

Initial Application Part I

Received: 08/21/2019

This application is placed in file for record. It MAY or MAY NOT have been reviewed to be determined Administratively Complete

RECEIVED:	REVIEWER:	TYPE: SWD	APP NO: pMAM1923345698
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ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
 - Geological & Engineering Bureau -
 1220 South St. Francis Drive, Santa Fe, NM 87505



ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: AWR Disposal LLC **OGRID Number:** 328805
Well Name: Final Final SWD #1 **API:** _____
Pool: Proposed: SWD, Devonian, Fusselman, Montoya **Pool Code:** _____

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A] SWD-2252

A. Location – Spacing Unit – Simultaneous Dedication

☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [I] or [II]

[I] Commingling – Storage – Measurement

☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery

☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

2) **NOTIFICATION REQUIRED TO:** Check those which apply.

- A. ☒ Offset operators or lease holders
 B. ☐ Royalty, overriding royalty owners, revenue owners
 C. ☒ Application requires published notice
 D. ☒ Notification and/or concurrent approval by SLO
 E. ☒ Notification and/or concurrent approval by BLM
 F. ☒ Surface owner
 G. ☒ For all of the above, proof of notification or publication is attached, and/or,
 H. ☐ No notice required

FOR OCD ONLY

- ☐ Notice Complete
☐ Application Content Complete

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Randy Hicks (agent)

Print or Type Name

Signature

08/21/2019

Date

505 238 9515

Phone Number

r@rthicksconsult.com

e-mail Address

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources
Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

FORM C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

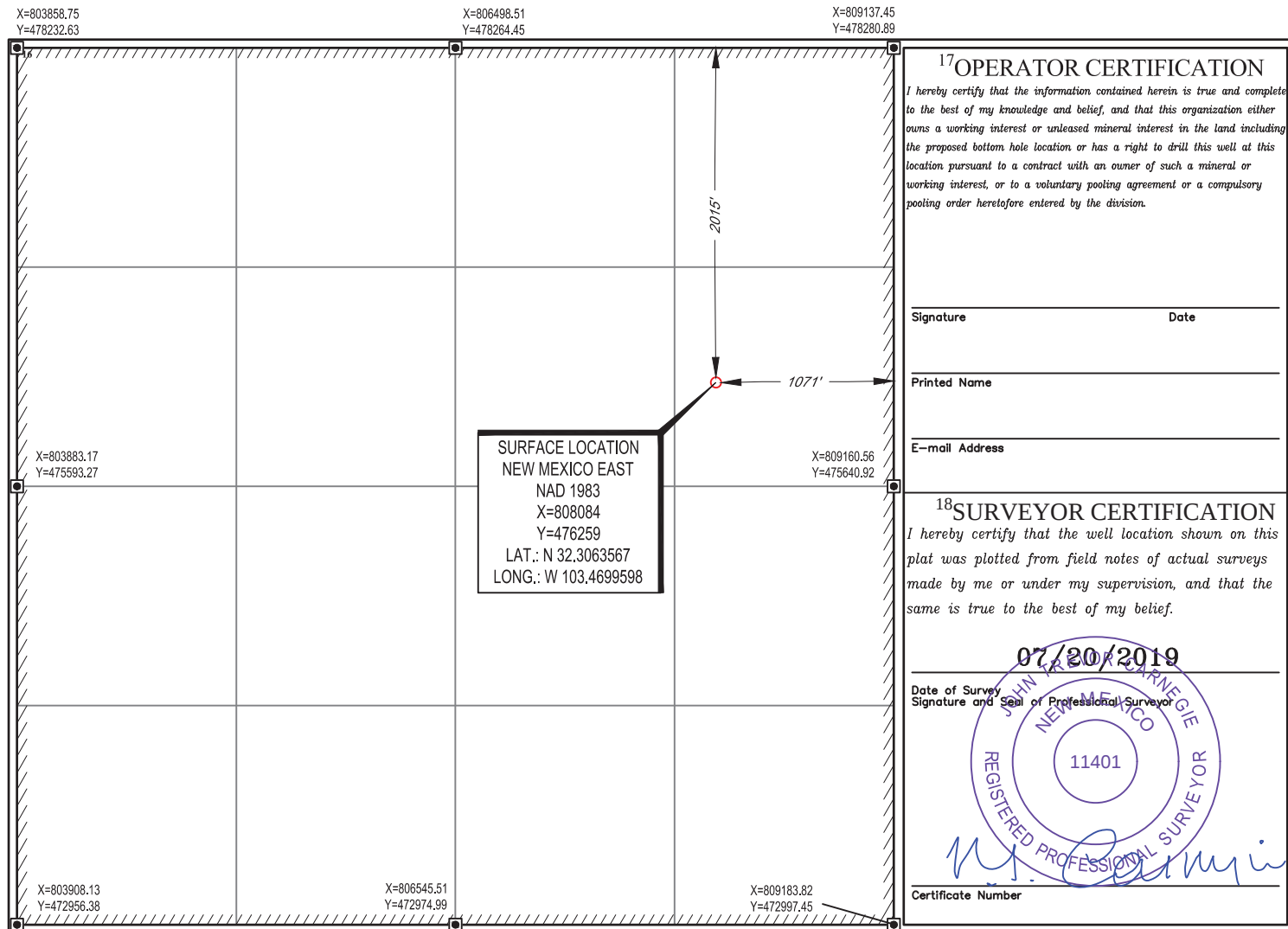
¹ API Number		² Pool Code		³ Pool Name	
⁴ Property Code		⁵ Property Name FINAL FINAL SWD			⁶ Well Number #1
⁷ OGRID No. 328805		⁸ Operator Name AWR DISPOSAL, LLC			⁹ Elevation 3418'

¹⁰ Surface Location									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	16	23-S	34-E	-	2015'	NORTH	1071'	EAST	LEA

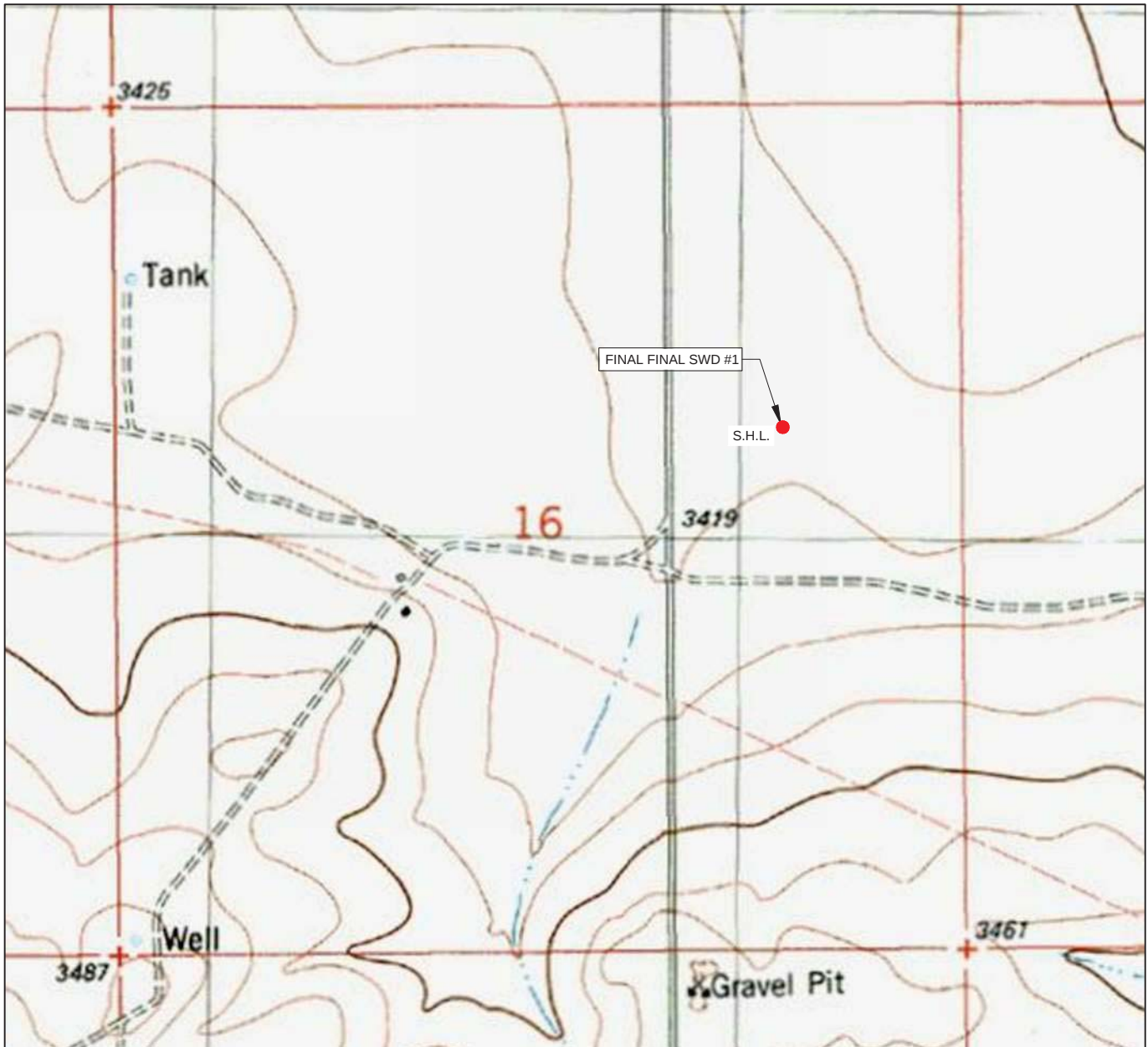
¹¹ Bottom Hole Location If Different From Surface									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

¹² Dedicated Acres	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



LOCATION & ELEVATION VERIFICATION MAP



AWR DISPOSAL, LLC

LEASE NAME & WELL NO.: FINAL FINAL SWD #1

SECTION 16 TWP 23-S RGE 34-E SURVEY N.M.P.M.
 COUNTY LEA STATE NM ELEVATION 3418'
 DESCRIPTION 2015' FNL & 1071' FEL

LATITUDE N 32.3063567 LONGITUDE W 103.4699598



SCALE: 1" = 1000'
 0' 500' 1000'

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY AWR DISPOSAL, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.



WWW.TOPOGRAPHIC.COM

28 27 26 25 30 29 28 27 26 25 30 29 28 27

33 34 32 33 34 35 36 31 32 33 34

9 16 15 18 17 10 11 12 7 8 9 10

3S-33E 23S-34E 23S-35E

21 22 23 24 21 22 23 24 21 22

28 27 26 25 30 29 28 27 26 25 30 29 28 27

33 34 35 36 31 32 33 34 35 36 31 32 33 34

4 3 2 1 6 5 4 3 2 1 6 5 4 3

9 10 11 12 7 8 9 10 11 12 7 8 9 10

16 15 14 13 18 17 16 15 14 13 18 17 16 15

4S-33E 24S-34E 24S-35E

21 22 23 24 19 20 21 22 23 24 19 20 21 22

220' 50' 160'

