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:

OWL SWD OPERATING, LLC APPLICATION FOR AUTHORIZATION TO INJECT **Case No. 15723**

OWL'S CLOSING ARGUMENT AND CONSOLIDATED RESPONSES TO THE OTHER PARTIES' POST-HEARING BRIEFS

I. INTRODUCTION

In support of its application for approval to inject from the proposed Bobcat SWD No. 1 Well, OWL SWD Operating, LLC ("OWL") presents its written closing arguments, consolidated with its responses to the Oil Conservation Division's ("Division") Post-Hearing Brief, the Post-Hearing Brief filed by the State Land Office ("SLO"), and the City of Jal's ("Jal") Post-Hearing Brief. OWL also submitted a post-hearing brief entitled OWL's Opening Legal Brief, and legal references from that brief are referenced or included herein. OWL is consolidating its responses with its closing argument for the Hearing Examiners' ease of reference. Attached hereto as Exhibit "A" is OWL's is a proposed form of an Order including findings in support of the issuance of an Order granting OWL's application and possible conditions based upon recent Division Orders and the testimony in this case.

II. GOVERNING LAW

The parties' legal briefs address the law governing the Hearing Examiners' consideration of the Application, the evidence presented at the Hearing, and a decision on the Application. The

Division and OWL are largely in agreement that this case is governed by the Oil and Gas Act. The starting point is the Oil and Gas Act and its provisions on "waste":

> The production or handling of crude petroleum oil or natural gas of any type or in any form, or the handling of products thereof, in such manner or under such conditions or in such amounts as to constitute or result in waste is each hereby prohibited.

§ 70-2-2 NMSA 1978. As it relates to this matter, "waste" is defined by the Act as follows:

> 'underground waste' as those words are generally understood in the oil and gas business, and in any event to embrace the inefficient, excessive, or improper, use or dissipation of the reservoir energy, including gas energy and water drive, or any pool, and the locating, spacing, drilling, equipping, operating or producing, of any well or wells in a manner to reduce or tend to reduce the total quantity of crude petroleum oil or natural gas ultimately recovered from any pool, and the use of inefficient underground storage of natural gas.

§ 70-2-3(A) NMSA 1978. The Commission and the Division have the authority and duty to prevent waste and to protect correlative rights by making and enforcing rules, regulations and orders. § 70-2-11 and -12 NMSA 1978.

With regard to regulation of produced water in order to protect water supplies, the Act states that the Division is authorized "to regulate the disposition of water produced or used in connection with the drilling for or producing of oil or gas or both and to direct surface or subsurface disposal of the water, including disposition by use in drilling for or production of oil or gas, in road construction or maintenance or other construction, in the generation of electricity or in other industrial processes, **in a manner that will afford reasonable protection against contamination of fresh water supplies** designated by the state engineer." § 70-2-12(B)(15) NMSA 1978 (emphasis added). The Division's brief cites to and provides a copy of a letter dated April 13, 1967 under which the State Engineer designated "all underground water in the State of New Mexico containing 10,000 parts per million or less of dissolved solids," provided that the designation "shall not include any water for which there is no present or reasonably foreseeable

beneficial use that would be impaired by contamination." That language apparently relates to the state engineer designation referred to in the above-quoted language. Similar language relating to impairment of water with reasonably foreseeable beneficial use also is reflected in the definition of "fresh water" in the Commission's regulations, which includes "underground waters containing 10,000 mg/l or less of TDS **except for which, after notice and hearing, it is found there is no present or reasonably foreseeable beneficial use that contamination of such waters would impair**." 19.15.2.7.F(3) NMAC (emphasis added).

The Division, SLO and OWL all appear to agree that OWL's application is governed by 19.15.26.8 NMAC. As discussed in OWL's brief on page 8, that provision originally was adopted by the Commission in 1981 as the Commission was preparing to apply for authority to issue permits for Class II injection wells under the federal Safe Drinking Water Act's Underground Injection Control ("UIC") program. As discussed in the Division's Post-Hearing Brief on pages 2-3, the State has primacy over the permitting of Class II injection wells and the enforcement of permits with respect to the UIC program. OWL agrees with the Division that the OCD administers the Oil and Gas Act and the UIC program through a single set of rules and procedures. OWL, however, does not necessarily agree with the Division that a person seeking to inject must demonstrate that the requested permit will comply with the requirements of both the Commission's rules and the federal UIC program. OWL contends that when the Division applied for and obtained primacy to administer the UIC program, the Division submitted its rules, including 19.15.26.8 NMAC and the applicable definitions, as part of its application for primacy. When the Environmental Protection Agency ("EPA") granted primacy, the effect was that EPA approved the Division's Rules as being compliant with the requirements for a state program such that OCD's rules, and not the federal rules, govern OWL's Application. *See* 40 C.F.R. § 146.1(b) and OWL's

Legal Brief on page 8. That said, this issue may not be material to the Hearing Examiners' decision in this case.

The SLO cites to the Environmental Improvement Act on page 3 of its Post-Hearing Brief, but does not explain its applicability in this case. The Division does not cite to that Act, and OWL does not agree that the Environmental Improvement Act applies. OWL also does not agree that, for purposes of this proceeding, OCD acts as a constituent agency under the New Mexico Water Quality Act, as SLO contends on pages 3-4 of its Post-Hearing Brief. As discussed on page 11 of OWL's Brief, this case is governed by the Oil and Gas Act, and the Water Quality Act does not apply to any activity or condition regulated under the Oil and Gas Act. § 74-6-12(G) NMSA 1978. The Division also does not cite the Water Quality Act as governing authority for this case. OWL contends that the SLO's reliance on the Environmental Improvement Act and the Water Quality Act are erroneous. Jal's Post-Hearing Brief does not identify any additional issues of law that require a response.

III. OWL'S APPLICATION

OWL submitted an application, dated April 28, 2017, to the Division for a permit for injection for the Bobcat SWD No. 1 Well, in accordance with 19.15.26.8 NMAC ("Application"). The Application, which is included in evidence as OWL's Exhibit 5, was submitted on Form C-108 and included all of the information required on that form, including the location of the proposed well, the proposed depth of the well (3,060 feet), the proposed injection interval (2915 to 3,060 feet below ground surface), the formation where injection is proposed (Yates-Seven Rivers), and the proposed casing and cement program. OWL proposes to inject fluids consisting of produced water at an average volume of 25,000 BPD and a maximum volume of 30,000 BPD. Water quality data provided in the Application indicates that the produced waters to be injected

may contain approximately 140,000 mg/l of total dissolved solids. The anticipated injection pressure is an average of 550 PSI (surface pressure) and a maximum of 580 PSI (surface pressure). The Application also contains information on all offset wells within two miles along with a location map.

The well design, including the casing and cement program described in the Application are designed to comply with 19.15.16.9, 19.15.16.10, and 19.15.26.9 and .10 NMAC, as applicable. During the hearing, no party raised any question regarding the completeness of the Application, the proposed casing and cement program or any other technical aspects of the Application. Instead, the objections raised relate to whether the proposed injection may result in waste or impairment of correlative rights and whether the proposed injection will impair reasonably foreseeable beneficial use of fresh water and/or underground sources of drinking water and/or protectable ground water. OWL submits that it has met all of the technical requirements for approval of its Application.

