Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:
12/24/2018		SWD	pMAM1836036437

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: Solaris Water Midstream, LLC **OGRID Number:** 371643
Well Name: Mills 19 SWD No.1 **API:** 30-025-xxxxx
Pool: Proposed: SWD; Devonian-Silurian **Pool Code:** 97869

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

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

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

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

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.

Ben Stone
Print or Type Name

Signature

12/19/2018
Date

903-488-9850
Phone Number

ben@sosconsulting.us
e-mail Address

SOS Consulting, LLC

December 19, 2018

New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Attn: Ms. Heather Riley, Director

Re: Application of Solaris Water Midstream, LLC to drill and permit for salt water disposal the Mills 19 SWD Well No.1, to be located in Section 19, Township 22 South, Range 32 East, NMPM, Lea County, New Mexico.

Dear Ms. Riley,

Please find the enclosed form C-108 Application for Authority to Inject, supporting the above-referenced request for salt water disposal. The well will be operated as a commercial endeavor offering operators in the area additional options for produced water disposal.

Solaris Water Midstream is a major provider of salt water disposal services to operators in southeast New Mexico and seeks to optimize efficiency, both economically and operationally, of all its operations. Approval of this application is consistent with that goal as well as the NMOCD's mission of preventing waste and protection of correlative rights.

I would point out that this application for a proposed Devonian SWD interval includes the currently mandated increased One-Mile Area of Review including pertinent and available seismic information for the area and region. Published legal notice ran December 15, 2018 in the Hobbs News-Sun and all offset operators and other interested parties have been notified individually. The legal notice affidavit is included with this application. The application also includes a wellbore schematic, area of review maps, affected party plat and other required information for a complete Form C-108. The well is located on private surface and minerals. There are state and federal lands & minerals and private minerals within the one-mile radius notice area; the State Land Office, Bureau of Land Management and offset operators have been notified of this application.

I respectfully request that the approval of this salt water disposal well proceed swiftly and if you or your staff requires additional information or has any questions, please do not hesitate to call or email me.

Best regards,

Ben Stone, Partner
SOS Consulting, LLC
Agent for Solaris Water Midstream, LLC

Cc: Application attachment and file

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: ***Salt Water Disposal*** and the application ***QUALIFIES*** for administrative approval.

II. OPERATOR: ***Solaris Water Midstream, LLC***
ADDRESS: ***701 Tradewinds Blvd., Suite C, Midland, TX 79706***

CONTACT PARTY: ***Agent: SOS Consulting, LLC – Ben Stone (903) 488-9850***

III. WELL DATA: ***All well data and applicable wellbore diagrams are ATTACHED.***

IV. ***This is not an expansion of an existing project.***

V. ***A map is attached*** 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. A tabulation is attached of data on all wells of public record within the area of review which penetrate the proposed injection zone. ***There are NO (0) Wells in the subject AOR which Penetrate the proposed Devonian interval.*** The data includes a description of each well's type, construction, date drilled, location, depth, and a schematic of any plugged well illustrating all plugging detail. ***NO P&A Wells penetrate.***

VII. ***The following data is ATTACHED*** 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. ***Appropriate geologic data on the injection zone is ATTACHED*** 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. ***Stimulation program – a conventional acid job may be performed to clean and open the formation.***

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

*XI. ***There is 1 (one) water well POD within one mile of the proposed salt water disposal well. Analysis will be forwarded.***

XII. ***An affirmative statement is ATTACHED that available geologic and engineering data has been examined and no evidence was found*** of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. ***"Proof of Notice" section on the next page of this form has been completed and ATTACHED. There are 4 offset lessees and/or operators within 1 mile and federal minerals - all have been noticed. Well location is Private.***

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: ***Ben Stone*** TITLE: ***SOS Consulting, LLC agent for Solaris Water Midstream, LLC***

SIGNATURE: _____ DATE: ***12/19/2018***

E-MAIL ADDRESS: ***ben@sosconsulting.us***

* 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:

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

FORM C-108 – APPLICATION FOR AUTHORIZATION TO INJECT (cont.)

III. WELL DATA – ***The following information and data is included (See ATTACHED Wellbore Schematic):***

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 ***pursuant to the following criteria is ATTACHED.***

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.

C-108 - Items III, IV, V

Item III - Subject Well Data

Wellbore Diagram - PROPOSED

Item IV – Tabulation of AOR Wells

NO wells penetrate the proposed injection interval.

Item V – Area of Review Maps

1. Two Mile AOR Map with One-Mile Fresh Water Well Radius

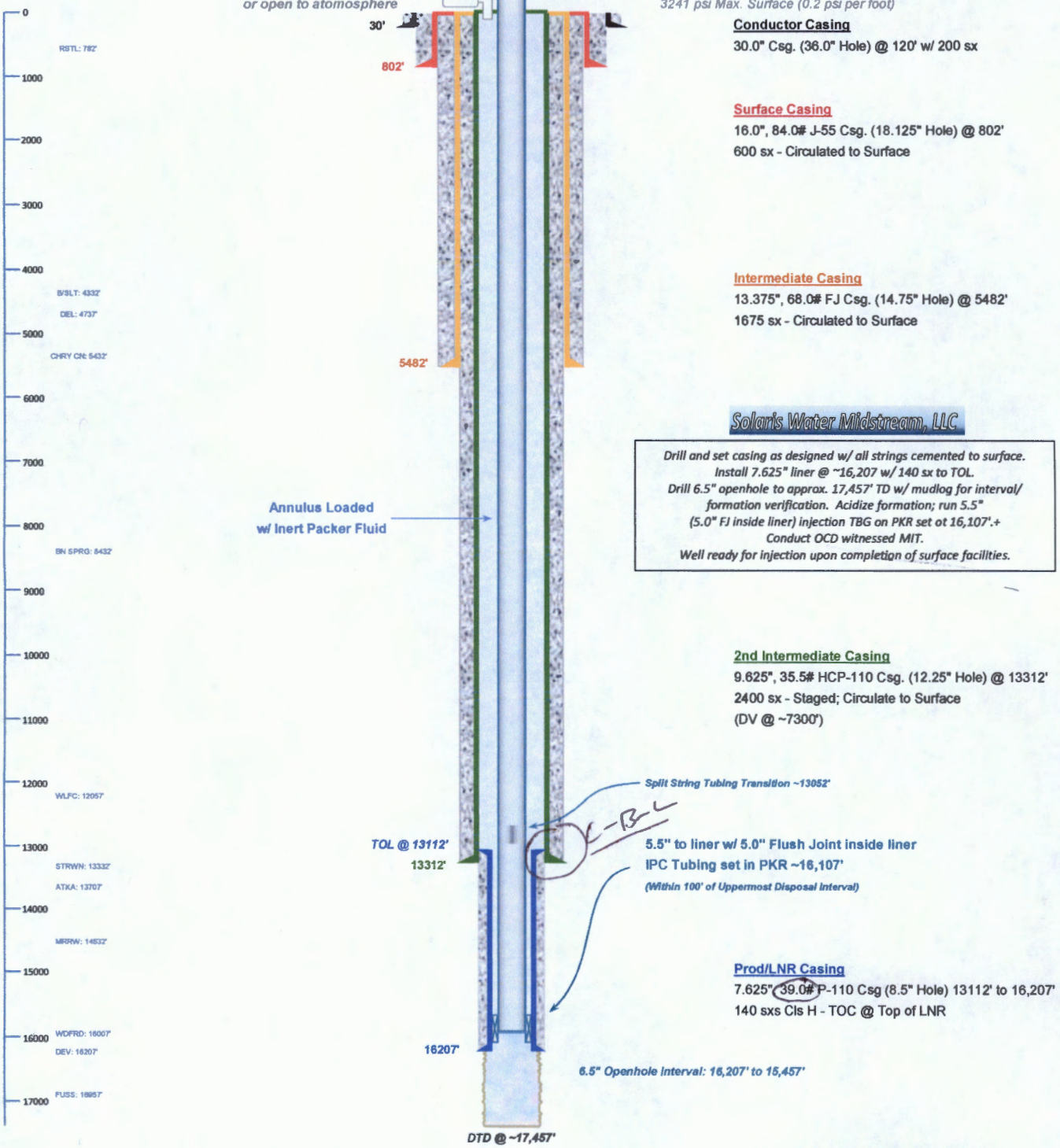
2. One-Half Mile AOR Map

All Above Exhibits follow this page.

