Initial

Application

Part I

Received: <u>04/24/2019</u>

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

RECEIVED:	REVIEWER:	TYPE:	APP NO:	
4 64/24/201	4	ABOVE THIS TABLE FOR OCT DIVISIO	PMAM191	15 3984/
	- Geologia	O OIL CONSERVATI cal & Engineering B ancis Drive, Santa F	ureau -	
		ATIVE APPLICATION		
THIS CHE	CKLIST IS MANDATORY FOR AL REGULATIONS WHICH RE	L ADMINISTRATIVE APPLICATION QUIRE PROCESSING AT THE DIV		SION RULES AND
Applicant: LilyStream				umber: 373500
Well Name: Lucas SW			API: 30-015-	
Proposed: SWD; I	Devonian-Silurian		Pool Cod	e: 97869
	E AND COMPLETE INF	INDICATED BELOW	D TO PROCESS THE	TYPE OF APPLICATION
	Spacing Unit – Simult	aneous Dedication	RORATION UNIT) SD	
[1] Commi D [11] Injectio	only for [1] or [1] ngling – Storage – Mo HC □CTB □PL on – Disposal – Pressu /FX □PMX ■SV	.C \square PC \square OLS re Increase – Enhance		FOR OCD ONL
A. Offset on B. Royalty, C. Application Notification F. Surface G. For all of	EQUIRED TO: Check to be a tors or lease hold overriding royalty over tion requires published tion and/or concurred tion and/or concurred owner the above, proof of the required	ders vners, revenue owne ed notice ent approval by SLO ent approval by BLM		Notice Complete Application Content Complete
administrative ap understand that	hereby certify that to proval is accurate of no action will be tak submitted to the Divi	and complete to the en on this applicatio	best of my knowled	dge. I also
Note:	Statement must be complet	ed by an individual with ma	nagerial and/or supervisor	y capacity.
			4/19/2010	
Joel Lowry			4/18/2019 Date	
Print or Type Name			432-466-4450	
O la			Phone Number	
Signature June	7		joel@lowryenvironmen e-mail Address	tal.com
0.5.0.0.0			0 111011 / (001033	

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: Secondary Recovery Pressure Maintenance XXX Disposal Storage Application qualifies for administrative approval? XXX Yes No
II.	OPERATOR: LilyStream Water Solutions, LLC ADDRESS: 1308 West Ave. N, Lovington, NM, 88260 CONTACT PARTY: Joel Lowry PHONE: 432-466-4450
III.	WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injections. Additional sheets may be attached if necessary.
	Applicable Well Data is provided as <u>Attachment #1</u> .
IV.	Is this an expansion of an existing project? Yes XXX No If yes, give the Division order number authorizing the project: N/A
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.
	A map identifying all wells and leases within a two mile radius is provided as Figure 1 in <u>Attachment #2</u> . A map identifying all wells and leases within the one-mile expanded Area of Review is provided as Figure 2 in <u>Attachment #2</u> .
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.
	A tabulation of data on all wells of public record within the expanded area of review which penetrate the proposed injection zone is provided as <u>Attachment #3</u> .
VII.	Attach data on the proposed operation, including:
	 Proposed average and maximum daily rate and volume of fluids to be injected; Whether the system is open or closed; Proposed average and maximum injection pressure; Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and, 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.).
	Proposed operation details are provided as <u>Attachment #4</u> . Analysis from source zone produced water is provided as <u>Attachment #4a</u> . Analysis from injection zone produced water is provided as <u>Attachment #4b</u> .
*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.

Coological data on the proposed injection zone is provided as Attachment #F

Geological data on the proposed injection zone is provided as Attachment #5.

IX. Describe the proposed stimulation program, if any.

Acid may be utilized to clean and open the formation in accordance with industry standards, as necessary.

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

As this is a new drill, logging and test data is not available. Well Log and test data will be filed with the NMOCD upon completion of the well. NMOCD District I Office will be notified prior to conducting MIT.

	injection or disposal well s	thowing location of wells and dates samples w	vere taken.
	A map depicting fresh was Attachment #6.	nter wells within a one mile radius and asso	ciated chemical analysis, if applicable, is provided
XII		55	ey have examined available geologic and engineering data between the disposal one and any underground sources of
	An Affirmative Statemen	t is provided as Attachment #7.	
XIII	Applicants must complete t	the "Proof of Notice" section on the reverse si	de of this form.
	"Proof of Notice" docume	entation is provided as Attachment #8.	
XIV.	Certification: I hereby cert belief.	tify that the information submitted with the ap	plication is true and correct to the best of my knowledge and
	NAME:	Joel Lowry	TITLE: Agent of Lilystream Water Solutions, LLC
	SIGNATURE:	Ljourn	
	EMAIL ADDRESS:	joel@lowryenvironmental.com	been previously submitted, it need not be resubmitted.
		rircumstances of the earlier submitte	veen previously suomitted, a need not ve resuomated.
		3	

Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any

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

*XI.

Well Data

(5

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:

		General Well Information
Operator		LilyStream Water Solutions, LLC
Lease Name & W	ell No.	Lucas SWD #1
Location		250' FNL & 2,390' FEL, UL B, Sec. 10, T25S, R25E

			(Casing Informa	tion			
String	Size (in.)	Grade	Weight	Setting Depth (ft bgs)	Cement (sx)	Hole Size (in.)	Estimated Top of Cement	Method of Determination
Surface	20	J-55	94.0 lb/ft.	300	825	26	Surface	Circulation
Intermediate 1	13.375	P-110	80.7 lb/ft	2,000	1,140	17.5	Surface	Circulation
Production	9.625	P-110	53.5 lb/ft.	8,885	1,510	12.25	Surface	Circulation
Liner	7.625	P-110	39.0 lb/ft.	8585 to 11932	351	8.5	8585' (TOL)	CBL

3)				
	Size	Weight	Lining Material	Setting Depth (ft.)
	5.5"	23.0 lb/ft	Internal Plastic Coated	8,525
	5"	18.0 lb/ft	Internal Plastic Coated	11,832

(4)	Packer Information				
	Туре	Setting Depth (ft.)			
	LOK-SET TM or Equivalent	11,832			

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.

Inje	ection Information
Name of Injection Formation:	Devonian-Silurian
Injection Interval:	11932 to 13032 ft.
Perforated or Open-Hole:	Open Hole
Purpose of Well:	New Drill for Salt Water Disposal
Other Perforated Intervals:	None

Estimated Depth of Various Formations Inc	cluding Oil and Gas Zones (ft. bgs)
B. Salt	1,224
T. Delaware	1,312
T. Bone Spring	4,887
T. Wolfcamp	8,032
T. Cisco	9,674
T. Strawn	9,780
T. Atoka	10,062
T. Morrow	10,589
T. Woodford Shale	11,812
T. Devonian	11,932
T. Montoya	13,032

There are no known oil and gas zones beneath the proposed injection zone.