IV. NOTICE OF APPLICATION, PARTIES, AND PROCEDURES

Upon the filing of the Application, OWL's agent Longquist furnished notices of the Application by certified or registered mail to all affected parties required by the Commission's Rules. OWL also arranged for publication of a Legal Notice of the Application, which was published on May 3, 2017, in the Hobbs News. OWL Exhibits 5 and 7 and TR Vol. 2 P 66 L 22 to P 67 L11 and P 71 L 20 to P 74 L 11.[1]

Prior to the filing of the Application, the Division had advised OWL that it would not administratively approve the Application and that a hearing would be required. Consequently, OWL, through counsel, applied for a hearing on the Application on May 9, 2017. A hearing on this matter was originally set for June 8, 2017, and OWL's agent provided notice of the hearing.

[1] In this document, TR refers to the hearing transcript, Vol. refers to the volume number, P refers to the page or pages of that volume, and L refers to the lines of the transcript.

OWL Exhibits 5, 7 and 10 and TR Vol. 2 P 66 L 22 to P 69 L 11 and P 71 L 20 to P 74 L 11. The Division, through its normal practice, also provided notice of the hearing on its dockets posted on its website and emailed to the Division's email list.

OWL and the Division filed prehearing statements on June 1, 2017. The SLO filed a Prehearing Statement on May 25, 2017, and subsequently filed a Motion to Intervene on June 1, 2017, to which OWL responded on June 5, 2017. The SLO, on June 2, 2017, moved for a continuance until June 22. At a prehearing conference on June 6, 2017, the Hearing Examiner granted SLO's Motion to Intervene and also granted a continuance of the hearing to June 22, 2017.

Following a motion by OWL to vacate the hearing in favor of a hearing before the Commission, the Division moved for a continuance to July 20, 2017, and on June 22, the hearing was continued to July 20. OWL's motion for a hearing before the Commission was denied by Order dated June 26, 2017. Subsequently, the hearing on this matter was placed on a Special Examiner Docket to begin at 9:00 am on August 1, 2017. Prior to the hearing, OWL filed an Amended Prehearing Statement containing Mr. Blandford's written report.

At the hearing OWL, the Division and the SLO appeared through counsel and presented technical witnesses as identified in their pre-hearing statements. Jal did not file a prehearing statement and did not present any witnesses or evidence, but appeared through counsel, who was allowed to make an opening statement, to cross-examine witnesses, and to file post-hearing pleadings. At the conclusion of the hearing, the Hearing Examiners requested legal briefs to be filed and allowed the parties to file written closing arguments, proposed findings, and responses to the other parties' legal briefs.

During the hearing, the Hearing Examiner required OWL to provide additional notice of the Application to additional affected parties. TR Vol. 2 P 75 L6 to P 79 L 3. The additional

notices were provided by certified mail on August 15, 2017, as verified by an Affidavit of Christopher Weyend filed and served along with OWL's Status Report filed on August 30, 2017. On August 30, 2017, a letter from Special Energy Corporation was filed indicating no objection to the Application as long as OWL does not operate both the Maralo Sholes B Well No. 2 and the proposed Bobcat SWD Well No. 1 at the same time. On September 6, 2017, the Hearing Examiner notified the parties of the examination of the affidavit regarding the additional notices and that the additionally requested notice was properly provided. No other persons filed protests, appearances or opposition to the Application following the additional notice.

Based on the foregoing, OWL submits that it has provided evidence that all required public notice of the Application was given, that due public notice has been given of the hearing, and that the Division has jurisdiction of this case and its subject matter.

V. OWL'S PROJECT AND THE IMPORTANCE OF THE PROPOSED INJECTION

At the hearing OWL presented the testimony of Roger Johnson of OWL, who described OWL's project to transport by pipeline and recycle or dispose of produced water and the importance of the project to facilitate oil and gas production in the region. TR Vol. 1 P 13 L 23 to P 30 L 6. OWL currently collects and aggregates produced water from various sources in the area and transports the produced water through its pipeline system for injection to an existing injection well, Maralo Sholes B No. 2. TR Vol. 1 P 14 L 11 to P 15 L 4; P 16 L 10-20; P 26 L 3-12. OWL intends to replace that well with the Bobcat SWD No. 1 Well if the Hearing Examiners rule that a permit should be issued for the new well. TR Vol. 1 P 16 L 2-7. OWL's system aggregates water where it is produced and transports it out of the core of the production area, partially replacing truck hauling and small gathering systems. TR Vol. 1 P 16 L 8 to P 17 L 23. The current and proposed injection is a key part of the system and is essential to developing recycling capabilities.

TR Vol. 1 P 16 L 10-20; P 17 L 5-11; and P 25 L 3-21. OWL's project also reduces costs and environmental impacts and improves safety. TR Vol. 1 P 17 L 15-23; P 20 L 3-12; P 22 L 9 to P 24 L3. If the system is shut down, operators must revert to trucking, and if there is an extended shutdown of the system operators may have to start shutting in wells. TR Vol. 1 P 28 L 1-5.

VI. OWL'S APPLICATION AND HEARING EVIDENCE DEMONSTRATES THAT THE PROPOSED INJECTION WILL NOT RESULT IN WASTE OR IMPACT CORRELATIVE RIGHTS.

As discussed above, the Oil and Gas Act requires that the Hearing Examiners consider whether OWL's proposed injection will result in waste or will impair correlative rights. As discussed below, none of the actual operators and mineral lessees in the vicinity of the proposed injection well have protested OWL's Application. Moreover, OWL presented evidence that its proposed injection will not affect current or future oil and gas production and, indeed, is likely to improve the ability to produce oil and gas from the reservoir.

A. No Operator or Mineral Lessee Protested the Application.

As discussed above, notices of the Application and of the hearing were provided as required by rule individually to affected persons and by publication. In addition to those notices, the Hearing Examiners required OWL to provide additional notices to "affected persons" within a four square mile area. Not a single well operator or mineral lessee protested the Application or appeared at the hearing. The Hearing Examiners can rightfully conclude from the lack of protest or objection to the Application that well owners and operators and mineral lessees in the area, with notice of the application, chose not to raise concerns that OWL's proposed injection will result in waste or will impair correlative rights.

B. OWL'S Expert Testimony Demonstrates that the Proposed Injection Will Not Interfere with Oil and Gas Production or Impair Correlative Rights.

OWL presented an experienced and qualified petroleum engineer and expert on reservoirs, Chad Kronkosky, who testified regarding the conditions of the reservoir in the proposed injection interval and the potential impacts of the injection. TR Vol. 1 P 43 L 23 to P 45 L 1 and OWL Exhibit 3. His qualifications as an expert in petroleum and reservoir engineering were accepted without objection. TR Vol. 1 P 45 L 12-20. Mr. Kronkosky testified regarding his exhaustive review of the available information regarding the reservoir and nearby wells. *See, e.g.,* TR Vol. 1, P 77 L 17 to P 78 L 17; P 123 L 21-25 (reviewed approximately 100 well logs); TR Vol. 3 P 147 L 16 to P 148 L 6 and P 162 L 2 to P 163 L 11. His work is summarized in his written report and its tabs, which was admitted into evidence as OWL's Exhibit 1, which contains numerous references to Mr. Kronkosky's research.

Mr. Kronkosky's written report, beginning on page 3 and continuing on page 4, including Tabs A-E, summarize Mr. Kronkosky's geological investigation of the proposed injection interval, comprising the top of the Seven Rivers Formation and the basal Yates Formation, the same as the current injection interval of the Maralo Sholes B Well No. 2. OWL Exhibit 1; TR Vol. 1 P 48 L 20 to P 49 L 7. The report describes the geologic nature of the injection interval and surrounding area, which include highly permeable reservoirs such as the injection interval. OWL Exhibit 1 P 3. Mr. Kronkosky's report and exhibits identify the hydrocarbon contacts and indicate that the proposed injection interval is proximal to, but below, the regional historical Gas-Oil contact. *Id.;* TR Vol. 1 P 56 L 15 to P 57 L 5; P 59 L 7-23; P 61 L 6-7.

