Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:
6/20/2017	PRG	SWD	pMAM1717136579

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: Santo Operating, LLC **OGRID Number:** 371502
Well Name: Ocotillo Sunrise SWD # 001 **API:** pending
Pool: Bell Canyon/Cherry Canyon **Pool Code:** 96802

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 ☐PPRX

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.

June 12, 2017
Date

Loren Diede
Print or Type Name

505-334-8867
Phone Number

Signature

Loren.diede@soudermiller.com
e-mail Address

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: _____Secondary Recovery _____Pressure Maintenance _____**X**__Disposal _____Storage
Application qualifies for administrative approval? __**X**_____Yes _____No

II. OPERATOR: _____**Santo Operating, LLC**_____

ADDRESS: _____**P.O. Box 1020, Artesia, New Mexico 88211**_____

CONTACT PARTY: _____**Loren Diede , Agent (Souder Miller and Associates)**_____PHONE: _**(505) 334-8867**_____

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 ____**X**_____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).

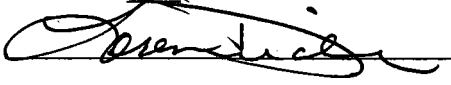
*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

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: ____**Loren Diede**_ **(Souder Miller and Associates)**_____TITLE: _____**Agent**_____

SIGNATURE:  _____DATE: _____June 12, 2017_____

E-MAIL ADDRESS: _____**loren.diede@soudermiller.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: _____

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

Side 2

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.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: Santo Operating, LLC

WELL NAME & NUMBER: Ocotillo Sunrise SWD # 001

WELL LOCATION: 2630' FSL and 2310' FEL | J | 15 | 25S | 34E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

Santo Petroleum LLC

Ocotillo Sunrise SWD #001
API #
Section 15, T25S, R34E
2630' FSL, 2310' FEL
Lea County, NM

Review with District

GL 3330' KB 3355'

Formation Tops	FGL	
Rustler	848'	
Salt	1252'	
Castille	5055'	
Lamar	5311'	Delaware
Bell Canyon	5349'	5462' - 7156' Perf. Interval
Cherry Canyon	6300'	

FW (?) to ~1100' 1100

Brine (?) Water Mud

1352'

5155'

5362'

7325'

Brine (?) Mud

Estimated BHT 137 degrees

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.1/2" Casing Size: 13 3/8" 54.5# J-55 BTC

Cemented with: _____ sx. *or* 1409 ft³

Top of Cement: Surface Method Determined: Circulation

Intermediate Casing

Hole Size: 12 ¼" Casing Size: 9 5/8" 40# J-55 LTC 0-3911' / 40# HCK-55 3911' – 5155'

Cemented with: _____ sx. *or* 2013 ft³

Top of Cement: Surface Method Determined: Circulation

Production Casing

Hole Size: 8 ¾" Casing Size: 7" 26# HCL-80 LTC

Cemented with: _____ sx. *or* ~~1257~~ ft³ recalculate to Surface

Top of Cement: Surface Method Determined: ~~CBL~~ Circulate to Surface

Total Depth: 7325'

Injection Interval

5462' feet to 7156' Perforated

(Perforated or Open Hole; indicate which)

Souder, Miller & Associates ♦ 401 W. Broadway ♦ Farmington, NM 87401
(505) 325-7535 ♦ (800) 519-0098 ♦ fax (505) 326-0045

Date: June 12, 2017

New Mexico Oil Conservation Division
Attn: Phillip Goetze
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Application for Authorization to Inject
Santo Operating, LLC Ocotillo Sunset SWD # 001
2630'FSL & 2310' FEL, Section 15
T 25S, R 34E N.M.P.M.
Lea County, NM

Dear Mr. Goetze:

Santo Operating, LLC respectfully requests administrative approval for Authorization to Inject for the referenced well. Attached for your review is a copy of the completed Administrative Application Checklist and C-108 Application with required attachments.
Santo Operating intends to drill the Ocotillo Sunrise SWD # 001 and utilize the Bell Canyon and Cherry Canyon members of the Delaware Mountain Group for produced water disposal.
Our geologic prognosis indicates that potential fresh water formations will be protected by 3 strings of casing and cement and that no open faults or hydrologic connectivity exists between the proposed injection intervals and any fresh water zones.
There currently are no producing intervals above or below the proposed injection intervals in this area.

Please do not hesitate to contact me at (505) 334-8867 or Austin Weyant at (575) 689-7040 with any questions.

Sincerely,

Loren Diede (agent)
Souder Miller and Associates
Loren.diede@soudermiller.com

Side 2

INJECTION WELL DATA SHEET

Tubing Size: **3 ½" J-55** Lining Material: **IPC**

Type of Packer: **Hornet or similar**

Packer Setting Depth: **5362'**

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

Additional Data

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

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

2. Name of the Injection Formation: **Bell Canyon and Cherry Canyon (Delaware)**

3. Name of Field or Pool (if applicable): **SWD Bell Canyon / Cherry Canyon 96802**

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: _____

   There currently are no producing oil or gas zones overlying the injection interval in this area.

   There currently are no underlying oil or gas production intervals in this area.

C-108 Application for Authorization to Inject

Santo Operating, LLC

Ocotillo Sunrise SWD # 001

2630' FSL & 2310' FEL, UL J

Sec. 15, T 25S, R34E

Lea County, NM

V. Maps and plat are attached.

VI. Well information for wells within the area of review. No existing wells penetrate the proposed injection zone. Note: Wood Fed Com No.1 (30-025-27328) only to 400'/Surface Casing only then P&A'd 7/26/1981

API #	Well Name	Operator	Location	Comments
30-025-27328	Wood Fed Com #1	Enserch	G-15-25S-34E	Drilled to 400', cased, P&A 1981
30-025-43419	Ocotillo Sunrise 15 001H	Santo	P-15-25S-34E	APD 2016, Not yet drilled
30-025-43420	Ocotillo Sunrise 15 002H	Santo	P-15-25S-34E	APD 2016, Not yet drilled
30-025-43421	Ocotillo Sunrise 15 003H	Santo	O-15-25S-34E	APD 2016, Not yet drilled

VII. 1. Proposed average daily injection rate = 2000 bbl / day

Proposed maximum daily injection rate = 6000 bbl / day.

2. Closed system.

3. Proposed maximum injection pressure = 1092 psi (5462 x 0.20)

(A change of maximum injection pressure may be requested based on results of step-rate test at future time.)

4. The source of injection water will be the future Santo Wolfcamp wells above. No compatibility issues are anticipated, analysis of offset representative Wolfcamp water is attached.

VIII. The proposed injection zone is the Permian age Bell Canyon and Cherry Canyon members of the of the Delaware Mountain Group. The injection intervals are primarily sandstone with bentonitic shale partings. Estimated sandstone porosities of 14 to 20%. Proposed injection interval perforations are from 5462'to 7156' AGL. Any underground fresh water sources are expected to be above 848' AGL, based on the top of the Rustler anhydrite estimated to be 848' AGL.

IX. The intervals will be perforated; no further stimulation is currently planned.

X. Well logs and mud logs will be filed with NMOCD. Type logs used in the design of this well are attached.

XI. A map showing the fresh water wells within 1 mile and 3 miles of the proposed SWD is attached.

Water analysis from these wells is also attached

XII. *Based on examination of available geological and engineering data, I find no evidence of open faults or any hydrological connection between the proposed disposal zone and any underground sources of drinking water. – John Weihe, Geologist and Exploration Manager – Santo Petroleum.*