FINAL FINAL SWD #1

SEE DETAIL

FINAL FINAL SWD #1

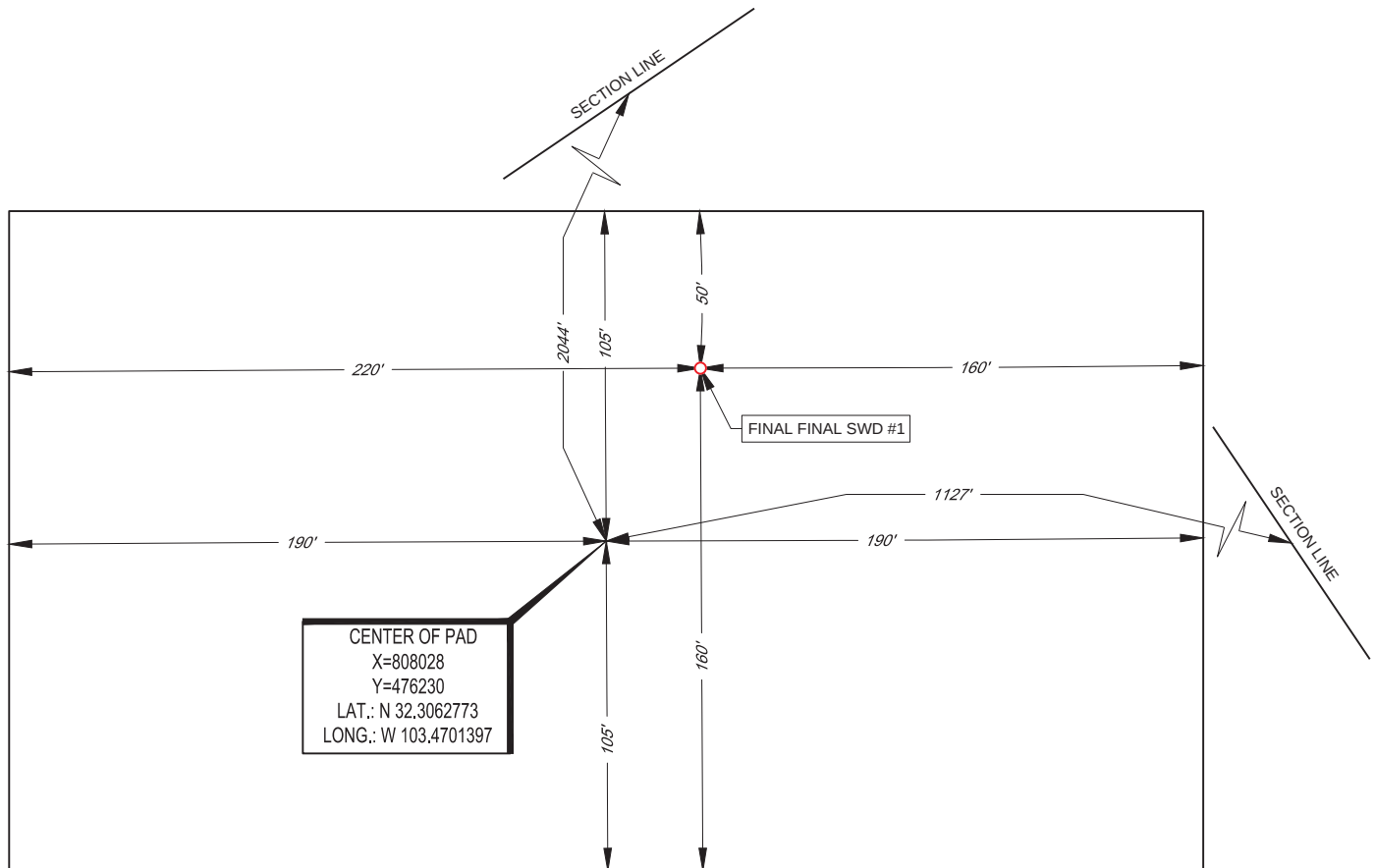
SCALE: 1" = 300'

S:\SURVEY\ACCELERATED WATER RESOURCES LP\LIMESTONE\FINAL PRODUCTS\LO_FINAL_FINAL_SWD_1.DWG 8/13/2019 10:26:58 AM hperezgomez

EXHIBIT 2A
AWR DISPOSAL, LLC

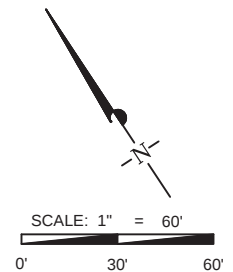
EXHIBIT 2B
AWR DISPOSAL, LLC

SECTION 16, TOWNSHIP 23-S, RANGE 34-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



LEASE NAME & WELL NO.: _____ FINAL FINAL SWD #1
#1 LATITUDE _____ N 32.3063567 _____ #1 LONGITUDE _____ W 103.4699598 _____

CENTER OF PAD IS 2044' FNL & 1027' FEL



ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID
BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY
FEET.

THIS PROPOSED PAD SITE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER
MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY,
AND DATA PROVIDED BY AWR DISPOSAL, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE
PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS
SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.



WWW.TOPOGRAPHIC.COM

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: _____ Secondary Recovery _____ Pressure Maintenance ☒ Disposal _____ Storage
Application qualifies for administrative approval? ☒ Yes _____ No
- II. OPERATOR: _____ AWR Disposal, LLC _____
ADDRESS: _____ 3300 N. A Street, Ste 220, Midland, Texas 79705 _____
CONTACT PARTY: _____ Randall Hicks (agent) _____ PHONE: _____ 505 238 9515 _____
- III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.
Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project? _____ Yes ☒ No
If yes, give the Division order number authorizing the project: _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
NAME: _____ **Randall Hicks** _____ TITLE: _____ **Agent** _____
SIGNATURE: _____  _____ DATE: _____ **08/21/2019** _____
E-MAIL ADDRESS: _____ r@rthicksconsult.com _____
- * If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

III. WELL DATA

- A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

- (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

- B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,
- (4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

INJECTION WELL DATA SHEET

OPERATOR: AWR Disposal, LLC.WELL NAME & NUMBER: FINAL FINAL SWD #1WELL LOCATION: 2,015' FNL & 1,071' FEL H 16 SECTION 23S TOWNSHIP 34E
FOOTAGE LOCATION UNIT LETTER RANGEWELLBORE SCHEMATICWELL CONSTRUCTION DATASurface CasingHole Size: See attachments Casing Size: Cemented with: sx. or ft³Top of Cement: Method Determined: Intermediate CasingHole Size: Casing Size: Cemented with: sx. or ft³Top of Cement: Method Determined: Production CasingHole Size: Casing Size: Cemented with: sx. or ft³Top of Cement: Method Determined: Total Depth: Injection Interval feet to

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: _____ See attachments _____ Lining Material: _____

Type of Packer: _____

Packer Setting Depth: _____

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? ☐ X ☐ Yes ☐ No

If no, for what purpose was the well originally drilled? _____

2. Name of the Injection Formation: _____

3. Name of Field or Pool (if applicable): Proposed: SWD, Devonian, Fusselman, Montoya

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. ____ No

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: See attachments

Attachments to C-108

Copy of well bore diagram

Section III-XII Written descriptions to supplement C-108

Plates referenced in written descriptions

Tables referenced in written descriptions

OSE well logs referenced in written descriptions

Section XIII Proof of Notice

Directions to the **Final Final SWD #1**

Date Spudded: TBD

AWR Disposal LLC

Lease Name: Final Final SWD #1

Unit Letter H, Sec. 16, T23S R34E

2015' FNL, 1071' FEL

Lea County, NM

Latitude + N 32° 18' 22.88", Longitude W 103° 28' 11.85"

From Carlsbad:

20", 133#, J-55 casing @ 1,050'.

Cmt w/ 450 sks, 13.7 lead and 450 sks,
14.8 tail

24" Hole

13-3/8", 68# L-80 EZ-GO FJ3 casing @ 4,550'.

DV Tool w/ 10' pkr at 4,000'

1st Stg Cmt w/ 1000 sks 11.8 ppg lead & 400 sks 13.2 ppg
tail.

2nd Stg Cmt w/ 1000 sks 11.8 ppg lead & 380 sks 13.2 ppg
tail.

17.5" Hole

9-5/8", 35.5#, HCP-110 BTC casing @ 11,750'.

Upper DV Tool w/ 10' pkr at 7,000'
Lower DV Tool w/ 10' pkr at 9,000'

1st Stg Cmt w/ 600 sks 11.8 ppg lead &
400 sks 13.2 ppg tail.

2nd Stg Cmt w/ 600 sks 11.8 ppg lead &
380 sks 13.2 ppg tail.

3rd Stg Cmt w/ 600 sks 11.8 ppg lead &
380 sks 13.2 ppg tail.

12.25" Hole

5.5" Tubing

5" Tubing

7-5/8" Liner, 39#, P-110 casing @ 14,671'.

Cmt w/ 230 sks 11.9 ppg Class C

Maximum Proposed Injection Rate: 40,000 BBLs PER DAY

Maximum Proposed Injections Pressure: 3,000 psi

Injection Interval:

8.5" Hole

Packer set @ 14,571

14,671	-	15,787	DVNN
15,787	-	16,312	FSLM
16,312	-	16,661	MNTY

6.5" Openhole

TD : 16,661

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include

1. Lease name; Well No.; Location by Section, Township and Range; and footage location within the section

Lease Name: Final Final SWD #1

Unit Letter H, Section 16, T23S R34E, 2,015' FNL, 1,071 FEL

Limeston Basin Prop LLC owns the surface upon which the SWD is located.

2. Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined

The attached Wellbore Data Sheet provides all of the design specifics required and a tabulation of these data are shown on the diagram.

The formation tops for the Final Final SWD #1 were established by Geologist Herb Wacker TBPG license #4517. For the deepest formations, we used the log from the Amerada Hess Bell Lake North Fed #3 (30-325-33077) that has a total depth of 17540 feet in the Ellenburger Formation. The distance from Final Final SWD #1 location to this well is 2.7 miles to the northeast.

For picking tops of more shallow formations, we used the log from the MADDOX FEDERAL 8016 JV-P No. 001 (30-025-27824) TD 13650 feet in the Devonian). The distance from Final Final SWD #1 location is 1.27 mile southeast.

3. A description of the tubing to be used including its size, lining material, and setting depth

5-1/2" (20#) internal plastic coated tubing swaged down to 5" (18#) with setting depth of 14,571 feet.

AWR 204 Final Final Sec16 Twp 23S Rge 34E		
	GL	3410
Geologist	KB	3440
H. Wacker	MD	SS
Dockum	350	3090
Santa Rosa	383	3057
Dewey Lake	625	2815
Rustler	991	2449
Salt	1441	1999
Delaware	4975	-1535
Bell Canyon	4996	-1556
Cherry Canyon	5791	-2351
Brushy Canyon	7195	-3755
Bone Spring	8462	-5022
Avalon	8843	-5403
1st Bone Spring	9608	-6168
2nd Bone Spring	10141	-6701
3rd Bone Spring	11037	-7597
Wolfcamp	11366	-7926
Strawn	11900	-8460
Atoka	12152	-8712
Morrow	12845	-9405
Barnett	13520	-10080
Miss Limestone	14051	-10611
Woodford	14420	-10980
Devonian	14641	-11201
Fusselman	15787	-12347
Montoya	16312	-12872
Simpson	16691	-13251
Top of Interval	14671'	Devonian +30'
Bottom of Interval	16661'	Simpson -30'
TD	16661'	
Thickness of Injection Interval = 1990'		

4. The name, model, and setting depth of the packer used or a description of any other seal system or assembly used

Tryton Tools, 7" Arrow Set 1-X Nickel Plated Injection Packer will be set at 14,571 feet.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name

The proposed injection intervals include the Devonian, Fusselman and Montoya in an open-hole interval.

(2) The injection interval and whether it is perforated or open-hole.

The depth interval of the open-hole injection interval is 14,671 - 16,661 (1,990 feet).

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

The well will be drilled for disposal.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations

There are no perforated intervals, only the open-hole completion described above.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

Overlying Oil & Gas Zone (Using GL of 3410 feet):

Bone Spring	8462
Avalon	8843
1st Bone Spring	9608
2nd Bone Spring	10141
3rd Bone Spring	11037
Wolfcamp	11366
Strawn	11900
Atoka	12152
Morrow	12845

Underlying Oil & Gas Zones:

Devonian	17124
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IV. Is this an expansion of an existing project

No.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review

Plate 1a identifies all OCD listed wells and API numbers and shows circles with radii of 0.5, 1.0, and 2.0 miles. Note that where numerous wells are closely spaced, the API number may not be labeled for clarity. New wells, active wells, plugged wells, and canceled wells have color-coded symbols. Plate 1b shows only new and active wells and circles with radii of 0.5 and 1.0 miles.

Plate 2 identifies the leases within 2-miles of the proposed SWD as well as leases within the 1-mile area of review.

- Plate 2a presents the lease numbers for the SLO and BLM oil and gas leases. Also shown is mineral rights owned by the U.S. that are unleased at this time.
- Plate 2b presents land ownership for the same area and identifies the oil and gas mineral rights ownership.

Table 1 and Table 2 identify all affected persons within the 1 mile area of review

- Table 1 lists all of the Oil and Gas Well Operators shown on Plate 1a within the circle having a 1.0 mile radius.
- Table 2 lists all leasees, lessors/mineral interests and surface owners (affected persons) within the 1-mile AOR presented on Plate 2a.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail

There are no other wells that penetrate the proposed injection zone in the 1-mile AOR.