Mr. Kronkosky thoroughly reviewed the historical oil and gas production in the area, as discussed on pages 3-4 of his report. OWL Exhibit 1 PP 3-4; TR Vol. 1 P 60 L 10 to P 61 L 2. In his opinion, the Jalmat Field is a solution gas-cap drive reservoir with little to no appreciable water production. OWL Exhibit 1 P 3. Mr. Kronkosky's report summarizes production from the project

area as well as changes in the reservoir pressures over time. OWL Exhibit 1 P 4; TR Vol. 1 P 57 L 15-21. In addition, it provides an estimate of the reservoir pore space originally occupied by gas and oil. OWL Exhibit 1 P 4; TR Vol. 1 P 68 L 20 to P 69 L 17. Mr. Kronkosky further summarized production in his testimony and report. TR Vol. 1 P 62 L 13 to P 63 L 21; P 65 L 23 to P 66 L 18.

The fields and reservoir that include the proposed injection interval in the Yates and Seven Rivers Formations have been producing since the late 1920s, and primary production has been depleted. TR Vol. 1 P 55 L 9-17; P 65 L 23 to P 66 L 11. Consequently, beginning in the 1960s, operators began installing water injection wells, saltwater disposal wells, and waterflood injection wells to perform secondary recovery. *Id.* Mr. Kronkosky identified and evaluated numerous saltwater disposal wells in the vicinity. OWL Exhibit 1, Tab A; TR Vol. 1 P 53 L 21 to P 54 L 11. A number of injection wells are injecting into the basal Yates and top of the Seven Rivers. TR Vol. 1 P 61 L 19 to P 62 L 6. Mr. Kronkosky compared production information within the project area with records of historical water production and found that they matched, resulting in his conclusion that water production prior to 1994 was made up of recycled, produced water. Exhibit 1 P 4; TR Vol. 1 P 64 L 19 to P 65 L 19; P 67 L 18 to P 68 L 19.

Mr. Kronkosky concluded that a very large volume of water would need to be injected into the reservoir before a waterflood-front could be established to support additional production from a waterflood. Exhibit 1 PP 4-5; TR Vol. 1 P 69 L 23 to P 70 L 25. Mr. Kronkosky further concluded that current oil and gas production is sub-commercial at today's prices so that the proposed injection's impact to correlative rights on existing production is non-existent. OWL Exhibit 1, P 5; TR Vol. 1 P 64 L 1-13; P 143 L 19-22; Vol. 3 P 157 L 13 to P 159 L 17. He further opined that the proposed injection would likely benefit adjacent property owner's future secondary

oil recovery practices. OWL Exhibit 1, P 5; TR Vol. 1 P 70 L 19 to P 71 L 1-21; Vol. 3 P 159 L 18 to P 160 L 7.

In summary, OWL presented evidence consisting of a qualified expert's thorough technical analysis of potential impacts of the proposed injection on correlative rights and potential waste of resources. OWL's expert concluded that the proposed injection will not impact correlative rights and further testified that the proposed injection will likely benefit future secondary oil recovery practices. Based upon OWL's evidence, along with the lack of objection by any operator or mineral lessee in the area, the Hearing Examiners should conclude that OWL has met its burden to show that the proposed injection will not result in waste or impact correlative rights.

C. OWL Refuted the Only Evidence Presented by the Other Parties of Potential Impact on Correlative Rights.

The only evidence presented by any of the other parties relating to potential impacts on correlative rights was Mr. Goetz's testimony and exhibits on behalf of the Division which asserts a correlation between injection rates by the Maralo Sholes B Well No. 2 and the volume of produced water from a nearby well, Sholes B 25 Well No. 2. See Division's Post-Hearing Brief at PP 5-6; SLO Post Hearing Brief at P 4; Jal Post Hearing Brief at P 3. Additionally, the SLO did not present evidence regarding potential impacts on correlative rights but unqualified concerns. In response to a Hearing Examiner's question, Mr. Holm briefly addressed the issue and indicated that the SLO has a "concern," but his testimony suggests a greater concern with water quality and he did not provide evidence to refute Mr. Kronkosky's testimony that the proposed injection will not result in waste or impairment of correlative rights. *See* TR Vol. 3 P 80 L 9 to P 82 L 3. The Division asserts that the Hearing Examiners may also consider Applicant's Exhibit 1.F. OWL provides this response to the Division's evidence on this point and to the three Post-Hearing Briefs on this point.

It is important to note that the operator of the Sholes B 25 Well No. 2 did not protest the Application or appear at the hearing to assert any impairment of correlative rights. In response to Mr. Goetz's testimony and Exhibit 5, OWL offered testimony by Mr. Kronkosky, Mr. Kronkosky's report (OWL Exhibit 1), and OWL's Exhibit 16. Importantly, with regard to Mr. Goetz's testimony and Division Exhibit 5 showing volumes of water produced by the Sholes B 25 Well No. 2, Mr. Kronkosky testified that he had inspected that well and that it is a flowing gas well which is not connected to electricity and has not been so connected for some time. TR Vol. 3 P 151 L 21 to P 152 L 1. In order to produce water at the volumes indicated in the Division's Exhibit 5, there would have to be an artificial lift mechanism such as a submersible pump, and there was no power to the well to operate such a pump. TR Vol. 1 P 151 L 1-9. Consequently, that well was not physically capable of producing water at a rate of 3,000 barrels per day, as indicated by Division's Exhibit 5. TR Vol. 3 P 151 L 16-18 and P 179 L 1-22. Mr. Kronkosky's report also indicates that the Sholes B 25 Well No. 2 produces sub-commercial volumes of gas. Exhibit 1 P 5.

Through Mr. Kronkosky's testimony, OWL introduced OWL Exhibit 16, corrected reports regarding the volume of water produced by the Sholes B 25 Well No. 2. TR Vol. 3 P 151 L 3-9. Based upon his inspection of the well and his conclusion that it is physically incapable of producing the high volumes of water indicated in Division Exhibit 5, Mr. Kronkosky concluded that the corrected reports as shown in OWL's Exhibit 16 are likely more accurate and the data shown in Division's Exhibit 5 are incorrect. TR Vol. 1 P 71 L 3 to P 72 L 7; Vol. 3 P 152 L 19-24. Mr. Kronkosky concluded that the actual water production was less than 1,000 barrels per month. TR Vol. 1 P 142 L 9-16.

Mr. Goetz, though aware of the corrected reports, had no opinion of whether the original reports used for Division Exhibit 5 or the corrected reports identified in OWL Exhibit 16 were correct. On cross-examination, Mr. Goetz indicated that, based on the corrected reports offered by Mr. Kronkosky, additional investigation is warranted. TR Vol. 3 P 150 L 16 to P 151 L 17. Mr. Goetz testified that he had no way of knowing which data was correct and that incorrect data is reported from time to time. TR Vol. 3 P 151 L 18 to P 152 L 6. Mr. Kronkosky further provided rebuttal testimony on the waste and correlative rights issue at TR Vol. 3 P 157 L 7 to P 160 L 7. Based on the weight of the evidence, and particularly Mr. Kronkosky's testimony that the Sholes B 25 No. 2 Well was not capable of producing the originally-reported water volumes relied upon by Mr. Goetz and in the Division's Exhibit 5, and the lack of protest by the well operator, the Hearing Examiners should find that OWL effectively rebutted the evidence offered by the Division on this topic.

