

**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. 16159
ORDER NO. R-20321**

**APPLICATION OF OXY USA WTP LIMITED PARTNERSHIP FOR
APPROVAL OF A WATERFLOOD UNIT AGREEMENT FOR PURPOSES OF
IMPLEMENTING A PRESSURE MAINTENANCE PROJECT IN THE BENSON;
BONE SPRING POOL THROUGH ITS SMOKEY BITS STATE COM NO. 2H
WELL, EDDY COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on May 17, 2018, at Santa Fe, New Mexico, before Examiners Scott Dawson, Phillip R. Goetze and Michael McMillan.

NOW, on this 15th day of January, 2019, the Division Director, having considered the testimony, the record and the recommendations of the Examiners,

FINDS THAT:

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

(2) By this application, OXY USA WTP Limited Partnership ("Applicant" or "OXY") seeks approval of a pressure maintenance project in the Bone Spring formation, Benson; Bone Spring, Pool (Pool code 5200), within the horizontal boundaries described below, in Eddy County, New Mexico.

Township 18 South, Range 30 East, NMPM
Section 36: All

(3) Applicant proposes to inject produced water into the Bone Spring formation at a true vertical depth interval from approximately 7862 feet to approximately 8818 feet below the surface, through the following horizontal well:

Smokey Bits State Com Well No. 2H (API No. 30-015-40196) with a surface location of 1575 feet from the North line and 75 feet from the West line (Unit letter E) of Section 36, Township 18 South, Range 30 East, NMPM, and a terminus of 2020 feet from the North line and 341 feet from the East line (Unit letter H) of Section 36, Township 18 South, Range 30 East, NMPM.

(4) Applicant further seeks the ability for the administrative approval of additional injection wells within the pressure maintenance project area without the necessity for further hearings pursuant to Rule 19.15.26.8(F)(3) NMAC.

(5) No other party appeared at the hearing or otherwise opposed the application.

(6) Applicant appeared through counsel and presented testimony and exhibits to the effect that:

- (a) As proposed in the Smokey Bits State Unit Agreement, the project comprises three separately owned tracts. All of the tracts are in the State Trust and are administered by the Commissioner of Public Lands of the State of New Mexico (the "State Land Office"). All of the tracts are within three State Land Office leases.
- (b) The Commissioner of Public Lands has given preliminary approval of the project and the Smokey Bits Unit Agreement will be effective upon final approval of the Commissioner.
- (c) In this area of Eddy County, the Second Bone Spring sand is a productive interval within the Bone Spring formation and is well delineated and characterized. Applicant stated that the existing configuration of horizontal wells in Section 36 offered opportunity for studying the potential of increased recovery by utilizing injection to supplement current reservoir pressures.
- (d) The Smokey Bits State Com Well No. 2H (the "proposed injection well") is a horizontal well in the Bone Spring formation currently producing from the Second Bone Spring sand. This well has declined in production over the last year.
- (e) Applicant has designed a pilot pressure maintenance project limited to Section 36 utilizing the proposed injection well along with two additional horizontal wells to monitor and assess the injection process. These wells are the Smokey Bits State Com Well No. 3H (API No. 30-015-39118) and the Smokey Bits State Com Well No. 6H (API No. 30-015-40148).

- (f) Applicant proposes a pilot project utilizing continuous water injection to support the primary reservoir recovery mechanism to evaluate the effects on production in the adjacent horizontal wells.
- (g) Applicant predicted that the recovery factor can be improved with the water injection process by an additional 5% to 15% in excess of the primary recovery of 5% to 10% for the original oil in place.
- (h) Applicant proposes utilizing its Smokey Bits State Com Well No. 3H and the Smokey Bits State Com Well No. 6H which are south and north of the proposed injection well as pressure sinks to isolate the lateral effects of the project to Section 36.
- (i) Applicant provided evidence that proposed injection interval is confined by large sequences of limestones both above and below, thereby preventing any vertical migration of injection fluids.
- (j) Applicant will utilize the proposed injection well with existing perforation and well construction.
- (k) Produced water for pilot project will be from area production wells in the Queen, Bone Spring, and Wolfcamp formations. Applicant provided analyses of various mixing scenarios of produced water along with testimony demonstrating compatibility with well components and the reservoir conditions. Applicant further stated that the produced water would be treated prior to injection.
- (l) Applicant has proposed a maximum surface injection pressure for produced water of 1706 pounds per square inch (psi) based on the true vertical depth of 8532 feet for the first perforation in the subject well.
- (m) Applicant has proposed the placement of the packer significantly above the first perforations located in the horizontal portion of the production casing but within the upper confining layer, the Second Bone Spring limestone. Applicant requested an exception for the 100-foot packer setting depth requirement applied to vertical injection wells.
- (n) Applicant proposed a tubing lined with a proprietary component be allowed for use in the injection operation.
- (o) Applicant stated that a reasonable response for assessment of the project would occur within two years following commencement of injection.