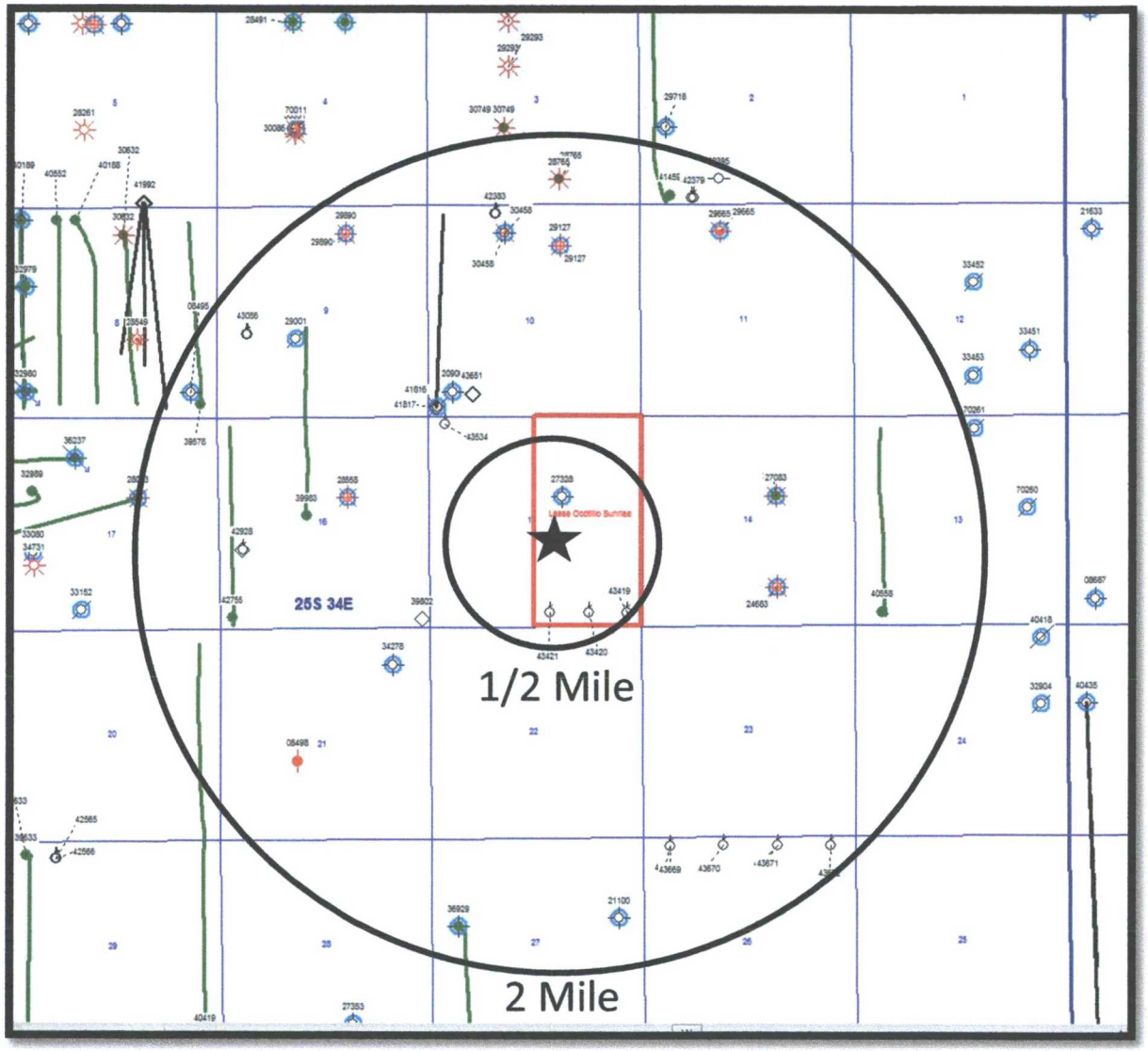
XIII. Proof of notification is attached.

Attachments for

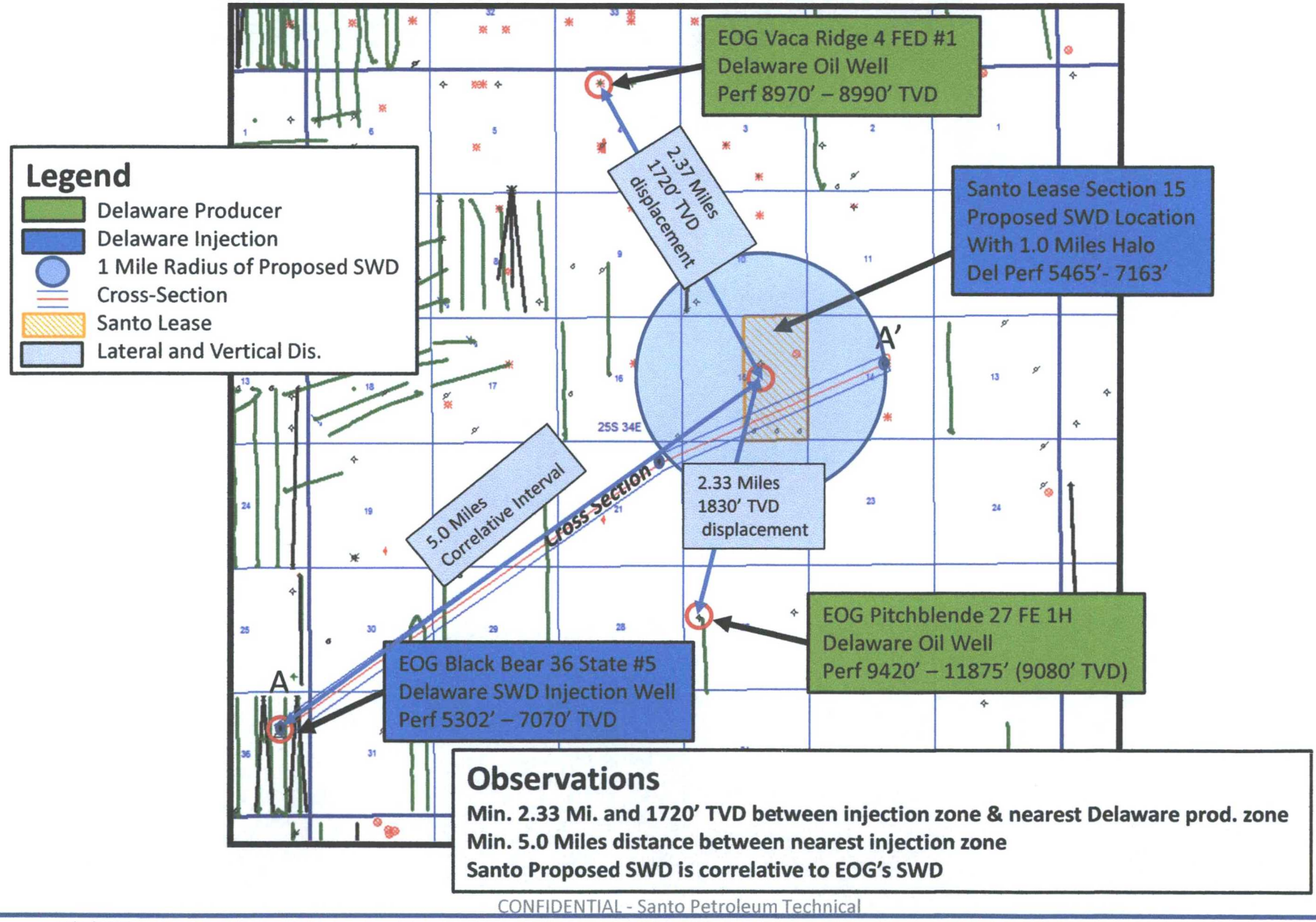
V.

Maps and Plat

Ocotillo Sunrise SWD #001
Well Base Map



T 25S R 34E Area Base Map – Active Delaware Wells



Observations

Min. 2.33 Mi. and 1720' TVD between injection zone & nearest Delaware prod. zone
Min. 5.0 Miles distance between nearest injection zone
Santo Proposed SWD is correlative to EOG's SWD

OCOTILLO SUNRISE SWD #1

Located 2630' FSL and 2310' FEL
Section 15, Township 25 South, Range 34 East,
N.M.P.M., Lea County, New Mexico.

basin surveys
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P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

0' 1000' 2000' 3000' 150'0'
SCALE: 1" = 2000'

W.O. Number: KJG 32846

Survey Date: 04-07-2017

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

N

SANTO

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 Rd., 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 and Natural Resources Department

OIL CONSERVATION DIVISION

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

Form C-102
Revised August 4, 2011

Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
pending	96802	SWD Bell Canyon / Cherry Canyon

Property Code	Property Name	Well Number
	OCOTILLO SUNRISE SWD	001

OGRID No.	Operator Name	Elevation
371502	SANTO OPERATING, LLC	3330'

Surface Location

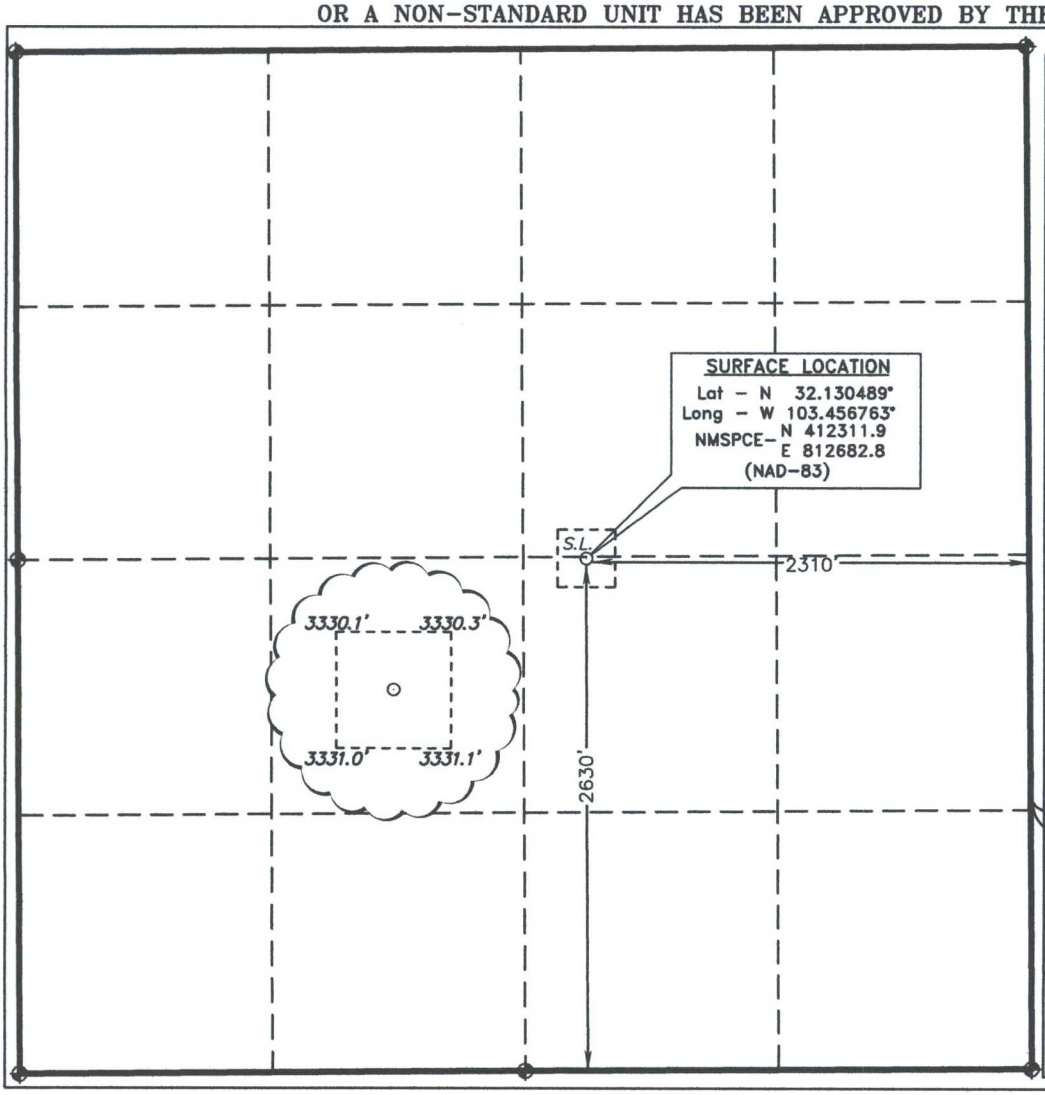
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	SOUTH/South line	Feet from the	East/West line	County
J	15	25 S	34 E		2630	SOUTH	2310	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	SOUTH/South line	Feet from the	East/West line	County