The Division asserts that there are at least 17 producing wells in the area where the proposed well will be located and adjoining sections. Division Post-Hearing Brief at P 5. SLO alleges in its Post-Hearing Brief that it has mineral rights including oil and gas reserves in the project area, that it has a fiduciary duty to protect those rights, and asserts that it has identified nine oil or gas wells on state trust land in the vicinity. However, none of the operators or mineral lessees for those wells protested the Application. Moreover, aside from the Sholes B 25 No. 2 Well discussed above, neither the Division nor the SLO presented any evidence of impairment of correlative rights with respect to other wells. Jal presented no evidence at all, only argument in relation to the Division's testimony regarding the Sholes B 25 No. 2 Well, which ignored most of Mr. Kronkosky's testimony, particularly that it was impossible for that well to produce the volumes of water attributed to it in the original reports and Division Exhibit 5. *See also* TR P 160

L 8-13. Jal also identified no interest as an operator, mineral lessee, or owner of mineral rights that would give it any footing to raise as issue as to protection of correlative rights.

VII. OWL'S APPLICATION AND TESTIMONY DEMONSTRATES THAT THE PROPOSED INJECTION WILL NOT IMPAIR THE REASONABLY FORESEEABLE BENEFICIAL USE OF FRESH WATER.

In addition to the testimony and report of Mr. Kronkosky, whose qualifications are discussed above, OWL presented the testimony and written report of Neil Blandford, who was qualified as an expert in hydrology, hydrogeology and water supplies. Mr. Blandford has worked on many water supply projects, in the environmental field, and as a modeler during his 30-year career as a consulting hydrogeologist. TR Vol. 1 P 163 L 10 to P 164 L 5. Mr. Blandford also performed a thorough review of relevant publications regarding area geology and hydrology as well as relying on information provided by Mr. Kronkosky. TR Vol. 1 P 164 L 19 to P 166 L 3.

A. OWL Demonstrated that the Injected Fluids Will Remain Within the Injection Interval.

As discussed above on pages 8-10, the proposed injection interval is the top of the Seven Rivers Formation and the basal Yates Formation within a depleted oil and gas producing reservoir. Under the applicable rules, OWL is obligated to confine its injection to the authorized zone. 19.15.26.10.B NMAC. OWL's experts described the nature of the injection interval and how the injected fluids will be confined to that zone. TR Vol. 1 P 201 L 23 to P 202 L 6 and further discussion below.

As discussed above, with regard to protection of ground water aquifers above the injection interval, OWL has presented a proposed well design with casing and cement to meet the requirements of the applicable rules. The well design is intended to seal off the well to prevent migration of fluids from the well into any intersected formations containing protectable ground water and to prevent ground water within the intersected formations from migrating up or down

the well bore. No party raised any issue with the proposed well design as presented in the Application.

OWL also presented testimony regarding how the injected fluids will be confined within the injection interval, as required by 19.15.26.10.B NMAC. With respect to the potential for injected fluids to migrate upward from the injection interval, that is addressed by both the design of the well to prevent migration of injected fluids up the well, as presented in the Application, and also by impermeable confining formations located above the injection interval. TR Vol. 1 P 181 L 4-17.

OWL established that the injected fluids will not migrate upward from the proposed injection interval. Mr. Blandford testified regarding the nature of the 1250 foot-thick, impermeable Salado Formation, which sits between the Rustler Formation (a possible water supply) and the injection interval. TR Vol. 1 P 171 L 14 to P 172 L 2. According to Mr. Kronkosky, due to the nature of the reservoir where the injection interval is located, injected fluids will migrate horizontally, not vertically. TR Vol. 1 P 66 L19 to P 67 L 12. Mr. Kronkosky also discussed production logs that OWL ran in the adjacent Maralo Sholes B No. 2 well indicating that injected fluids remain in the injection interval. TR Vol. 1 P 86 L 7-15. This is supported by the relatively high permeability of the reservoir comprising the injection interval as well as its low pressure. TR Vol. 1 P 86 L 18-25 and P 89 L18 to P 90 L 5. Indeed, Mr. Kronkosky testified that based upon his assessment of the reservoir where the injection interval is located, it is one of the most viable candidates for injection of large volumes of water. TR Vol. 1 P 105 L 20 to P 106 L15. Again, no party presented any testimony raising any issue with the design of the well or refuting OWL's evidence that there will be no upward migration.

OWL also established that the injected fluids will not migrate downward out of the injected zone. There is an impermeable zone beneath the proposed injection interval that will prevent downward migration. TR Vol. 1 P 111 L 15 to P 112 L 1. Additional evidence, including modeling, demonstrate that the proposed injection will not impact the Capitan Reef Aquifer either below or to the west of the injection area is discussed in detail below.

Regarding horizontal migration of the injected fluids, Mr. Kronkosky presented calculations and testimony regarding the radius of influence of the proposed injection. Exhibit 1 P 6 and Tab K; TR Vol. 1 P 78 L 19 to P70 L16 and P 81 L 14 to P 85 L 25. The potential horizontal migration of the injected fluids is further addressed in the analysis and modeling presented by Mr. Blandford, as discussed below.

The Division presented testimony through Mr. Goetz suggesting that there could be preferential flow paths that might result in flow different than that calculated by Mr. Kronkosky. Mr. Kronkosky addressed that in his written report, Exhibit 1, and testimony as described above. Mr. Holm raised an issue of the possibility of faulting in the area based upon his review of regional geology. *See* TR Vol. 3 P 115 L 25 to P 116 L 22. However, both Mr. Blandford and Mr. Kronkosky indicated that their detailed review of area geology indicated no evidence of local faulting. TR Vol. 3 P 115 L 1-24 and P 164 L 25 to P 166 L 13 (if there were faults that were conduits for fluid flow, there would be evidence of water flow due to the head difference, which is not observed).

B. OWL'S Injection Will Not Affect Jal's Present or Potential Future Water Supplies.

Obviously, it is important to OWL, the other parties, and the Hearing Examiners to be sure that OWL's proposed injection will not affect municipal water supplies. To confirm this, Mr. Blandford reviewed Jal's existing and potential future water supplies based upon his knowledge

of the area as well as a report prepared by Jal's consultant. TR Vol. 1 P 166 L 4 to P 167 L 14. Jal's existing wells are in an alluvial aquifer several miles away and much shallower than the proposed injection interval. TR Vol. 1 P 173 L 18 to P 174 L 3. Jal has applied to the State Engineer to establish a new water supply in the Santa Rosa Formation, about 600 to 700 feet deep. Those wells would be located within the Capitan Underground Water Basin as defined by the State Engineer, but are not in the Capitan Reef Aquifer, which are two very different things. TR Vol. 1 P 167 L 15 to P 169 L15 and P 174 L 4-14. Based upon his evaluation of all of the information and modeling, as discussed below, Mr. Blandford gave his opinion that the proposed injection will have no effect on Jal's existing water sources, water rights, or proposed new water supplies. TR Vol. 1 P 201 L 17-22.

As discussed below, OWL has demonstrated that its proposed injection will not impact the Capitan Reef Aquifer. As it relates to Jal, Mr. Blandford also reviewed a report prepared by Jal's consultant Souder Miller, which indicated that the Capitan Reef Aquifer would not be a good source of supply for Jal because of its depth and water quality. TR Vol. 1 P 175 L 4-13. Mr. Blandford agreed that the Capitan Reef Aquifer would not be a good water supply for Jal for the same reasons. Portions of the Capitan Reef Aquifer (or its recharge areas) have been considered as a municipal water supply only in areas which are 60-80 miles away from Jal. TR Vol. 1 P 175 L 18 to P 176 L 3. The Capitan Reef Aquifer in the vicinity of Jal has variable water quality but is high in total dissolved solids, generally well over 10,000 mg/l. TR Vol. 1 P 176 L 4 to P 178 L 6. Some of the most useful data in the area comes from completed wells that actually draw water from a significant thickness of the aquifer, which are more useful to consider in assessing a potential water supply, and recent wells of that sort in the area of Jal showed total dissolved concentrations of approximately 70,000 mg/l. *Id.* In contrast, those looking for brackish water as

a water supply may consider water quality up to 4,000 mg/l. TR Vol. 1 P 178 L 12-21. Even then, those sources are very expensive to treat so the water is suitable for municipal or even industrial users. TR Vol. 1 P 178 L 22 to P 179 L 8. Moreover, as discussed below, OWL has demonstrated that its proposed injection will not impact the Capitan Reef Aquifer.