VII. Attach data on the proposed operation, including:**1. Proposed average and maximum daily rate and volume of fluids to be injected**

Proposed Maximum Injection Rate: 40,000 bbl/day

Proposed Average Injection Rate: 30,000 bbl/day

2. Whether the system is open or closed

This is will be an open system. All AWR Disposal, LLC SWDs may receive produced water from recycling storage facilities, such as in-ground containments or above-ground steel-walled containments, which are registered or permitted under Rule 34.

3. Proposed average and maximum injection pressure

Proposed Maximum Injection Pressure: 3,000 psi

Proposed Average Injection Rate: 2,000 psi

4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water

The attached Table 3 "Produced Water Chemistry of Nearby Wells" provides the requisite analyses. The Delaware and Bone Spring Formations are the subjects of the analyses. These formations and the Wolfcamp will provide most of the produced water to the proposed SWD. At the time of writing, we are unaware of any problems associated with disposal of produced water derived from any Formations into the Devonian, Fusselman and Montoya injection zone.

5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

Table 4 presents formational water quality data from the Go-Tech site for Devonian-Fusselman-Montoya producing wells. As stated above, we are unaware of any problems associated with disposal of produced water derived from the Delaware, Avalon, Bone Spring, and Wolfcamp Formations into the Devonian, Fusselman and Montoya injection zone.

***VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth.**

The proposed injection intervals include the Devonian, Fusselman and Montoya in an open-hole interval. The proposed injection intervals in the Pre-Mississippian Carbonates are well cemented and will provide the necessary open hole integrity while allowing salt water to be injected. Because of the competency of the rock, the open hole section has very little chance of collapsing.

As indicated in Section III.A.2, the approximate depths to the top of the Devonian and the base of the Montoya are 14,641 and 16,691 respectively. The depth interval of the injection interval is 14,671 - 16,661 (1,990 feet), within the Devonian, Fusselman and Montoya Formations.

Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with

total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

The Rustler Formation and the Chinle Formation yield water to supply wells in southeastern Eddy County and southwestern Lea County. In the immediate area of the Final Final SWD #1, the closest water well (Well CP-1075) was drilled in 2012 and appears to be an active well supplying water for oil and gas E&P. This well is about ½ mile north of the proposed SWD and appears to draw water mainly from 215-412 feet deep. Well CP-1730 was drilled in 2018 and the well log states that most water is derived from sandstone and gravel at a depth of 350-580 feet. Well USGS-15292, which is 0.75 to the northwest (mis-located on the USGS database) provides the best depth to groundwater data at 328.93 feet in 1986. This USGS well is associated with old corrals north of Delaware Basin Road.

In this area of Lea County, the Chinle yields water to wells from 100-200 feet below the ground surface (bgs) to a depth of about 600 feet. The upper portion of the Rustler Formation yields fresh water to wells in Lea County and in the area of the Final Final SWD #1, the depth interval of this potential source of fresh water is about 900-1400 feet. Based upon investigation of the area by Hicks Consultants, we conclude most water supply wells are completed in the Chinle or Santa Rosa at depth of less than 1000 feet.

The locations of all water supply wells listed in public databases are shown in Plates 3, 3a and 3b. The location of nearby mapped surface water bodies are shown in Plate 4.

IX. Describe the proposed stimulation program, if any

A cleanup acid job may be used to remove mud and drill cuttings from the formation. However, no other formation stimulation is currently planned.

***X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted)**

Logs will be submitted to OCD upon completion of the well.

***XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken**

No active water supply wells with water chemistry data were identified within one mile of the proposed SWD. Data from various sources permit a conclusion that groundwater within the Chinle Formation is potable. In this area, groundwater in the underlying Rustler formation may be relatively brackish.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any

other hydrologic connection between the disposal zone and any underground sources of drinking water

Randall T. Hicks, a Professional Geologist with decades of experience in hydrogeology, affirms, on behalf of AWR Disposal, LLC, that

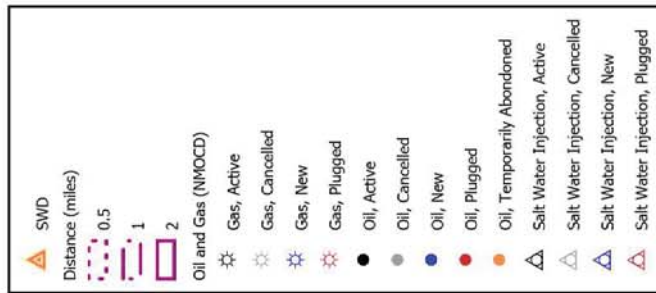
- The USGS has mapped quaternary faults in New Mexico and no such faults are mapped in the area of the proposed Final Final SWD #1¹
- The Texas Bureau of Economic Geology has mapped older faults (e.g. basement and Woodford) in New Mexico and the closest mapped fault is 1 mile to the west²
- With respect to migration of produced water from the injection zone to underground sources of drinking water via faults or other natural conduits, the following conditions were considered
 - o The lowest underground source of drinking water is the middle and upper Rustler Formation.
 - o More than 10,000 feet of sedimentary rock separates the bottom of the Rustler Formation and the top of the injection zone. Many of the formations that lie between the injection zone and the lowermost aquifer are permeable and contain oil, gas or water at various pressures. Any excursion of injected fluids from the Devonian disposal zone would undoubtedly enter these permeable formations prior to moving into the Rustler Formation.
 - o There is no evidence that the pressure regime in the oil and gas reservoirs is sufficient to cause the upward migration of formation water through the bedded salt and into the Rustler or Chinle aquifers.
- There is no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water

¹ <https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf>

² Bureau of Economic Geology (Accessed April 2019). University of Texas at Austin. Basement Faults (Ewing 1990, Tectonic Map of Texas); Precambrian Faults (Frenzel et al. 1988, Figure 6); Woodford Faults (Comer 1991, plate 1). <http://www.beg.utexas.edu/resprog/permianbasin/gis.htm>

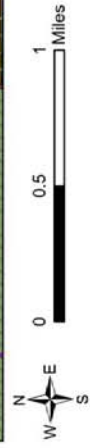
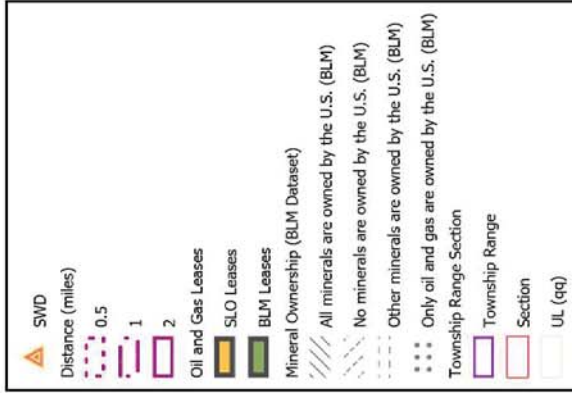
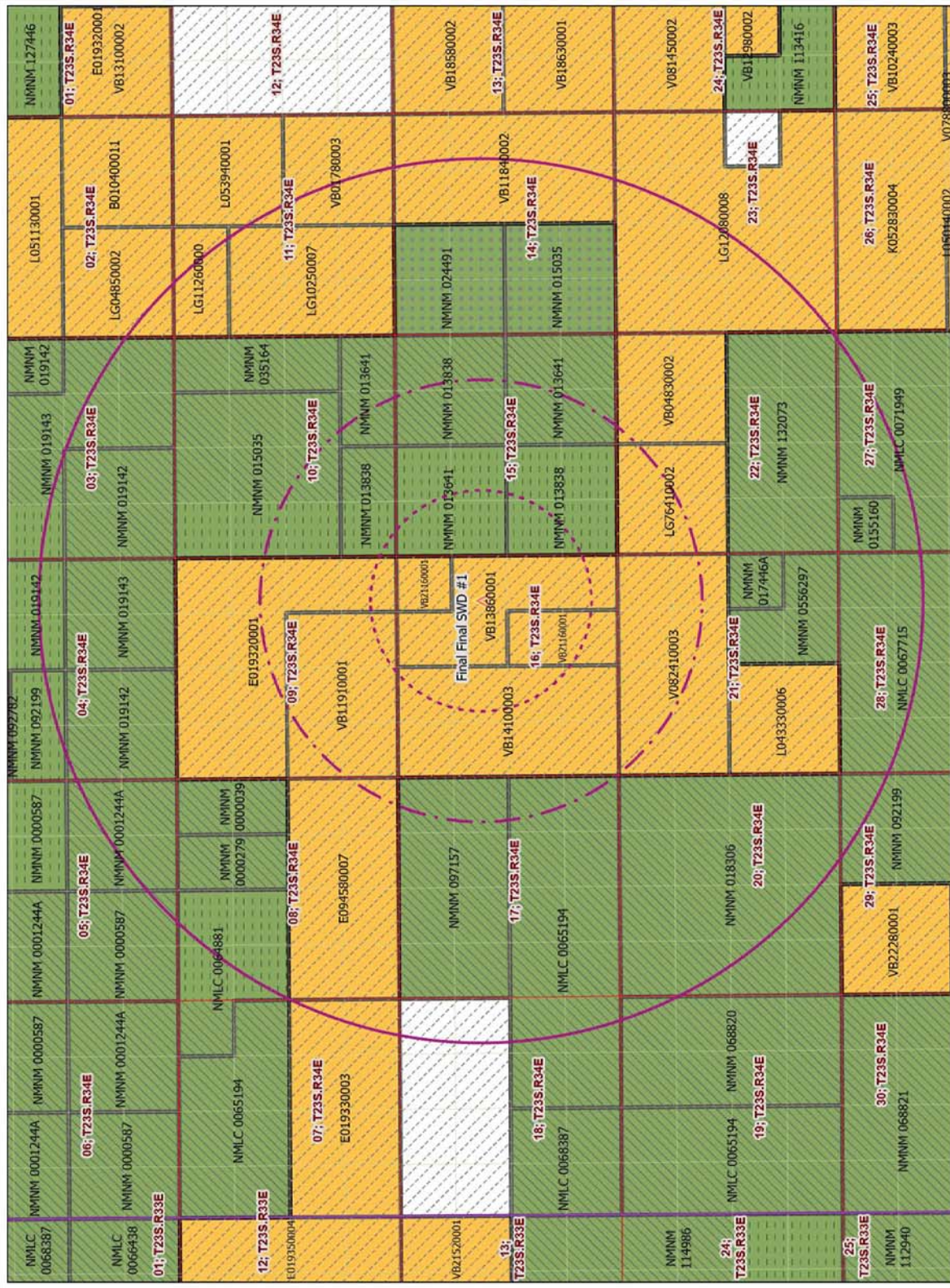
Plates

Plates 1	OCD wells within the area of review
Plate 1a	Oil and Gas Wells within 2 Miles
Plate 1b	Oil and Gas Wells within 1 mile (active and new only)
Plates 2	Mineral leases within the area of review
Plate 2a	Oil and Gas Leases with Mineral Ownership within 2 miles
Plate 2b	Surface and Mineral Ownership within 2 Miles
Plates 3	Water supply wells within the area of review
Plate 3a	Water Wells with Potentiometric and Geology
Plate 3b	Nearby OSE Water Wells
Plate 4	Surface water within the area of review