INJECTION WELL DATA SHEET

OPERATOR:

T. Mont

LilyStream Water Solutions, LLC

WELL NAME & NUMBER:

Lucas SWD #1

WELL LOCATION

250' FNL & 2,390' FEL

FOOTAGE LOCATION

B UNIT LETTER 10 SECTION 25S TOWNSHIP 25E RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

	nation epth	Setting depth	Surface Casing
		300	Hole Size 26 in. Casing Size: 20 in. Setting Depth: Surface ft. to 300 ft. Cemented with: 825 sx. or ft ³ Top of Cement: Surface Method Determined Circulation
B. Sait	1,224		1st Intermediate Casing
		DV @	Hole Size 17.5 in. Casing Size: 13.375 in.
T. Del.	1,312		Setting Depth: Surface ft. to 2,000 ft.
		2,000	Cemented with: 1140 sx. or ft ³
T. BN Spg	4,887	Inert Packer Fluid Filled Annulus	Top of Cement: Surface Method Determined Circulation
1. им ард	4 ,00 /	DV @	Production Casing
		5.5 to 5 in. tubing Transistion @ 8525	Hole Size 12.25 in. Casing Size: 9.625 in. Setting Depth: Surface ft. to 8,885 ft.
T. WLFC	8,012	TOL 8,585 8,885	Cemented with: 1510 sx. or ft ³
			Top of Cement: Surface Method Determined Circulation
T. Cisco	9.674		
T. STWN	9,780		<u>Liner</u>
T. ATKA	10.062		Hole Size 8.5 in. Casing Size: 7.625 in. Setting Depth: 8,585 ft. to 11,932 ft.
T. MRRW	10.589		
			Cemented with:sx. orft ³
T. Wd. Sh.	11.812	Packer 11,832	Top of Cement: 8585 TOL Method Determined CBL
T. Dev.	11,932	11,932	
			Open Hole Injection Interval
			ft. to <u>13,032</u> ft

Formation tops have been extrapulated from control wells in the vicinity. During drilling activites, mud and other logs will be utilized to confirm depths and thicknesses of geologic formations. Should logging data indicate adjustments are required to the casing and cement program, applicable Sundry Notices will be filed with the Not to Scale

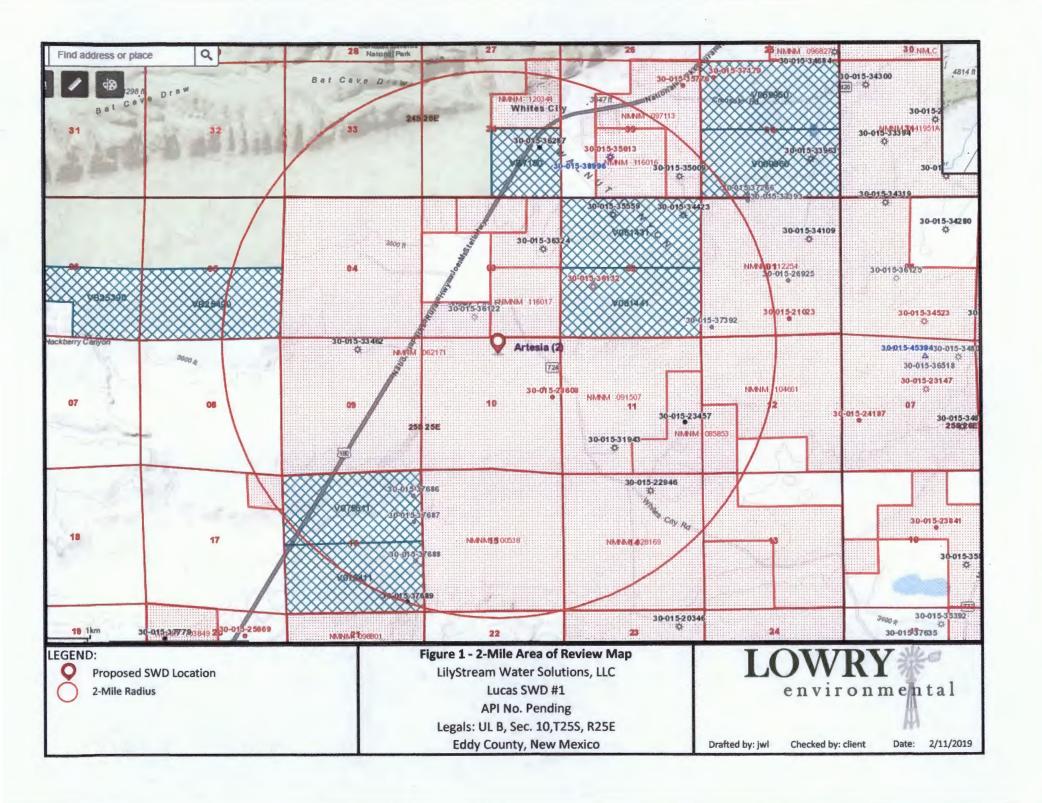
NMOCD.