Dedicated Acres	Joint or Infill	Consolidation Code	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



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unLEAsed mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

Email Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervison, and that the same is true and correct to the best of my belief.

APRIL 7, 2017
Date Surveyed

Signature & Seal of Professional Surveyor

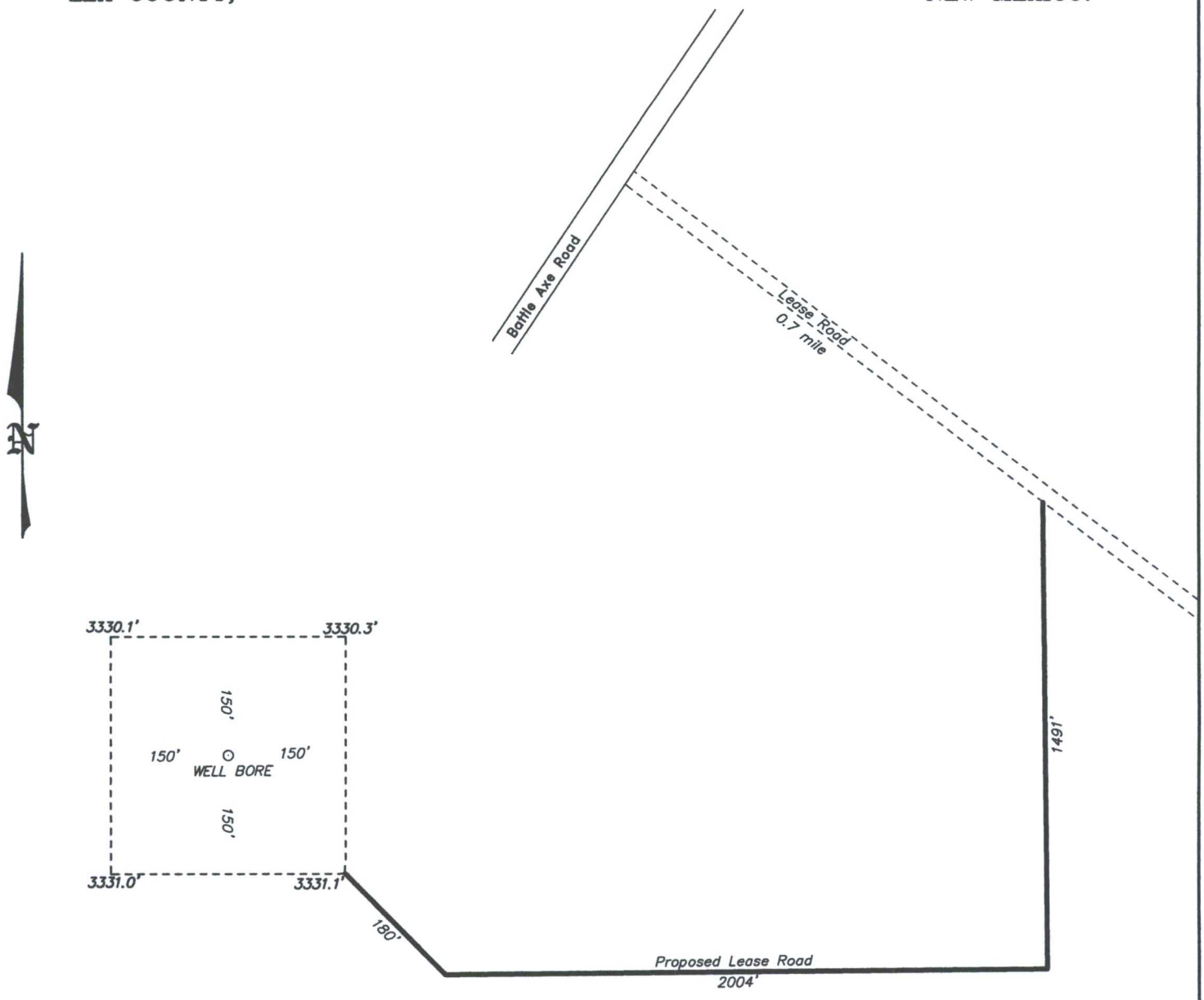
GARY L. JONES NEW MEXICO 7977 REGISTERED PROFESSIONAL LAND SURVEYOR

Certificate Gary L. Jones 7977
BASIN SURVEYS

0' 500' 1000' 1500' 2000' N
SCALE: 1" = 1000'
WO Num.: 32846

SECTION 15, TOWNSHIP 25 SOUTH, RANGE 34 EAST. N.M.P.M.,

LEA COUNTY, NEW MEXICO.



SANTO OPERATING, LLC
OCOTILLO SUNRISE SWD #1
ELEV. - 3330'

Lat - N 32.130489°
Long - W 103.456763°
NMSPCE- N 412311.9
E 812682.8
(NAD-83)

JAL, NM IS ±15 MILES TO THE EAST OF LOCATION.

200 0 200 400 FEET

SCALE: 1" = 200'

SANTO OPERATING, LLC

REF: OCOTILLO SUNRISE SWD #1 / WELL PAD TOPO

THE OCOTILLO SUNRISE SWD #1 LOCATED 2630' FROM THE SOUTH LINE AND 2310' FROM THE EAST LINE OF SECTION 15, TOWNSHIP 25 SOUTH, RANGE 34 EAST. N.M.P.M., LEA COUNTY, NEW MEXICO.