- (p) Applicant established a modified area of review (AOR) using the horizontal segment of the proposed injection well (as defined by the surface location, the first take point, and the terminus) as the center line for the one-half mile radius and defining the AOR as being the area within one-half mile of any point on the horizontal well's lateral. Applicant stated that there are 14 producing wells and two plugged wells that penetrate the injection interval and are within the one-half mile AOR. Eight of these producing wells are one-mile or longer horizontal wells. All wells in the AOR, both producing and the plugged well, are properly cased and cemented.
- (q) Applicant located one fresh water well within one mile of the proposed injection wells. Applicant provided an analysis for a water well (NMOSE POD CP-00818) which was drilled to depth of 240 feet. Applicant stated that the deepest groundwater occurrence in the surrounding townships was measured at 630 feet below surface.
- (r) Applicant has provided proper notice to affected persons including the surface land owner. Applicant has also published notice of the pilot project in Carlsbad Current-Argus, a newspaper with general circulation in the county where the project is located.

(7) Subsequently on May 21, 2018, the Applicant provided additional information requested by the Division regarding the technical specifications for tubing with "Novolac" lining (Tuboscope TKTM-15) proposed for use in the injection well.

The Division concludes that:

(8) The subject well has proper casing and cement as to be protective of all Underground Sources of Drinking Water within the proposed project area. The Division notes that the proposed pilot project is located approximately 2.5 miles north of the northern extent of the Capitan Reef.

(9) All of the wells (active and plugged) in the one-half mile modified AOR surrounding the proposed injection well appear to be adequately cased and cemented, so that none will become a conduit for the escape of injected fluid or gas from the permitted injection formation. Accordingly, there is no requirement for remedial work on any wells within the modified AOR for each of the injection wells.

(10) Applicant should be authorized to inject fluids at a surface injection pressure not to exceed 1706 psi for produced water. Applicant may apply to the Division for a higher injection pressure upon satisfactorily demonstrating that an increase in injection pressure will not result in fracturing of the injection formation or confining strata.

(11) The proposed project will, in reasonable probability, result in production of substantially more hydrocarbons from the project area that would otherwise be produced therefrom, will prevent waste, and will not impair correlative rights.

(12) Accordingly, the application should be approved.

IT IS THEREFORE ORDERED THAT:

(1) OXY USA WTP Limited Partnership (the "operator") is hereby authorized to inject produced water into the Bone Spring formation [Benson; Bone Spring, pool (Pool code: 5200)] through an existing horizontal well located within the Unit area.

(2) This project is hereby designated the **Hackberry Pressure Maintenance Pilot Project** (the "project") and the Unit shall consist of the Bone Spring formation underlying the following lands in Eddy County, New Mexico:

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(3) The "Unitized Formation" of the project, as defined in the Unit Agreement, is the stratigraphic equivalent of "*the Second Bone Spring which covers depths from 7862 feet to 8818 feet in the Oxy Smokey State #1 (30-015-31611) located 1780 feet from the North line and 1980 feet from the West line of Section 36, Township 18 South, Range 30 East, Eddy County, New Mexico.*"

(4) The operator's existing horizontal well (the "subject well") is approved for injection during the project:

Smokey Bits State Com Well No. 2H (API No. 30-015-40196) with a surface location of 1575 feet from the North line and 75 feet from the West line (Unit letter E) of Section 36, Township 18 South, Range 30 East, NMPM, and a terminus of 2020 feet from the North line and 341 feet from the East line (Unit letter H) of Section 36, Township 18 South, Range 30 East, NMPM.

(5) OXY USA WTP Limited Partnership (OGRID 192463) is designated operator of the Unit and the project.

(6) The operator shall take all steps necessary to ensure that the injected fluid enters only the injection interval, the Unitized Formation, and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(7) The subject well shall use the existing construction with injection occurring through perforations currently in place.