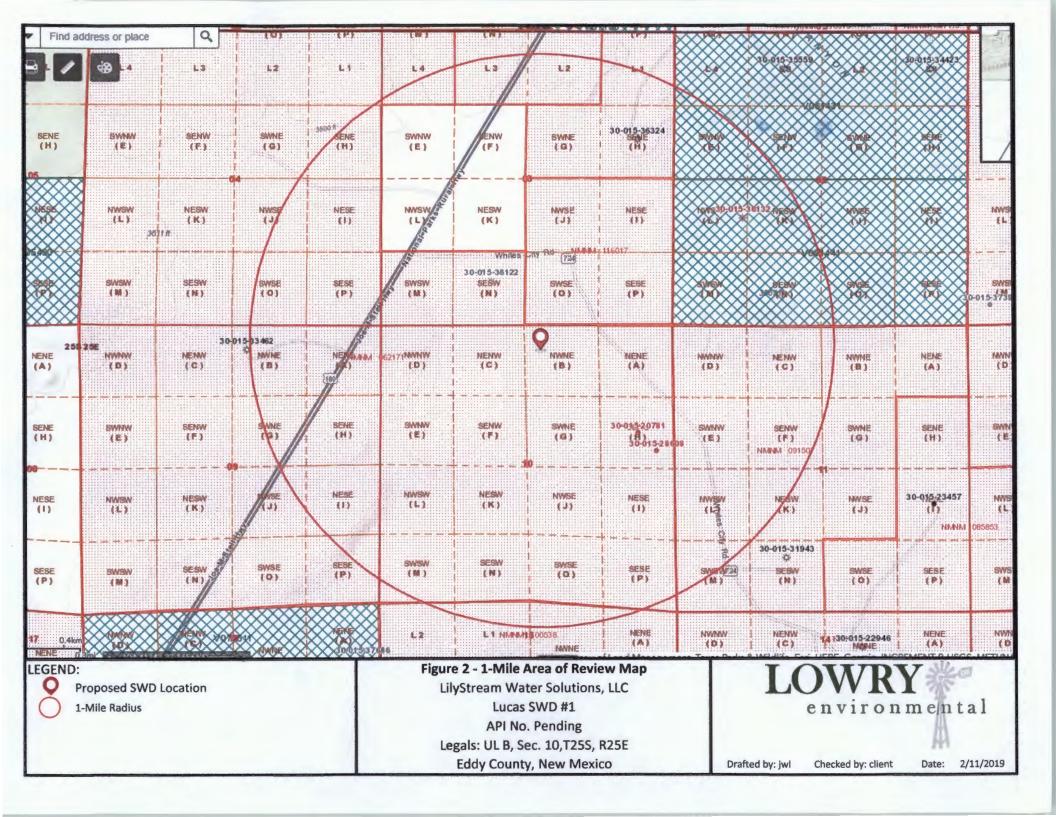
INJECTION WELL DATA SHEET

ubing S	ize.	5.5" tapered to 5"	Lining Matrial:		astic Coated (ICP)
ype of l	Packer:	LOK-S	SET TM or Equivalent		
acker S	etting Depth:	11,832 Ft.			
ther Ty	pe of Tubing/O	Casing Seal (if applicable):		Not Applicabl	<u>le</u>
		Add	ditional Data		
1.	Is this a ne	w well drilled for injection?	<u>XXX</u>	Yes	No
	If no, for w	what purpose was the well or	ringally drilled?		N/A
2.	Name of th	ne Injection Formation:		Devonian-Siluria	an
3.	Name of F	ield or Pool (if applicable):		SWD; Devonian-	-Silurian
4.	Has the we	ell ever been perforated in an	ny other zones (s)" Li	st all such perforate	ed
	intervals as	nd give plugging detail, i.e. s	sacks of cont or pluce	s(s) used.	N/A
5.		ame and depths of any oil or			# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area:		g or overlying the p	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name		g or overlying the p	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt		g or overlying the p depth 1,224	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware		g or overlying the p depth 1,224 1,312	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring		g or overlying the p depth 1,224 1,312 4,887	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware		g or overlying the p depth 1,224 1,312	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp		g or overlying the p depth 1,224 1,312 4,887 8,032	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco		g or overlying the p depth 1,224 1,312 4,887 8,032 9,674	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn		g or overlying the p depth 1,224 1,312 4,887 8,032 9,674 9,780	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn T. Atoka		depth 1,224 1,312 4,887 8,032 9,674 9,780 10,062	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn T. Atoka T. Morrow		g or overlying the p depth 1,224 1,312 4,887 8,032 9,674 9,780 10,062 10,589	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn T. Atoka T. Morrow T. Woodford		g or overlying the p depth 1,224 1,312 4,887 8,032 9,674 9,780 10,062 10,589 11,812	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn T. Atoka T. Morrow T. Woodford T. Devonian		depth 1,224 1,312 4,887 8,032 9,674 9,780 10,062 10,589 11,812 11,932	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn T. Atoka T. Morrow T. Woodford T. Devonian		depth 1,224 1,312 4,887 8,032 9,674 9,780 10,062 10,589 11,812 11,932	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1
5.	Give the na	ame and depths of any oil or one in this area: name B. Salt T. Delaware T. Bone Spring T. Wolfcamp T. Cisco T. Strawn T. Atoka T. Morrow T. Woodford T. Devonian		depth 1,224 1,312 4,887 8,032 9,674 9,780 10,062 10,589 11,812 11,932	# 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1

Figure 1 - 2-Mile Area of Review Map

Figure 2 - 1-Mile Area of Review Map





Tabulation of Data Wells within AOR

API No.	Well Name	Туре	Status	Section	Township	Range	Unit Letter	OCRID Name	Pool ID
30-015-20781	PRE-ONGARD WELL #001	Oil	Plugged (Site Released	10	255	25E	Н	PRE-ONGARD WELL OPERATOR	
30-015-22946	MEANDER FEDERAL #001	Gas	Active	14	255	25E	В	TAP ROCK OPERATING, LLC	[87285] WHITE CITY, WOLFCAMP (GAS)(ABOLISHED; [98220] PURPLE SAGE, WOLFCAMP (GAS)
30-015-23147	DELTA FEDERAL #001	Gas	Plugged (Site Released	7	258	26E	G	OXY USA WTP LIMITED PARTNERSHIP	[84407] SAGE DRAW, WOLFCAMP (GAS)(ABOLISH); [96086] WC, WOLFCAM (GAS)DO NOT USE
0-015-23457	SHEARNWEST FEDERAL #001	Oil	Active	11	255	25E	1	JKM ENERGY, LLC	[96382] WHITE CITY, DELAWARE
0-015-24187	PRE-ONGARD WELL #002	Oil	Plugged (Site Released	7	255	26E	L	PRE-ONGARD WELL OPERATOR	
0-015-28608	BLUESTAR FEDERAL #001	Oil	Plugged (Site Released	10	255	25E	Н	CABAL ENERGY CORPORATION	[96382] WHITE CITY, DELAWARE
80-015-31943	WILD HOG 11 FEDERAL #001	Gas	Active	11	255	25E	N	JKM ENERGY, LLC	[87285] WHITE CITY, WOLFCAMP (GAS)(ABOLISHED; [98220] PURPLE SAGE, WOLFCAMP (GAS)
30-015-34807	DELTA FEDERAL #002	Gas	Active	7	258	26E	1	BREITBURN OPERATING LP	[74900] CHOSA DRAW, MORROW (GAS)

No Wells within AOR penetrate the proposed injection zone.

Proposed Operations

- A. Source Zone Produced Water Analysis
- **B. Injection Zone Produced Water Analysis**

VII. Proposed Operations

Attach data on the proposed operation, including:

Prope	sed Operation	
Average Rate:	20,000 bbls	
Maximum Rate:	30,000 bbls	
Open or Closed:	Open	
Average Injection Pressure:	1,500 - 2,000	psi
Maximum Injection Pressure:	2,386	psi

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

The anticipated sources of produced water proposed to be injected into the Devonian and Silurian formations are from the Delaware, Wolfcamp and Bone Springs Formations, which are known to be compatible with formation water from the Devonian Formation. Laboratory analysis of water samples collected from the respective formations is provided as Attachment #4a.

(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

Laboratory analysis of water samples collected from the Devonian and Fusselman Formations are provided as Attachment #4b.