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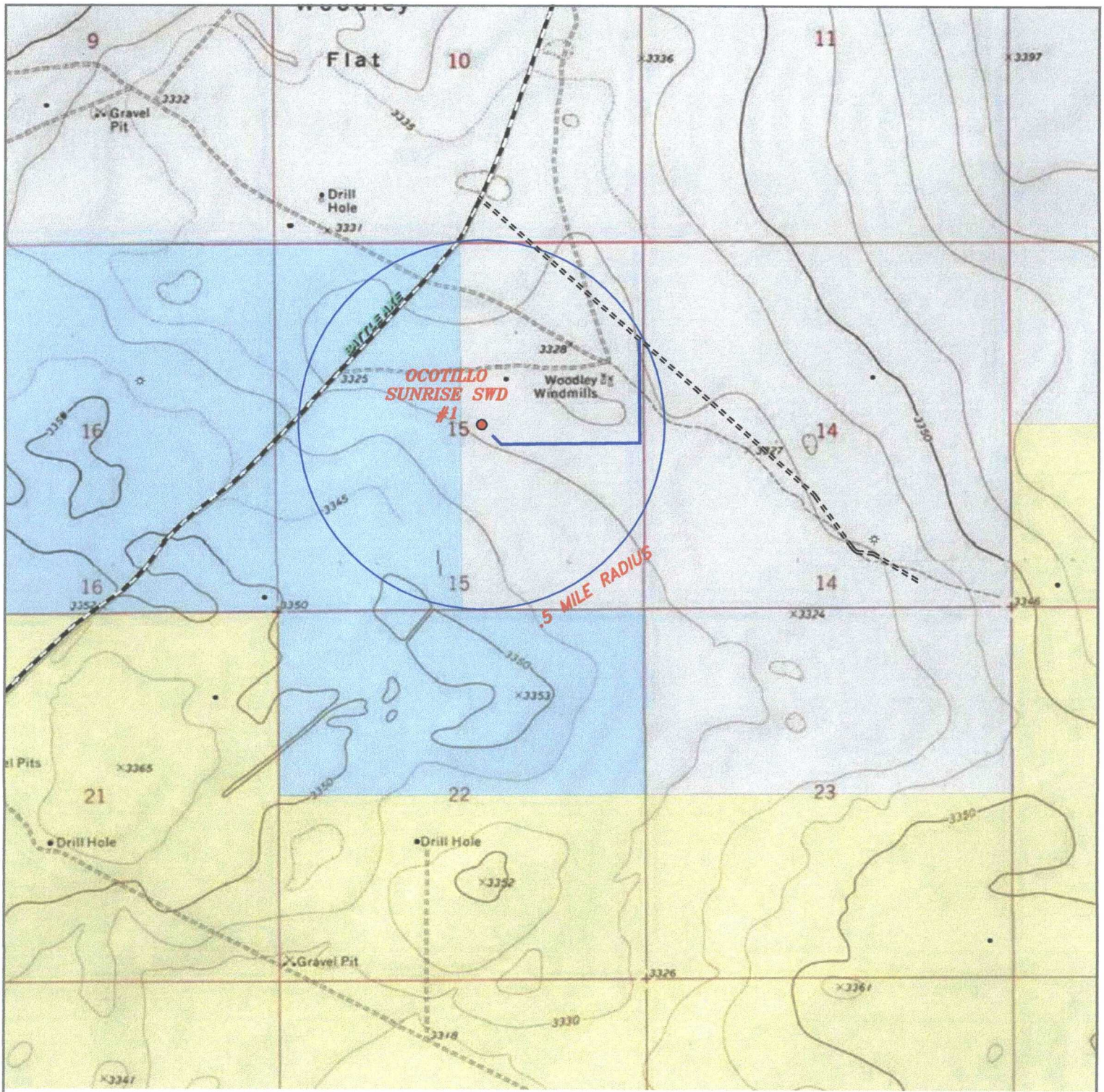
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 32846	Drawn By: K. GOAD	Date: 04-18-2017	Survey Date: 04-07-2017	Sheet 1 of 1 Sheets



OCOTILLO SUNRISE SWD #1

Located 2630' FSL and 2310' FEL
Section 15, Township 25 South, Range 34 East,
N.M.P.M., Lea County, New Mexico.

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(575) 393-7316 – Office
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basinsurveys.com

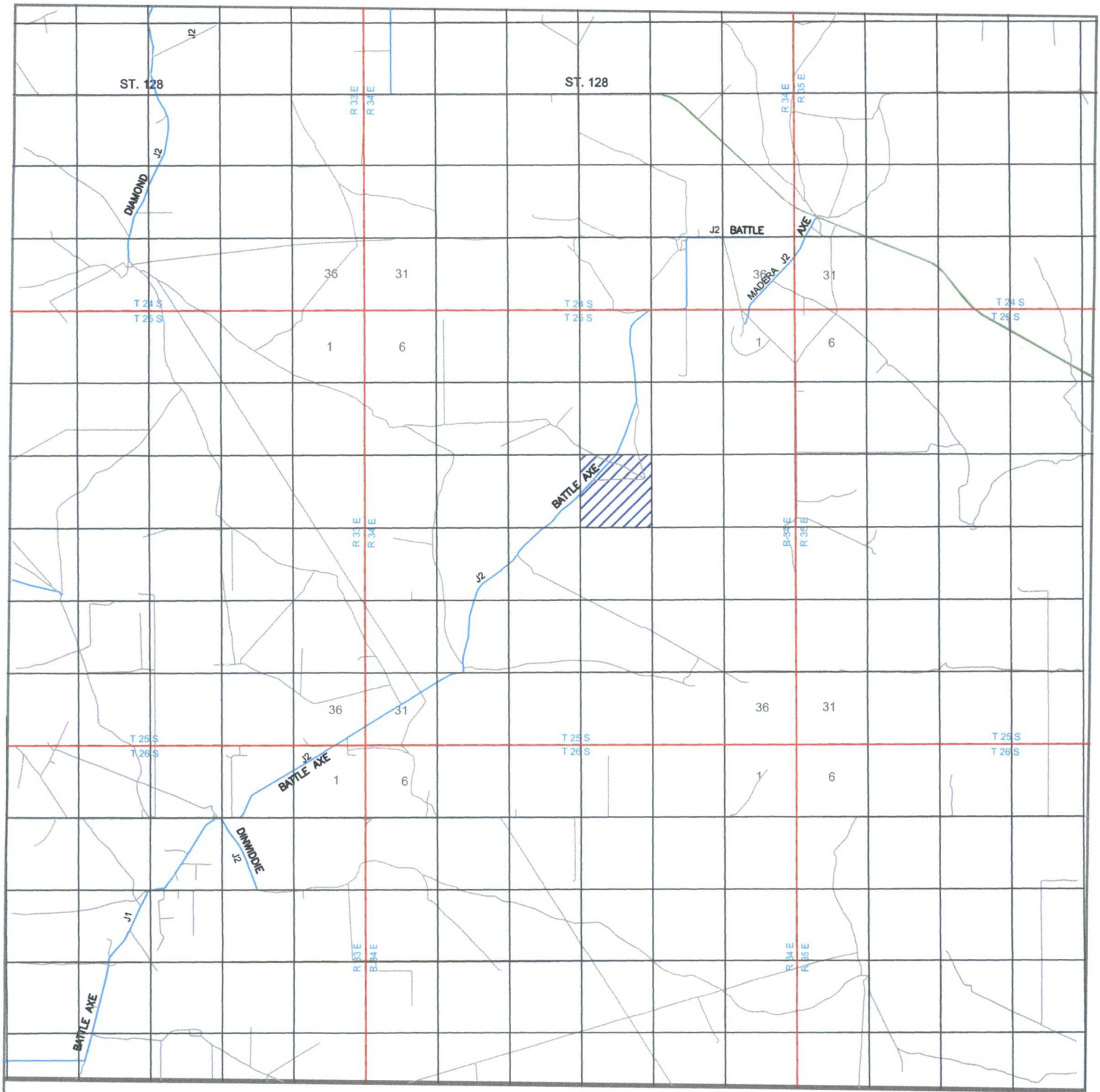
0' 1000' 2000' 3000' 150'0'
SCALE: 1" = 2000'

W.O. Number: KJG 32846

Survey Date: 04-07-2017

YELLOW TINT – USA LAND
BLUE TINT – STATE LAND
NATURAL COLOR – FEE LAND

SANTO



OCOTILLO SUNRISE SWD #1

Located 2630' FSL and 2310' FEL
Section 15, Township 25 South, Range 34 East,
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Hobbs, New Mexico 88241
(575) 393-7316 – Office
(575) 392-2206 – Fax
basinsurveys.com

