

**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:**

**CASE NO. 15059
ORDER NO. R-13889**

**APPLICATION OF MESQUITE SWD, INCORPORATED FOR APPROVAL OF
A SALT WATER DISPOSAL WELL, LEA COUNTY, NEW MEXICO**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on January 9, 2014, at Santa Fe, New Mexico, before Examiner Phillip R. Goetze and Examiner Michael McMillan.

NOW, on this 2nd day of September, 2014, 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 its subject matter.

(2) Mesquite SWD, Incorporated ("Applicant" or "Mesquite") seeks authority to drill and utilize its Blue Quail SWD Well No. 1 (API No. 30-025-pending; the "subject well"), located 2100 feet from the North line and 1660 feet from the West line (Unit letter F) of Section 11, Township 25 South, Range 32 East, NMPM, Lea County, New Mexico, for commercial disposal of produced water into the Bell Canyon formation of the Delaware Mountain Group through an open-hole interval from 4790 feet to 6200 feet.

(3) On June 26, 2013, Mesquite submitted an administrative application (Application No. pAXK1316849130) to the Division for approval of this well for injection of produced water. On July 2, 2013, the Division received a notification of protest by Yates Petroleum Corporation, Abo Petroleum Corporation, and Myco Industries, Incorporated and a second notification of protest by Devon Energy Production Company, L.P. On October 18, 2013, the Division received a request from Mesquite to place this application on a hearing docket.

(4) The Applicant appeared through counsel and presented the following testimony:

- (a) The subject well is to be drilled to a total depth of 6200 feet with the seven (7)-inch production casing shoe at the top of the injection interval at approximately 4790 feet. The injection interval will be approximately 1410 feet of open hole with the packer set in the seven (7)-inch casing at approximately 4740 feet.
- (b) The proposed average injection rate is 3500 barrels of water per day (BWPD) with a maximum injection rate of 6000 BWPD.
- (c) The proposed maximum surface injection pressure is 958 pounds per square inch (psi) which conforms to the pressure gradient of 0.2 psi per foot to the top perforation (or top of open-hole interval) which the Division may administratively approve without testing.
- (d) The produced waters going into the subject well would be from horizontal production wells completed in the Bone Spring formation. This source of produced water is compatible with existing formation fluids in the proposed injection interval.
- (e) No fresh-water wells were identified within a two-mile radius of the subject well. The well will be adequately equipped and cemented to isolate any fresh water intervals.
- (f) The results of the half-mile Area of Review (AOR) around the subject well found no existing wells that penetrated the proposed injection interval.
- (g) Devon Energy Production Company, L.P. protested the original C-108 application for the subject well filed on June 26, 2013. Applicant amended the application by decreasing the injection interval and excluding the upper Cherry Canyon formation that has an estimated top of formation of approximately 6250 feet. Devon withdrew its protest of the application with the amended injection interval.
- (h) Applicant found no geologic evidence of faulting or potential hydrologic connections between the proposed injection interval and any possible occurrences of underground sources of drinking water.
- (i) Applicant identified the necessity for commercial disposal of produced water in the vicinity of the subject well due to the prolific development of the Bone Spring formation by horizontal wells.

- (j) Applicant provided the opinion that the operation of the subject well will not adversely impact offset leasehold interest owners.
- (k) Applicant identified potential for hydrocarbon occurrences in the Ramsey and Olds members in the upper section of the Bell Canyon formation which has been developed but other penetrations in the area have not found any indications of commercial production.

(5) Yates Petroleum Corporation, Abo Petroleum Corporation, and Myco Industries, Incorporated (collectively referred to as "Yates") appeared at hearing through counsel in opposition to this application and presented the following testimony:

- (a) Yates is preparing to develop the Farber Working Interest Unit with several horizontal wells that are within the AOR for the subject well. The target of the development program is the Bone Spring formation which is stratigraphically below the injection interval in the Delaware Mountain Group.
- (b) Based on the completion and initial production of the Undaunted BSD State Com. Well No. 1H (API No. 30-025-40408), Yates stated that all of the proposed wells will be productive in the second Bone Spring sand.
- (c) Yates provided a preliminary drilling program showing horizontal wells that are oriented North to South or South to North and are approximately one mile in length with a proposed distribution of four wells per section. This pattern of development is identified for Sections 1, 2, 11, 12, 13 and 14, and is scheduled for completion between 2014 and 2016. Several of these development wells will have surface locations within the AOR of the subject well.
- (d) Yates anticipates that the plume from the injection of produced water into the Bell Canyon formation would extend significantly into half-mile AOR during the three years proposed for the development drilling of the Farber Working Interest Unit.
- (e) Yates' engineer testified that injection of produced water with high total dissolved solids (TDS) concentrations as proposed by the Applicant and at the administratively approved surface pressure will result in formations fluids that will require a drilling mud weight equivalent to 13.9 pounds per gallon. Yates' engineer opined this weight of drilling mud would be "on the high end of what's possible in the real world".

