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

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF OASIS WATER SOLUTIONS, LLC FOR APPROVAL OF A SALT WATER DISPOSAL WELL, LEA COUNTY, NEW MEXICO.

CASE NO. 15307
ORDER NO. R-14567

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on August 6, 2015, at Santa Fe, New Mexico, before Examiners Michael McMillan and Phillip R. Goetze, on September 17, 2015, before Examiners Michael McMillan and Phillip R. Goetze, and finally on October 1, 2015, before Examiners Phillip R. Goetze and William V. Jones.

NOW, on this 31st day of January, 2018, the Division Director, having considered the testimony, the record, and the recommendations of Examiner Goetze,

FINDS THAT:

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

(2) Oasis Water Solutions LLC ("Applicant" or "Oasis") seeks authority to utilize its Cooper 17 Well No. 1 (API No. 30-025-Pending; the "Subject well"), to be located 2310 feet from the North line and 2200 feet from the West line (Unit F) of Section 17, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico, as an Underground Injection Control (UIC) Class II well for disposal of produced water into the lower San Andres formation through an open-hole interval from 4170 feet to 4900 feet below surface.

(3) On January 12, 2015, Oasis submitted an administrative application (Application No. pMAM1502757846) to the Division for approval of the Subject well for commercial disposal of produced water. After the submittal of the application, the Division received notifications of protests by the New Mexico State Land Office (the "NMSLO")

and by Dr. Randy Briggs, business interest owner in Piper Energy, LLC, a produced-water disposal operator ("Protestants").

(4) On April 15, 2015, the Division received a request from Oasis to place the application for the Subject well on a hearing docket.

(5) At the hearing on August 6, 2015, no parties other than the Protestants appeared or otherwise opposed the granting of this application.

Applicant appeared at the hearings through counsel and presented the following evidence and testimony.

(6) Applicant seeks to drill the Subject well to an approximate total depth of 4900 feet below surface. The injection will occur through an open borehole from approximately 4170 feet to approximately 4900 feet below surface.

(7) The Subject well will be constructed with the following three casing strings: 13⅜-inch surface casing set at 1085 feet; 9⅝-inch intermediate casing set at 2450 feet; and 7-inch production casing set at 4170 feet. All three casings will have cement circulated to the surface.

(8) The Subject well will inject fluids through plastic-lined, 4½-inch tubing attached to a packer set no shallower than 100 feet above the top of the open-hole interval.

(9) Applicant proposes a closed system operation with an average injection rate of 20000 barrels of water per day (BWPD).

(10) The primary source for disposal in the Subject well would be produced water from area wells, but Applicant provided no additional information in the Form C-108 application to assess the compatibility of the injection fluids with formation fluids in the proposed disposal interval.

(11) One active fresh-water well was identified within a two-mile radius of the Subject well and the Applicant provided an analysis of this water well with the Form C-108 application.

(12) Applicant identified 17 wells within the half-mile Area of Review (AOR) around the Subject well, but none penetrated the proposed injection interval.

(13) Applicant provided a summary of historical hydrocarbon production in the area around the Subject well which has occurred in the upper half of the San Andres formation. The injection interval was proposed for the lower San Andres formation which has no historical production in this area.

(14) Applicant contended that the historical interpretation of the Capitan Reef structure was inaccurate and that the extension of the Reef into the area of the Subject well is also inaccurate based on re-interpretation of additional geophysical log data.

(15) Applicant documented the Division's history of multiple approvals for permits for disposal of produced water in the San Andres formation with no impact on hydrocarbon production and without a significant increase in formation pressure with the continuous injection.

(16) Applicant provided testimony that the dissolved chloride ion concentrations from the water samples of the San Andres formation were not representative of the true total dissolved solids (TDS) concentrations of that formation fluid since other dissolved solid constituents that could significantly increase the TDS value were not included in the analysis.

The NMSLO appeared at the hearings through counsel and presented the following evidence and testimony.

(17) The NMSLO presented testimony that the proposed injection interval was within a segment of the Capitan Reef aquifer system where the ground water of the Capitan Reef flows northeast towards Hobbs into the shelf aquifers. The dominant shelf aquifer at this location where the reef facies transitions into the backreef facies is the San Andres formation.

(18) The NMSLO provided published reports containing San Andres water samples in the vicinity of the Subject well with dissolved chloride ion concentrations below 10000 milligrams per liter (mg/L).

(19) Based on this water quality information and the hydrologic connection with the reef, the NMSLO contended that this portion of the San Andres formation contained waters having TDS concentrations of 10000 mg/L or less are protectable under Division Rule 19.15.26.8(E)(2) NMAC.

(20) Additionally, the NMSLO identified applications for the allocation of ground water being processed for commercial use of ground water from the San Andres formation by the potash industry and oil and gas operators.

Dr. Briggs appeared at the hearing through counsel and presented the following statement of facts.

(21) Dr. Briggs presented statements into the hearing record regarding the Anderson Well No. 1 (API No. 30-025-29962), an adjacent disposal well, located approximately one-half mile northeast, to be replaced by the Subject well. Dr. Briggs stated:

(a) the Anderson Well No. 1 was a salt water disposal well operated by J. Cooper Enterprises, Inc., a corporation which included the same current personnel as the Applicant;

(b) the mechanical integrity of the Anderson Well No. 1 was poor and, if not properly plugged and abandoned, would allow for cross-contamination of fluids and waters from all zones; and

(c) the Division should require the proper abandonment of the Anderson Well No. 1 as a condition if an order was issued approving the application.