WELL SCHEMATIC - PROPOSED
Mills 19 SWD Well No.1

API 30-025-xxxxx
2430' FNL & 1170' FWL, SEC. 19-T22S-R32E
LEA COUNTY, NEW MEXICO

SWD; Devonian-Silurian (97869)
Spud Date: 3/01/2019
SWD Config Dt: 4/01/2019



Conductor Casing
30.0" Csg. (36.0" Hole) @ 120' w/ 200 sx

Surface Casing
16.0", 84.0# J-55 Csg. (18.125" Hole) @ 802'
600 sx - Circulated to Surface

Intermediate Casing
13.375", 68.0# FJ Csg. (14.75" Hole) @ 5482'
1675 sx - Circulated to Surface

Solaris Water Midstream, LLC

Drill and set casing as designed w/ all strings cemented to surface.
Install 7.625" liner @ ~16,207 w/ 140 sx to TOL.
Drill 6.5" openhole to approx. 17,457' TD w/ mudlog for interval/ formation verification. Acidize formation; run 5.5" (5.0" FJ inside liner) injection TBG on PKR set ot 16,107'.+
Conduct OCD witnessed MIT.
Well ready for injection upon completion of surface facilities.

2nd Intermediate Casing
9.625", 35.5# HCP-110 Csg. (12.25" Hole) @ 13312'
2400 sx - Staged; Circulate to Surface
(DV @ ~7300')

Prod/LNR Casing
7.625", 39.0# P-110 Csg (8.5" Hole) 13112' to 16,207'
140 sxs Cls H - TOC @ Top of LNR

Drawn by: Ben Stone, 12/14/2018

SOS Consulting, LLC

SOLARIS MIDSTREAM

Mills 19 SWD #1

WELLBORE DATA SHEET

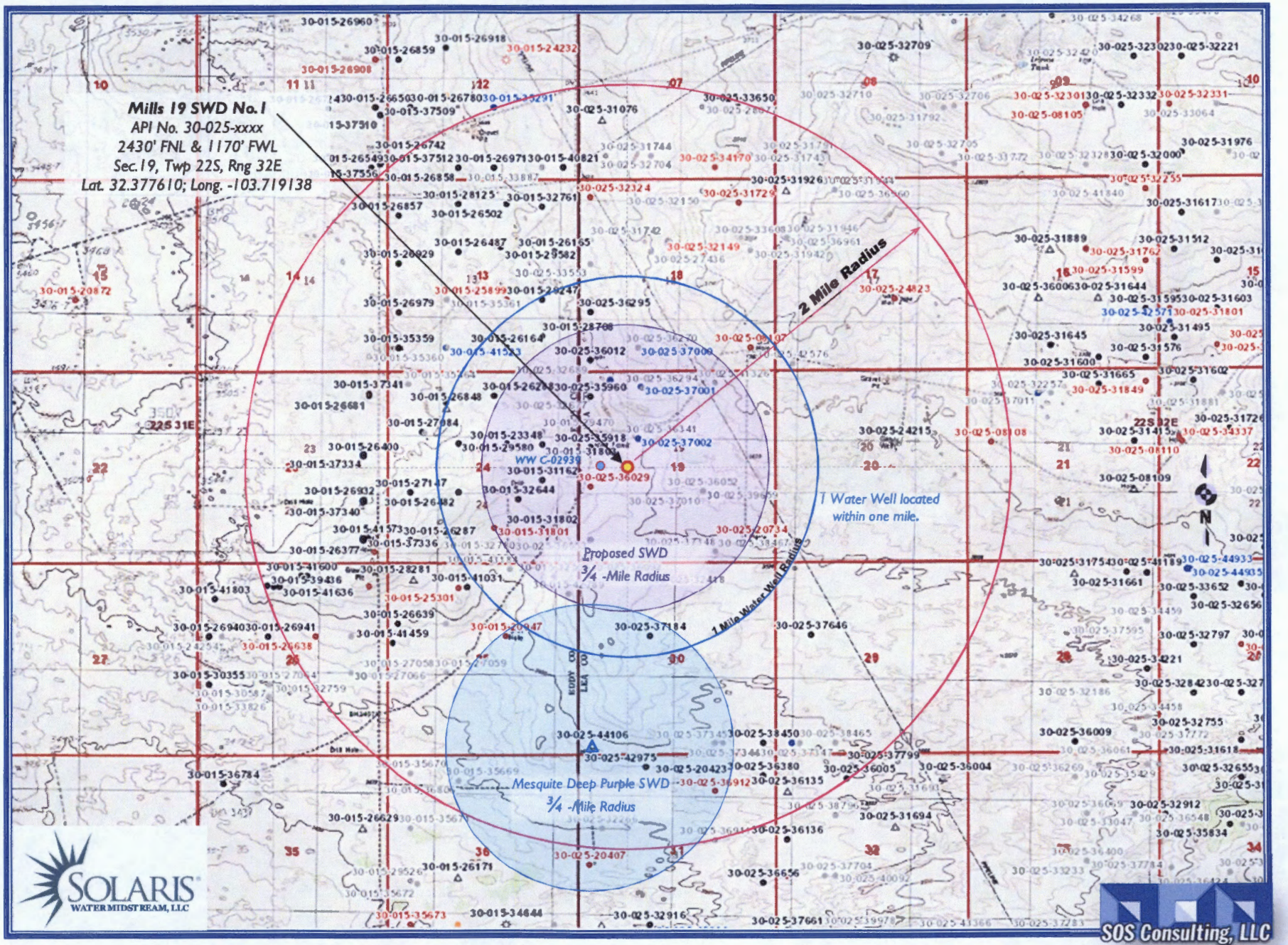
FIELD NAME: SWD
WELL NAME: Mills 19 SWD #1
LOCATION: 2430' FNL & 1170' FWL
Lea Co. NM
OBJECTIVE: Devonian/Fusselman SWD

TOTAL DEPTH: 17,457
SURF. LOC'N: Section 19, T22S, R32E
BTM. HOLE LOC'N: Same As Above
SURFACE ELEV.: 3589'