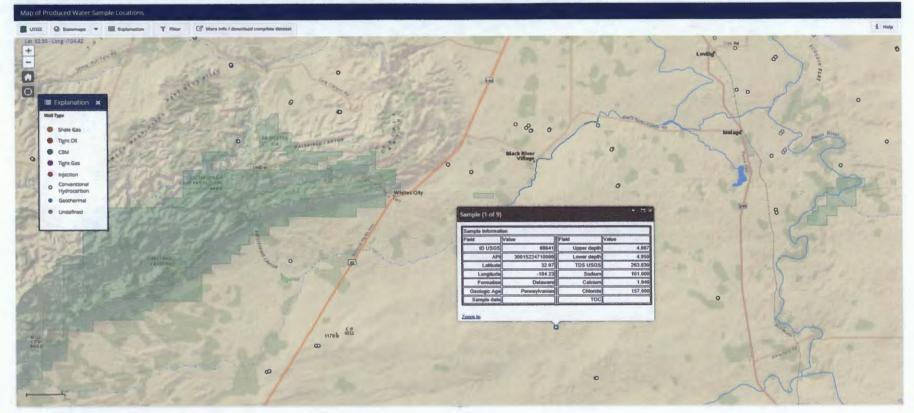
Safety, Spill Prevention and Release Response

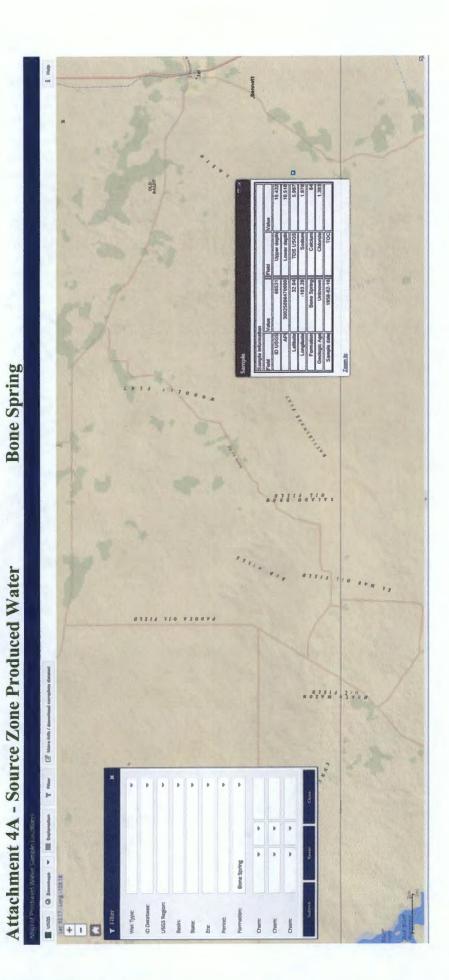
Above-ground storage tanks (ASTs) associated with the SWD operation will be placed into a steel-walled, lined containment system. The well, injection equipment and ASTs will be equipment with metering and pressure sensing devices in an effort to monitor and ensure the integrity of the equipment and prevent accidental releases to the environment.

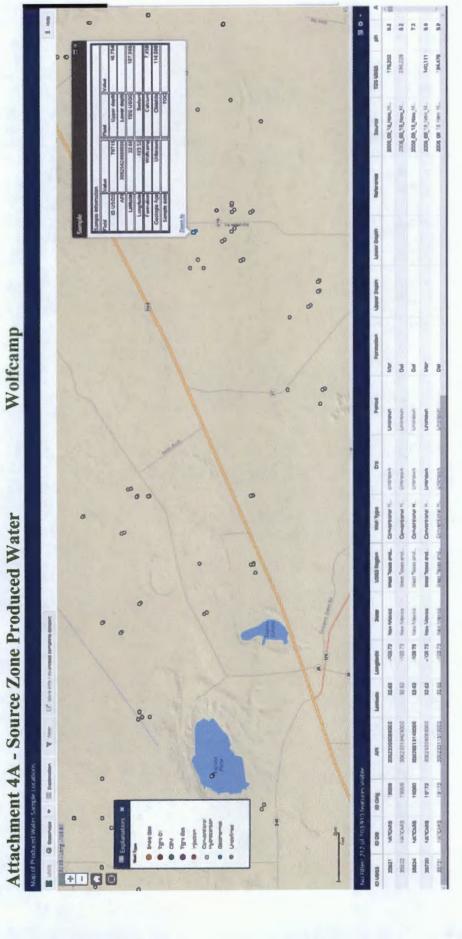
In the event of an accidental releases to the environment, a Release Notification (NMOCD Form C-141) will be prepared, characterizing the release and proposing remediation activates designed to mitigate environmental impacts, as necessary. In the event of an accidental discharge of greater than 25 bbls, the NMOCD will be notified immediately.

Attachment 4A - Source Zone Produced Water

Delaware

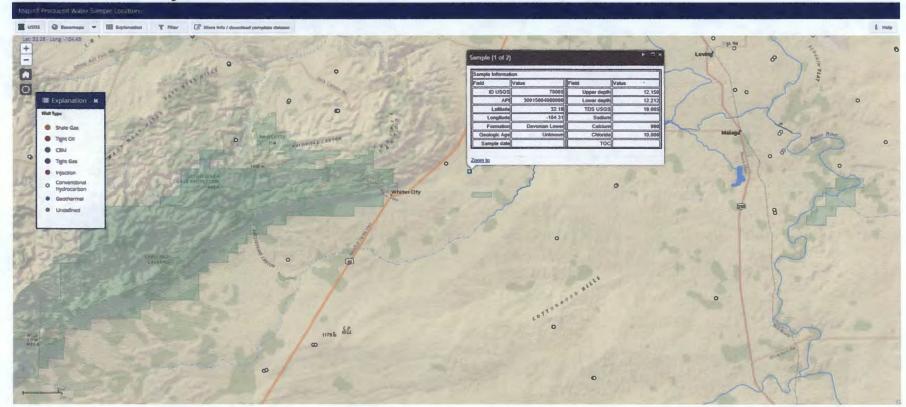


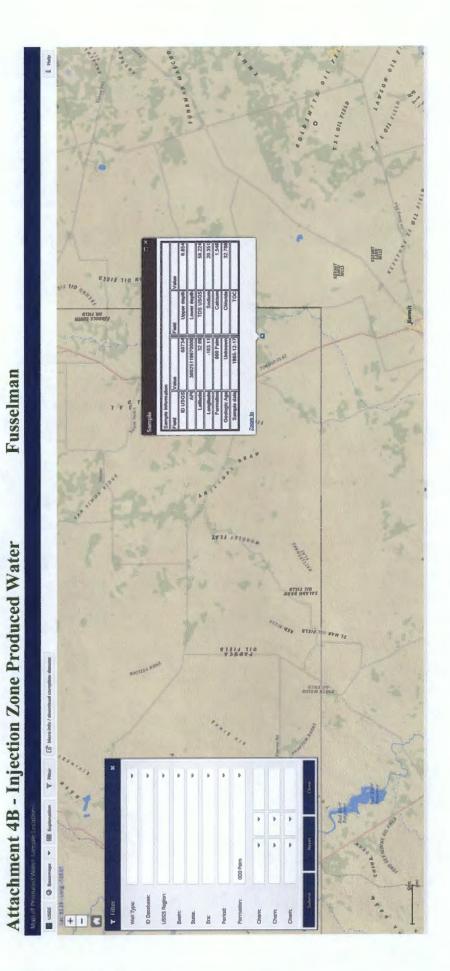




Attachment 4B - Injection Zone Produced Water

Devonian





- A. Geological Description
- **B.** Seismic Information

VIIIa Geologic Description

a. Attach appropriate geologic data on the injection zone including appropriate lithological detail, geologic name, thickness, and depth.