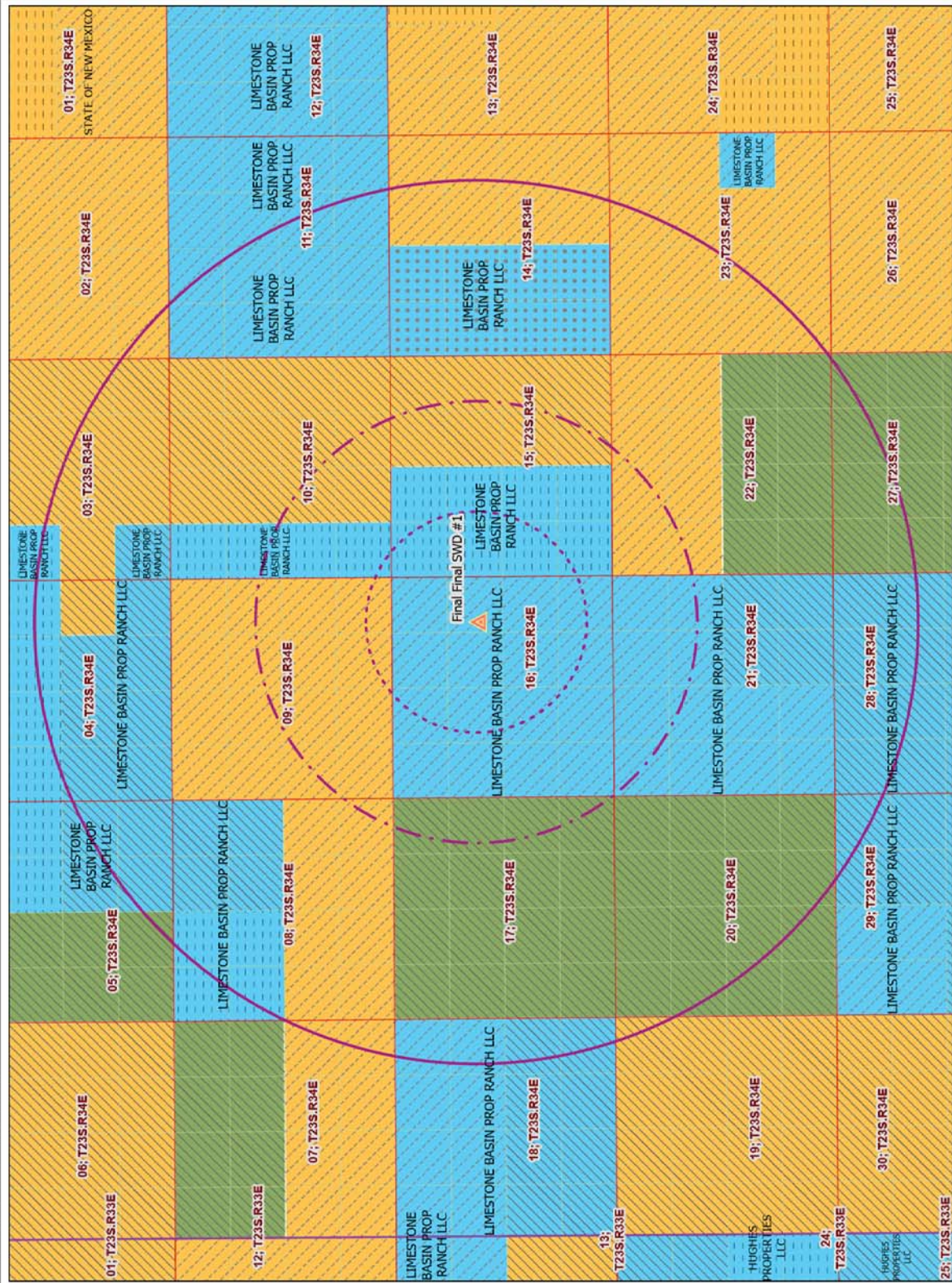
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-42 Albuquerque, NM 87104 Ph: 505-266-5004	NM Oil and Gas Wells within 1 Mile (Active & New Only) AWR Disposal, LLC Final Final SWD #1	Plate 1b August 2019
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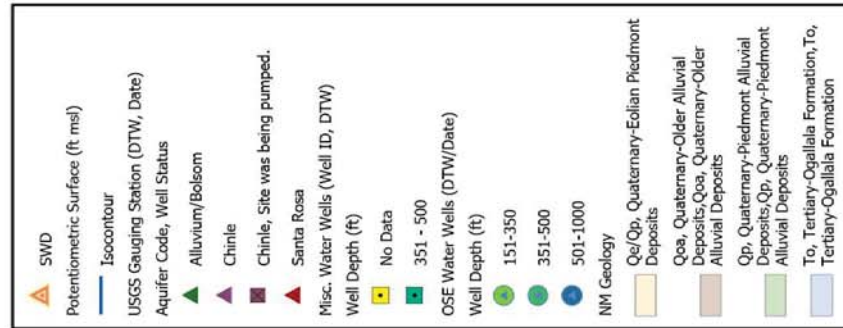
R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505-266-5004

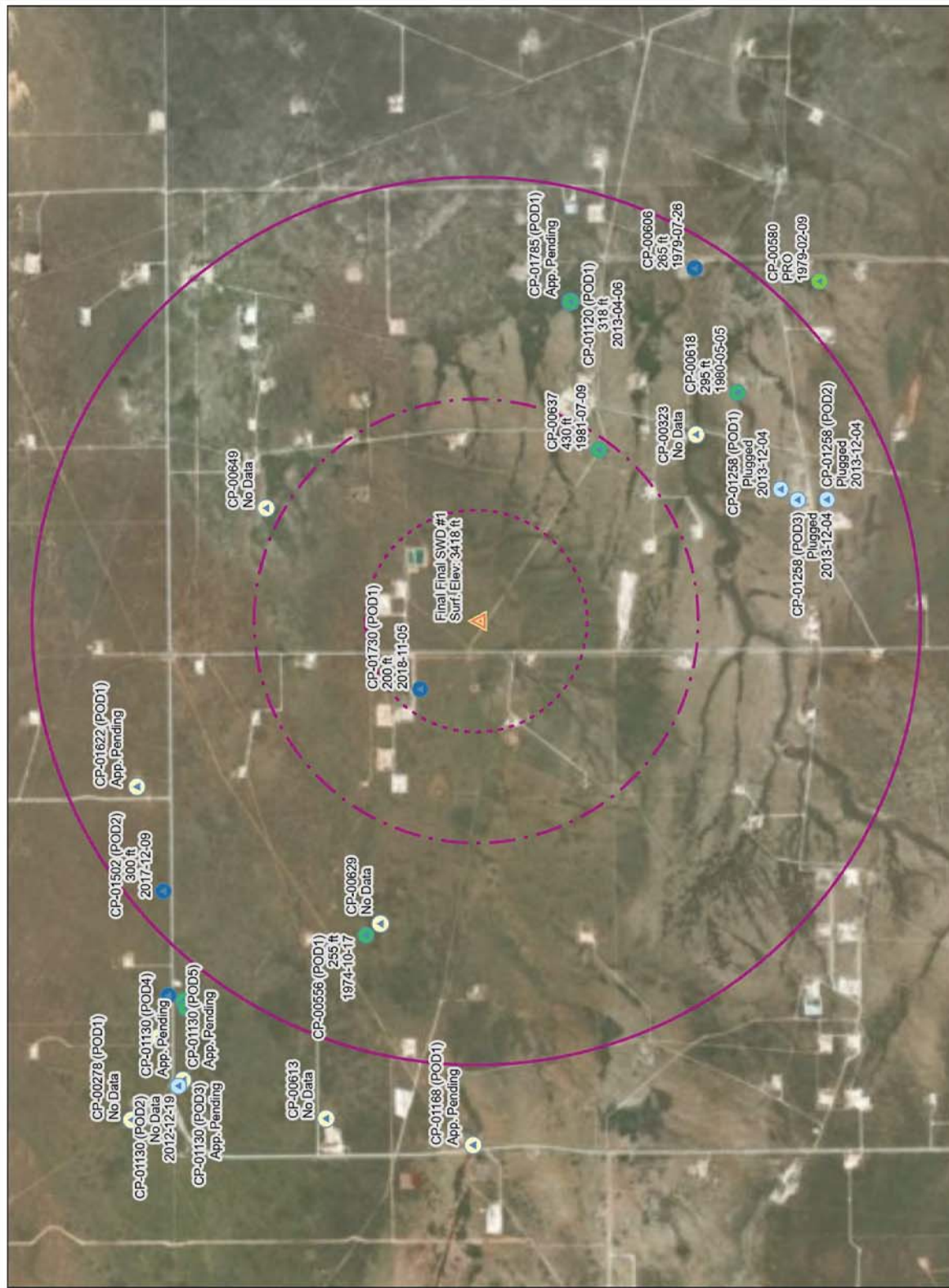
Oil and Gas Leases with Mineral Ownership
Within 2-Miles
AWR Disposal, LLC
Final Final SWD #1

Plate 2a
August 2019

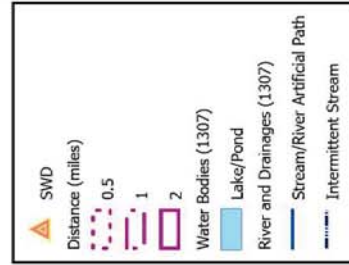
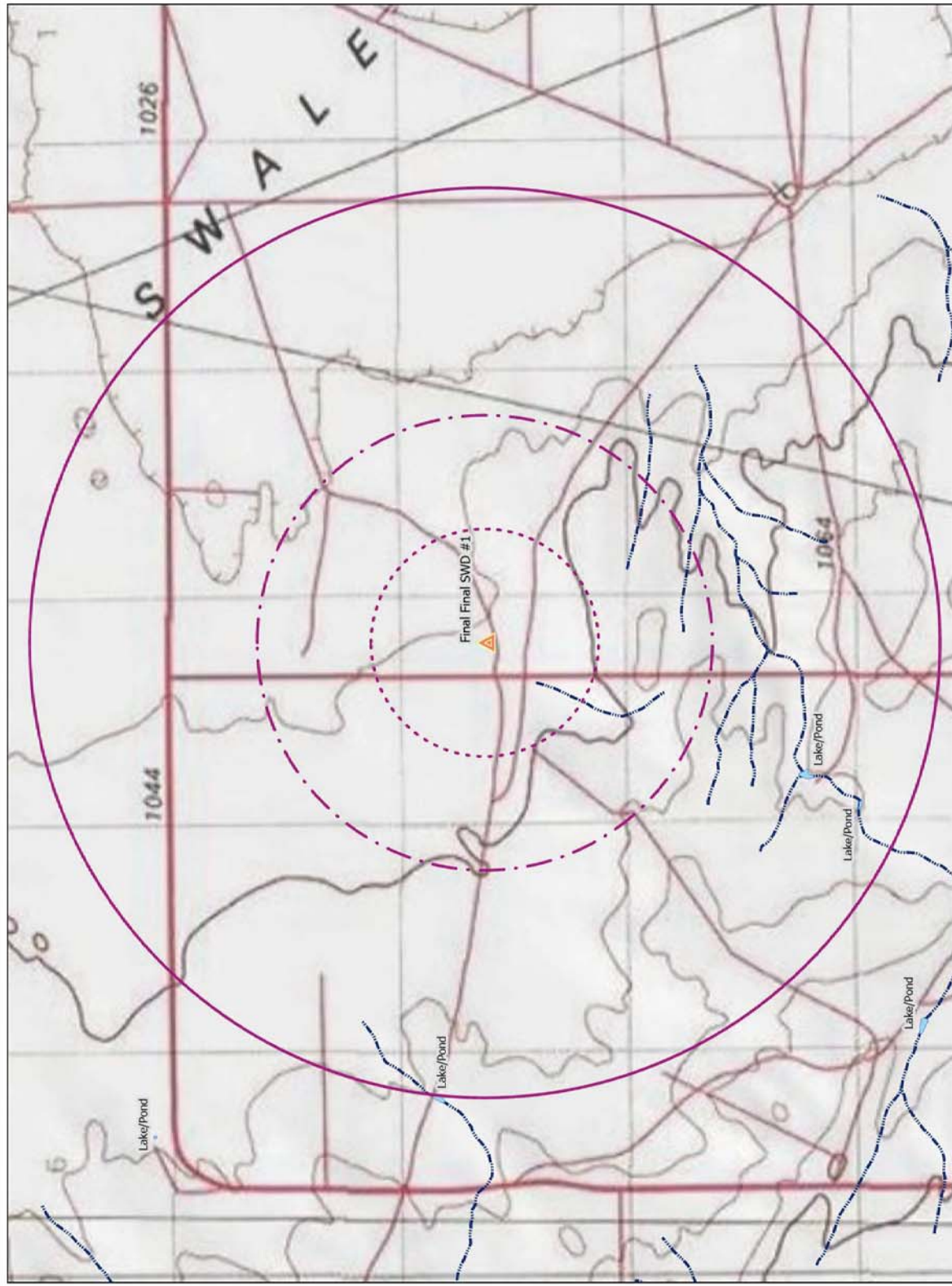


R.T. Hicks Consultants, Ltd 9001 Rio Grande Blvd NW Suite F-1412 Albuquerque, NM 87104 Ph: 505-266-5004		Surface and Mineral Ownership within 2-Miles AWR Disposal, LLC Final Final SWD #1	Plate 2b August 2019
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R.T. Hicks Consultants, Ltd 9001 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505-266-5004	Nearby OSE Water Wells AWR Disposal, LLC Final Final SWD #1	Plate 3b August 2019
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R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505-266-5004	Nearby Surface Water AWR Disposal, LLC Final Final SWD #1	Plate 4 August 2019
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Tables