0 1 MI 2 MI 3 MI 4 MI
SCALE: 1" = 2 MILES

W.O. Number: KJG 32846

Survey Date: 04-07-2017

YELLOW TINT – USA LAND
BLUE TINT – STATE LAND
NATURAL COLOR – FEE LAND

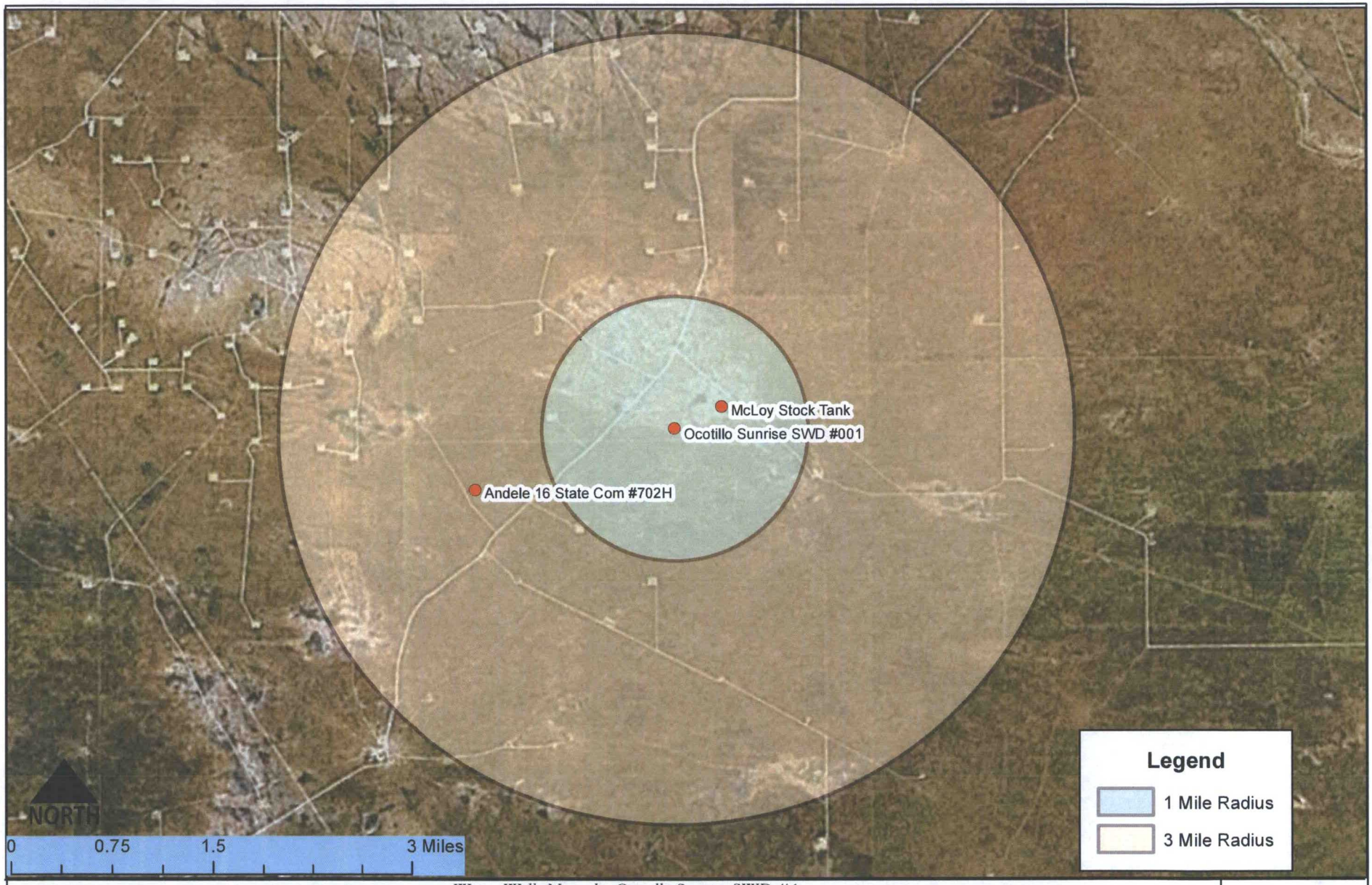
N

SANTO

Attachments for

XI.

Fresh Water Analysis



Water Wells Near the Ocotillo Sunrise SWD #1
Ocotillo Sunrise SWD #1 - Santo
J 15-T25S-R34E, New Mexico

Figure 1b

Date Saved: 6/8/2017

Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Heather Patterson
Checked
Approved

SMA
201 South Halagueña Street
Carlsbad, New Mexico 88221
(575) 689-7040
www.soudermiller.com
Serving the Southwest & Rocky Mountains

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 16, 2017

Austin Weyant
Souder, Miller & Associates
201 S Halagueno
Carlsbad, NM 88221
TEL: (575) 689-7040
FAX

RE: Ocotilla OrderNo.: 1706496

Dear Austin Weyant:

Hall Environmental Analysis Laboratory received 3 sample(s) on 6/9/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1706496**
Date Reported: **6/16/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Project: Ocotilla
Lab ID: 1706496-001 **Matrix:** AQUEOUS

Client Sample ID: Red Hills
Collection Date: 6/7/2017 9:00:00 AM
Received Date: 6/9/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	95	6.6		mg/L	1	6/12/2017	R43428
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Fluoride	1.3	0.10		mg/L	1	6/12/2017 6:33:10 PM	A43443
Chloride	14	0.50		mg/L	1	6/12/2017 6:33:10 PM	A43443
Bromide	ND	0.10		mg/L	1	6/12/2017 6:33:10 PM	A43443
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	6/12/2017 6:33:10 PM	A43443
Sulfate	87	10		mg/L	20	6/12/2017 6:45:34 PM	A43443
Nitrate+Nitrite as N	ND	1.0		mg/L	5	6/12/2017 8:12:24 PM	R43443
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	790	5.0		µmhos/cm	1	6/13/2017 5:20:26 PM	R43498
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	301.0	20.00		mg/L CaCO3	1	6/13/2017 5:20:26 PM	R43498
Carbonate (As CaCO3)	ND	2.000		mg/L CaCO3	1	6/13/2017 5:20:26 PM	R43498
Total Alkalinity (as CaCO3)	301.0	20.00		mg/L CaCO3	1	6/13/2017 5:20:26 PM	R43498
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	476	20.0		mg/L	1	6/12/2017 6:02:00 PM	32219
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.20		mg/L	10	6/12/2017 7:05:16 PM	A43428
Barium	0.034	0.0020		mg/L	1	6/12/2017 6:54:15 PM	A43428
Calcium	13	1.0		mg/L	1	6/12/2017 6:54:15 PM	A43428
Chromium	ND	0.0060		mg/L	1	6/12/2017 6:54:15 PM	A43428
Cobalt	ND	0.0060		mg/L	1	6/12/2017 6:54:15 PM	A43428
Copper	ND	0.0060		mg/L	1	6/12/2017 6:54:15 PM	A43428
Iron	0.47	0.020	*	mg/L	1	6/12/2017 6:54:15 PM	A43428
Lead	ND	0.0050		mg/L	1	6/12/2017 6:54:15 PM	A43428
Magnesium	15	1.0		mg/L	1	6/12/2017 6:54:15 PM	A43428
Manganese	0.011	0.0020		mg/L	1	6/12/2017 6:54:15 PM	A43428
Molybdenum	0.017	0.0080		mg/L	1	6/12/2017 6:54:15 PM	A43428
Nickel	ND	0.010		mg/L	1	6/12/2017 6:54:15 PM	A43428
Potassium	3.6	1.0		mg/L	1	6/12/2017 6:54:15 PM	A43428
Silica	9.2	1.7		mg/L	10	6/12/2017 7:05:16 PM	A43428
Sodium	150	10		mg/L	10	6/12/2017 7:05:16 PM	A43428
Strontium	0.46	0.10		mg/L	10	6/12/2017 7:05:16 PM	A43428
Tin	ND	0.010		mg/L	1	6/12/2017 6:54:15 PM	A43428
Titanium	ND	0.0050		mg/L	1	6/12/2017 6:54:15 PM	A43428
Vanadium	ND	0.050		mg/L	1	6/12/2017 6:54:15 PM	A43428
Zinc	0.14	0.10		mg/L	10	6/12/2017 7:05:16 PM	A43428

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Project: Ocotilla
Lab ID: 1706496-002 **Matrix:** AQUEOUS

Client Sample ID: McCoy
Collection Date: 6/7/2017 10:00:00 AM
Received Date: 6/9/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	450	6.6		mg/L	1	6/12/2017	R43428
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Fluoride	3.6	0.10		mg/L	1	6/12/2017 6:57:59 PM	A43443
Chloride	75	10		mg/L	20	6/12/2017 7:10:23 PM	A43443
Bromide	0.73	0.10		mg/L	1	6/12/2017 6:57:59 PM	A43443
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	6/12/2017 6:57:59 PM	A43443
Sulfate	320	10	*	mg/L	20	6/12/2017 7:10:23 PM	A43443
Nitrate+Nitrite as N	9.3	1.0		mg/L	5	6/12/2017 8:24:49 PM	R43443
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	1300	5.0		µmhos/cm	1	6/13/2017 5:34:54 PM	R43498
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	179.4	20.00		mg/L CaCO3	1	6/13/2017 5:34:54 PM	R43498
Carbonate (As CaCO3)	7.360	2.000		mg/L CaCO3	1	6/13/2017 5:34:54 PM	R43498
Total Alkalinity (as CaCO3)	186.7	20.00		mg/L CaCO3	1	6/13/2017 5:34:54 PM	R43498
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	864	20.0	*	mg/L	1	6/12/2017 6:02:00 PM	32219
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.020		mg/L	1	6/12/2017 7:07:50 PM	A43428
Barium	0.017	0.0020		mg/L	1	6/12/2017 7:07:50 PM	A43428
Calcium	79	1.0		mg/L	1	6/12/2017 7:07:50 PM	A43428
Chromium	ND	0.0060		mg/L	1	6/12/2017 7:07:50 PM	A43428
Cobalt	ND	0.0060		mg/L	1	6/12/2017 7:07:50 PM	A43428
Copper	0.051	0.0060		mg/L	1	6/12/2017 7:07:50 PM	A43428
Iron	0.026	0.020		mg/L	1	6/12/2017 7:07:50 PM	A43428
Lead	ND	0.0050		mg/L	1	6/12/2017 7:07:50 PM	A43428
Magnesium	60	1.0		mg/L	1	6/12/2017 7:07:50 PM	A43428
Manganese	0.0029	0.0020		mg/L	1	6/12/2017 7:07:50 PM	A43428
Molybdenum	0.010	0.0080		mg/L	1	6/12/2017 7:07:50 PM	A43428
Nickel	ND	0.010		mg/L	1	6/12/2017 7:07:50 PM	A43428
Potassium	6.7	1.0		mg/L	1	6/12/2017 7:07:50 PM	A43428
Silica	30	1.7		mg/L	10	6/12/2017 7:10:22 PM	A43428
Sodium	100	10		mg/L	10	6/12/2017 7:10:22 PM	A43428
Strontium	2.2	0.10		mg/L	10	6/12/2017 7:10:22 PM	A43428
Tin	ND	0.010		mg/L	1	6/12/2017 7:07:50 PM	A43428
Titanium	ND	0.0050		mg/L	1	6/12/2017 7:07:50 PM	A43428
Vanadium	ND	0.050		mg/L	1	6/12/2017 7:07:50 PM	A43428
Zinc	0.043	0.010		mg/L	1	6/12/2017 7:07:50 PM	A43428