The proposed injection interval consists of sedimentary rock formations deposited during the Devonian and Silurian Periods. The Devonian Formation consists of porous dolomites, chert intervals and limestone (McGlasson, E.H. 1967). The thickness of the Devonian and Silurian Formations is estimated to be approximately 1,000 feet (ft.) locally. Sections of porous dolomite and limestone are believed to be present at the proposed injection site. The proposed injection interval is overlain by the Woodford Shale, which ranges in thickness from 100 to 300 ft. consists of organic-rich dark shales, black cherts, siltstone, sandstone and greenish-colored shales (Broadhead, R.F., 2010). Inferred depths of the proposed injection zone were estimated utilizing completions data from wells within the vicinity.

During the advancement of the proposed well, mud logging data will be utilized to ensure that the thickness of the Devonian and Silurian Formation is adequately defined, allowing for the proper placement of the packer, casing shoe and determination of the open-hole injection interval. Should logging data indicate depth adjustments are required for the casing program, applicable Sundry Notices will be filed with the NMOCD.

b. 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/kg or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

A search of the USGS database suggests the historic presence of **four (4) wells** within the vicinity of the Site. **Each** of the wells were completed in Alluvium and Bolson Deposits. Data from wells with available information suggested static water levels ranged from **33.14 ft. bgs** as measured in a well approximately **2 Mi East-Southeast** of the Site to **87.9 ft. bgs** as measured in a well approximately **1.1 Mi. Southeast** of the Site. There is **one (1) inactive** USGS wells within a 1-Mile radius of the proposed injection well.

A search of the NMOSE database suggests the historic presence of **five (5)** wells within a 1-mile radius of the Site. The wells are were drilled to depths ranging from 70 to 200 ft. bgs. If available and producing, two (2) of the identified fresh water wells will be sampled. Analytical results, if applicable, are provided in Attachment #6.

Other known water sources in the area include the Rustler Formation, which outcrops in the area and the underlying Salado and Castile Formations. Groundwater within the Rustler, Salado and Castile is not a a source of drinking water. No usable water is expected to be encountered beyond 300 Ft. bgs.



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW#### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is

closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

P	n	n	
	v	v	

		Sub-		Q	Q	Q								W	ater
POD Number	Code	basin	County	64	16	4	Sec	Tws	Rng	X	Y	DistanceDep	thWellDep	thWater Col	umn
<u>C 00824</u>		C	ED	3	1	3	03	25S	25E	557409	3557916*	1270	70	19	51
C 01705		C	ED	3	1	3	03	25S	25E	557409	3557916*	1270	70	21	49
C 01619		C	ED	4	4	4	04	25S	25E	557194	3557504*	1334	100		
C 03291		C	ED	4	4	4	04	25S	25E	557194	3557504*	1334	78	24	54
C 03748 POD1		С	ED	2	4	4	04	25S	25E	557192	3557661	1371	200		

Average Depth to Water:

21 feet

Minimum Depth:

19 feet

Maximum Depth:

24 feet

Record Count: 5

UTMNAD83 Radius Search (in meters):

Easting (X): 558509.5

Northing (Y): 3557280.2

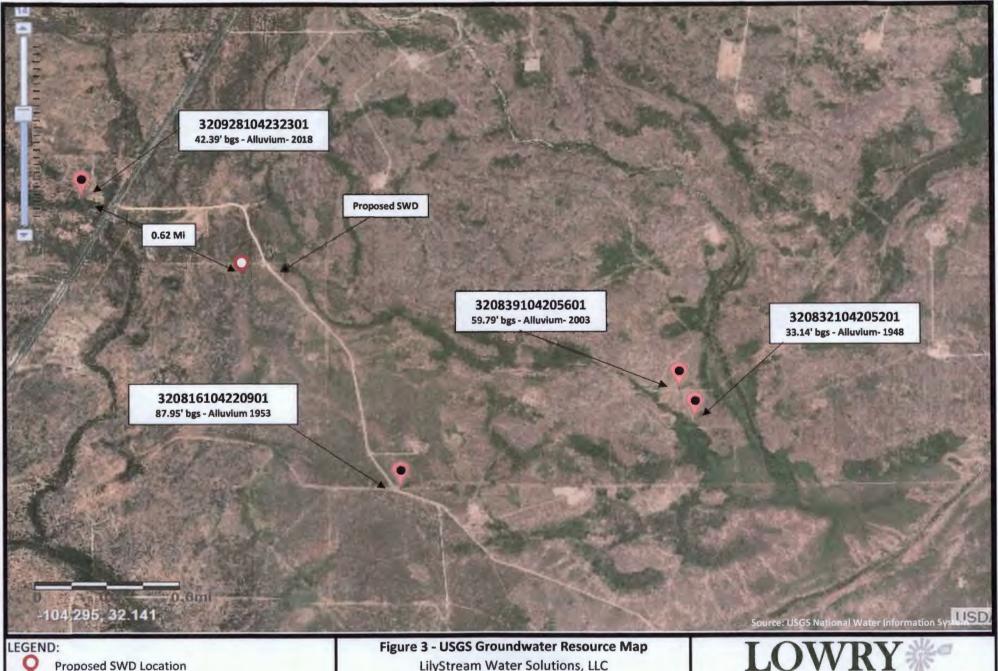
Radius: 1608

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, or suitability for any particular purpose of the data.

4/12/19 9:06 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER



Proposed SWD Location

USGS Water Well (Reported)

LilyStream Water Solutions, LLC Lucas SWD #1 API No. Pending Legals: UL B, Sec. 10,T25S, R25E Eddy County, New Mexico

environmental

Drafted by: jwl

Checked by: client

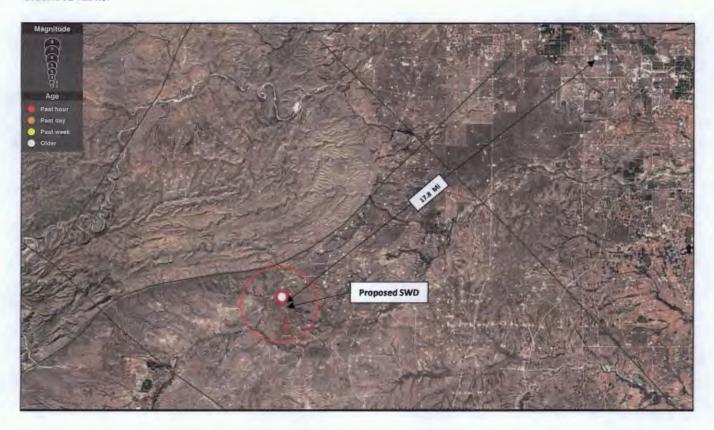
Date: 2/11/2019

VIIIb Seismic Information

The proposed injection well is located within the western portion of the Delaware Basin in Unit Letter "B", Section 10, Township 25 South, Range 25 East in Eddy County, New Mexico. A review of USGS data available on the ComCat Earthquake Catalog indicates the nearest seismic event exceeding a magnitude of 0.1 occurred approximately 17.8 Mi northeast of Site. The seismic event was reported as a magnitude 3.9 occurring in November of 1974.