Table 1	Oil&Gas Well Operators (Affected Persons) within 1-mile
Table 2	Oil&Gas Mineral Interests & Affected Persons within 1-mile
Table 3	Produced Water Chemistry of Nearby Wells
Table 4	Formational water quality data

Table 1
Oil & Gas Operators (Affected Persons) within 1-Mile

API	OGRID	OGRID Name	Well Type	Status	Well Name	District	UL-S-T-R	Total Depth	Pool ID
30-025-26887	372098	MARATHON OIL PERMIAN LLC	G	A	ADOBE FEDERAL COM #001	1	G-15-23S-34E	13274	[70440] ANTELOPE RIDGE, MORROW (GAS); [70450] ANTELOPE RIDGE, STRAWN (GAS)
30-025-26888	372098	MARATHON OIL PERMIAN LLC	G	P	BELCO FEDERAL COM #001	1	O-15-23S-34E	13239	[70450] ANTELOPE RIDGE, STRAWN (GAS)
30-025-27805	214263	PRE-ONGARD WELL OPERATOR	O	P	PRE-ONGARD WELL #001	1	J-09-23S-34E	11031	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-27813	11158	J C WILLIAMSON	O	P	LISA FEDERAL #001	1	N-10-23S-34E	9870	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-28208	214263	PRE-ONGARD WELL OPERATOR	O	C	PRE-ONGARD WELL #001	1	K-10-23S-34E	0	
30-025-28647	168687	SIANA OPERATING LLC	O	A	CURRY STATE #002	1	C-22-23S-34E	12504	[2215] ANTELOPE RIDGE, CHERRY CANYON, SOUTH
30-025-28872	25575	EOG Y RESOURCES, INC.	G	P	KELLER ATF STATE #001	1	G-21-23S-34E	14000	[2209] ANTELOPE RIDGE, BONE SPRING, WEST; [2215] ANTELOPE RIDGE, CHERRY CANYON, SOUTH; [70360] ANTELOPE RIDGE, ATOKA (GAS); [70450] ANTELOPE RIDGE, STRAWN (GAS)
30-025-34258	229137	COG OPERATING LLC	S	A	GETTYSBURG 16 STATE SWD #001	1	J-16-23S-34E	8830	[96100] SWD, DELAWARE; [96838] DRY AND ABANDONED
30-025-35306	25575	EOG Y RESOURCES, INC.	G	P	JEN AXB STATE #001	1	F-16-23S-34E	20	[96838] DRY AND ABANDONED
30-025-37017	25575	EOG Y RESOURCES, INC.	G	C	IMPALA BFM STATE COM #001	1	B-16-23S-34E	0	
30-025-38225	25575	EOG Y RESOURCES, INC.	G	C	IMPALA BFM STATE COM #001	1	B-16-23S-34E	0	
30-025-40638	14744	MEWBOURNE OIL CO	O	P	SABLE BSA STATE #001	1	M-09-23S-34E	285	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-40874	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #002H	1	C-16-23S-34E	10452	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-40916	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #003H	1	B-16-23S-34E	10485	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-41236	229137	COG OPERATING LLC	O	P	VETO STATE COM #002H	1	C-16-23S-34E	8568	[96322] BELL LAKE, DELAWARE, EAST
30-025-41453	168687	SIANA OPERATING LLC	O	A	CURRY STATE #006	1	D-22-23S-34E	7796	[2215] ANTELOPE RIDGE, CHERRY CANYON, SOUTH
30-025-41928	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #001H	1	D-16-23S-34E	10420	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-41929	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #004H	1	A-16-23S-34E	10457	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-42365	14744	MEWBOURNE OIL CO	O	C	ANTELOPE 9 B30B STATE COM #001C	1	O-09-23S-34E	0	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-42366	14744	MEWBOURNE OIL CO	O	A	ANTELOPE 9 B2MD STATE COM #001H	1	M-09-23S-34E	10335	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-42650	14744	MEWBOURNE OIL CO	O	A	ANTELOPE 9 B2NC STATE COM #001H	1	N-09-23S-34E	10343	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-42651	14744	MEWBOURNE OIL CO	O	A	ANTELOPE 9 B3PA STATE #001H	1	P-09-23S-34E	11299	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-42968	14744	MEWBOURNE OIL CO	O	A	PRONGHORN 15 B3DM FEDERAL COM #001H	1	D-15-23S-34E	11378	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-43702	14744	MEWBOURNE OIL CO	O	N	ANTELOPE 9 B30B STATE COM #001H	1	O-09-23S-34E	0	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-43903	14744	MEWBOURNE OIL CO	O	A	PRONGHORN 15 B3BO FEDERAL #001H	1	B-15-23S-34E	11281	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44011	14744	MEWBOURNE OIL CO	O	A	PRONGHORN 15 B3CN FEDERAL COM #001H	1	C-15-23S-34E	11340	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44159	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #011H	1	A-16-23S-34E	11433	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44160	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #012H	1	B-16-23S-34E	11593	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44230	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #013H	1	C-16-23S-34E	0	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44231	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #014H	1	C-16-23S-34E	11554	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44232	229137	COG OPERATING LLC	O	A	GETTYSBURG STATE COM #015H	1	C-16-23S-34E	11494	[2209] ANTELOPE RIDGE, BONE SPRING, WEST
30-025-44585	14744	MEWBOURNE OIL CO	O	A	IBEX 10 B3MD FEDERAL COM #001H	1	D-15-23S-34E	11261	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-44586	14744	MEWBOURNE OIL CO	O	A	IBEX 10 B3NC FEDERAL COM #001H	1	C-15-23S-34E	11300	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-44587	14744	MEWBOURNE OIL CO	O	A	IBEX 10 B30B FEDERAL COM #001H	1	B-15-23S-34E	11288	[2207] ANTELOPE RIDGE, BONE SPRING, NW
30-025-44968	14744	MEWBOURNE OIL CO	O	A	ANTELOPE 9 B2PA STATE #002H	1	D-15-23S-34E	10328	[2207] ANTELOPE RIDGE, BONE SPRING, NW

Table 2
Oil & Gas Mineral Interests and Affected Persons within 1-Mile AOR

AWR Disposal, LLC
Final Final SWD #1

Township	Range	Section	Unit Letter	Lease Number	Leasee (O & G Minerals)	Lessor (O & G Minerals)	Surface Owner	UPC
23S	34E	08	P	E094580007	KAISER-FRANCIS OIL CO	State	New Mexico State Land Office	4199134268397
23S	34E	09	F	E019320001	CONOCOPHILLIPS COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	G	E019320001	CONOCOPHILLIPS COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	H	E019320001	CONOCOPHILLIPS COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	I	E019320001	CONOCOPHILLIPS COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	J	VB11910001	MEWBOURNE OIL COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	K	VB11910001	MEWBOURNE OIL COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	L	VB11910001	MEWBOURNE OIL COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	M	VB11910001	MEWBOURNE OIL COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	N	VB11910001	MEWBOURNE OIL COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	O	VB11910001	MEWBOURNE OIL COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	09	P	E019320001	CONOCOPHILLIPS COMPANY	State	New Mexico State Land Office	4200134266266
23S	34E	10	E	NMNM 015035	NORTEX CORP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201134682266
23S	34E	10	F	NMNM 015035	NORTEX CORP	BLM (U.S.)	New Mexico State Land Office	4201134332265
23S	34E	10	J	NMNM 015035	NORTEX CORP	BLM (U.S.)	New Mexico State Land Office	4201134332265
23S	34E	10	K	NMNM 015035	NORTEX CORP	BLM (U.S.)	New Mexico State Land Office	4201134332265
23S	34E	10	L	NMNM 015035	NORTEX CORP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201134682266
23S	34E	10	M	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201134682266
23S	34E	10	N	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	New Mexico State Land Office	4201134332265
23S	34E	10	O	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	New Mexico State Land Office	4201134332265
23S	34E	15	A	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	15	B	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	15	C	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	D	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	E	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	F	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	G	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	15	H	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	15	I	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	15	J	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	15	K	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	L	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	M	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	N	NMNM 013838	DEVON ENERGY PROD CO LP	BLM (U.S.)	LIMESTONE BASIN PROP RANCH LLC	4201135134266
23S	34E	15	O	NMNM 013641	MEWBOURNE OIL CO	BLM (U.S.)	New Mexico State Land Office	4201135398264
23S	34E	16	A	VB21160001	THE ALLAR COMPANY	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	B	VB13860001	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	C	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	D	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	E	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	F	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	G	VB13860001	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	H	VB13860001	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	I	VB13860001	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	J	VB21160001	THE ALLAR COMPANY	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	K	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266

Table 2

Oil & Gas Mineral Interests and Affected Persons within 1-Mile AOR

Township	Range	Section	Unit Letter	Lease Number	Leasee (O & G Minerals)	Leasor (O & G Minerals)	Surface Owner	UPC
23S	34E	16	L	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	M	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	N	VB14100003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	O	VB21160001	THE ALLAR COMPANY	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	16	P	VB13860001	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200135266266
23S	34E	17	A	NMNM 097157	DEVON ENERGY PROD CO LP	BLM (U.S.)	Bureau of Land Management	4199135266265
23S	34E	17	H	NMNM 097157	DEVON ENERGY PROD CO LP	BLM (U.S.)	Bureau of Land Management	4199135266265
23S	34E	17	I	NMLC 0065194	CONOCOPHILLIPS CO	BLM (U.S.)	Bureau of Land Management	4199135266265
23S	34E	17	P	NMLC 0065194	CONOCOPHILLIPS CO	BLM (U.S.)	Bureau of Land Management	4199135266265
23S	34E	21	A	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	21	B	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	21	C	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	21	D	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	21	F	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	21	G	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	21	H	V082410003	COG OPERATING LLC	State	LIMESTONE BASIN PROP RANCH LLC	4200136266265
23S	34E	22	B	VB04830002	ENDEAVOR ENERGY RESOURCES, LP	State	New Mexico State Land Office	4201136265133
23S	34E	22	C	LG76410002	SIANA OIL & GAS CO.	State	New Mexico State Land Office	4201136265133
23S	34E	22	D	LG76410002	SIANA OIL & GAS CO.	State	New Mexico State Land Office	4201136265133
23S	34E	22	E	LG76410002	SIANA OIL & GAS CO.	State	New Mexico State Land Office	4201136265133
23S	34E	22	F	LG76410002	SIANA OIL & GAS CO.	State	New Mexico State Land Office	4201136265133

Table 3
Produced Water

api	wellname	section	township	range	unit	ftgs	ftwq	county	state	ph	tds_mgl	resistivity_ohm_cm	sodium_mgl	calcium_mgl	iron_mgl	magnesium_mgl	manganese_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl	h2s_mgl	co2_mgl
3002538983	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6			89832	22107	15	4443	3	189304	73	200		350
3002540010	THISTLE UNIT #018H	28	23S	33E	C	150N	1470W	Lea	NM	6.1			51720	22643	31	4570	3.2	195932	73	270		390
3002541254	THISTLE UNIT #019H	34	23S	33E	N	280S	2611W	Lea	NM	6.1			80875	8636	84	1117	0.95	98474	183	690		300
3002541303	THISTLE UNIT #019H	33	23S	33E	P	124S	1058E	Lea	NM	6.3			80875	6665	79	871	0.95	138579	183	470		300
3002541487	THISTLE UNIT #019H	22	23S	33E	M	200S	660W	Lea	NM	6.3			84834	7818	12	927	0.12	146996	146	480		250
3002541505	THISTLE UNIT #019H	34	23S	33E	N	280S	2611W	Lea	NM	6.1	21,352.8		84834	7818	12	927	0.12	146996	146	480		250
3002541586	THISTLE UNIT #019H	34	23S	33E	F	1980N	1980W	Lea	NM	6.99	24146		28899	1996	27	253		44527	386	260		350
3002540010	THISTLE UNIT #018H	28	23S	33E	C	150N	1470W	Lea	NM	6	25,702.7		70268	20684	47	3452.1	3.83	157600	122	200		200
3002540016	THISTLE UNIT #018H	33	23S	33E	P	150S	150E	Lea	NM	6	25,604.9		68949.7	20755.4	30.7	3375.3	3.98	160500	122	0		400
3002540088	THISTLE UNIT #018H	33	23S	33E	N	280S	2611W	Lea	NM	6.6	14,879.2		40565.9	7296.4	79.8	820.9	0.6	86700	244	0		300
3002541118	THISTLE UNIT #018H	33	23S	33E	N	280S	2611W	Lea	NM	6.5	16,164.2		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541253	THISTLE UNIT #018H	34	23S	33E	N	280S	2611W	Lea	NM	6.5	16,164.2		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541254	THISTLE UNIT #018H	34	23S	33E	N	280S	2611W	Lea	NM	6.5	16,164.2		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541302	THISTLE UNIT #018H	34	23S	33E	P	200S	660E	Lea	NM	6.5	16,164.2		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541342	THISTLE UNIT #018H	22	23S	33E	O	150S	2100E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002538983	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541467	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541468	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541466	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541467	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541468	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541469	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541470	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541471	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541472	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541473	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541474	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541475	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541476	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541477	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541478	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541479	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541480	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541481	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541482	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541483	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541484	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541485	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541486	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541487	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541488	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541489	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541490	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541491	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541492	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541493	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541494	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541495	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541496	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541497	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541498	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541499	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541500	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541501	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541502	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541503	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541504	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541505	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541506	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15,976.1		5347.9	8192.1	46.1	890.3	1.64	99400	122	0		200
3002541507	THISTLE UNIT #017H	33	23S	33E	O	150S	1470E	Lea	NM	6.4	15											