MUD LOGGING / E LOGGING / DIRECTIONAL	CASING SIZE (IN.)	RKB DRILL DEPTH MD	RKB DRILL DEPTH TVD	BOPE	FORMATION	HOLE SIZE (IN.)	MUD WT.	FRAC GRAD
	RKB	30						
Grnd Level		3,731						
GL ELEV.								
							Set and grouted	
	30"	120'	120'		Open		8.8	
						18.125"	8.4	
		782			Rustler			
	16"	802	802		21-1/4"-5M Annular/Diverter		8.4	
	84 lb/ft J55 BTC						9.5	
		[illegible]			T Salt:			
		4,382			B/Salt			
							9.5	
						14.75"	to	
							10	
		[illegible]			Bell Canyon			
Mud Logging to begin @2500'								
		5,432			Cherry Canyon			
	13.375"	5,482	5,482		13-5/8"-5M Annular		10.0	
	68 lb/ft L-80, EZ-GO FJ3				13-5/8"-10M BOP's		9.4	FIT
		6,707			Brushy Canyon			
		8,432			Bone Spring LM			
		9,507			First BS Sand			
		10,457			2nd BS Sand			
		11,507			Third BS Sand		9.4	
						12.25"	to	
		12,057			Wolfcamp		10.0	
	TOL	13,112	13,112					
	9.625"				13-5/8"-5M Annular		10.0	
	53.50 lb/ft HCP-110, BTC	13,312	13,312		13-5/8"-10M BOP's		12.5	15.6
		13,332			Strawn			
		13,707			Atoka			
		14,532			Morrow			
							12.5	
		15,232			Barnett	8.5"	to	
		15,682			Mississipian LM		13.5	
		16,007			Woodford			
		16,207			Devonian			
	Wedge 513 Liner 7.625"	16,207	16,207		13-5/8"-5M Annular		13.5	
	39 lb/ft P-110				13-5/8"-10M BOP's			
Run #1		16,957			Fusselman	6.5"	9.0	
GR/NEUTRON ##### - 0								
USIT/CBL ##### - 0								
Dual 0"		TD 17,457	17,457		13-5/8"-5M Annular	TD at Base of Fusselman		
					13-5/8"-10M BOP's			

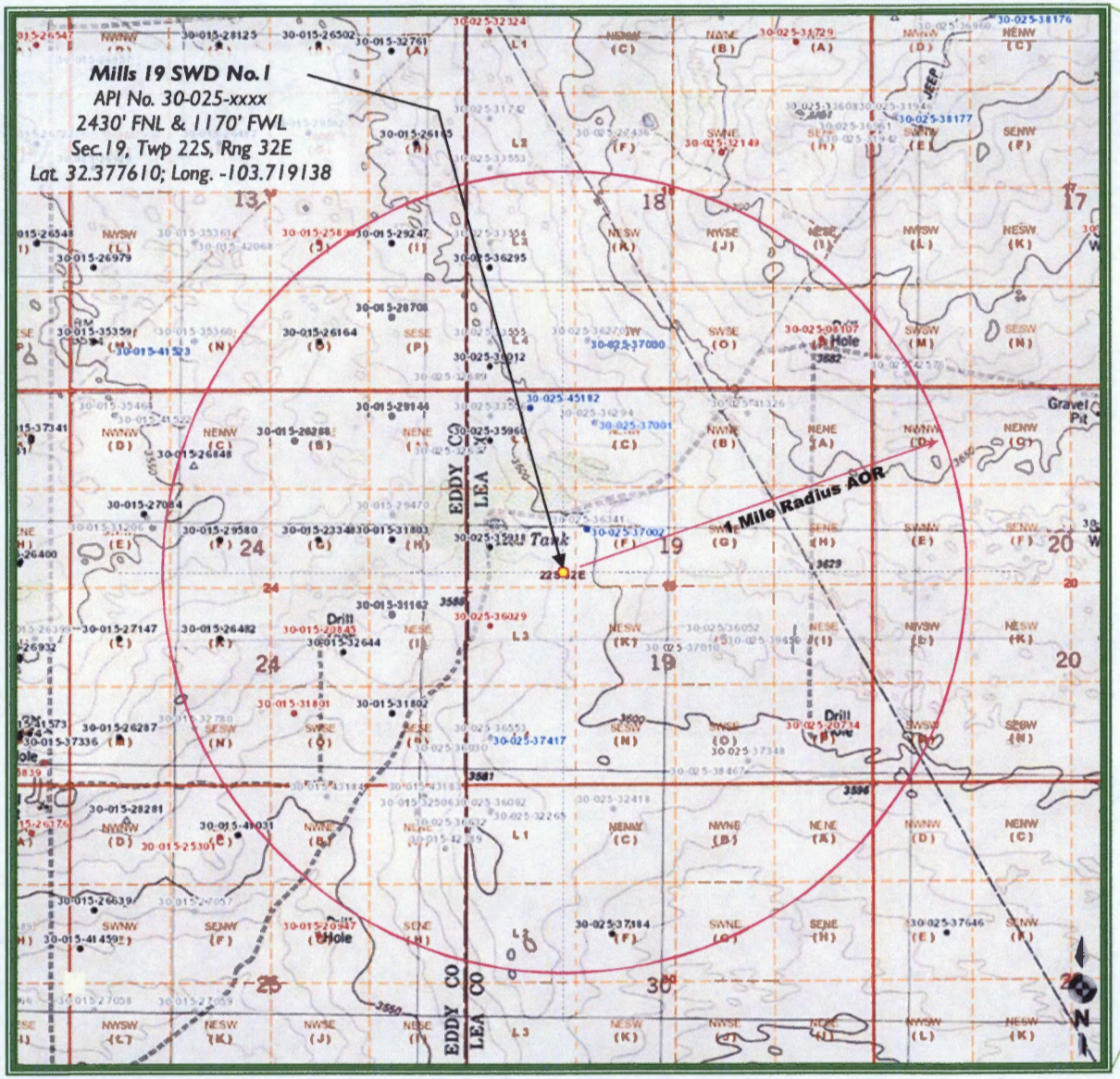
Mills 19 SWD No.1 - Area of Review / 2 Miles

(Attachment to NMOCD Form C-108 - Item V)



Mills 19 SWD Well No.1 - Area of Review / Overview Map

(Attachment to NMOCD Form C-108, Application for Authority to Inject.)



22.6 miles E/NE of Loving, NM

Lea County, New Mexico

SOLARIS WATER MIDSTREAM, LLC

SOS Consulting, LLC

C-108 ITEM X – LOGS and AVAILABLE TEST DATA

A Standard Suite of Logs will be run after drilling the well and submitted to the Division.

C-108 ITEM VII – PROPOSED OPERATION

Mills 19 SWD No.1

Commercial SWD Facility

Upon approval of all permits for SWD, operations would begin within 30 days. Completion of the well operations will take approximately 6-8 weeks. Facility construction including installation of the tank battery, berms, plumbing and other and associated equipment would be occurring during the same interval but at a different location from the well. In any event, it is not expected for the construction phase of the project to last more than 75 days, depending on availability of contractors and equipment.

Configure for Salt Water Disposal

Prior to commencing any work, an NOI sundry(ies) will be submitted to configure the well for SWD and will detail the completion workover including all work otherwise described above, any change to the procedure noted herein and to perform mechanical integrity pressure test per OCD test procedures. (Notify NMOCD 24 hours prior.) The casing/tubing annulus will be monitored for communication with injection fluid or loss of casing integrity.

Operational Summary

The SWD facility will not be fenced so that trucks may access for load disposal 24/7.

The well and injection equipment will be a closed system and equipped with pressure limiting devices and volume meters. The annulus, loaded with an inert, anti-corrosion packer fluid, will be monitored for pressure.