The nearest fault trace is approximately 1.7 Mi North of the proposed injection well. The fault trace is indicative of a normal fault striking Northeast-Southwest.

Data available on the ComCat Earthquake Catalog suggests the recorded seismic events within the region did not occur on the described faults.



Faults traces are depicted as green linear features. Seismic events with available data are depicted as grey dots of which the size is representative of the magnitude. Details regarding the depicted faults are provided on the following page.

Sources:

Bureau of Economic Geology. Accessed February 2019. Permian Basin Geologic Synthesis Project. https://gis.utlands.utsystem.edu/ags/rest/services/GeologicFeatures/MapServer

U.S. Geological Survey (USGS). February 2019. Earthquakes Hazard Program: ComCat Earthquake Catalog. https://earthquake.usgs.gov/learn/kml.php

VIIIb Seismic Information

A recent publication prepared by Snee and Zoback (2018) entitled "State of Stress in the Permian Basin, Texas and New Mexico" discusses the fault slip potential of fault traces complied from Ewing et al. (1990), Green and Jones (1997), Ruppel et al. (2005) as well the USGS Quaternary Faults and Fold Database. A map detailing their findings with the proposed injection well location superimposed is provided below:

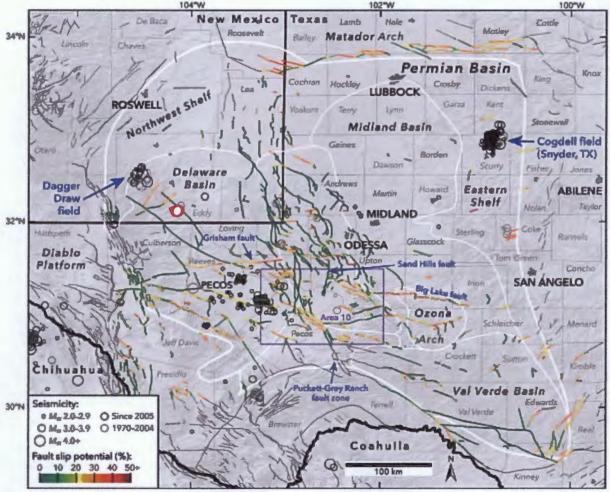


Figure 3. Results of our probabilistic FSP analysis across the Permian Basin. Data sources are as in Figures 1 and 2.

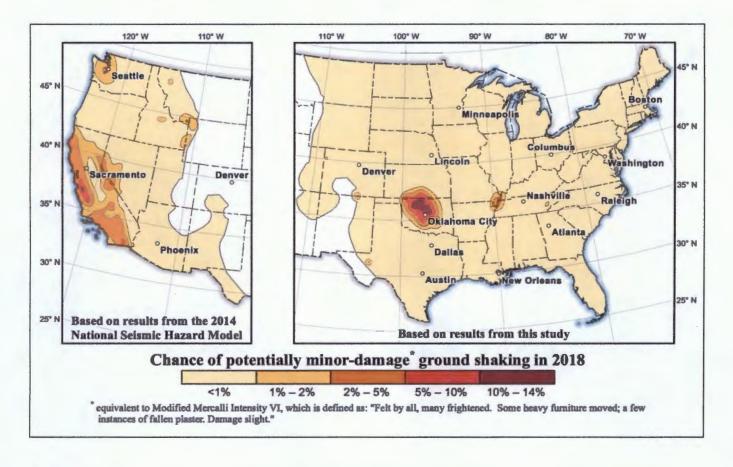
Based on the proposed injection well's distance to known faults, relative low faulting and seismic activity in the area, review of historical earthquake data and the presence of confining layers above and beneath the proposed injection zone, it is unlikely that the proposed injection activities will contribute to a fault-slip event.

Source:

Snee, Jens-Erik Lund, and Mark D. Zoback. 2018 "State of Stress in the Permian Basin, Texas and New Mexico; Implication for Induced Seismicity." The Leading Edge 37 (February 2018).

VIIIb Seismic Information

Data from the 2018 USGS One-Year probabilistic seismic hazard forecast suggests there was a less than 1% chance of potentially minor-damage from induced and natural ground shaking in 2018, as depicted on the map below:

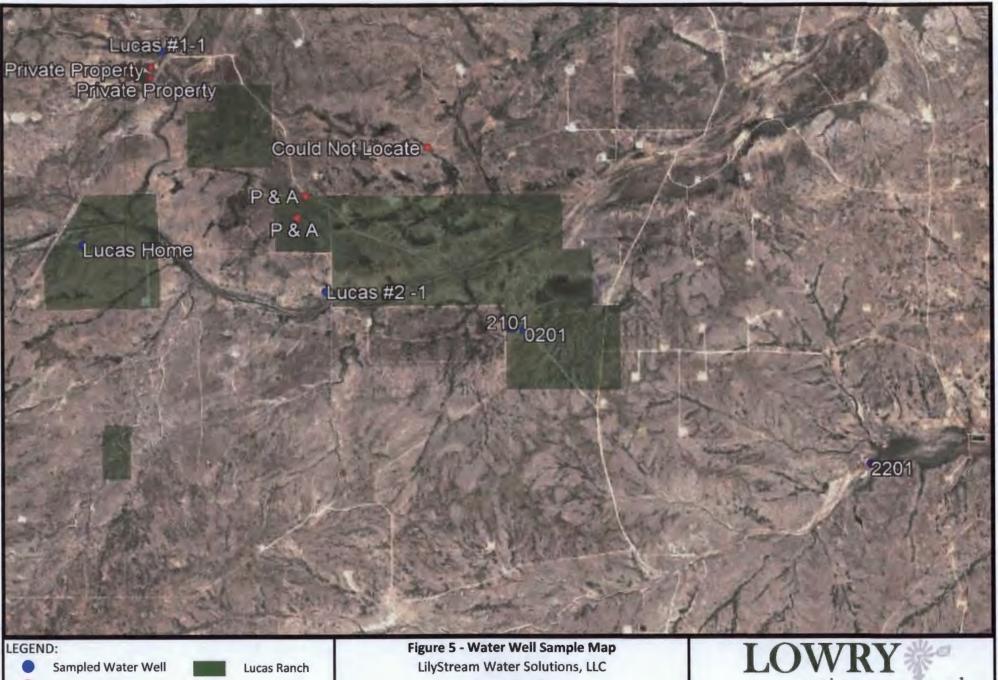


Source:

U.S. Geological Survey (USGS). February 2019. Earthquakes Hazard Program: Short-term Induced Seismicity Models. https://earthquake.usgs.gov/hazards/induced/index.php#2018

Fresh Water Laboratory Analysis (if applicable)

Fresh Water Sample Location Map (if applicable)



*Reported Water Well

* Not Sampled due to Absence, P&A Status, or Access Issues Laboratory Analysis not appended to this report will be provided upon receipt under a separate cover

Lucas Ranch

Eddy County, New Mexico



Drafted by: jwl

Checked by: client

Date:

2/11/2019



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 (575) 393-2326 FAX (575) 393-2476

Company Name:	ompany Name: Lowry Environmental										BIL	LL TO						ANAL	YSIS	REC	QUES.	Γ		
Project Manager	: Joel Lowry							P	.0.	余														
Address: PO	Box 896							C	om	pany	:	Lowry Env												
City: Lov	ington	State:	Zip	:	#			A	ttn:	Joe	Lov	wry												
Phone #: 432-	466-4450 I	Fax #:						Address: PO Box 896																
Project #:		Project Owner	:					C	ity															
Project Name:	Lucas Ranch	1					and the same	S	tate	D:		Zip:												
Project Location	:							P	hoi	ne #:														
Sampler Name:	Joel Lowry							F	ax					1										
FOR LAB USE ONLY			0.			MA	TRIX		P	RESE	RV.	SAMPL	ING	1										
Lab I.D. H901418	Sample I.D	D.	(G)RAB OR (C)OMP	# CONTAINERS	GROUNDWATER	SOIL	OIL	SLUDGE	OINER:	ICE / COOL	OTHER:	DATE	TIME	Chloride	ТРН	BTEX 8021	Tos							
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April 15, 2019

JOEL LOWRY

LOWRY ENVIROMENTAL & ASSOCIATES

PO BOX 296

LOVINGTON, NM 88260

RE: LUCAS SWD

Enclosed are the results of analyses for samples received by the laboratory on 04/08/19 14:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab accredited certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2 Haloacetic Acids (HAA-5)
Method EPA 524.2 Total Trihalomethanes (TTHM)
Method EPA 524.4 Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

Celey D. Keene

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager



Analytical Results For:

LOWRY ENVIROMENTAL & ASSOCIATES JOEL LOWRY PO BOX 296 LOVINGTON NM, 88260

Fax To:

Received:

04/08/2019

Reported:

04/15/2019

Project Name: Project Number: LUCAS SWD NONE GIVEN

Project Location:

EDDY CO NM

Sampling Date:

04/08/2019

Sampling Type:

Water

Sampling Condition:

Cool & Intact

Sample Received By:

Tamara Oldaker

Sample ID: 2101 (H901273-01)

Chloride, SM4500CI-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	44.0	4.00	04/11/2019	ND	104	104	100	3.92	
TDS 160.1	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	2010	5.00	04/15/2019	ND	506	96.0	527	2.08	

Sample ID: 0201 (H901273-02)

Chloride, SM4500Cl-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	36.0	4.00	04/11/2019	ND	104	104	100	3.92	
TDS 160.1 mg/L		/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	2360	5.00	04/15/2019	ND	506	96.0	527	2.08	

Sample ID: 2201 (H901273-03)

Chloride, SM4500CI-B	mg	/L	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	252	4.00	04/11/2019	ND	104	104	100	3.92	
TDS 160.1 mg/L		Analyze	d By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	4650	5.00	04/15/2019	ND	506	96.0	527	2.08	

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and clients exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whetsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affillates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such daim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celeg Ditrema-



Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

** Samples not received at proper temperature of 6°C or below.

*** Insufficient time to reach temperature.

Chloride by SM4500Cl-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and clients exclusive remedy for any daim arising, whether based in contract or tort, shall be limited to the amount paid by client for analysiss. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal webin thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for inodernal or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey & Keine



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 (575) 393-2326 FAX (575) 393-2476

Company Name:										7	E	3//	410	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					ANA	LYSI	S RE	QUE	ST		
Project Manager	Juel Lowry			-					P.C	O. #:	L	0~	my E.	~U,				T							
Address: Po									Co	mpa	any:		(
City: Louis		State: NWA	Zip:	8	n	40			Att	in:															
Phone #: 432	-466-4460	Fax #:							Ad	dres	ss:														
Project #: N/		Project Owner							Cit	y:															
	Lucas SWD								Sta	ate:		2	Zip:												
Project Location									Ph	one	#:										1				
Sampler Name:	Juel Loury								Fa	x #:															
FOR LAB USE ONLY						M	ATR	X	T	PRI	SEF	₹V.	SAMPLI	NG	1 1										
Lab I.D.	Sample I.	D.	(G)RAB OR (C)OMP	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	705	doisons									
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enelyses, All claims include service. In no event shall Carlinguished By Relinquished By Relinquished By Delivered By	any	cause whatsoever shall be quental damages, including of services hereunder by C Date: 8 - (9	withou ardinal	d walv	ved unitation, undless ved	By: Samp	le in was intermediated and the control of the Color of t	etting ar suptions. th claim	loss (is bar	elved to of use, sed up	or loss or loss on any	ECK (Initi	ithin 30 days aft sits incurred by	er completion of client, its subsidi	the applicationies, itse. esult: ilt:	☐ Ye		□ No □ No		I Phon I Fax #					