Table 3
Produced Water

wellname	api	latitude	longitude	section	township	range	unit	ftgs	ftgws	county	state	ph	tds_mgl	resistivity_ohm_cm	sodium_mgl	calcium_mgl	iron_mgl	magnesium_mgl	manganese_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl	h2s_mgl	co2_mgl
THISTLE UNIT #048H	3002541253	32.284959	-103.560495	34	23S	33E	N	2805	2561W	Lea	NM	6.7	16709.3	0.039	5387.8	7649	28.6	877.2	1.03	98977.7	244	675		300
THISTLE UNIT #054H	3002541302	32.254463	-103.553757	34	23S	33E	P	2005	660E	Lea	NM	6.68	14616.4	0.04	47938.1	7126	53.7	824.4	1.28	88180	183	880		450
THISTLE UNIT #055H	3002541303	32.254463	-103.553757	34	23S	33E	P	1245	1058E	Lea	NM	6.73	15950.4	0.04	47938.1	7126	53.7	824.4	1.28	88180	183	880		500
SEA SNAKE 35 STATE #003H	3002541625	32.2544518	-103.5474319	35	23S	33E	M	2005	1295W	Lea	NM	6.73	14616.4	0.04	47938.1	7126	53.7	824.4	1.28	88180	183	880		60
SEA SNAKE 35 STATE #004H	3002541626	32.2544518	-103.5474319	35	23S	33E	M	2005	1295W	Lea	NM	6.73	14616.4	0.04	47938.1	7126	53.7	824.4	1.28	88180	183	880		40
THISTLE UNIT #056H	3002540015	32.285584	-103.5664825	27	23S	33E	D	150N	150W	Lea	NM	6.5	16967.8	0.035	53906.6	9118	40.6	1014	1.19	102765.8	71.2	425	200	
THISTLE UNIT #057H	3002540743	32.311583	-103.5587692	15	23S	33E	D	150N	150W	Lea	NM	6.5	16967.8	0.035	53906.6	9118	40.6	1014	1.19	102765.8	71.2	425	200	
THISTLE UNIT #058H	3002541340	32.283371	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #059H	3002541342	32.283371	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #060H	3002541466	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #061H	3002541467	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #062H	3002541468	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #063H	3002541469	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #064H	3002541470	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #065H	3002541471	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #066H	3002541472	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #067H	3002541473	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #068H	3002541474	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #069H	3002541475	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #070H	3002541476	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #071H	3002541477	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #072H	3002541478	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #073H	3002541479	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #074H	3002541480	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #075H	3002541481	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #076H	3002541482	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #077H	3002541483	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #078H	3002541484	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #079H	3002541485	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #080H	3002541486	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #081H	3002541487	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #082H	3002541488	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #083H	3002541489	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #084H	3002541490	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #085H	3002541491	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #086H	3002541492	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #087H	3002541493	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #088H	3002541494	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #089H	3002541495	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #090H	3002541496	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #091H	3002541497	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #092H	3002541498	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #093H	3002541499	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #094H	3002541500	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #095H	3002541501	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #096H	3002541502	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #097H	3002541503	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #098H	3002541504	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2	765	230	
THISTLE UNIT #099H	3002541505	32.2841988	-103.5587692	22	23S	33E	O	1505	2200E	Lea	NM	5.43	135196.2	0.047	43971.3	7109	54.7	790.2	1.15	93881.5	500.2			

Table 3
Produced Water

wellname	api	latitude	longitude	section	township	range	unit	ftgs	ftgsw	county	state	ph	tds_mgl	resistivity_ohm_cm	sodium_mgl	calcium_mgl	iron_mgl	magnesium_mgl	manganese_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl	h2s_mgl	co2_mgl
RIO BLANCO 5 STATE #001	3002536302	32.3246078	-103.4773582	9	23S	34E	B	660N	2129E	Lea	NM	5.6	6810.3		15070.8	6754	28	2137		41261	165.9	277		
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	6.2	71521.1		25245.7	1754	5	255		42208	207.4	1176		75
RIO BLANCA 4 FEDERAL COM #001	3002534515	32.3354988	-103.4771652	4	23S	34E	P	1980N	1980W	Lea	NM	5.7	84267.8		28936.1	2670	64	383		50154	153.7	1230		
RIO BLANCO 9 STATE #001	3002536302	32.3246078	-103.4773582	9	23S	34E	B	660N	2129E	Lea	NM	5.9	83217.6		28207.2	2817	1	493		49511	290.4	1188		
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	5.8	81393.3		27595.1	2657	9.5	497		48230	331.8	1340		
RIO BLANCO 9 STATE #001	3002536302	32.3246078	-103.4773582	9	23S	34E	B	660N	2129E	Lea	NM	5.9	81393.3		27595.1	2657	107	497		48230	331.8	1340		
RIO BLANCO 9 STATE #001	3002536302	32.3246078	-103.4773582	9	23S	34E	B	660N	2129E	Lea	NM	5.9	72771.3		25998.8	2724	8	454		44417	311.1	1123		
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	5.8	72187.8		26914.3	2151	7.5	345		42673	331.8	1198		
RIO BLANCA 4 FEDERAL COM #001	3002534515	32.3354988	-103.4771652	4	23S	34E	P	1980N	1980W	Lea	NM	6.1	74296		25272.2	2558	47	343		44022	456.3	1031		60
RIO BLANCO 9 STATE #001	3002536302	32.3246078	-103.4773582	9	23S	34E	B	660N	2129E	Lea	NM	6	74579		25245.9	2472	33	363		44159	414.8	1112		50
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	6.1	73515.4		25198.7	2394	22	320		43444	456.3	1134		25
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	6.6	73741.5		24588.3	2814	5	363	0.2	42853	732	1724		
ANTELOPE RIDGE UNIT #003	300251082	32.2593155	-103.4610748	34	23S	34E	K	1980S	1650W	LEA	NM	6.9	80187							47900	476	900		
RIO BLANCO 9 STATE #001	3002534577	32.321888	-103.4844224	9	23S	34E	E	1650N	660W	Lea	NM	6.9	70554		22500.6	2476.8	0	337.7	0	42721	732	1299		200
RIO BLANCO 9 STATE #001	3002536302	32.3246078	-103.4773582	9	23S	34E	B	660N	2129E	Lea	NM	6.2	192154		5408.3	13493.7	59.3	1983	2.7	139514	122	943		200
HELL LAKE UNIT #009	3002526261	32.3208468	-103.5110779	18	23S	34E	K	1980S	1980W	LEA	NM	6.2	294052							130000	512	260		
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	7	69346		21964.7	3876	1	378	0.08	40711	366	1404		100
MAD DOG 15 FEDERAL COM #001	3002536778	32.299302	-103.4514099	15	23S	34E	P	660S	660E	Lea	NM	8.4	69346		24102.3	1893	4.5	298	0.2	40711	366	1404		20
CABALLO 9 STATE #001	3002534577	32.321888	-103.4844224	9	23S	34E	E	1650N	660W	LEA	NM	7	122402.2		38021	6823	11	1120	1	73500	622.2	1213		300