The tanks will be equipped with telemetry devices and visual alarms to alert the operator and customers of full tanks or an overflow situation.

Anticipated daily maximum volume is 40,000 bpd and an average of 25,000 bpd at a maximum surface injection pressure of 3241 psi (.2 psi/ft gradient – maximum pressure will be adjusted If the top of interval is modified after well logs are run).

Potential releases will be contained and cleaned up immediately. The operator shall repair or otherwise correct the situation within 48 hours before resuming operations. OCD will be notified within 24 hours of any release greater than 5 bbls. If required, remediation will start as soon as practicable. Operator shall comply with 19.15.29 NMAC and 19.15.30 NMAC, as necessary and appropriate.

C-108 ITEM VII – PRODUCED WATER ANAYLSES

Item VII.4 – Water Analysis of Source Zone Water

San Andres

Bone Spring

Wolfcamp

Item VII.5 – Water Analysis of Disposal Zone Water

Devonian

Analyses follow this page.

C-108 Item VII.5 - Produced Water Data
Solaris Water Midsteam, LLC - Mills 19 SWD Project

Source Zone - San Andres

SAN ANDRES

Lab ID

Sample ID 2814

API No 3002523275

Sample No

Well Name HUGH 013

Location ULSTR 14 22 S 37 E **Lat / Long** 32.39811 -103.13935

330 N 820 W **County** Lea

Operator (when sampled) ANADARKO PETROLEUM CORP.

Field EUNICE SOUTH Unit D

Sample Date 2/19/1998 Analysis Date 3/2/1998

Sample Sourc

Water Typ

Depth (if known)

ph	7.6	alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity	1.011	hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	14215.2	resistivity_ohm_cm_temp_	
tds_mgL_180C		conductivity	
chloride_mgL	6494.66	conductivity_temp_F	
sodium_mgL	4424.14	carbonate_mgL	0
calcium_mgL	299.256	bicarbonate_mgL	2528.51
iron_mgL	0.1011	sulfate_mgL	191.079
barium_mgL	1.011	hydroxide_mgL	
magnesium_mgL	179.958	h2s_mgL	151.65
potassium_mgL	232.53	co2_mgL	
strontium_mgL	20.22	o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 Item VII.5 - Produced Water Data

Solaris Water Midsteam, LLC - Mills 19 SWD Project

Source Zone - Bone Spring

BONE SPRING

Lab ID

Sample ID 6070

API No 3002527250

Sample No

Well Name BERRY APN STATE 001

Location ULSTR 05 21 S 34 E **Lat / Long** 32.50569 -103.49786

1980 S 660 W **County** Lea

Operator (when sampled) YATES PETROLEUM CORPORATION

Field BERRY NORTH Unit L

Sample Date 1/12/1998 Analysis Date 1/21/1998

Sample Sourc Depth (if known)

Water Typ

ph	7.18	alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity	1.08	hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	128117	resistivity_ohm_cm_temp_	
tds_mgL_180C		conductivity	
chloride_mgL	82351.1	conductivity_temp_F	
sodium_mgL	49793.4	carbonate_mgL	0
calcium_mgL	2715.12	bicarbonate_mgL	567
iron_mgL	0.216	sulfate_mgL	1722.6
barium_mgL	1.62	hydroxide_mgL	
magnesium_mgL	631.8	h2s_mgL	
potassium_mgL	466.56	co2_mgL	
strontium_mgL	116.64	o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 Item VII.5 - Produced Water Data

Solaris Water Midsteam, LLC - Mills 19 SWD Project

Source Zone - Wolfcamp

WOLFCAMP

									Lab ID		
									Sample ID		3575
API No	3002531756								Sample No		
Well Name	INCA FEDERAL				012						
Location	ULSTR	17	18	S	32	E	**Lat / Long**	32.74837		-103.79584	
		2310	N		330	W			**County**	Lea	
Operator (when sampled)		COASTAL MANAGEMENT									
	Field	YOUNG NORTH							Unit E		
Sample Date		7/22/1999			Analysis Date			8/2/1999			

Sample Sourc		Depth (if known)	
Water Typ			
ph	6.1	alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity	1.123	hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	187007	resistivity_ohm_cm_temp	
tds_mgL_180C		conductivity	
chloride_mgL	127936	conductivity_temp_F	
sodium_mgL	66744.4	carbonate_mgL	0
calcium_mgL	10171	bicarbonate_mgL	175.188
iron_mgL	10.107	sulfate_mgL	970.272
barium_mgL	0.5615	hydroxide_mgL	
magnesium_mgL	2103.38	h2s_mgL	
potassium_mgL	1509.31	co2_mgL	
strontium_mgL	389.681	o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 Item VII.5 - Produced Water Data

Solaris Water Midsteam, LLC - Mills 19 SWD Project

DISPOSAL ZONE

DEVONIAN

Lab ID

Sample ID 5035

API No 3002502432

Sample No

Well Name LEA UNIT 009

Location ULSTR 13 20 S 34 E **Lat / Long** 32.57779 -103.51152

660 N 2130 E **County** Lea

Operator (when sampled)

Field LEA Unit B

Sample Date Analysis Date

Sample Sourc UNKNOWN Depth (if known)

Water Typ

ph		alkalinity_as_caco3_mgL	
ph_temp_F		hardness_as_caco3_mgL	
specificgravity		hardness_mgL	
specificgravity_temp_F		resistivity_ohm_cm	
tds_mgL	45778	resistivity_ohm_cm_temp_	
tds_mgL_180C		conductivity	
chloride_mgL	26440	conductivity_temp_F	
sodium_mgL		carbonate_mgL	
calcium_mgL		bicarbonate_mgL	1145
iron_mgL		sulfate_mgL	729
barium_mgL		hydroxide_mgL	
magnesium_mgL		h2s_mgL	
potassium_mgL		co2_mgL	
strontium_mgL		o2_mgL	
manganese_mgL		anionremarks	

Remarks

(Produced water data courtesy of NMT Octane NM WAIDS database.)

SOS Consulting, LLC

C-108 – Item VIII

Geologic Information

The Devonian and Silurian consist of carbonates including light colored dolomite and chert intervals interspersed with some tight limestone intervals. Several thick sections of porous dolomite capable of taking water are believed present within the subject formations in the area. Depth control data was inferred from deep wells to the south and east. If the base of Devonian and top of Silurian rocks come in as expected the well will only be drilled deep enough for adequate logging rathole.

At a proposed depth of 17,457' BGL (Below Ground Level) the well will TD approximately 1,250' below the estimated top of the Devonian. Mud logging through the interval will ensure the target interval remains in Devonian and Silurian. Once Devonian is determined, the casing shoe depth will be set at an approximate maximum upper depth of 16,207' BGL. Injection will occur through the resulting openhole interval. Should mud or other logs indicate depth adjustment is required to exploit the desired formation as described; sundries with appropriate data will be filed with the OCD.

The Devonian is overlain by the Woodford Shale and Mississippian Lime and underlain by the Middle and Lower Ordovician; Simpson, McKee and Ellenburger.

Fresh water in the area is generally available from the Santa Rosa formation and some alluvial deposits. State Engineer's records show 4 water wells in the township with an average depth to groundwater of 160 feet.

There is 1 water well located within one mile of the proposed SWD. It is being located, sampled and analyzed. Analysis will be forwarded upon receipt. A representative analysis for the area is included.

