25) The disposal authority granted herein shall terminate one year after the effective date of this order if the Operator has not commenced injection operations into the proposed well, provided however, the OCD, upon written request, submitted by the Operator prior to the termination date, may grant an extension thereof for good cause.

(26) One year after disposal into the subject well has ceased, said well will be considered abandoned and the authority to dispose will terminate *ipso facto.* Unless terminated sooner, this Permit shall remain in effect for a term of ten (10) years beginning on the date of issuance. Permittee may submit an application for a new permit prior to the expiration of this Permit. If Permittee submits an application for a new permit, then the terms and conditions of this Permit shall remain in effect until OCD denies the application or grants a new permit. When the permitted maximum surface pressure is reached, the injection authority shall be terminated and the well be plugged and abandoned.

(27) 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.

(28) 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, or prior to notice and hearing in the event of an emergency, terminate the disposal authority granted herein.

DONE at Santa Fe, New Mexico, on this 19th day of February, 2021.

**STATE OF NEW MEXICO**
**OIL CONSERVATION DIVISION**

**ADRIENNE SANDOVAL**
**DIRECTOR**