C. The Injection Interval Does Not Contain Fresh Groundwater with a Reasonably Foreseeable Beneficial Use That Would Be Impaired by the Proposed Injection.

With regard to the formations that comprise the injection interval and the Artesia group in general, the Division contends and OWL agrees that they are "exempt aquifers" excluded from the status of an underground source of drinking water and not protectable under the Commission's Rules governing permits for purposes of the UIC program. Division's Post-Hearing Brief at 4. As discussed above, there is a long history of approval of injection of produced waters into the same formations where OWL is proposing to inject, both for waterflood projects and injection of produced water. Indeed, consistent with the Division's contention that the Yates and Seven Rivers Formations are "exempt aquifers," most of those projects have been approved administratively.

OWL demonstrated that the injection interval contains very poor quality water. Mr. Kronkosky reviewed all available water quality information in the area, including published literature and a report of data utilized by Dr. Hiss in his 1975 report that was obtained from the Library of Congress. TR Vol. 1 P 97 L 14 to P 102 L 19 and Exhibit 1, Tabs L through P. Based upon his review of the data, Mr. Kronkosky concluded that the waters in the Seven Rivers and Yates Formations in the injection interval are mineralized to a degree well above 10,000 mg/l total dissolved solids. TR Vol. 1 P 99 L 8-14. Furthermore, OWL has demonstrated that the waters that exist within the injection interval do not require protection under the Oil and Gas Act because they have no reasonably foreseeable beneficial use. Mr. Blandford testified that no one would

look at the Artesia Group in the vicinity of the proposed injection as a potential aquifer. TR Vol. 1 P 179 L 18-24. In his view, the Artesia Group is not even an aquifer—where a usable quantity of water can be obtained from wells—because it is too deep, the permeability is too low, the interval that might have production is too thin, and the water quality is poor. TR Vol. 1 P 180 L 4-12. Mr. Blandford would not consider the Artesia Group as a viable water supply source, and there is no reasonably foreseeable development of the Artesia Group or any formations within that group as a water supply for municipal or even industrial use. TR Vol. 1 P 180 L 13-25. Mr. Blandford further testified that nobody ever would get water from the units of the Artesia Group so injection to those formations will not affect anyone adversely. TR Vol. 1 P 201 L 23 to P 202 L 13.

SLO's witness provided testimony and exhibits purporting to show that there are waters with a total dissolved solids concentration of less than 10,000 mg/l in the Yates and Seven Rivers Formations and other parts of the Artesia Group. That testimony can be compared with Mr. Kronkosky's more detailed and careful review of local water quality, and Mr. Kronkosky questioned the validity and usefulness of much of the data presented by the SLO. TR Vol. 3 P 161 L 9 to P 164 L 12. However, even if the Hearing Examiners were to accept some of the SLO's witness's testimony as showing that some ground water in these formations might, at some time, have been below the 10,000 mg/l threshold, that by itself, it is not sufficient to preclude granting OWL's Application. As discussed above, the SLO's Post-Hearing Brief erroneously relies upon the Environmental Improvement Act and the Water Quality Act as an apparent basis for Mr. Holm's testimony that these formations contain "protectable groundwater." The Oil and Gas Act and the Commission's rules, however, while recognizing the same 10,000 mg/l threshold, provide that ground water with a total dissolved solids concentration below that threshold need not be

protected as "fresh water" if there is no reasonably foreseeable future use that would be impaired by the activity proposed to be permitted. The SLO did not present any testimony that there is any reasonably foreseeable beneficial use of the ground water within these formations, nor did it present any analysis indicating where and how any future use, should one exist, might be impaired as a result of OWL's proposed injection.

OWL's evidence and its expert's explanation of why there is no reasonably foreseeable beneficial use of ground water in the injection interval that would be impaired by the proposed injection, as discussed above, is unrefuted by any credible evidence from the SLO or any other party. SLO's Post-Hearing Brief cites to "OCD's website" as a basis for a contention that reasonably foreseeable future use must be considered over a period of 200 years, but provides no legal authority for that contention. Even then, based on Mr. Blandford's testimony, the Hearing Examiners could and should conclude that ground water in these formations has no reasonably foreseeable beneficial use that would be impaired by the proposed injection. That is further supported by the Division's conclusion that these formations are "exempt aquifers" and the long history of approval of injection of salt water into these formations, which certainly would be disrupted by a finding that these formations contain "protectable ground water" such that applications for injection may be denied.

D. OWL Demonstrated that Its Injection Will Not Impact the Capitan Reef Aquifer.

OWL also evaluated whether its proposed injection could impact the Capitan Reef Aquifer. OWL's evaluation of that issue included an exhaustive review of all available data from local wells and sources and published literature. There is considerable evidence that the Capitan Reef Aquifer in the vicinity of the injection interval is a brine aquifer that is not suitable as a water supply source. Based upon his review of available water quality data, Mr. Kronkosky concluded that waters

coming out of the Capitan Reef Aquifer are mineralized to a degree of about 10,000 mg/l total dissolved solids—for example the State Engineer concluded that a water supply developed by EOG from the Capitan Reef Aquifer was over 10,000 mg/l. TR Vol. 1 P 100 L 13-22 and Exhibit 1 Tab O. Mr. Kronkosky also referred to a conclusion by Dr. Lewis Land characterizing the Capitan Reef Aquifer as a brine aquifer with an average total dissolved solids concentration of 54,000 mg/l. TR Vol. 1 P 101 L 11 to P 102 L 19 and Exhibit 1, Tab P. Generally, the Capitan Reef Aquifer is not considered for municipal water supplies. TR Vol. 3 P 119 L 25 to P 120 L 121.

However, OWL does not need to show that the Capitan Reef Aquifer in the vicinity of the injection interval is not an underground source of drinking water because OWL has shown that its injection will not impact that aquifer. Mr. Blandford testified that he assessed the potential for OWL's proposed injection to communicate with and impact the Capitan Reef Aquifer. TR Vol. 1 P 182 L 10-16. He first assessed that issue based upon the available information including: the relative hydraulic head of the Capitan Reef Aquifer, compared with that of the injection interval; the available geologic and hydrologic information; the hydraulic properties of the rocks within the Artesia Group; and potentially the density and nature of the injected water. TR Vol. 1 P 182 L 17 to P 184 L 8. Considering the head differential and the other information, Mr. Blandford concluded that there is extremely limited conductivity in this region between the proposed injection interval and the Capitan Reef Aquifer. TR Vol. 1 P 184 L 3-8. In response to a theory raised by Mr. Goetz that water level changes within the Capitan Reef Aquifer may be due to local salt water injection, Mr. Blandford testified that the changes are more likely explained by reduced pumping of the Capitan Reef Aquifer for an industrial water supply. TR Vol. 1 P 184 L 9 to P 185 L 9. Mr. Kronkosky testified to the same point. TR Vol. 1 P 94 L 5 to P 96 L 8.