C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT

INFERRED INFORMATION FROM OFFSET WELL FILE

The Deep Purple SWD No.1, located 1310' FSL & 1310' FWL in Section 30, Twp 22 South, Rng 32 East is approximately 1.49 miles (7892 feet) due south of the proposed Mills 19 SWD. The well was permitted, drilled in late 2017 and is currently operated by Mesquite SWD, Inc.

In January 2018, Mesquite applied for and received approval to increase the tubing size in the Deep Purple SWD. In support of that application, which also received scrutiny through the OCD examiner hearing process, Mesquite supplied several exhibits by prepared by experts in their respective fields.

Given the proximity of the Deep Purple SWD to the proposed SWD and based on comments offered by at least one of the experts, it is reasonable to assume the data and results provided would have complete applicability to the Mills 19 SWD.

In preparing the C-108 application for the Mills 19, SOS Consulting researched the area of review as a matter of routine. In the course of this review, the publicly-available well file documents filed for the Deep Purple SWD were reviewed. As a matter of standard practice, the above-mentioned exhibits and data contained therein are cited as reference and the results are hereby inferred to be applicable and made part of this application as generally allowed by OCD.

Applicable Statements

Application of Mesquite SWD, Inc., To Amend Approval for Tubing Size in Administrative Order SWD-1681-A (January 11, 2018) *OCD Online File: pmam1713256939_2_ao.pdf*

"... within what is commonly referred to by operators and the Division as the "Devonian-Silurian" formations. These zones consist of a very thick sequence of limestone and dolostone which has significant primary and secondary porosity and permeability that is collectively between 1,500 to 3,000 feet thick.

"I have also studied the location of known fault lines with the area were the well is proposed to be drilled and the closest known fault line to the well is located approximately 15 miles away from where the well is proposed to be drilled.

Zigler, K. (2018). *Exhibit B: Declaration of Kate Zigler*

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Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT

INFERRED DATA FROM OFFSET WELL FILE (cont.)

"New Mexico Tech University has gathered seismic monitoring data in areas near where the wells are located for several decades. This seismic data, along with data compiled from other sources, show there has not been significant seismic activity with in the area where the well is located.

"I have also completed several different fault skip probability analysis [sic], using a tool created by Stanford University. These fault slip potential models showed low probability of slip of earthquakes to known mapped faults located closest to the well...

Bilek, S. (2018). *Exhibit C: Declaration of Susan Bilek*

"I have also studied the potential impact on pore pressures and put together a simulation of the radial influence that the well would have if 5 ½" tubing is used for a period of 20 years. This study shows that when 5 ½" tubing is used for a period of 20 years, it is anticipated that there will be a very minimal impact on reservoir pressure at distances greater than 1 mile.

"My studies further indicate that addition [sic] a second wells one mile away for the well, will not create any materially adverse pressures in the formation.

Wilson, S.J. (2018). *Exhibit D: Declaration of Scott J. Wilson*

These experts' opinions as cited, in conjunction with the exhibits generated by SOS Consulting and contained herein, support the conclusion that the risk of induced seismic activity due to disposal injection into this well is extremely low.

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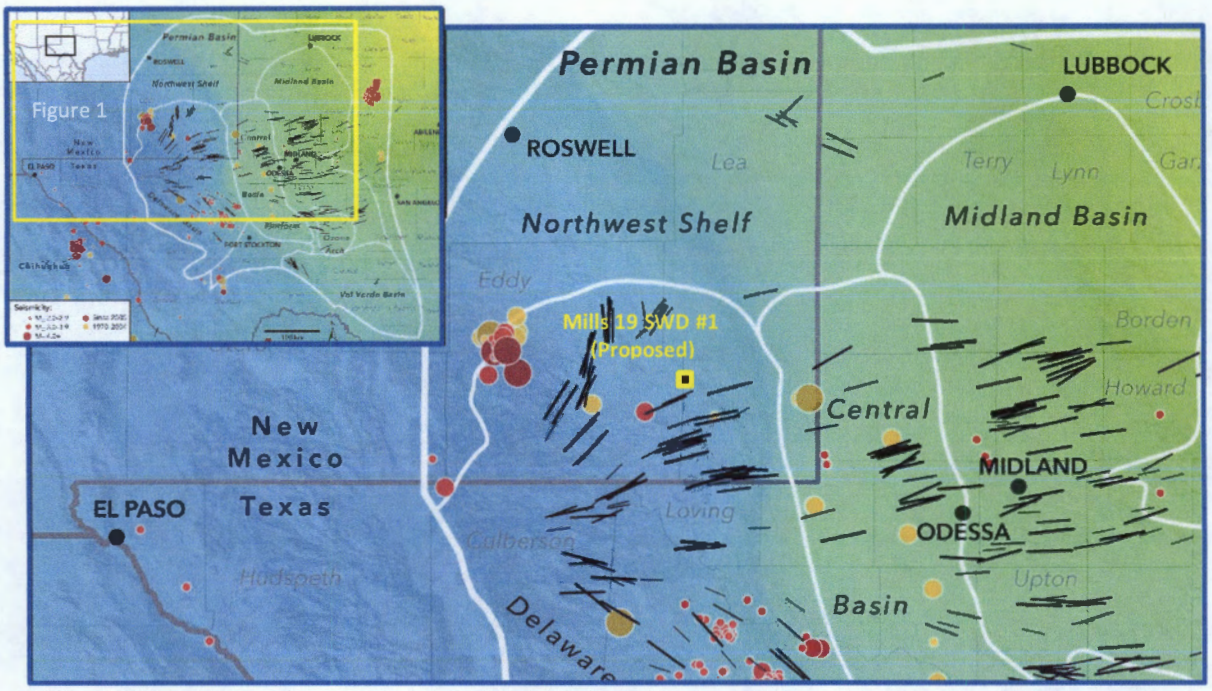
Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT

Map Source: State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity (Figure 1); Jens-Erik Lund Snee/ Mark Zoback, February 2018



PROJECT VICINITY

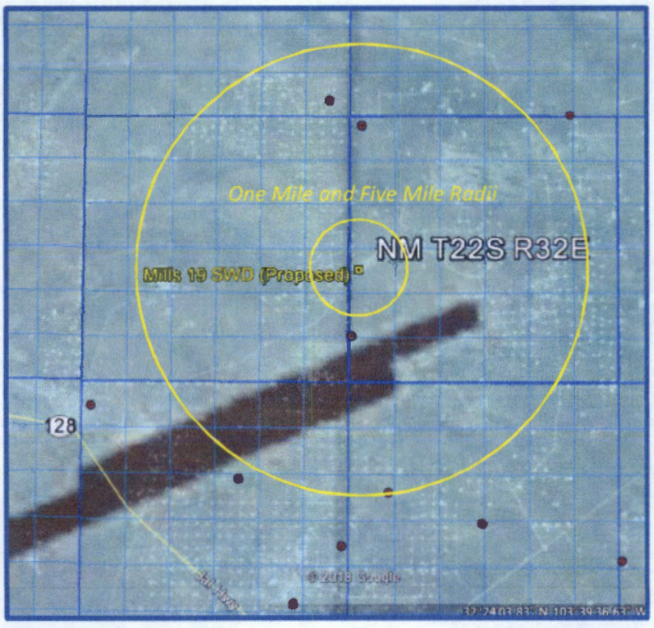


Figure 1. State of stress in the Permian Basin, Texas and New Mexico. Black lines are the measured orientations of the maximum horizontal stress (SHmax), with line length scaled by data quality. The colored background is an interpolation of measured relative principal stress magnitudes (faulting regime) expressed using the Aφ parameter (see text for details) of Simpson (1997). Blue lines are fault traces known to have experienced normal-sense offset within the past 1.6 Ma, from the USGS Quaternary Faults and Folds Database (Crone and Wheeler, 2000). The boundary between the Shawnee and Mazatzal basement domains is from Lund et al. (2015), and the Precambrian Grenville Front is from Thomas (2006). The Permian Basin boundary is from the U.S. Energy Information Administration, and the subbasin boundaries are from the Texas Bureau of Economic Geology Permian Basin Geological Synthesis Project. Earthquakes are from the USGS National Earthquake Information Center, the TexNet Seismic Monitoring Program, and Gan and Frohlich (2013). Focal mechanisms are from Saint Louis University (Herrmann et al., 2011).