Table 4 - Chemistry of Produced Water from Formations

wellname	api	section	township	range	unit	county	state	field	formation	depth	samplesource	sampledate	ph	specificgravity	specificgravity_temp_F	ids_mgl	resistivity_ohm_cm	resistivity_ohm_cm_temp_F	conductivity	conductivity_temp_F	sodium_mgl	calcium_mgl	magnesium_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl
MCKITTRICK FED #1	3001500135	25 225	25E	G	EDDY NM				DEVONIAN	DST						16200								8762	290	1175
MCKITTRICK FED #1	3001500135	25 225	25E	G	EDDY NM				DEVONIAN	DST						17510								9389	664	982
CARNERO PEAK UT #001	3001510053	31 225	25E	A	EDDY NM				DEVONIAN	DST						14601								7236	515	1487
CARNERO PEAK UT #001	3001510053	31 225	25E	A	EDDY NM				DEVONIAN	DST						15780								8126	336	1467
CARNERO PEAK UT #001	3001510053	31 225	25E	A	EDDY NM				DEVONIAN	DST						15580								7853	487	1488
BANDANA POINT UT #001	3001500044	13 235	23E	O	EDDY NM			BANDANA POINT	DEVONIAN	DST						15500								8020	500	1190
TORTOISE ASB COM #001	3001510490	29 235	24E	G	EDDY NM				DEVONIAN	DST						17861								7760	490	3100
TORTOISE ASB COM #001	3001510490	29 235	24E	G	EDDY NM				DEVONIAN	DST						15601								7780	476	1600
REMUDA BASIN UNIT #001	3001508691	24 235	29E	J	EDDY NM			REMUDA	DEVONIAN	DST						64582								37500	610	1700
REMUDA BASIN UNIT #001	3001508691	24 235	29E	J	EDDY NM			REMUDA	DEVONIAN	DST						29000								1740	4980	1000
BELL LAKE UNIT #006	3002508483	6 235	34E	O	LEA NM			BELL LAKE NORTH	DEVONIAN	SWAB	HEATER TREATER	14/11/1967 0:00	7			56922								29000	1740	4980
ANTELOPE RIDGE UNIT #003	3002510282	34 235	34E	K	LEA NM			ANTELOPE RIDGE	DEVONIAN	UNKNOWN	UNKNOWN	14/11/1967 0:00	6.9			80187								47900	476	900
ANTELOPE RIDGE UNIT #003	3002510282	34 235	34E	K	LEA NM			ANTELOPE RIDGE	DEVONIAN	UNKNOWN	UNKNOWN	14/11/1967 0:00	6.9			80187								47900	476	900
CUNE FEDERAL #001	3002510717	14 235	37E	K	LEA NM			CUNE	DEVONIAN	PRODUCTION TEST	UNKNOWN					118979								71380	462	2593
E C HILL B FEDERAL #001	3002510945	34 235	37E	A	LEA NM			TEAGUE	DEVONIAN	UNKNOWN	UNKNOWN					112959								67390	288	2765
E C HILL D FEDERAL #001	3002510947	34 235	37E	H	LEA NM			TEAGUE	DEVONIAN	UNKNOWN	UNKNOWN					35659								48	246	2020
E C HILL D FEDERAL #004	3002510950	34 235	37E	A	LEA NM			TEAGUE	DEVONIAN	DST	UNKNOWN					286252								71380	462	2593
HUAPACHE #003	3002510020	22 245	22E	F	EDDY NM				DEVONIAN	DST	UNKNOWN					3110								121000	175	2220
JURNEGAN POINT #001	3002510280	5 245	25E	M	EDDY NM			WILDCAT	DEVONIAN	DST	DST	14/12/1964 0:00	7			229706								136964	198	2511
JURNEGAN POINT #001	3002510280	5 245	25E	M	EDDY NM			WILDCAT	DEVONIAN	DST	DST	14/12/1964 0:00	7			229706								136964	198	2511
WHITE CITY PENN GAS COM UNIT 1 #001	3002509716	36 245	26E	A	EDDY NM				DEVONIAN	DST	UNKNOWN	01/03/1960 0:00	7	1.012	60	203100	0.36	75	25596	64	6072	1002	132	10320	653	1336
STATE B COM #001	3002509716	36 245	36E	C	LEA NM			CUSTER	DEVONIAN	UNKNOWN	UNKNOWN					176234								107400	128	1004
ELLIOTT H FEDERAL #001	3002512272	31 245	38E	H	LEA NM			DOLLARHIDE	DEVONIAN	WELLHEAD	WELLHEAD					58687										
ELLIOTT H FEDERAL #001	3002512272	31 245	38E	H	LEA NM			DOLLARHIDE	DEVONIAN	WELLHEAD	WELLHEAD					57018										
WEST DOLLARHIDE DEVONIAN UNIT #104	3002512297	32 245	38E	I	LEA NM			DOLLARHIDE	DEVONIAN	WELLHEAD	WELLHEAD	17/06/1961 0:00	6			50858								30200	183	980
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					80880								46200	340	3050
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					84900								48600	840	2650
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					72200								41000	370	2960
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					80900								46200	340	3050
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					77600								44000	550	3240
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					135000								77000	650	5810
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					114000								65000	280	5110
WESTATES FEDERAL #004	3002511389	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	DST	DST					135000								77000	500	5320
WESTATES FEDERAL #008	3002511393	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	UNKNOWN	UNKNOWN					91058								51020	376	4783
WESTATES FEDERAL #008	3002511393	1 255	37E	E	LEA NM			JUSTIS NORTH	FUSSELMAN	UNKNOWN	UNKNOWN					86847								50450	363	2544
STATE NJ A #001	3002511398	2 255	37E	A	LEA NM			JUSTIS NORTH	DEVONIAN	DST	UNKNOWN					105350								59300	660	4950
NEW MEXICO BNA STATE #002	3002511407	2 255	37E	I	LEA NM			JUSTIS NORTH	DEVONIAN	UNKNOWN	UNKNOWN					77770								45500	1800	2400
HALE STATE #003	3002512581	2 255	37E	H	LEA NM			JUSTIS NORTH	DEVONIAN	WELLHEAD	WELLHEAD					64916								37000	813	2500
SOUTH JUSTIS UNIT #016F	3002511556	13 255	37E	F	LEA NM			JUSTIS NORTH	FUSSELMAN	UNKNOWN	UNKNOWN					57675								34930	595	1211
LEARCY MCBUFFINGTON #008	3002511569	13 255	37E	N	LEA NM			203MINITY, 259PSLM	FUSSELMAN	7052	UNKNOWN	02/01/1900 0:00	7.6	1.037	78	67909								684	2603	81429
LEARCY MCBUFFINGTON #008	3002511569	13 255	37E	N	LEA NM			JUSTIS	DEVONIAN	UNKNOWN	UNKNOWN					67898								38880	742	2489
A B COATES C FEDERAL #014	3002511736	24 255	37E	G	LEA NM			JUSTIS	DEVONIAN	UNKNOWN	UNKNOWN					39261								22840	871	1030
SOUTH JUSTIS UNIT #023C	3002511760	25 255	37E	C	LEA NM			JUSTIS	FUSSELMAN	DST	SEPARATOR					63817								35870	360	3442
CARLSON A #002	3002511760	25 255	37E	C	LEA NM			JUSTIS	FUSSELMAN	DST	SEPARATOR					208280								124000	510	3400
STATE Y #009	3002511771	25 255	37E	A	LEA NM			JUSTIS	FUSSELMAN	DST	DST	17/03/1961 0:00	7.3			219570								129000	960	4630
STATE Y #009	3002511771	25 255	37E	A	LEA NM			JUSTIS	FUSSELMAN	DST	DST	18/03/1961 0:00	6.8			163430								96000	290	3780
CARLSON B 25 #004	3002511784	25 255	37E	P	LEA NM			JUSTIS	FUSSELMAN	UNKNOWN	SEPARATOR					184030								112900	68	1806
COPPER #001	3002511818	28 255	37E	J	LEA NM			CROSSBY	DEVONIAN	UNKNOWN	UNKNOWN					27506								15770	1089	1079
ARNOTT RAMSAY NCTB #003	3002511863	32 255	37E	A	LEA NM			CROSSBY	DEVONIAN	8797	UNKNOWN	02/01/1900 0:00		1.142	70									17244	5345	100382
ARNOTT RAMSAY NCTB #003	3002511863	32 255	37E	A	LEA NM			CROSSBY	DEVONIAN	UNKNOWN	UNKNOWN					158761								56776		
WEST DOLLARHIDE DEVONIAN UNIT #110	3002512386	5 255	38E	B	LEA NM			DOLLARHIDE	DEVONIAN	UNKNOWN	UNKNOWN															
FAIRNSWORTH FEDERAL #006	3002511950	4 265	37E	A	LEA NM			CROSSBY	DEVONIAN	UNKNOWN	UNKNOWN					31931								20450	302	591

OSE Well Logs – NO WATER SUPPLY WELLS

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996
Artesia ▲ Carlsbad ▲ Durango ▲ Midland

August 6, 2019

Hobbs News Sun
201 N. Thorp
P.O. Box 850
Hobbs, N.M. 88240

LEGAL NOTICE

AWR Disposal LLC, 3300 N. A Street, Ste. 220, Midland, TX 79705 filed Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Final Final SWD #1 will be located 2,015 feet from the North line and 1,071 feet from the East line, Section 16, Township 23 South, Range 34 East, Lea County, New Mexico. Produced water from area production will be commercially disposed into the Devonian, Fusselman and Montoya Formations at a depth of 14,671 feet to 16,661 feet at a maximum surface pressure of 3,000 psi and an average injection rate of 30,000 barrels per day. The proposed SWD well is located approximately 26.5 miles southwest of Eunice, New Mexico.

Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, NM 87505 (505) 476-3460 within 15 days of the date of this notice.

Additional information can be obtained by contacting Mr. Randall Hicks, agent for Accelerated Water Resources, LP, at 505-238-9515.

Sincerely,
R.T. Hicks Consultants



Randall Hicks
Principal

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
August 07, 2019
and ending with the issue dated
August 07, 2019.



Publisher

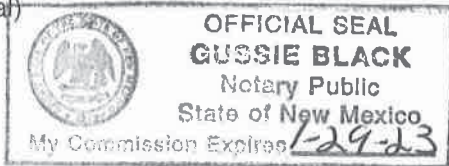
Sworn and subscribed to before me this
7th day of August 2019.



Business Manager

My commission expires
January 29, 2023

(Seal)



This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

LEGALS

LEGAL NOTICE AUGUST 7, 2019

AWR Disposal LLC, 3300 N. A Street, Ste. 220, Midland, TX 79705 filed Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Final SWD #1 will be located 2,015 feet from the North line and 1,071 feet from the East line, Section 16, Township 23 South, Range 34 East, Lea County, New Mexico. Produced water from area production will be commercially disposed into the Devonian, Fusselman and Montoya Formations at a depth of 14,671 feet to 16,661 feet at a maximum surface pressure of 3,000 psi and an average injection rate of 30,000 barrels per day. The proposed SWD well is located approximately 26.5 miles southwest of Eunice, New Mexico.

Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, NM 87505 (505) 476-3460 within 15 days of the date of this notice.

Additional information can be obtained by contacting Mr. Randall Hicks, agent for Accelerated Water Resources, LP, at 505-238-9515.

Sincerely,
R.T. Hicks Consultants
Randall Hicks
Principal
#34532

67115764

00231780

RANDALL HICKS
R.T. HICKS CONSULTANTS, LTD
901 RIO GRANDE BLVD NM
SUITE F-142
ALBUQUERQUE, NM 87104

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996
Artesia ▲ Carlsbad ▲ Durango ▲ Midland

August 09, 2019

NOTIFICATION TO INTERESTED PARTIES

Via U.S. Certified Mail – Return Receipt Requested

To Whom It May Concern:

AWR Disposal, LLC, Midland, Texas, has made application to the New Mexico Oil Conservation Division to drill and complete, for salt water disposal, the Final Final SWD #1. The proposed commercial operation will be for produced water disposal from area operators. As indicated in the notice below, the well is Section 16, Township 23 South, Range 34 East in Lea County, New Mexico.

The published notice states that the interval will be from 14,671 feet to 16,661 feet into the Devonian, Fusselman and Montoya Formations.

LEGAL NOTICE

AWR Disposal LLC, 3300 N. A Street, Ste. 220, Midland, TX 79705 filed Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Final Final SWD #1 will be located 2,015 feet from the North line and 1,071 feet from the East line, Section 16, Township 23 South, Range 34 East, Lea County, New Mexico. Produced water from area production will be commercially disposed into the Devonian, Fusselman and Montoya Formations at a depth of 14,671 feet to 16,661 feet at a maximum surface pressure of 3,000 psi and an average injection rate of 30,000 barrels per day. The proposed SWD well is located approximately 26.5 miles southwest of Eunice, New Mexico.

Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 S. St. Francis Dr., Santa Fe, NM 87505 (505) 476-3460 within 15 days of the date of this notice.

You have been identified as a party who may be interested as an offset lessee or operator. **IF YOU WOULD LIKE AN ELECTRONIC COPY OF THE ENTIRE PERMIT PACKAGE, PLEASE SEND YOUR REQUEST TO** david@rthicksconsult.com (request a read receipt to avoid your email becoming stuck in spam).

Thank you for your attention in this matter.

Sincerely,
R.T. Hicks Consultants



Randall Hicks
Principal

OPERATORS, LEASEHOLDERS AND SURFACE OWNERS WITHIN 1 MILE -RADIUS

Bureau of Land Management Final Final SWD #1 620 E. Greene Street Carlsbad, NM 88220-6292	COG OPERATING LLC Final Final SWD #1 600 W Illinois Ave Midland, TX 79701	ConocoPhillips Final Final SWD #1 Attn: Lakeiva Noel PO Box 2197 Houston, TX 77252
DEVON ENERGY PRODUCTION CO. Final Final SWD #1 333 W. SHERIDAN AVENUE Oklahoma City, OK 73102	ENDEAVOR ENERGY RESOURCES, LP Final Final SWD #1 110 NORTH MARIENFELD SUITE 200 Midland, TX 79701	EOG Y RESOURCES, INC. Final Final SWD #1 104 S 4TH ST Artesia, NM 88210
J C WILLIAMSON Final Final SWD #1 PO BOX 16 Midland, TX 79702	KAISER-FRANCIS OIL CO Final Final SWD #1 6733 S YALE AVE Tulsa, OK 74136	LIMESTONE BASIN PROP RANCH LLC Final Final SWD #1 18 DESTA DRIVE Midland, TX 79705
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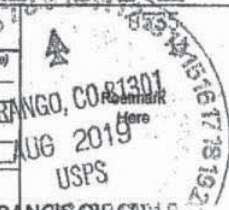
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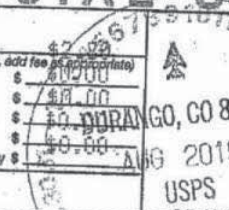
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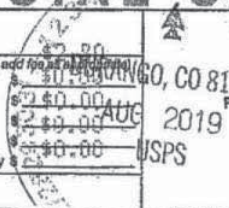
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Artesia ▲ Carlsbad ▲ Durango ▲ Midland

August 21, 2019

Mr. Phillip Goetze, P.G.
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: AWR Disposal, LLC. Final Final SWD#1
UL H, Section 16 T23S R34E, Lea County

Dear Mr. Goetze:

On behalf of AWR Disposal LLC, R.T. Hicks Consultants is providing data and an opinion regarding the probability that injection of wastewater in the above referenced well at the proposed rates will cause seismic events of sufficient magnitude to create damage. It is our understanding that OCD is interested in such an opinion as part of the SWD approval process. We elected to provide this opinion as a separate submission as the C-108 does not specifically require such an opinion.