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: Andelle
Project: Ocotilla
Collection Date: 6/7/2017 12:00:00 PM
Lab ID: 1706496-003
Matrix: AQUEOUS
Received Date: 6/9/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS						Analyst: **pmf**	
Hardness (As CaCO3)	470	6.6		mg/L	1	6/13/2017	R43471
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Fluoride	ND	0.50		mg/L	5	6/12/2017 7:47:36 PM	A43443
Chloride	3100	250	*	mg/L	500	6/15/2017 4:00:07 AM	A43510
Bromide	24	2.0		mg/L	20	6/12/2017 8:00:00 PM	A43443
Phosphorus, Orthophosphate (As P)	ND	2.5	H	mg/L	5	6/12/2017 7:47:36 PM	A43443
Sulfate	58	2.5		mg/L	5	6/12/2017 7:47:36 PM	A43443
Nitrate+Nitrite as N	ND	4.0		mg/L	20	6/15/2017 4:12:32 AM	A43510
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	10000	25		µmhos/cm	5	6/15/2017 11:05:05 AM	R43555
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	273.4	20.00		mg/L CaCO3	1	6/13/2017 5:46:22 PM	R43498
Carbonate (As CaCO3)	ND	2.000		mg/L CaCO3	1	6/13/2017 5:46:22 PM	R43498
Total Alkalinity (as CaCO3)	273.4	20.00		mg/L CaCO3	1	6/13/2017 5:46:22 PM	R43498
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	6020	100	*D	mg/L	1	6/12/2017 6:02:00 PM	32219
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.020		mg/L	1	6/14/2017 12:57:29 PM	32236
Barium	0.10	0.0020		mg/L	1	6/13/2017 4:13:49 PM	32236
Calcium	150	10		mg/L	10	6/13/2017 4:15:51 PM	32236
Chromium	ND	0.0060		mg/L	1	6/13/2017 4:13:49 PM	32236
Cobalt	ND	0.0060		mg/L	1	6/13/2017 4:13:49 PM	32236
Copper	ND	0.0060		mg/L	1	6/14/2017 12:57:29 PM	32236
Iron	1.8	0.20	*	mg/L	10	6/13/2017 4:15:51 PM	32236
Lead	ND	0.0050		mg/L	1	6/13/2017 4:13:49 PM	32236
Magnesium	20	1.0		mg/L	1	6/13/2017 4:13:49 PM	32236
Manganese	0.99	0.0020	*	mg/L	1	6/13/2017 4:13:49 PM	32236
Molybdenum	0.012	0.0080		mg/L	1	6/13/2017 4:13:49 PM	32236
Nickel	ND	0.010		mg/L	1	6/13/2017 4:13:49 PM	32236
Potassium	33	1.0		mg/L	1	6/13/2017 4:13:49 PM	32236
Silica	7.6	0.17		mg/L	1	6/13/2017 4:13:49 PM	32236
Sodium	1700	50		mg/L	50	6/14/2017 12:59:31 PM	32236
Strontium	11	0.50		mg/L	50	6/14/2017 12:59:31 PM	32236
Tin	ND	0.010		mg/L	1	6/13/2017 4:13:49 PM	32236
Titanium	ND	0.0050		mg/L	1	6/13/2017 4:13:49 PM	32236
Vanadium	ND	0.050		mg/L	1	6/13/2017 4:13:49 PM	32236
Zinc	ND	0.050		mg/L	1	6/15/2017 2:28:50 PM	32236

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	170613041
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1706496
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	170613041-001	**Sampling Date**	6/7/2017	**Date/Time Received**	6/13/2017	12:05 PM	
Client Sample ID	1706496-001C / RED HILLS	**Sampling Time**	9:00 AM	**Extraction Date**	6/15/2017		
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
acetic acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	
butyric acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	
propionic acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	

Sample Number	170613041-002	**Sampling Date**	6/7/2017	**Date/Time Received**	6/13/2017	12:05 PM	
Client Sample ID	1706496-002C / MCCOY	**Sampling Time**	10:00 AM	**Extraction Date**	6/15/2017		
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
acetic acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	
butyric acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	
propionic acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	

Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	170613041
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1706496
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	170613041-003	**Sampling Date**	6/7/2017	**Date/Time Received**	6/13/2017 12:05 PM
Client Sample ID	1706496-003C / ANDELLE	**Sampling Time**	12:00 PM	**Extraction Date**	6/15/2017
Matrix	Water	**Sample Location**			
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
acetic acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	
butyric acid	ND	mg/L	20	6/15/2017	TGT	EPA 8015D	
propionic acid	27.2	mg/L	20	6/15/2017	TGT	EPA 8015D	

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	170613041
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1706496
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
propionic acid	33.4	mg/L	30	111.3	80-120	6/15/2017	6/15/2017
butyric acid	32.6	mg/L	30	108.7	80-120	6/15/2017	6/15/2017
acetic acid	31.2	mg/L	30	104.0	80-120	6/15/2017	6/15/2017

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
acetic acid	ND	mg/L	20	6/15/2017	6/15/2017
butyric acid	ND	mg/L	20	6/15/2017	6/15/2017
propionic acid	ND	mg/L	20	6/15/2017	6/15/2017

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates
Project: Ocotilla

Sample ID **MB-A**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	Batch ID: **A43428**	RunNo: **43428**
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367322** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.020								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Molybdenum	ND	0.0080								
Nickel	ND	0.010								
Potassium	ND	1.0								
Silica	ND	0.17								
Sodium	ND	1.0								
Strontium	ND	0.010								
Tin	ND	0.010								
Titanium	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCSLL-A**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **A43428**	RunNo: **43428**
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367323** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	100	50	150			
Barium	0.0022	0.0020	0.002000	0	110	50	150			
Calcium	ND	1.0	0.5000	0	104	50	150			
Chromium	0.0060	0.0060	0.006000	0	101	50	150			
Cobalt	0.0064	0.0060	0.006000	0	107	50	150			
Copper	ND	0.0060	0.006000	0	83.3	50	150			
Iron	0.021	0.020	0.02000	0	103	50	150			
Lead	ND	0.0050	0.005000	0	90.4	50	150			
Magnesium	ND	1.0	0.5000	0	106	50	150			
Manganese	0.0022	0.0020	0.002000	0	110	50	150			
Molybdenum	ND	0.0080	0.008000	0	97.8	50	150			
Nickel	ND	0.010	0.005000	0	126	50	150			
Potassium	ND	1.0	0.5000	0	103	50	150			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates

Project: Ocotilla

Sample ID **LCSLL-A**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Metals**
Client ID: **BatchQC**	Batch ID: **A43428**	RunNo: **43428**
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367323** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Silica	ND	0.17	0.1712	0	97.3	50	150			
Sodium	ND	1.0	0.5000	0	102	50	150			
Strontium	ND	0.010	0.005000	0	99.2	50	150			
Tin	0.011	0.010	0.01000	0	106	50	150			
Titanium	0.0051	0.0050	0.005000	0	102	50	150			
Vanadium	ND	0.050	0.01000	0	102	50	150			
Zinc	ND	0.010	0.005000	0	108	50	150			

Sample ID **LCS-A**	SampType: **LCS**	TestCode: **EPA Method 200.7: Metals**
Client ID: **LCSW**	Batch ID: **A43428**	RunNo: **43428**
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367324** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	105	85	115			
Barium	0.47	0.0020	0.5000	0	94.3	85	115			
Calcium	50	1.0	50.00	0	100	85	115			
Chromium	0.48	0.0060	0.5000	0	96.1	85	115			
Cobalt	0.45	0.0060	0.5000	0	90.8	85	115			
Copper	0.47	0.0060	0.5000	0	93.5	85	115			
Iron	0.48	0.020	0.5000	0	96.5	85	115			
Lead	0.47	0.0050	0.5000	0	93.7	85	115			
Magnesium	51	1.0	50.00	0	102	85	115			
Manganese	0.46	0.0020	0.5000	0	91.4	85	115			
Molybdenum	0.50	0.0080	0.5000	0	101	85	115			
Nickel	0.46	0.010	0.5000	0	91.6	85	115			
Potassium	50	1.0	50.00	0	99.3	85	115			
Silica	5.5	0.17	5.350	0	102	85	115			
Sodium	51	1.0	50.00	0	101	85	115			
Strontium	0.094	0.010	0.1000	0	94.0	85	115			
Tin	0.49	0.010	0.5000	0	98.5	85	115			
Titanium	0.50	0.0050	0.5000	0	99.1	85	115			
Vanadium	0.50	0.050	0.5000	0	99.7	85	115			
Zinc	0.47	0.010	0.5000	0	93.8	85	115			

Sample ID **MB-32236**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Metals**
Client ID: **PBW**	Batch ID: **32236**	RunNo: **43471**
Prep Date: **6/12/2017**	Analysis Date: **6/13/2017**	SeqNo: **1369053** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates
Project: Ocotilla