- (f) Yates' engineer provided additional testimony for a scenario with the subject well operating at a maximum surface injection pressure with a pressure gradient of 0.3 pounds per square inch (psi) per foot and injection of produced water with high concentrations of TDS. This increase in surface pressure will double the pressure in the injection interval which may result in adverse drilling conditions such as washouts and lost circulation.
- (g) Yates' engineer presented testimony regarding the drilling operations for the Door BIW State Well No. 1 (API No. 30-025-37843) and the Door BIW State Well No. 1Y (API No. 30-025-38016) in relationship to an operating salt water disposal well, the State T SWD Well No. 2 (API No. 30-025-03735; Administrative Order SWD-836), located approximately one-half mile from these two Yates wells. This testimony included the impacts of water flow within the San Andres and Glorieta formations on drilling, the abandonment of the Yates' Door BIW State Well No. 1, the replacement of this well with Yates' BIW State Well No. 1Y and an account of the mud weights for the drilling of both wells.

(6) Yates requested that the subject well should not be approved based on testimony and exhibits presented at hearing. Yates contended that approval of the subject well would increase well costs and would reduce production efficiency of the completed wells. Yates also opposed the injection into the shallower stratum since the operation of the subject well will potentially interfere with their opportunity to recover its just and fair share of hydrocarbons in the Bone Spring formation, thereby impairing correlative rights.

The Division concludes that:

(7) Yates' concern for the utilization by Applicant of the proposed Blue Quail SWD Well No. 1 for disposal of produced salt water into a shallower interval that can interfere with the drilling to deeper targets is noted. However, under Section 70-2-12.B(4) NMSA Laws of 1978, the Division is required to prevent the drowning by water any stratum or part thereof capable of producing oil and gas in pay quantities and to prevent the premature and irregular encroachment of water or any other kind of water encroachment that reduces or tends to reduce the total ultimate recovery of crude petroleum oil or gas from any pool. Under the Oil and Gas Act, the Division's authority to prevent "the drowning by water any stratum" does not extend into formations that are not the targeted hydrocarbon reservoirs or pools.

(8) Under Section 70-2-12.B(15) NMSA Laws of 1978, the Division is required to regulate the disposition of water produced or used in connection with the drilling for or producing of oil or gas and to direct surface and subsurface disposal of the water in a manner that will afford reasonable protection against contamination of fresh water supplies designated by the state engineer. Yates' testimony and evidence for the

utilization by Applicant of the subject well for disposal of produced salt water did not demonstrate any potential for contamination of fresh water supplies.

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

(10) Division records indicate Mesquite SWD, Incorporated (OGRID 161968) as of the date of this Order is in compliance with Division Rule 19.15.5.9 NMAC.

(11) There are no wells within the half-mile AOR for the subject well that penetrate the proposed injection interval.

(12) The applicant has presented satisfactory evidence that all requirements prescribed in Division Rule 19.15.26.8 NMAC have been met.

(13) The application should be approved with conditions.

(14) Division considers the proposed open-hole completion for the subject well capable of having a greater probability to allow migration of injected fluids to other formations. Therefore, an open-hole injection interval will not be approved and the casing program shall be amended to include casing with cement to total depth of the permitted interval. Injection will be through perforations from 4790 feet to 6200 feet.

(15) Division does consider Yate's testimony and evidence regarding formation pressure relevant to the Applicant's proposed commercial operation of the subject well and the potential drilling operations within the immediate area. Consequently, the maximum surface injection pressure for the subject well will be limited to an equivalent gradient of 0.2 psi per foot to the top of perforations. Relief from this pressure requirement should be granted only following notice and adjudicatory hearing.

IT IS THEREFORE ORDERED THAT:

(1) Mesquite SWD, Incorporated ("Mesquite" or "operator"), is hereby authorized to utilize its proposed Blue Quail SWD Well No. 1 (API No. 30-025-pending; the "subject well"), located 2100 feet from the North line and 1660 feet from the West line (Unit letter F) of Section 11, Township 25 South, Range 32 East, NMPM, Lea County, New Mexico, for commercial disposal of only UIC Class II fluids.