Affirmative Statement

XII. AFFIRMATIVE STATEMENT

Re: LilyStream Water Solutions, LLC

Lucas SWD #1

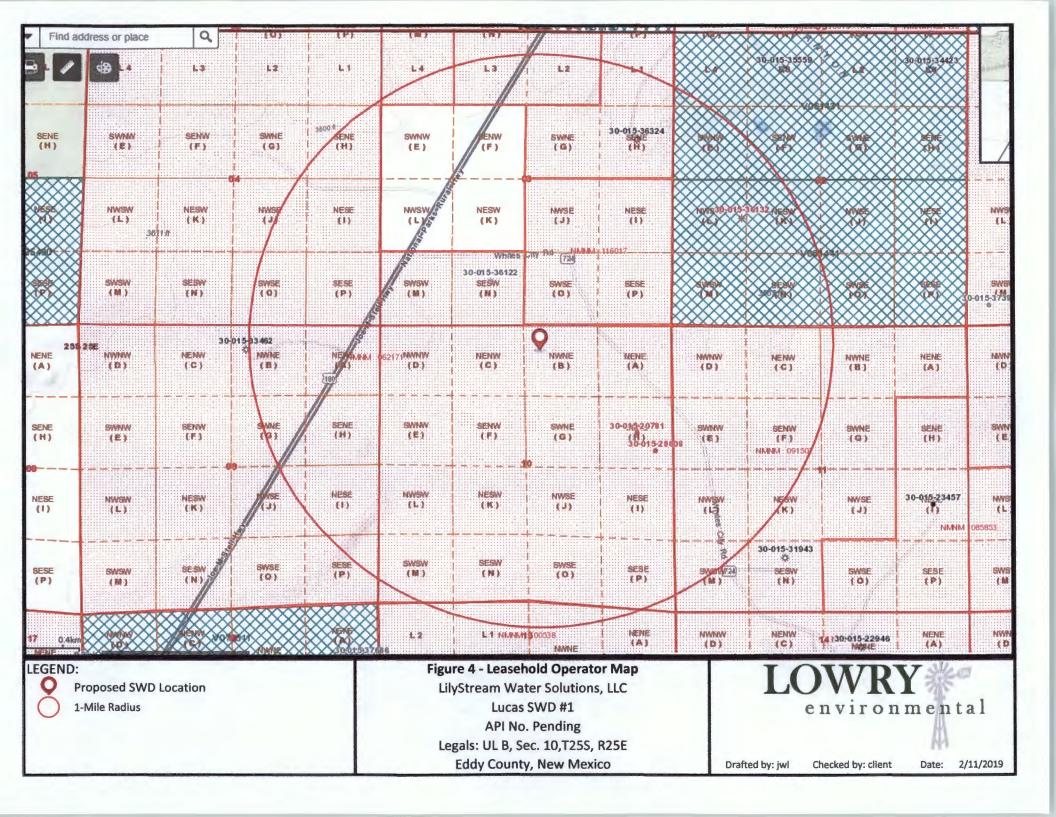
Legals: UL B, Sec. 10, T25S, R25E

Available geologic and engineering data has been examined and we find no evidence of open faults or any hydrologic connection between the disposal interval and any underground sources of drinking water.

Joel W. Lowry

LOWRY environmental

Proof of Notice Documentation



XIV. PROOF OF NOTICE

Surface Owner:

Berry and Janice Lucas, husband and

P.O. Box 96

White City, NM 88268

Leasehold Operators and/or Unleased Mineral Owners within a One-Mile Radius:

EOG M Resources, Inc.

105 S. 4th St.

Artesia, NM 88210

Cimarex Energy Co. of Colorado 600 N. Marienfeld Street, Suite 600

Midland, TX 79701

EOG Y Resources, Inc.

105 S 4th St.

Artesia, NM 88210

Tap Rock Operating, LLC

602 Park Point Drive Suite 200

Golden, CO 80401

EOG A Resources, Inc.

105 S. 4th St.

Artesia, NM 88210

Concho Oil & Gas LLC

600 W. Illinois Ave Midland, TX 79701

Oxy Y-1 Company

P.O. Box 27570

Houston, TX 77227

Hanagan, Robert W

223 West Wall #301 Midland, TX 79702

COG Operating LLC

600 W. Illinois Ave

Midland, TX 79701

JKM Energy, LLC

26 E. Compress Road

French L R Jr

P.O. Box 11327

Midland, TX 79701

Artesia, NM 88210

Cabal Energy Corp

415 W. Wall St STE 1700

Midland, TX 79701

Cimarex Energy Co.

600 N. Marienfeld Street, Suite 600

Midland, TX 79701

XTO Holdings LLC

810 Houston St

Fort Worth, TX 76102

XIV. PROOF OF NOTICE

Regulatory Agency:

NMOCD - Santa Fe 1220 S. St. Francis Dr. Santa Fe, NM 87505 NMOCD - District 2 811 S. First Artesia, NM 88210

































NOTIFICATION TO INTERESTED PARTIES

Via U.S. Certified Mail - Return Receipt Requested

RE:

Application for Authroization to Inject

Lucas SWD #1

Township 25S, Range 25E, N.M.P.M Section 10, 250' FNL & 2,390' FEL

Eddy County, New Mexico

To Whom It May Concern:

Enclosed for your review is a copy of a C-108 Application submitted by LilyStream Water Solutions, LLC, Lovington, New Mexico, to the New Mexico Oil Conservation Division to drill and complete for produced water disposal the Lucas SWD #1.

The well is located in Section 10, Township 25S, Range 25E, 250' FNL and 2,390' FEL, Eddy County, New Mexico.

As required by NMOCD, we are notifying you because you have been indentified as an operator or surface owner and therefor an affected party by this action. Any objections must be submitted in writing to NMOCD, 1220 S. St. Francis Drive, Santa Fe, New Mexico 87505. Objections must be received within fifteen (15) days of receipt of this letter.

The well will be a commercial SWD well taking produced water from oil and gas operations in the surrounding area. Please contact Joel Lowry with Lowry Environmental and Associates, LLC, at 432.466.4450, with any questions or concerns regarding this well or application.

Respectfully,

Joel W. Lowry

environmental

XIV. PROOF OF NOTICE

Affidavit of Publication

Affidavit of Publication

25081 State of New Mexico County of Eddy: Danny Scott being duly sworn sayes that he is the Publisher of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached Legal Ad was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for Consecutive weeks/day on the same day as follows: First Publication April 21, 2019 Second Publication Third Publication Fourth Publication Fifth Publication Sixth Publication Seventh Publication Subscribed and sworn before me this 2019 22nd day of April



Latisto Romine

Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication

Legal Notice

LilyStream Water Solutions, LLC, 1308 W. Ave D, Lovington, NM 88260, is filing Form C-108 for an application for Authority to Inject with the New Mexico Oil and Conservation Division requesting administrative approval for a salt water disposal well. The proposed newly drilled well, the Lucas SWD No. 1 is located at 250' FNL & 2,390' FEL, Section 10, Township 25S Range 25E, N.M.P.M., Eddy County, New Mexico: approximately 19.5 miles Southwest of Carlsbad down National Parks Hwy, NM down and 0.5 Miles Southeast on White City Road. (API # to be assigned). Produced water from area oil and gas producing wells will be commercially disposed into the Devonian and Silurian formations from 11,932' to 13,032' below surface. Expected maximum injection rate is 30,000 bpd, and the expected maximum injection pressure is 2,386 psi. Questions concerning the application can be directed to the applicant's agent Lowry Environmental, LLC, PO Box 948, Lovington, NM 88260, by phone (432) 466-4450 or email joel@lowryenvironmental.com. Objections or request for hearing must be directed to the Oil Conservation Division, (505) 476-3440, 1220 South Saint Francis Drive, Santa Fe, NM 87504, within 15 days.

Published in the Artesia Daily Press, Artesia, N.M., April 21, 2019 Legal No. 25081.