Sample ID	MB-32236	SampType:	MBLK	TestCode:	EPA Method 200.7: Metals					
Client ID:	PBW	Batch ID:	32236	RunNo:	43471					
Prep Date:	6/12/2017	Analysis Date:	6/13/2017	SeqNo:	1369053	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Iron	ND	0.020								
Lead	ND	0.0050								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Molybdenum	ND	0.0080								
Nickel	ND	0.010								
Potassium	ND	1.0								
Silica	ND	0.17								
Sodium	ND	1.0								
Strontium	ND	0.010								
Tin	ND	0.010								
Titanium	ND	0.0050								
Vanadium	ND	0.050								

Sample ID	LCSLL-32236	SampType:	LCSLL	TestCode:	EPA Method 200.7: Metals					
Client ID:	BatchQC	Batch ID:	32236	RunNo:	43471					
Prep Date:	6/12/2017	Analysis Date:	6/13/2017	SeqNo:	1369054	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0021	0.0020	0.002000	0	103	50	150			
Calcium	ND	1.0	0.5000	0	102	50	150			
Chromium	0.0060	0.0060	0.006000	0	100	50	150			
Cobalt	0.0063	0.0060	0.006000	0	105	50	150			
Iron	ND	0.020	0.02000	0	89.8	50	150			
Lead	0.0064	0.0050	0.005000	0	128	50	150			
Magnesium	ND	1.0	0.5000	0	106	50	150			
Manganese	0.0021	0.0020	0.002000	0	103	50	150			
Molybdenum	0.0083	0.0080	0.008000	0	104	50	150			
Nickel	ND	0.010	0.005000	0	108	50	150			
Potassium	ND	1.0	0.5000	0	99.4	50	150			
Silica	0.19	0.17	0.1712	0	109	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			
Strontium	ND	0.010	0.005000	0	99.2	50	150			
Tin	0.012	0.010	0.01000	0	118	50	150			
Titanium	0.0051	0.0050	0.005000	0	102	50	150			
Vanadium	ND	0.050	0.01000	0	96.1	50	150			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates

Project: Ocotilla

Sample ID	LCS-32236	SampType:	LCS		TestCode:	EPA Method 200.7: Metals				
Client ID:	LCSW	Batch ID:	32236		RunNo:	43471				
Prep Date:	6/12/2017	Analysis Date:	6/13/2017		SeqNo:	1369055	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.3	85	115			
Calcium	50	1.0	50.00	0	99.7	85	115			
Chromium	0.48	0.0060	0.5000	0	97.0	85	115			
Cobalt	0.47	0.0060	0.5000	0	93.5	85	115			
Iron	0.47	0.020	0.5000	0	93.4	85	115			
Lead	0.48	0.0050	0.5000	0	96.4	85	115			
Magnesium	51	1.0	50.00	0	103	85	115			
Manganese	0.48	0.0020	0.5000	0	95.4	85	115			
Molybdenum	0.49	0.0080	0.5000	0	98.9	85	115			
Nickel	0.47	0.010	0.5000	0	93.2	85	115			
Potassium	49	1.0	50.00	0	98.7	85	115			
Silica	5.5	0.17	5.350	0	103	85	115			
Sodium	51	1.0	50.00	0	101	85	115			
Strontium	0.097	0.010	0.1000	0	96.6	85	115			
Tin	0.49	0.010	0.5000	0	98.9	85	115			
Titanium	0.50	0.0050	0.5000	0	99.1	85	115			
Vanadium	0.50	0.050	0.5000	0	99.5	85	115			

Sample ID	MB-32236	SampType:	MBLK		TestCode:	EPA Method 200.7: Metals				
Client ID:	PBW	Batch ID:	32236		RunNo:	43525				
Prep Date:	6/12/2017	Analysis Date:	6/14/2017		SeqNo:	1371011	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Copper	ND	0.0060								

Sample ID	LCSLL-32236	SampType:	LCSLL		TestCode:	EPA Method 200.7: Metals				
Client ID:	BatchQC	Batch ID:	32236		RunNo:	43525				
Prep Date:	6/12/2017	Analysis Date:	6/14/2017		SeqNo:	1371012	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	175	50	150			S
Copper	0.0072	0.0060	0.006000	0	119	50	150			

Sample ID	LCS-32236	SampType:	LCS		TestCode:	EPA Method 200.7: Metals				
Client ID:	LCSW	Batch ID:	32236		RunNo:	43525				
Prep Date:	6/12/2017	Analysis Date:	6/14/2017		SeqNo:	1371013	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.52	0.020	0.5000	0	103	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates

Project: Ocotilla

Sample ID	LCS-32236	SampType:	LCS		TestCode:	EPA Method 200.7: Metals				
Client ID:	LCSW	Batch ID:	32236		RunNo:	43525				
Prep Date:	6/12/2017	Analysis Date:	6/14/2017		SeqNo:	1371013	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Copper	0.49	0.0060	0.5000	0	97.4	85	115			

Sample ID	MB-32236	SampType:	MBLK		TestCode:	EPA Method 200.7: Metals				
Client ID:	PBW	Batch ID:	32236		RunNo:	43537				
Prep Date:	6/12/2017	Analysis Date:	6/15/2017		SeqNo:	1371222	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Zinc	ND	0.010								

Sample ID	LCSLL-32236	SampType:	LCSLL		TestCode:	EPA Method 200.7: Metals				
Client ID:	BatchQC	Batch ID:	32236		RunNo:	43537				
Prep Date:	6/12/2017	Analysis Date:	6/15/2017		SeqNo:	1371223	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Zinc	ND	0.010	0.005000	0	194	50	150			S

Sample ID	LCS-32236	SampType:	LCS		TestCode:	EPA Method 200.7: Metals				
Client ID:	LCSW	Batch ID:	32236		RunNo:	43537				
Prep Date:	6/12/2017	Analysis Date:	6/15/2017		SeqNo:	1371224	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Zinc	0.49	0.010	0.5000	0	97.1	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates
Project: Ocotilla

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R43443**	RunNo: **43443**							
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367810**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	ND	0.20								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R43443**	RunNo: **43443**							
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367811**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrate+Nitrite as N	3.4	0.20	3.500	0	98.0	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **A43443**	RunNo: **43443**							
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367842**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Bromide	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **A43443**	RunNo: **43443**							
Prep Date:	Analysis Date: **6/12/2017**	SeqNo: **1367843**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.53	0.10	0.5000	0	106	90	110			
Chloride	4.8	0.50	5.000	0	95.5	90	110			
Bromide	2.4	0.10	2.500	0	96.3	90	110			
Phosphorus, Orthophosphate (As P	4.9	0.50	5.000	0	97.7	90	110			
Sulfate	9.6	0.50	10.00	0	96.4	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **A43510**	RunNo: **43510**							
Prep Date:	Analysis Date: **6/14/2017**	SeqNo: **1370486**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates

Project: Ocotilla

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A43510**	RunNo: **43510**
Prep Date:	Analysis Date: **6/14/2017**	SeqNo: **1370487** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.7	90	110			
Nitrate+Nitrite as N	3.5	0.20	3.500	0	98.6	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates

Project: Ocotilla

Sample ID **mb-1**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**
Client ID: **PBW**	Batch ID: **R43498**	RunNo: **43498**
Prep Date:	Analysis Date: **6/13/2017**	SeqNo: **1369882** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID **lcs-1**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**
Client ID: **LCSW**	Batch ID: **R43498**	RunNo: **43498**
Prep Date:	Analysis Date: **6/13/2017**	SeqNo: **1369883** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	79.20	20.00	80.00	0	99.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1706496**

16-Jun-17

Client: Souder, Miller & Associates

Project: Ocotilla

Sample ID **MB-32219**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **32219**	RunNo: **43431**
Prep Date: **6/11/2017**	Analysis Date: **6/12/2017**	SeqNo: **1367395** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-32219**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **32219**	RunNo: **43431**
Prep Date: **6/11/2017**	Analysis Date: **6/12/2017**	SeqNo: **1367396** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: SMA-CARLSBAD Work Order Number: 1706496 RcptNo: 1

Received By: Sophia Campuzano 6/9/2017 9:30:00 AM

Completed By: Ashley Gallegos 6/9/2017 10:21:11 AM

Reviewed By: ENM 06/09/17

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☐	No ☑	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☐	No ☑	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: 6 (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? NO
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: SEC

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

For Fatty Acid analysis: Poured into 2-40mL H2SO4 voas for proper analysis

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.8	Good	Yes			

Chain-of-Custody Record

Client: SMA

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☒ Rush

Project Name: Ocotilla

Project #:

Project Manager: Austin Weyant

Sampler: HMP

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached				Air Bubbles (Y or N)
6/7/17	9	H2O	Red Hills			1701495-001												7				
"	10	"	McCoy			-002												7				
"	12	"	Andelle			-003												7				

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/8/17	1500			6/8/17	1500
6/8/17	1992			06/09/17	09:30

Remarks: See Attached

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Attachment for

VII.