(2) Disposal shall be through perforations from approximately 4790 feet to 6200 feet into the Bell Canyon formation of the Delaware Mountain Group. Injection is to be through lined tubing and a packer set within 100 feet above the top perforation in the permitted interval.

(3) The operator shall complete the subject well using the revised cement and casing program (operator's amended Page 10 and Page 10-A of Form C-108) provided to Division on July 28, 2014, and made part of this Order.

(4) The operator shall supply the Division with a copy of a mudlog over the permitted disposal interval. The operator shall notify the Division's District I of significant hydrocarbon shows that are observed during drilling, and provide Division's District I office and the Santa Fe engineering bureau with a copy of the log for review prior to perforation of the permitted interval. If significant hydrocarbon shows indicate the potential for the permitted interval to be classified as a stratum capable of producing hydrocarbons in paying quantities, then this disposal order shall be terminated *ipso facto* under Section 70-2-12.B(4) NMSA Laws of 1978.

(5) The operator of this well shall run an injection survey (tracer/temperature or equivalent) of the injection interval within one (1) year after commencing disposal into this well. The operator will supply both the Division District I office and Santa Fe engineering bureau with a copy of the survey log. If the Division does not receive the log within the prescribed time period, then this disposal order shall be terminated *ipso facto*.

(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 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 19.15.26.11A. NMAC.

(9) The wellhead injection pressure on the well shall be limited to **no more than 958 psi**. In addition, the disposal well or system shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface tubing pressure to the maximum allowable pressure for this well.

(10) The Director of the Division may authorize an increase in tubing pressure upon a proper showing **at Division hearing** by the operator of said well that such higher pressure will not result in migration of the disposed fluid from the approved formation. Notification for the hearing will follow Division Rule 19.15.26.8B.(2). 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 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 Rule 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 or 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 19.15.5.9 NMAC.

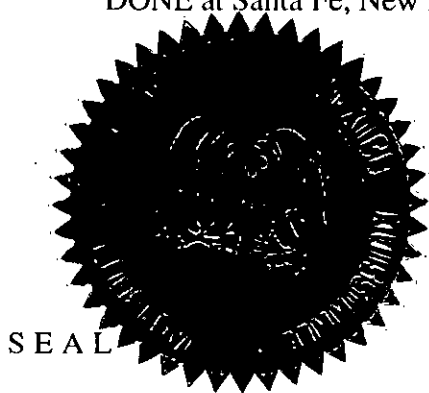
(15) The disposal authority granted herein shall terminate two years after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request, mailed by the operator prior to the termination date, may grant 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

JAMI BAILEY
Director

Mesquite SWD, Inc.
Blue Quail SWD #1
2100' FNL & 1660' FWL
Sec. 11, T25S-R32E Lea County, NM

API 30-025-NA

Proposed Drilling/Completion of Blue Quail SWD #1 Well

Proposed New Well Completion Diagram

API: 30025xxxx
Operator: Mesquite SWD, Inc.
Lease: Blue Quail SWD
Location: Sec 11, T25S-R32E Lea Co., NM
Footage: 2100' FNL & 1660' FWL

Well No: 1

KB: 3517 Est
GL: 3497 Est

Surface Csg

Size: 13-3/8" 48# H-40
Set @: 860
Sxs cmt: 560
Circ: Yes
TOC: Surface
Hole Size: 17-1/2"

Intermediate Csg

Size: 9--5/8" 36/40# J55/N80
Set @: 4550
Sxs cmt: 1255
Circ: Circ to Surface
TOC: Surface
Hole Size: 12-1/4"