The Division concludes as follows:

(22) The application has been duly filed under the provisions of Division Rule 19.15.26.8 NMAC.

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

(24) Division records indicate Oasis Water Solutions LLC (OGRID 310761) as of the date of this order is in compliance with Division Rule 19.15.5.9 NMAC.

(25) The hydraulic relationship between the Capitan Reef aquifer and the San Andres formation at this location in Lea County is well documented and is accepted as fact.

(26) NMSLO testimony and evidence suggested that the San Andres formation in the general area of the Subject well may, in places, contain formation waters with TDS concentrations of 10000 mg/L or less. However, NMSLO did not offer any evidence of water quality analysis for this area that supported this interpretation.

(27) Applicant offered that the lower San Andres formation within this township has historically been utilized for commercial disposal of produced water which continues to the present day.

(28) The Division recognizes this pattern of historical use within the township where the Subject well is proposed along with the status given to the San Andres formation as detailed in Appendix II of the Division's UIC Class II Primacy Demonstration (1980).

(29) The concerns presented by Dr. Briggs regarding the Anderson Well No. 1 (API No. 30-025-29962) are no longer relevant since this well was plugged and abandoned with the approval of the Division following the conclusion of the final hearing.

(30) Approval of disposal in the Subject well will enable Applicant to support existing production and future exploration in this area, thereby preventing waste, and will not impair correlative rights.

(31) The application should be approved with conditions to satisfy the Division's obligations as provided in its UIC Class II Demonstration including, but not limited to, sampling of formation fluids and the setting of casing and cement into the injection interval.

IT IS THEREFORE ORDERED THAT:

(1) Oasis Water Solutions LLC (the "Operator" or "Oasis") is hereby authorized to utilize its Cooper 17 Well No. 1 (API No. 30-025-Pending; the "Subject well"), to be located 2310 feet from the North line and 2200 feet from the West line (Unit F) of Section 17, Township 20 South, Range 37 East, NMPM, Lea County, New Mexico, as a commercial disposal well for UIC Class II fluids.

(2) Disposal shall be through perforations from 4170 feet to 4900 feet below surface. Injection is to be through plastic-lined tubing set in a packer within 100 feet above the top perforation of the permitted interval.

(3) The Operator shall complete the well with production casing set in cement for the entire length of the injection interval. The Operator shall prepare a new well design that includes a cased injection interval and submit the design in a Form C-103 to the Division's District I supervisor for approval.

(4) The Operator shall obtain formation water samples from the injection interval for analysis. The conditions for the sampling are as follows:

(a) Two discrete formation water samples shall be taken at depths (1) between approximately 4200 feet and 4400 feet below surface and (2) between 4500 feet and 4700 feet below surface.

(b) Each sample shall be analyzed for general water chemistry including major cations, major anions, and Total Dissolved Solids (TDS).

(c) The samples shall be collected and maintained following proper sampling protocols based on analytical methods selected to provide the analyses requested in paragraph (b).

The Division's District I office shall be noticed 72 hours prior to the sampling for the opportunity to witness the event. The Operator shall supply the results of the water sample analysis to the District office and engineering bureau in the Santa Fe office prior to commencing injection. If the samples are found to contain TDS concentrations of 10000 milligrams per liter or less, the injection authority under this Order shall be suspended, and the Division shall set a date for a hearing in this matter for consideration of modifying the injection authority of this order.

(5) The Operator shall supply the Division with a mudlog over the permitted disposal interval sufficient to demonstrate the hydrocarbon potential. The Operator shall

notify the Division's District I office of significant hydrocarbon shows that are observed during drilling, and provide the District office and the engineering bureau in Santa Fe with copies of the logs.

(6) The Operator shall take all steps necessary to ensure that the disposed water enters only the permitted disposal interval and is not permitted to escape to other formations or onto the surface.

(7) 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.

(8) The well shall pass an initial mechanical integrity test ("MIT") prior to commencement of disposal and prior to resumption of disposal each time the disposal packer is unseated. All MIT procedures and schedules shall follow the requirements in Division Rule 19.15.26.11(A) NMAC.

(9) The wellhead injection pressure shall be limited to **no more than 834 psi**. In addition, the disposal well 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.

(10) The Director of the Division 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 approved injection interval. Such proper showing shall be demonstrated by sufficient evidence including but not limited to an acceptable Step-Rate Test.

(11) The Operator shall notify the supervisor of the Division's District I office of the date and time of the installation of disposal equipment and of any MIT test so that the same may be inspected and witnessed. The Operator shall provide written notice of the date of commencement of disposal to the Division's District I office. The Operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Division Rules 19.15.26.13 NMAC and 19.15.7.24 NMAC.

(12) Without limitation on the duties of the Operator as provided in Division Rules 19.15.29 NMAC and 19.15.30 NMAC, or otherwise, the Operator shall immediately notify the Division's district 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.

(13) The injection authority granted under this order is not transferable except upon Division approval. The Division may require the Operator to demonstrate mechanical integrity of any injection well that will be transferred prior to approving

transfer of authority to inject.

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

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

(16) One year after disposal into the well has ceased, the well will be considered abandoned and the authority to dispose will terminate *ipso facto.*

(17) 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.

(18) Jurisdiction is retained by the Division 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 Division may, after notice and hearing, or prior to notice and hearing in event of an emergency, terminate the disposal authority granted herein.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

HEATHER RILEY
Director

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