We relied upon the following data to develop our opinion

- State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity, Jens-Erik Lund Snee and Mark D. Zoback, The Leading Edge, February 2018¹
- Plate 5, which is reproduced from the Snee and Zoback publication, which uses the following references
 - Crone, A. J., and R. L. Wheeler, 2000, Data for Quaternary faults, liquefaction features, and possible tectonic features in the Central and Eastern United States, east of the Rocky Mountain front; U.S. Geological Survey Open-File Report.
 - Ewing, T. E., R. T. Budnik, J. T. Ames, and D. M. Ridner, 1990, Tectonic map of Texas: Bureau of Economic Geology, University of Texas at Austin.
 - Green, G. N., and G. E. Jones, 1997, a digital geologic map of New Mexico in ARC/INFO format: U.S. Geological Survey Open-File Report.
 - Ruppel, S. C., R. H. Jones, C. L. Breton, and J. A. Kane, 2005, Preparation of maps depicting geothermal gradient and Precambrian structure in the Permian Basin: USGS Order no. 04CRSA0834 and Requisition no. 04CRPR01474.
 - NMOCD database of oil and gas wells
- Plate 5, which shows the distribution of active and new SWD wells in the area of the proposed AWR Disposal SWD well
- Stratigraphic and lithologic information from two deep wells in the Delaware Basin
- Data on the thickness and lithology of the Simpson Group from the Texas Bureau of Economic Geology²

¹ https://scits.stanford.edu/sites/default/files/3702_tss_lundsnee_v2.pdf

² http://www.beg.utexas.edu/resprog/permianbasin/PBGSP_members/writ_synth/Simpson.pdf

Plate 5 reproduces Figure 3 of the 2018 publication of Snee and Zoback and shows

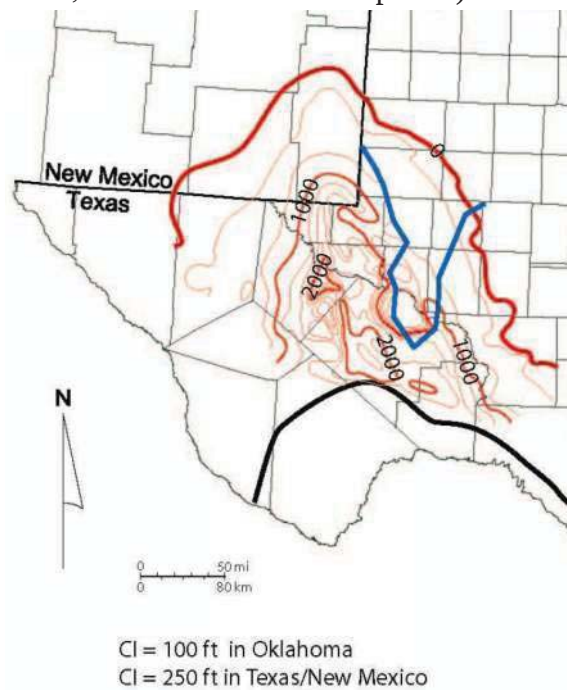
1. Fault traces based upon the references provided above for which Dr. Snee and Dr. Zoback provide a value of the fault slip potential (FSP)
2. Areas of documented seismic activity, and a magnitude 2.0-2.9 earthquake that occurred between 1970-2004 about 11 miles southwest of the proposed Final Final SWD #1. A slightly larger magnitude and more recent seismic event is reported about 24 miles west of the Final Final SWD #1 well location.
3. Although Plate 5 does not show faults that may be identified in confidential seismic data owned by oil and gas operators, the closest mapped basement fault is about 1 mile to the south, exhibits a low FSP (less than 5%) based upon the modeling and analysis of Snee and Zoback referenced above
4. Other mapped faults in southern Lea County shown on Plate 5 also show a low FSP, except for part of southwest-northeast trending fault about 15 miles north-northwest of the Final Final SWD #1 well that has a FSP of about 25 – 33% in the central portion of this fault trace.

Plate 6 reproduces the major elements of Plate 5 in the inset map and also shows that within an 6-mile radius around the proposed Final Final SWD #1, the OCD database shows about 3 active and 3 new Devonian SWDs, which translates into an average density of about one SWD for every 18 square miles.

Figure 4 from the referenced Bureau of Economic Geology (The Middle-Upper Ordovician Simpson Group of the Permian Basin: Deposition, Diagenesis, And Reservoir Development) is attached to this letter and the portion of that figure for the Delaware Basin is shown to the right. In southern Lea County the mapped thickness appears to be 500-1500 feet thick (note one contour line appears to be missing on the map). This unit, which is clay-rich carbonate interbedded with shale and sandstone, provides an excellent permeability/pressure barrier between the injection zone and the basement faults that were re-activated during Woodford time.

Data from the Amoco Federal CW Com 1 (3002528119) show that the thickness of the Simpson in the Antelope Ridge area of Lea County (Section 3 24S 34E) is about 450 feet thick with. This is consistent with Figure 4 of the BEG paper (probably because this well was used to produce the isopach map).

We contend that the data permit conclusion that unmapped faults (which may be located by confidential seismic data that AWR Disposal does not possess) near the Final Final SWD #1 would be dominantly north-south normal faults, as is common in Lea County. The data on Plate



July 23, 2019

Page 3

6 permit a conclusion that faults near the Final Final SWD #1 are also most likely to exhibit a low FSP, like the mapped faults shown on Plate 5.

Given the density of Devonian SWDs (planned/new and active) near the proposed Final Final SWD #1 well and the high likelihood that any unmapped faults in the area would exhibit a low FSP, the probability that injection into the Final Final SWD #1 would cause an increase in pore pressure to trigger a seismic event of sufficient magnitude to cause damage is very low.

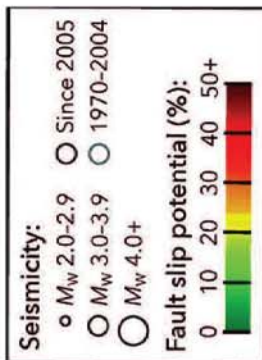
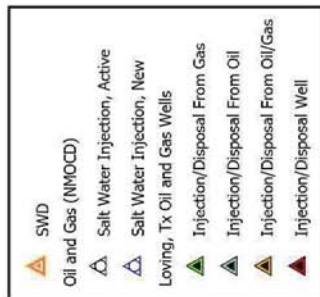
The users of this letter should recognize the uncertainties of using seismic maps of the Permian Basin to determine probability that injection of wastewater into a single SWD well could cause seismic events of sufficient magnitude to cause damage. However, on a regional basis injection by numerous wells into the Devonian/Fusselman/Montoya interval will raise the hydrostatic pressure. If pressure increases sufficiently, fluid could migrate from the injection zone along fault planes, up and down. Downward fluid migration will be intercepted first by the sandstone units of the Simpson Group. After fluid pressure increases in these sandstones, fluid would migrate downward into the Ellenberger Formation, which lies beneath the Simpson Group. This downward migration will next enter the permeable units of the Ellenberger and, over time, increase the fluid pressure. After fluid pressure in the Ellenberger is sufficiently large to cause downward migration along fault planes or other conduits, the migrating fluid will, in some areas, enter a thinner horizon of granite wash. Downward migrating fluids from the injection zone could then enter basement fault planes if the pressure in the granite wash horizon is sufficient, and reduce the frictional resistance (lubricate the faults). Reduction in the frictional force in faults due to fluid invasion can and has caused seismic events. In my opinion, the probability that injection into the Final Final SWD will measurably contribute to the events described above and will cause a seismic event resulting in damage is so low as to be nil.

Sincerely,
R.T. Hicks Consultants

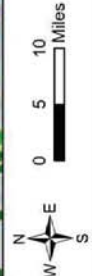
A handwritten signature in dark ink, appearing to read "Randall T. Hicks", with a stylized, cursive script.

Randall T. Hicks
Principal

Copy: AWR Disposal LLC

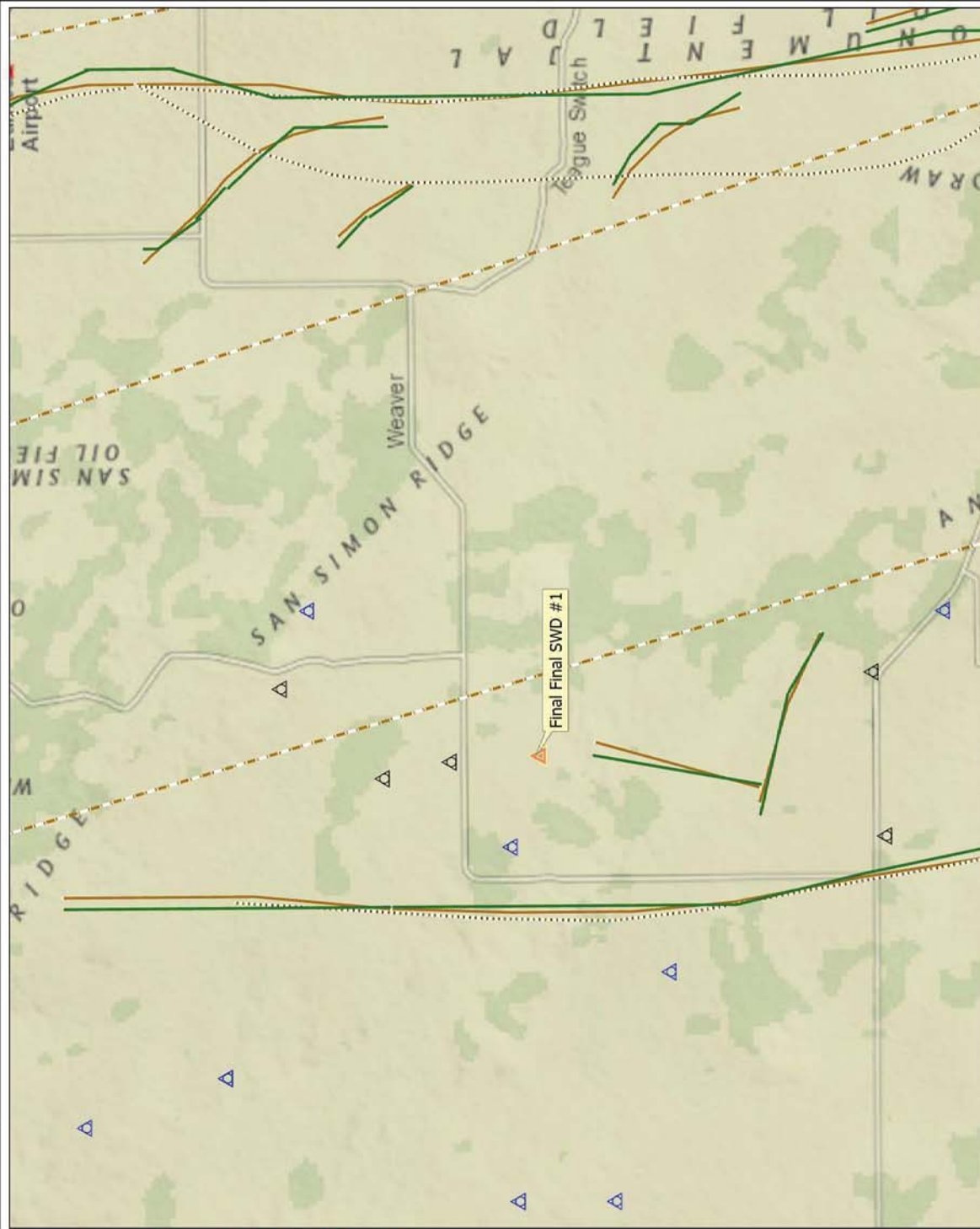


Seismic and Fault Slip Potential-
Ewing et al. (1990), Green and Jones (1997), Ruppel
et al. (2005), and the USGS Quaternary Faults and
Folds Database (Crone and Wheeler, 2000).



R.T. Hicks Consultants, Ltd 900 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505-266-5004	Fault Slip Potential and Seismicity AWR Disposal, LLC Final Final SWD #1	Plate 5 August 2019
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M:\Accelerated Water\SWD\arcGis\proj\Final\Final\arcGis\proj\Final\Final.aprx



- ▲ SWD
- ▲ Oil and Gas (NMOCD)
- ▲ Salt Water Injection, Active
- ▲ Salt Water Injection, New
- Faults**
- Fault - Woodford
- Fault - Precambrian
- Fault - Basement
- Fault Slip Potential (%)
- <5

Seismic and Fault Slip Potential-
Ewing et al. (1990), Green and Jones (1997), Ruppel
et al. (2005), and the USGS Quaternary Faults and
Folds Database (Crone and Wheeler, 2000).



R.T. Hicks Consultants, Ltd 9001 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505-266-5004	Fault Slip Potential AWR Disposal, LLC Final Final SWD #1	Plate 6 August 2019
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