All parties seem to agree that the injection interval is separated from the Capitan Reef Aquifer below by a relatively impermeable formation. Mr. Blandford assessed the thickness of that formation as between 275 and 450 feet. TR Vol. 3 P 109 L 6-23. Mr. Holm seemed to agree with a thickness of around 300-400 feet in the vicinity of the injection interval. TR Vol. 3 P 90 L 24 to P 91 L 14. However, the Hearing Examiners also should consider the importance of the undisputed data regarding the head differential between the Capitan Reef Aquifer and the injection interval, such that if substantial communication between the two actually existed, we would observe water coming up from the Capitan Reef Aquifer into the injection interval, which is not the case. TR Vol. 3 P 110 L 14 to P 111 L 9.

Mr. Blandford, an experienced modeler, also assessed the potential for the proposed injection to impact the Capitan Reef Aquifer using a numerical model, which was presented in his written report, OWL's Exhibit 2, admitted in evidence. The model was developed using the geologic and hydrologic information, and Mr. Blandford described the information, factors, and assumptions used in his model. TR Vol. 1 P 185 L 10 to P 187 L 17 and P 188 L 8 to P 189 L 7. The model represents the Artesia Group across the extent of the Capitan Reef Aquifer. TR Vol. 1 P 187 L 14-17. The Code used for the model is an update of MODFLOW developed by the USGS, which has the capability to simulate variable density groundwater flow (an issue raised by Mr. Goetz) and solute transport. TR Vol. 1 P 189 L 11 to P 190 L 9. Mr. Blandford's report presented the model layers and he explained the basis for the layers and how the modeling presents a full, three-dimensional picture of what the geology and hydrology look like. TR Vol. P 190 L 10 to P 191 L 19. Mr. Blandford also explained the initial conditions and the model boundaries and how the model represents potential exchanges of water between the Artesia Group and the Capitan Reef

Aquifer. TR Vol. 1 P 191 L 20 to P 194 L 15. Mr. Blandford addressed a few questions raised by Mr. Holm concerning the model boundaries. TR Vol. 3 P 122 L 16 to P 124 L 6.

Mr. Blandford ran simulations based upon 20 years of active injection followed by another 20 years after injection ceases and using an average injection rate of 25,000 barrels per day consistent with the Application and assuming the injection water has a total dissolved solids concentration of 125,000 mg/l. TR Vol. 1 P 194 L 20 to P 195 L 25. Based upon the simulation presented in Figure 11A of the written report, the model shows that no injected water will reach model layers four, five or six, which is where the Capitan Reef Aquifer exists in closest proximity to the injection interval. TR Vol. 1 P 195 L 11 to P 196 L 20 and Exhibit 2, Figure 11A. Based upon these simulations, the proposed injection will not affect the Capitan Reef Aquifer. TR Vol. 1 P 196 L 21-25. Figure 11A shows the extent of the injected water after 20 years of injection, and Figure 11B shows what it looks like another 20 years after injection stops. TR Vol. 1 P 197 L 23 to P 198 L 7.

Mr. Blandford discussed that the model simulation actually shows water from the Capitan Reef Aquifer entering the Artesia Group model layers based upon the assigned hydraulic heads and permeabilities. TR Vol. 1 P 198 L 8 to P 199 L 3. That does not appear to be happening, and could be prevented in the model by assigning lower permeabilities to the Artesia Group rocks, but this just illustrates that there is no connection between the Capitan Reef Aquifer and the Artesia Group in the modeled area. *Id.* For comparison, Mr. Blandford also ran another simulation, shown in Figures 12A and 12B, which assumed a lower hydraulic head in the Capitan Reef Aquifer than has been measured. TR Vol. 1 P 199 L 4 to P 200 L 13.

Based on both his modeling and his evaluation of the local geology and hydrology, Mr. Blandford gave his opinion that the injection will not impact the Capitan Reef Aquifer at all. TR

Vol. 1 P 201 L 6-16. The injected water will remain within the Artesia Group. TR Vol. 1 P 201 L 23 to P 202 L 6. Mr. Kronkosky also gave his opinion that the injection should not impact the Capitan Reef Aquifer based upon the substantially higher head level seen in the aquifer compared to the reservoir where the injection is proposed and the lack of any observation that the head from the aquifer is transmitted to the productive zone. TR Vol. 1 P 97 L 3-13.

As discussed above, OWL rebutted the arguments, presented by the Division's witness Mr. Goetz, testified to a theory that there might be communication between the Capitan Reef Aquifer and the Artesia Group in the area of the injection interval based upon water level changes observed in the Capitan Reef Aquifer. TR Vol. 3 P 96 L 20 to P 97 L 20l; P 101 L 6 to P 102 L 24 (it is hard to imagine more clear data indicating the lack of hydraulic connection) and P 108 L 11 to15 (the flow would be out of the Capitan Reef Aquifer, not into it) and the discussion above. None of the other parties presented any other evidence to rebut OWL's experts' thorough geological and hydrological analysis or the modeling presented by Mr. Blandford. The Division's Post-Hearing Brief mentions that the Division has viewed modeling with some skepticism. However, as discussed above, Mr. Blandford thoroughly explained his model and the results, and none of that information was rebutted by any technical witness. Moreover, OWL's experts do not rely solely on modeling, but also rely upon their extensive geological and hydrological investigations of the area. Consequently, OWL submits that it has provided convincing technical evidence that its injection will not impact the Capitan Reef Aquifer.

The Division's legal brief suggests that if, despite OWL's compelling evidence to the contrary, the Hearing Examiners are unconvinced that OWL's proposed injection will not impair beneficial use of the Capitan Reef Aquifer, the Hearing Examiners should allow OWL to demonstrate that the local portion of the Capitan Reef Aquifer qualifies as an "exempt aquifer."

As discussed above, the evidence presented by OWL demonstrated that there is no need to address whether the Capitan Reef Aquifer is an "exempt aquifer" because—since the injected fluids will not enter the Capitan Reef Aquifer—the proposed injection will not impair any reasonably foreseeable beneficial use of the Capitan Reef Aquifer that may exist. Moreover, under the Commission's rules as cited above, a determination that an aquifer or portion of an aquifer is an "exempt aquifer" allows the Division to approve permit applications administratively, rather than through a hearing. 19.15.26.8.E NMAC. In contrast, for a permit application reviewed through a hearing, the Hearing Examiners may approve the application without finding that a potentially affected aquifer is an "exempt aquifer." *See id.* Since this case has gone through a hearing, it is unclear how a determination that the Capitan Reef Aquifer is an exempt aquifer would assist OWL obtaining a permit under 19.15.26.8.E NMAC.

E. Wellbore Testing and Monitoring

OWL presented the testimony of Kevin Burns, an engineer employed by OWL who was qualified as an expert in the field of petroleum engineering. TR Vol. 2 P 51 L3 to P 52 L 22. Mr. Burns testified regarding OWL's plans for testing during completion and operation of the proposed new wellbore, including resistivity, gamma ray and density logs as described in the Application. TR Vol. 2 P 53 L 5-15. Mr. Burns further testified that OWL's plans for monitoring the new well included the monitoring of injection rates and injection pressures and the compilation of a Hall Plot to monitor the injectivity of the wellbore on a daily basis, consistent with industry practice. TR Vol. 2 P 53 L 19 to P 54 L 5 and P 59 L 8-12. In response to the Hearing Examiners' questions, Mr. Burns clarified that logging of the injection rates and pressures will be performed digitally on a 24-hour basis and that OWL has a SCADA system to monitor rates and pressures. TR Vol. 2 P 54 L 24 to P 55 L 2 and P 58 L 3-8. Mr. Kronkosky testified that periodic follow-up tests could

be performed, such as falloff testing, to assess any build-up of reservoir pressure. TR Vol. 1 P 158 L 9-23. With regard to the Capitan Reef Aquifer, monitoring could include wells to observe changes in pressure. TR Vol. 1 P 158 L 3-8. Existing wells are and could be used to monitor pressure in the Capitan Reef Aquifer. TR Vol. 1 P 158 L 24 to P 159 L 6; Vol. 3 P 95 L 19 to P 96 L 19; P 100 L 12-21 and P 102 L 15-23. None of the other parties introduced any testimony with regard to monitoring.