(8) The operator shall utilize the sources of produced water identified in Part VII of Applicant's Form C-108 (Proposed Operations) for use in the injection phases of the project.

(9) Injection shall be accomplished through lined tubing installed in a packer set in the production casing so as to provide a proper seal while being as close as practical to the uppermost injection perforations. The upper limit for placement of the packer in the production casing for the subject well shall be equal to or greater than a true vertical depth of 7962 feet which is 100 feet below the upper contact of the confining layer, the Second Bone Spring limestone. Furthermore, the upper limit for placement of the packer in the production casing for any additional injection wells shall be equal to or greater than the true vertical depth 100 feet below the upper contact of the Second Bone Spring limestone.

(10) The injection wells shall be initially equipped with a pressure control device or acceptable substitute that will limit the maximum surface injection pressure to no more than 1706 pounds per square inch (psi) for produced water.

(11) The casing-tubing annulus shall be filled with an inert fluid, and a gauge or approved leak-detection device shall be attached to the annulus in order to detect leakage in the casing, tubing or packer.

(12) The subject well shall pass a mechanical integrity test prior to initial commencement of injection and prior to resumption of injection each time the packer is unseated. All testing procedures and schedules shall conform to the requirements of Rule 19.15.26.11(A) NMAC. The Division Director retains the right to require at any time wireline verification of completion and packer setting depths.

(13) The subject well shall be monitored with a SCADA system and the operator shall ensure that additional sensor systems for each new injection well are installed and monitored.

(14) The Division Director shall have the authority to administratively authorize an increase in injection pressure upon a showing by the operator that such higher pressure will not result in fracturing of the injection formation or confining strata. The operator shall give at least 72 hours advance notice to the supervisor of the Division's District II office of the date and time (i) injection equipment will be installed, and (ii) the mechanical integrity pressure test will be conducted, so these operations may be witnessed.

(15) The operator shall provide written notice of the date of commencement of injection into the subject well to the Division's District II office.

(16) The operator shall immediately notify the supervisor of the Division's District II office of the failure of the tubing, casing or packer in either injection well, or the leakage of water, oil, gas or other fluid from or around any producing or abandoned

well within one-half mile of the subject well and shall take all steps as may be timely and necessary to correct such failure or leakage.

(17) The project shall be governed by Division Rules 19.15.26.8 through 19.15.26.15 NMAC. The operator shall submit monthly reports of the injection operations on Division Form C-115, in accordance with Rules 19.15.26.13 and 19.15.7.28 NMAC.

(18) The operator shall have the ability to apply for additional injection wells for administrative approval by satisfying the requirements of Rule 19.15.26.8(C) NMAC as provided for in Rule 19.15.26.8(F)(6) NMAC [as amended on December 27, 2018].

(19) The injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations; provided, however, the Division, upon written request by the operator filed prior to the expiration of the two-year time period, may grant an extension for good cause.

(20) Three (3) years following the commencement of injection in either injection well, the authority for injection under this order shall terminate. The operator shall make an application for a Division hearing to present the results of the pilot project and to make permanent the injection authority of this order. If the operator requires additional time for completion of the pilot project, the Division, upon written request by the operator filed prior to the expiration of the two-year period, may grant an extension for good cause.

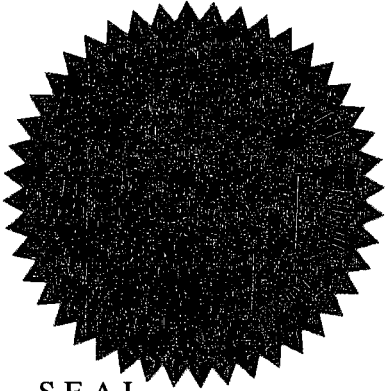
(21) The operator shall provide written notice to the Division upon permanent cessation of injection into the project.

(22) This order does not relieve the operator of responsibility should its operations cause any actual damage or threat of damage to protectable fresh water, human health or the environment; nor does it relieve the operator of responsibility for complying with applicable Division rules or other state, federal or local laws or regulations.

(23) Upon failure of the operator to conduct operations (1) in such manner as will protect fresh water or (2) in a manner consistent with the requirements in this Order, the Division may, after notice and hearing (or without notice and hearing in event of an emergency, subject to the provisions of NMSA 1978 Section 70-2-23), terminate the injection authority granted herein.

(24) Jurisdiction of this case is retained for the entry of such further orders as the Division may deem necessary.

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



SEAL

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

GABRIEL WADE
Acting Director