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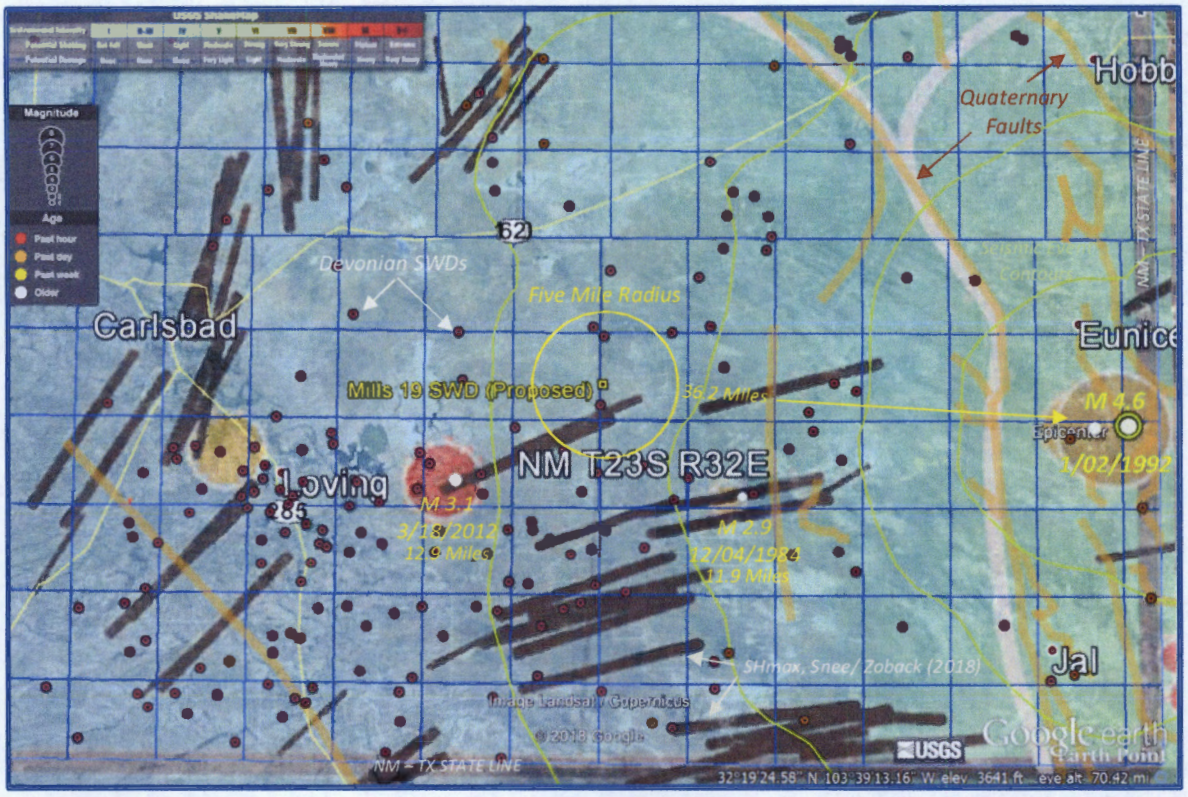
Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

In the following map, a layer with USGS historical earthquake data is overlain with a layer showing Quaternary Faults from a USGS dataset (2000) and Precambrian faults as documented by Ruppel, et al. (2005). Finally, a layer showing all currently permitted SWDs completed or proposed to be completed in the Devonian (Silurian) formation.

The USGS earthquakes shown are well known to the area. The most significant in the region was 4.6 magnitude in 1992 south of Eunice, New Mexico and was 36.2 miles from the proposed SWD. The 2012 quake 12.9 miles to the southwest is also shown and was determined to not be related to oil and gas activity. A small 2.9 magnitude occurred 11.9 miles southeast of the proposed site in 1984.

The Precambrian and Quaternary faults are discussed on the next page.



REGIONAL VIEW - USGS MAGNITUDE, PRECAMBRIAN FAULTS, S_{Hmax}, DEVONIAN SWDS

Based on publicly available data for the subject area, it is reasonable to believe the risk of induced seismic activity due to disposal injection into this well is extremely low.

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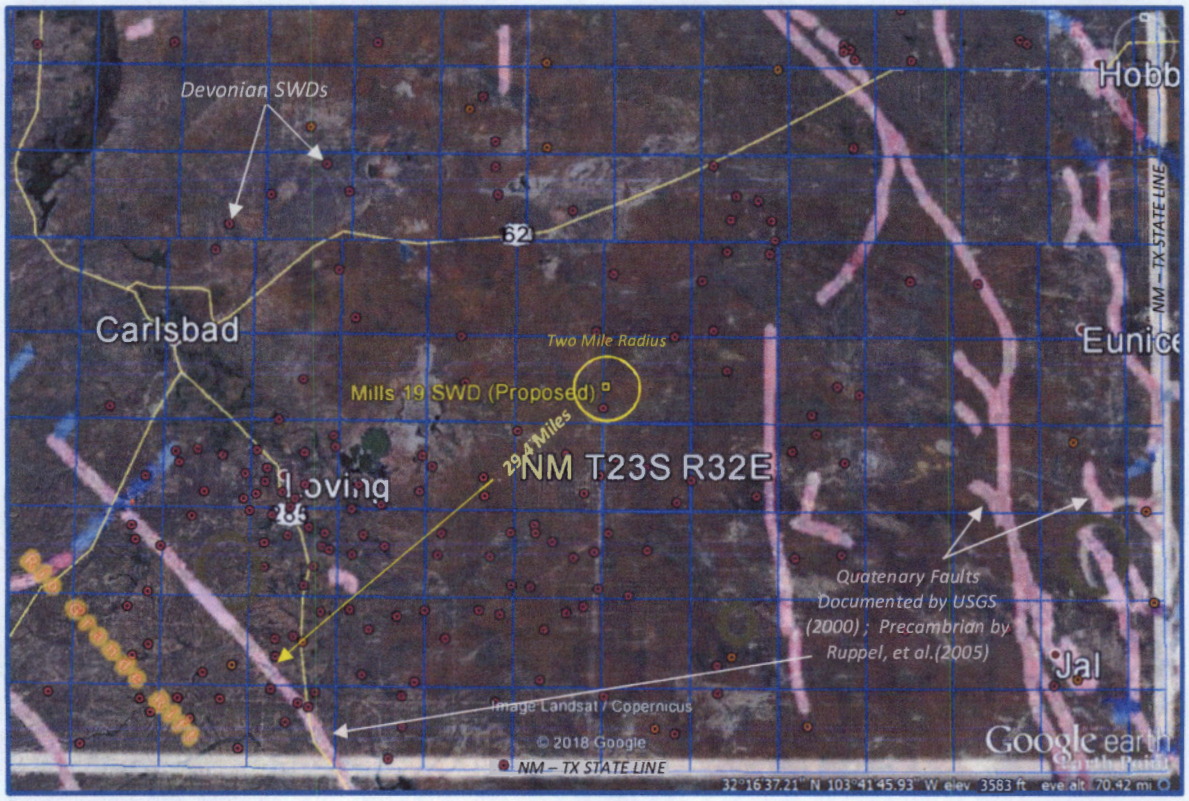
Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