F. Alternative Well Locations

OWL has applied for approval to construct and inject into the Bobcat SWD No. 1 Well, and the hearing addressed the merits of that Application. Under the applicable laws and rules, OWL has no obligation to assess or compare alternative well locations. The other parties have suggested that, as an alternative, OWL should consider injecting into the deeper Devonian Formation. However, that issue is not properly before the Hearing Examiners. If OWL satisfies the requirements for approval of its Application, the possibility that it could inject into the Devonian Formation is not a basis to deny OWL's Application.

That said, as discussed in Mr. Johnson's testimony, OWL has a need for SWD wells capable of injecting the high volumes of produced waters collected by OWL's pipeline system and delivered to OWL's facilities near the current injection site. Recent experience with an injection well drilled into the Devonian formation in this area suggests that such wells may not provide the necessary capacity that OWL needs for injection. TR Vol. 1 P 32 L 15-20; P 34 L 13-22 and P 35 L 19-21; TR Vol 2 P 146 L 11 to P 147 L 4. None of the other parties presented any evidence on the suitability of the Devonian Formation in this area for injection.

VIII. CONCLUSION

Based upon the discussion above and all of the evidence in the record, the Hearing Examiners should issue an Order granting OWL's Application for authorization to construct and inject into the Bobcat SWD No. 1 Well. OWL has met its burden by submitting a complete Application, providing all required notices, and supporting the Application with testimony and exhibits at the hearing, including rebuttal of all of the evidence and arguments presented by the other parties.

For the Hearing Examiners' convenience, OWL has prepared and is providing as Exhibit "A" hereto a proposed draft form of Order containing findings and conclusions supported by the record in this matter and supporting the granting of OWL's Application. OWL has included possible conditions for the Examiners' consideration, which are based upon recent Division Orders. OWL greatly appreciates the Hearing Examiners' time and careful attention to this matter.

Respectfully submitted,

GALLAGHER & KENNEDY, P.A.

By: _____

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing document was served via electronic mail upon the following counsel on the 26th day of September, 2017:

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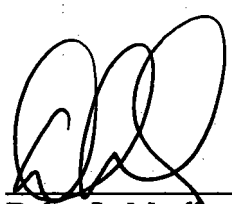

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ATTORNEYS FOR OWL SWD Operating, LLC

OWL EXHIBIT A

OWL SWD Operating, LLC
Case No. 15723

EXHIBIT "A" TO OWL'S WRITTEN CLOSING ARGUMENT
PROPOSED FORM OF FINDINGS AND ORDER

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:

OWL SWD OPERATING, LLC APPLICATION FOR AUTHORIZATION TO INJECT **Case No. 15723**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 9:00 am on August 1, 2017, at Santa Fe, New Mexico before Examiners William V. Jones, Scott Dawson, and Gabriel Wade.

NOW, on this __ day of _____, 2017, the Division Director, having considered the testimony, the record, and the recommendations of the Examiners,

FINDS THAT:

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

(2) OWL SWD OPERATING, LLC ("Applicant" or "OWL") seeks authority to construct and utilize its Bobcat SWD No. 1 Well ("subject well") located 740 feet from the South line and 705 feet from the East line of Section 25, Township 25 South, Range 35 East, NMPM, Lea County, New Mexico, for disposal of produced water into the Yates and Seven Rivers Formations through an open hole at the well bottom of 3,060 feet below surface. The subject well will be operated as part of a commercial operation that collects produced water from various sources in a pipeline system that transports the water to recycling and disposal facilities. A water sample included in the application indicates a representative water quality of the produced water to be injected of approximately 140,000 mg/l total dissolved solids.

(3) On or about April 28, 2017, OWL submitted its application to the Division for approval to drill the subject well and to operate it for disposal of produced water.

(4) Having been advised by the Division that it would not process the application administratively, on or about May 9, 2017, OWL, through counsel, filed an application to place the application on a hearing docket.

(5) The Division filed a Notice of Appearance and Prehearing Statement and appeared in opposition to OWL's application. The Division presented technical testimony and exhibits through its witness, Phillip Goetz, concerning potential communication between water within the injection interval and the Capitan Reef Aquifer and potential impairment of correlative rights.

(6) The State Land Office was granted permission to intervene, filed a Prehearing Statement and appeared in opposition to OWL's application. The State Land Office presented technical testimony and exhibits through its witness, Anchor Holm, regarding water quality within the formations comprising the injection interval.

(7) The City of Jal appeared through counsel at the hearing, did not present technical testimony, but was allowed to conduct cross-examination of the other parties' witnesses, and raised issues concerning possible water quality impacts and, in its Post-Hearing Brief, raised possible impacts on correlative rights based upon the Division's evidence.

Applicant appeared at the hearing through counsel and presented the following testimony.

(8) Applicant owns and operates the Red Hills Pipeline system, which collects and aggregates produced water from wells producing oil and gas from various formations in the area and transports that water out of the core of the production area for recycling or disposal. OWL currently injects a portion of the collected water to the Maralo Sholes B No. 2 Well and proposes to replace that well with the subject well. Applicant has an economic need for the subject well as a large-volume well for disposal to replace its current well.

(9) Applicant proposed an average injection rate of 25,000 barrels of water per day (BWPD), with a maximum injection rate of 30,000 BWPD.

(10) No active fresh water wells were identified within one mile of the subject well. Applicant identified the closest fresh water well (CP-01129-POD2) as located 2,328' from the proposed location of the subject well, which served as a monitoring well, not a production well. One other well (CP-00790) was indicated within one mile of the subject well location, but this well was assigned to a well permit that had expired.

(11) Applicant provided information regarding a number of present and former oil and gas production wells within the half-mile Area of Review (AOR) around the subject well and provided a map showing all wells identified within a two-mile radius of the subject well location along with their nature and available information from the Division's records. Within the AOR there are three active and eight plugged and abandoned wells. One of the active wells is Applicant's existing Maralo Sholes B No. 2 well. The other two wells are operated by Fulfer Oil & Cattle LLC.

(12) Applicant presented expert testimony through a qualified petroleum and reservoir engineer, Mr. Chad Kronkosky, regarding the condition of the reservoir that comprises the injection zone in the Yates and Seven Rivers formations. He testified as follows: The proposed

injection formation is a depleted reservoir in the Jalmat Field. The reservoir pressure has been greatly depleted over time. Current oil and gas production is sub-commercial. There has been considerable past injection of salt water into this area for both disposal and for waterflood projects. OWL's proposed injection will not impact correlative rights nor will it result in waste of petroleum resources, and will likely benefit future secondary oil recovery practices by increasing the reservoir pressure. Mr. Kronkosky also provided technical testimony to rebut the Division's testimony on this topic.

(13) No operator or mineral lessee protested the Application or appeared at the hearing to raise any concern with respect to correlative rights.