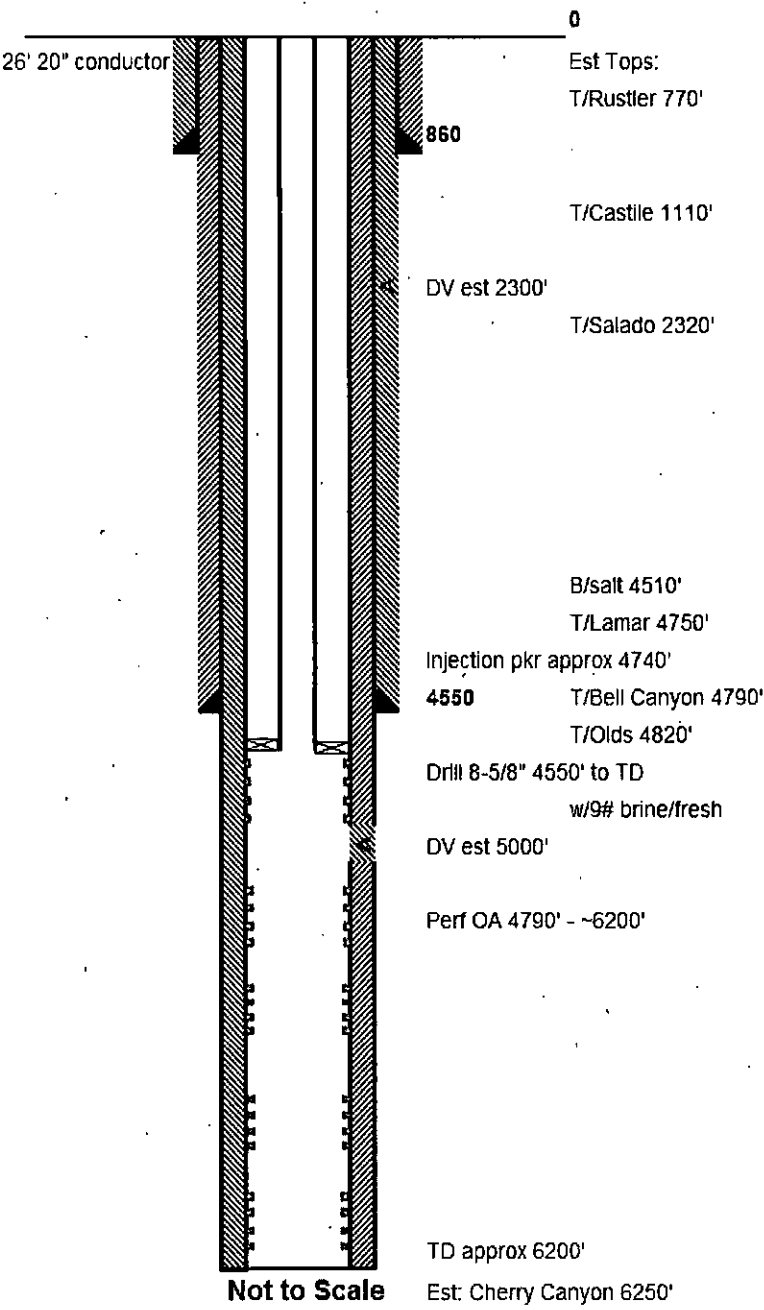
Production Csg

Size: 7" 23/26# J-55
Set @: ~6200
Sxs cmt: 850
Circ: Circ to Surface
TOC: Surface
Hole Size: 8-5/8"

Cmt calc @50% excess

Tubular requirements (made-up):
4740' 4-1/2" L/N80 12.75# upset Fiberglass lined
Lok-Set (or equivalent) Packer set approx 4740'

Load tubing annulus w/corrosion inhibitor
Complete surface head for disposal



Mesquite SWD, Inc.
Blue Quail SWD #1
2100' FNL & 1660' FWL
Sec. 11, T25S-R32E Lea County, NM

API 30-025-NA

Cement Program:

13-3/8" 48# H-40 Set 860' w/560 sx cmt

360 sx C + 4% PF20 + 2% PF1 + .125 pps FR29 + .4 pps PF45
Density 13.5 Yield 1.75 H²O 9.137

200 sx C + 2% PF1

Density 14.8 Yield 1.34 H²O 6.321

9-5/8" 36#/40# J-55/N-80 Set 4550' w/1255 sx cmt

Stage 1

415 sx 35/65 Poz/C + 5% (BWOW) PF44 + 6% PF20 + 1% PF1 + .125 pps pf29 + .4 pps PF45 + 3 pps PF42

Density 12.9 Yield 1.92 H²O 9.945

200 sx C + .2% PF13

Density 14.8 Yield 1.33 H²O 6.307

Stage 2

540 sx 35/65 Poz/C + 5% (BWOW) PF44 + 6% PF20 + 1% PF1 + .125% pps PF29 + .4 pps PF45 + 3 pps PF42

Density 12.9 Yield 1.92 H²O 9.945

100 sx C NEAT

Density 14.8 Yield 1.32 H²O 6.311

7" 23#/26# J-55 Set approx 6200' w/850 sx cmt

Stage 1

200 sx C + .3% PF13

Density 14.8 Yield 1.33 H²O 6.307

Stage 2

550 sx 35/65 Poz/C + 5% (BWOW) PF44 + 6% PF20 + .125 pps PF29 + .4 pps PF45

Density 12.9 Yield 1.89 H²O 10.051

100 sx C + .2% PF13

Density 14.8 Yield 1.33 H²O 6.331