The primary Precambrian faults in the area as documented by Ruppel, et al. (2005) is represented on this map by the thick, pink colored lines. The most significant of these is the fault associated with the Rio Grande Rift, running southeast to northwest and, runs adjacent to a portion of Hwy 285 however; only a small portion the associated fault which runs parallel approximately 15 miles northeast is depicted below. The proposed Mills 19 SWD is located some 29 miles from the fault. Other documented faults (USGS, 2000) are shown for eastern Lea County and extending into west Texas. Other Devonian SWDs in the area are also shown by small purple dots completed or proposed to be completed in the Devonian (Silurian) formation.

The previously referenced study by Snee and Zoback *(shown on previous exhibits)* evaluated the strike-slip probability using probabilistic FSP (Fault Slip Potential) analysis of known faults in the Permian Basin. The study predicts that the Precambrian fault shown here has less than a 10% probability of being critically stressed to the point of creating an induced seismicity event. The main reason for the low probability is due to the relationship of the strike of the fault to the regional S_{Hmax} orientation; the proposed SWD being well removed from the area.



VICINITY - PERMITTED DEVONIAN SWDS, COMPOSITE FAULTS

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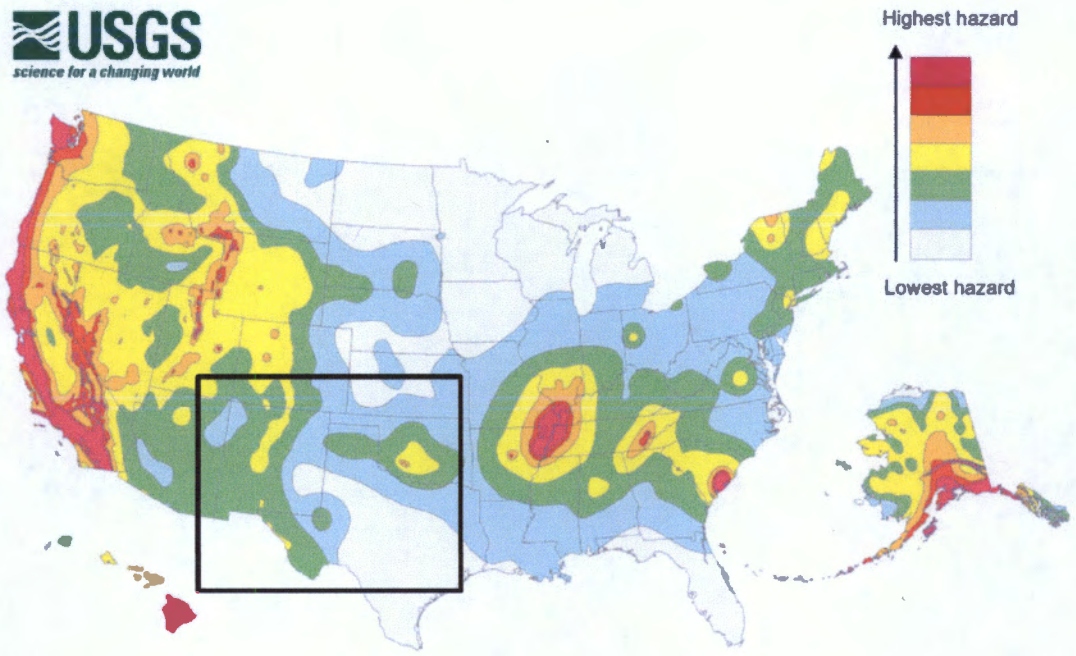
Geological Data

HISTORICAL

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)



2014 map data: The USGS notes in its report that fracking may be to blame for a sizeable uptick in earthquakes in places like Oklahoma. "Some states have experienced increased seismicity in the past few years that may be associated with human activities such as the disposal of wastewater in deep wells," the report says. USGS hopes to use that data in future maps but it isn't included in this one. "Injection-induced earthquakes are challenging to incorporate into hazard models because they may not behave like natural earthquakes and their rates change based on man-made activities," the report says.

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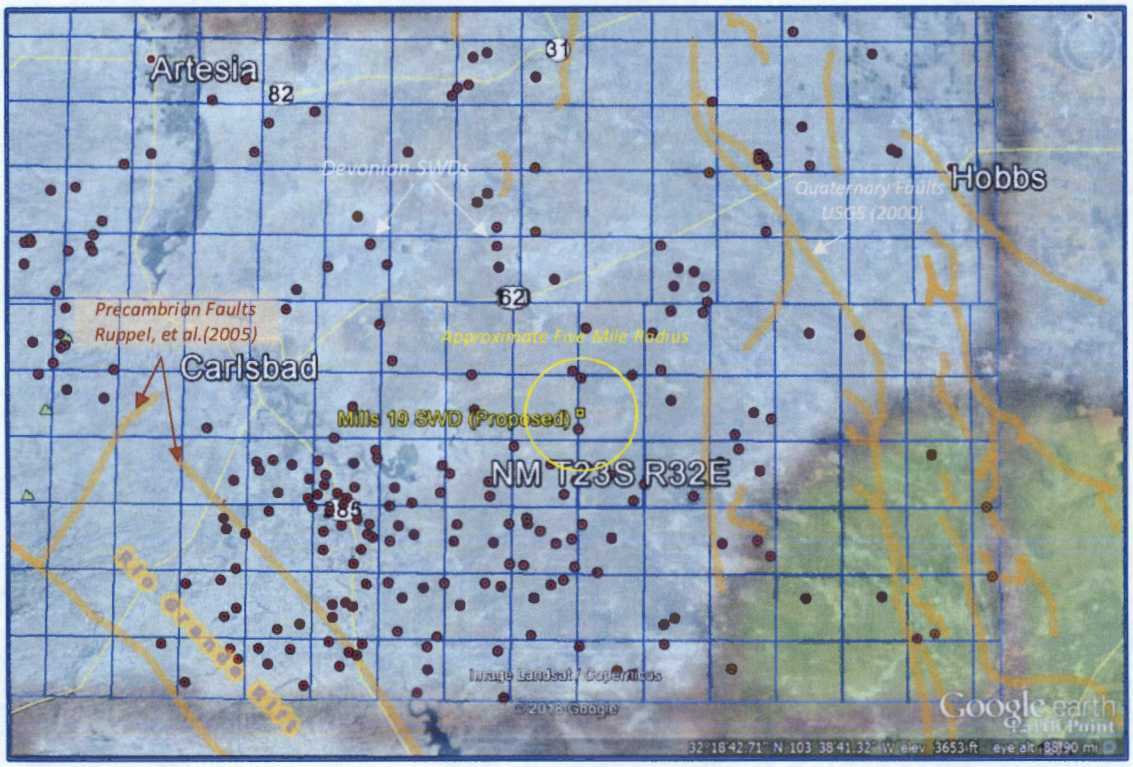
Geological Data

HISTORICAL

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

USGS 2014 MAP DATA OVERLAY IN GOOGLE EARTH



An updated USGS map for 2018 is on the next page. While methodology remained essentially the same according to USGS, the interpreted results and color-coding did have some modification. However, the subject area in southeast New Mexico on both maps remains very low and on the 2018 map, the area is assigned a value of <1% of "potentially minor-damage ground shaking".