(14) OWL presented evidence that the injected fluids will remain within the intended injection interval through the expert testimony of both Mr. Kronkosky and Mr. Neil Blandford, who was qualified as an expert in the fields of hydrology, geology, hydrogeology, and water supplies and their reports and exhibits, which describe their thorough examination of the geology and hydrology of the injection zone. The proposed casing and cementing of the well bore as well as confining formations will prevent upward migration of fluids. Confining formations and the difference in hydraulic head between the injection zone and the Capitan Reef Aquifer will prevent downward migration.

(15) OWL presented evidence through the testimony of Mr. Blandford and his written report that the proposed injection will not in any way affect the City of Jal's present or identified potential future water sources in the alluvial aquifer where the present water supplies are located, in the Santa Rosa formation where Jal is seeking new supplies, or in the Rustler Formation, which is a possible future source of water supply.

(16) OWL presented evidence through the testimony of Mr. Kronkosky and Mr. Blandford and their exhibits that water quality within the injection zone is poor and is mineralized above 10,000 mg/l total dissolved solids, including rebuttal to the testimony and exhibits provided by the State Land Office's witness on the same topic. Mr. Blandford testified that ground water within the injection interval is not a source of water for reasonably foreseeable beneficial use because the formations are too deep, the permeability is too low, the interval that might have production is too thin, and the water quality is poor. Consequently, it is not foreseeable that ground water will be sought from these formations for future beneficial use for any type of water supply so that the proposed injection will have no adverse affect.

(17) OWL presented evidence through the testimony of Mr. Kronkosky and Mr. Blandford and their reports and exhibits that the injection of fluids into the injection interval will not impact the Capitan Reef Aquifer due to confining zones between the injection zone and the Capitan Reef Aquifer. In addition, the difference in hydraulic head between the Capitan Reef Aquifer and the injection zone is such that, if there were any communication between waters in the two formations, water would flow from the Capitan Reef Aquifer into the injection zone, and that has not been observed. Mr. Blandford provided further evidence that the proposed injection will not impact the Capitan Reef Aquifer through numeric computer modeling. Mr. Kronkosky and Mr. Blandford provided rebuttal testimony to the Division's witness's testimony and exhibits on this topic.

(18) OWL presented evidence that it has plans and systems in place to monitor the proposed injection consistent with industry standards and in conformance with the Divisions's Rules, including constant monitoring of injection rates and pressures.

(19) Applicant provided evidence of proper notification including return receipts, affidavits of publication and mailing, and testimony of Mr. Steve Pardee and affidavit of Mr. Christopher Weyend.

Opponent the Division, through counsel, presented the following testimony.

(20) The Division presented evidence consisting of testimony and exhibits presented by Phillip Goetz that, based upon reports indicating a correlation between injection rates to OWL's existing well and produced water volumes in a nearby well, the injection could impair correlative rights.

(21) The Division presented evidence consisting of testimony and exhibits presented by Phillips Goetz regarding a geological evaluation indicating possible preferential flow paths that could result in communication between the injection zone and the Capitan Reef Aquifer as well as evidence relating to changes in water levels in the Capitan Reef Aquifer.

Opponent the State Land Office, through counsel, presented the following testimony.

(22) The State Land Office presented evidence consisting of testimony and exhibits presented by Anchor Holm that the formations comprising the injection zone may contain ground water of a quality better than 10,000 mg/l total dissolved solids.

The Division concludes as follows:

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

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

(25) Division records indicate OWL SWD OPERATING, LLC as of the date of this order is in compliance with Division Rule 19.15.5.9 NMAC.

(26) Applicant sufficiently demonstrated that the formation fluids found in the proposed injection interval contained greater than 10,000 parts per million (mg/l) total dissolved solids (TDS) such that there is no fresh water within the injection interval and, in the alternative, to the extent that fluids within the proposed injection interval with concentrations less than 10,000 mg/l TDS might exist within the proposed injection interval, such water is not protectable under the Division's definition as an underground source of drinking water, and is not protectable as fresh water as defined in the Division's definition because there is no reasonably

foreseeable beneficial use of such waters that would be impaired by the proposed injection, so that the Division may authorize the injection in accordance with 19.15.26.8.E NMAC.

(27) Applicant sufficiently demonstrated that fluids injected into the proposed injection interval will not communicate with the Capitan Reef Aquifer due to the confining formations and the much higher hydraulic head of the Capitan Reef Aquifer compared to the proposed injection interval, such that the proposed injection will not adversely affect water quality within the Capitan Reef Aquifer.

(28) Applicant sufficiently demonstrated that its injection will not affect present or reasonably potential future water supplies of the City of Jal.

(29) Approval of the application will prevent waste and protect correlative rights by increasing the reservoir pressure in a manner that will facilitate secondary recovery. Applicant showed that the evidence presented by the Division indicating that increases in produced water production from the Sholes B 25 No. 1 Well correlated with injection rates to Applicant's existing well were based upon erroneous reports that have been corrected and that it was not physically possible for that well to produce water at the elevated rates shown on the original reports.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, OWL SWD OPERATING, LLC is hereby authorized to drill and utilize its Bobcat SWD No. 1 Well located 740 feet from the South line and 705 feet from the East line of Section 25, Township 25 South, Range 35 East, NMPM, Lea County, New Mexico, as a disposal well for UIC Class II fluids.

(2) Disposal shall be by open hole injection from a bottom well depth of 3,060 feet to a permitted injection interval between 2,915 feet and 3,060 feet below the ground surface in the Yates and Seven Rivers Formations.

(3) Sources of the UIC Class II fluids for disposal in the subject well shall be water produced from various Formations in the vicinity of the pipeline system, with a representative water quality of approximately 140,000 mg/l. Any substantial increase in the total dissolved solids content of disposal fluids shall require Division approval, which may be given administratively.

(4) The operator shall take all steps necessary to ensure that the disposed water enters only the proposed injection interval and are not permitted to escape to other formations or onto the surface.

(5) 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.

(6) The well shall pass a 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 Division Rule 19.15.26.11(A) NMAC.

(7) The wellhead injection pressure on the well shall be limited to no more than 580 psi (surface pressure). 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. The operator shall install and maintain a chart recorder (or equivalent data logging system) showing casing and tubing pressures during disposal operations.

(8) The Director of the Division may administratively authorize an increase in tubing pressure upon a proper showing by the operator of the subject 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.

(9) Prior to commencing injection operations and annually thereafter, the casing shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

(10) The operator shall notify the Supervisor of the Division's District 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 Division's District 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.

(11) 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 Supervisor of the Division's District office of the failure of the tubing, casing or packer in the disposal well or the leakage of water, oil or gas form or around any produced or plugged and abandoned well within the area, and shall take all steps as may be timely and necessary to correct such failure or leakage.

(12) OWL will utilize SCADA to monitor injection pressure and injection volumes on a daily basis and will utilize that data to develop a Hall plot. The Hall plot will be utilized to determine if the reservoir is presuming (or plugging up) or if the reservoir is fractured.

(13) OWL will obtain data as available from the USGS observation well or other sources at least once every five years and shall use that information to calculate the hydraulic head of the Capitan Reef Aquifer in the vicinity of the injection interval.

(14) On an annual basis, OWL shall conduct injection profile surveys (temperature, spinner and radioactive tracer) and pressure Falloff/Build-up Tests on the subject well to estimate static reservoir pressure.

(15) The operator shall submit monthly reports of the disposal operations on the appropriate form in accordance with Division Rules.

(16) 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.

(17) 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.

(18) The injection authority granted herein for the Bobcat SWD No. 1 Well shall terminate two years after the effective date of this order if the operator has not commenced injection operations into the subject well; provided, however, the Division, upon written request mailed by the operator prior to the termination date, may grant an extension 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 hereby retained for the entry of such further orders as the Division may deem 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 herein above designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

DAVID R. CATANACH
Director