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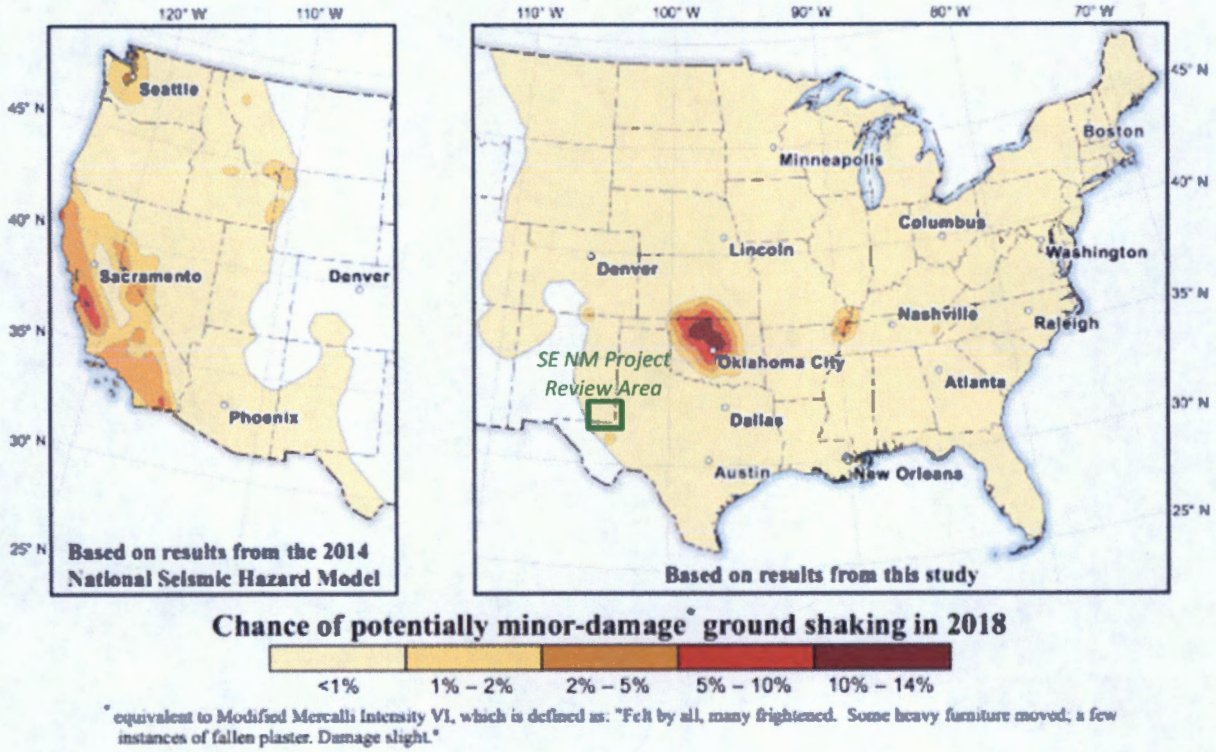
Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT (cont.)

USGS 2018 ONE-YEAR MODEL



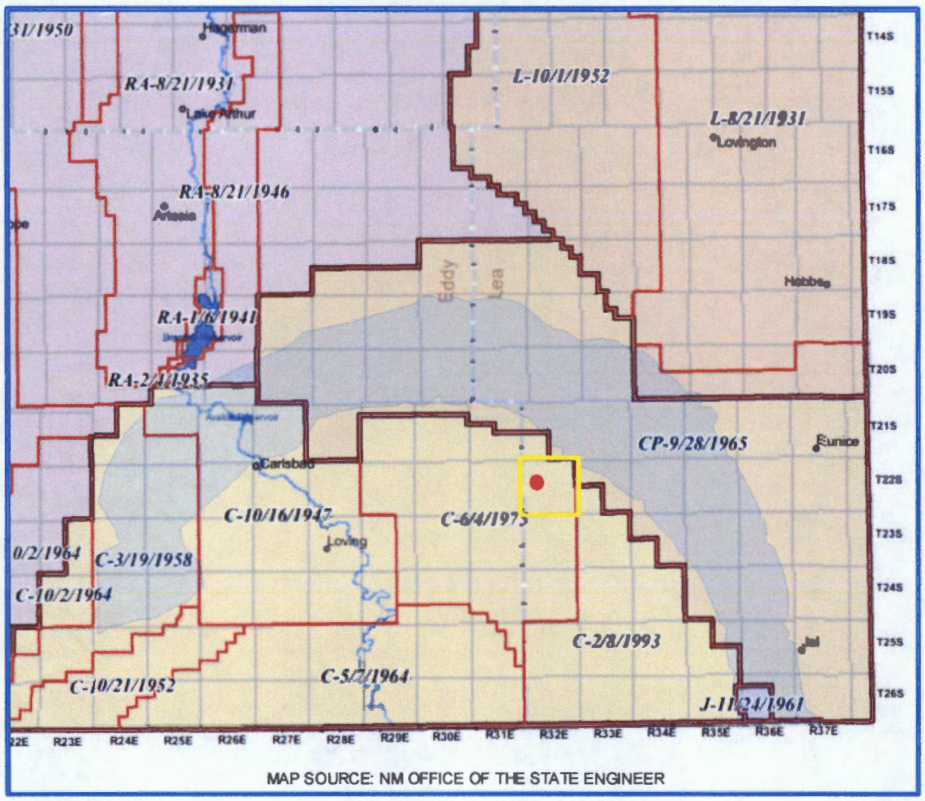
Map showing chance of damage from an earthquake in the Central and Eastern United States during 2018. Percent chances are represented as follows: pale yellow, less than 1 percent; dark yellow, 1 to 2 percent; orange, 2 to 5 percent; red, 5 to 10 percent; dark red, 10 to 12 percent. See Hazard from the western United States from the 2014 National Seismic Hazard Maps (Petersen et al., 2014) for comparison.

The USGS has produced the 2018 one-year probabilistic seismic hazard forecast for the central and eastern United States from induced and natural earthquakes. For consistency, the updated 2018 forecast is developed using the same probabilistic seismicity-based methodology as applied in the two previous forecasts.

Based on publicly available data for the subject area, it is reasonable to believe the risk of induced seismic activity due to disposal injection into this well is extremely low.

C-108 - Item XI

Groundwater Basins - Water Column / Depth to Groundwater



MAP SOURCE: NM OFFICE OF THE STATE ENGINEER

The subject well is located in the Carlsbad Basin, just south and west of the apparent boundary with the Capitan Basin.

Fresh water in the area is generally available from the Santa Rosa and similar aged deposits of the basin. State Engineer's records show water wells in 20S-35E with an average depth of approximately 160 feet.

There is one (1) water well located within one mile of the proposed SWD. A representative analysis from the area is included.

SOS Consulting, LLC