Water Analyses of Produced Water

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 3/10/2017

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	OCCIDENTAL PERMIAN EOR	**ACCOUNT REP:**	SHANNON LEE
DISTRICT:	NEW MEXICO	**SAMPLE ID:**	20160103194?
AREA/LEASE:	COMPATIBILITY - WATER - S. LEE	**SAMPLE DATE:**	3/8/2016
SAMPLE POINT NAME	25% RESERVOIR WATER, 75% INJECTION WATER	**ANALYSIS DATE:**	7/21/2016
SITE TYPE:	WELL SITES	**ANALYST:**	SH
SAMPLE POINT DESCRIPTION:	WELL HEAD		

OCCIDENTAL PERMIAN EOR, COMPATIBILITY - WATER - S. LEE, 25% RESERVOIR WATER, 75% INJECTION WATER

FIELD DATA		ANALYSIS OF SAMPLE					
		ANIONS:	**mg/L**	**meq/L**	**CATIONS:**	**mg/L**	**meq/L**
Initial Temperature (°F):	250	Chloride (Cl^-):	173360.8	4890.3	Sodium (Na^+):	75182.0	3271.6
Final Temperature (°F):	80	Sulfate (SO_4^{2-}):	742.5	15.5	Potassium (K^+):	ND	
Initial Pressure (psi):	100	Borate (H_3BO_3):	ND		Magnesium (Mg^{2+}):	4026.5	331.4
Final Pressure (psi):	15	Fluoride (F^-):	ND		Calcium (Ca^{2+}):	25275.0	1261.2
		Bromide (Br^-):	ND		Strontium (Sr^{2+}):	1592.5	36.4
pH:		Nitrite (NO_2^-):	ND		Barium (Ba^{2+}):	8.4	0.1
pH at time of sampling:	6.7	Nitrate (NO_3^-):	ND		Iron (Fe^{2+}):	32.7	1.2
		Phosphate (PO_4^{3-}):	ND		Manganese (Mn^{2+}):	2.1	0.1
		Silica (SiO_2):	ND		Lead (Pb^{2+}):	ND	
					Zinc (Zn^{2+}):	ND	

ALKALINITY BY TITRATION:	mg/L	meq/L			
Bicarbonate (HCO_3^-):	72.9	1.2		Aluminum (Al^{3+}):	ND
Carbonate (CO_3^{2-}):	ND			Chromium (Cr^{3+}):	ND
Hydroxide (OH^-):	ND			Cobalt (Co^{2+}):	ND

		ORGANIC ACIDS:	**mg/L**	**meq/L**		
					Copper (Cu^{2+}):	ND
aqueous CO_2 (ppm):	ND	Formic Acid:	ND		Molybdenum (Mo^{2+}):	ND
aqueous H_2S (ppm):	ND	Acetic Acid:	ND		Nickel (Ni^{2+}):	ND
aqueous O2 (ppb):	ND	Propionic Acid:	ND		Tin (Sn^{2+}):	ND
		Butyric Acid:	ND		Titanium (Ti^{2+}):	ND
Calculated TDS (mg/L):	283295	Valeric Acid:	ND		Vanadium (V^{2+}):	ND
Density/Specific Gravity (g/cm³):	1.1818				Zirconium (Zr^{2+}):	ND
Measured Specific Gravity	ND				Lithium (Li):	ND
Conductivity (mmhos):	ND					
Resistivity:	ND				Total Hardness:	81598 N/A
MCF/D:	No Data					
BOPD:	No Data					
BWPD:	No Data	Anion/Cation Ratio:		1.00	ND = Not Determined	

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA, FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	1.30	4.716	1.94	18.314	0.30	231.409	0.26	166.385
99°F	24 psi	1.18	4.640	1.96	18.417	0.31	236.321	0.35	202.727
118°F	34 psi	1.06	4.540	2.00	18.561	0.31	235.273	0.43	230.661
137°F	43 psi	0.95	4.414	2.03	18.702	0.30	231.928	0.51	253.958
156°F	53 psi	0.85	4.261	2.07	18.828	0.29	227.644	0.59	273.804
174°F	62 psi	0.75	4.073	2.09	18.936	0.29	222.805	0.68	290.641
193°F	72 psi	0.65	3.861	2.11	19.028	0.28	217.267	0.77	304.726
212°F	81 psi	0.57	3.611	2.13	19.116	0.26	210.532	0.85	316.307
231°F	91 psi	0.48	3.320	2.14	19.199	0.25	201.807	0.94	325.667
250°F	100 psi	0.40	2.983	2.14	19.264	0.23	189.998	1.02	333.104

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.95	411.840	0.27	0.000	8.01	0.000	0.41	8.405
99°F	24 psi	0.97	413.740	0.29	0.000	8.14	0.000	0.70	9.419
118°F	34 psi	0.97	414.525	0.30	0.000	8.22	0.000	0.79	10.436
137°F	43 psi	0.97	414.899	0.32	0.000	8.28	0.000	0.87	11.275
156°F	53 psi	0.97	415.306	0.34	0.000	8.33	0.000	0.93	11.913
174°F	62 psi	0.98	416.003	0.36	0.000	8.37	0.000	0.97	12.363
193°F	72 psi	0.99	417.099	0.37	0.000	8.41	0.000	0.99	12.640
212°F	81 psi	0.99	418.578	0.39	0.000	8.44	0.000	0.99	12.803
231°F	91 psi	1.01	420.328	0.41	0.000	8.47	0.000	0.98	12.845
250°F	100 psi	1.02	422.166	0.42	0.000	8.49	0.000	0.95	12.720

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.
Note 3: Saturation Index predictions on this sheet use pH and alkalinity; CO_2 is not included in the calculations.

ScaleSoftPitzer™ SSP2010

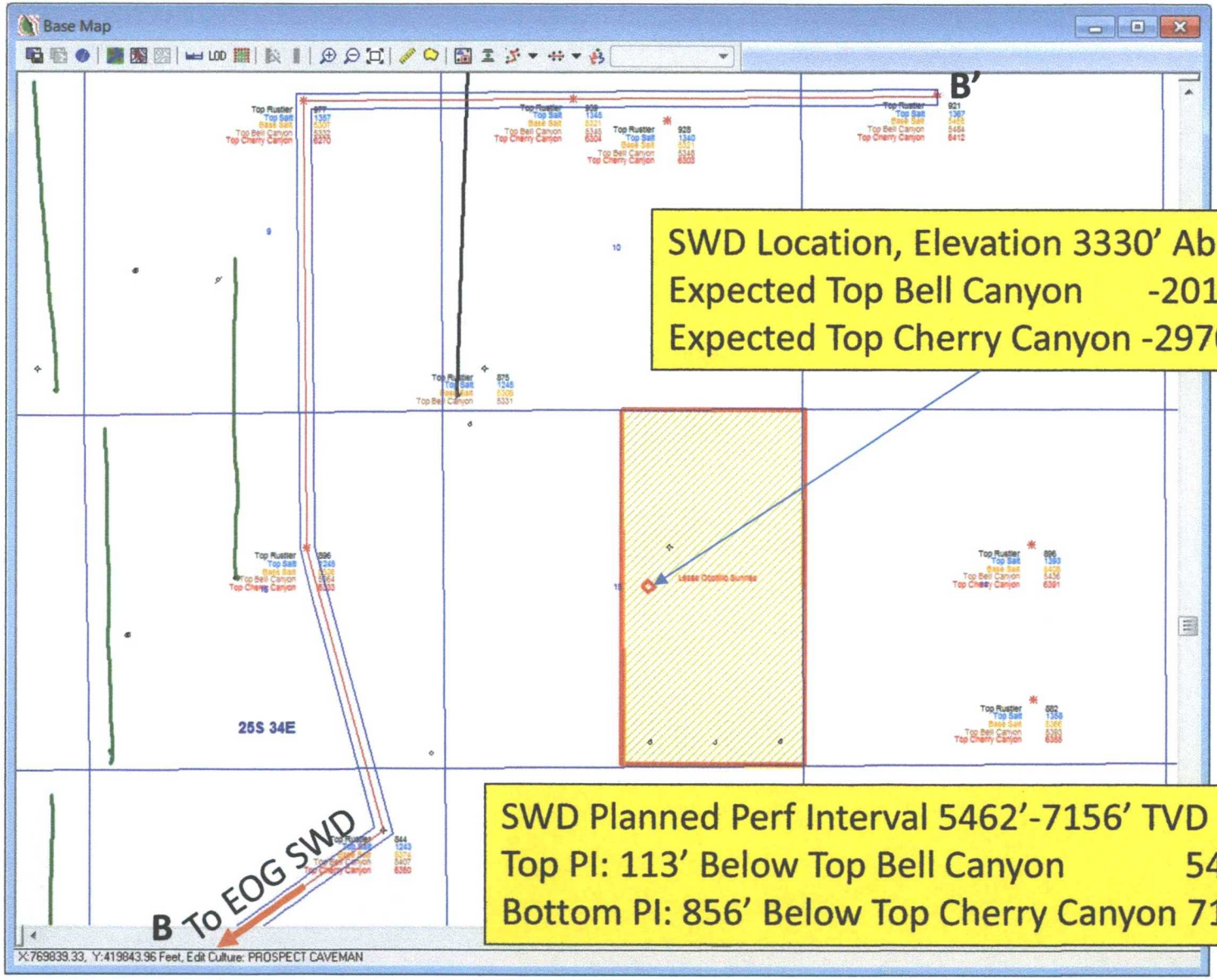
Comments

Attachments for

VIII.

Geologic Information

Base Map with Tops and Cross Section

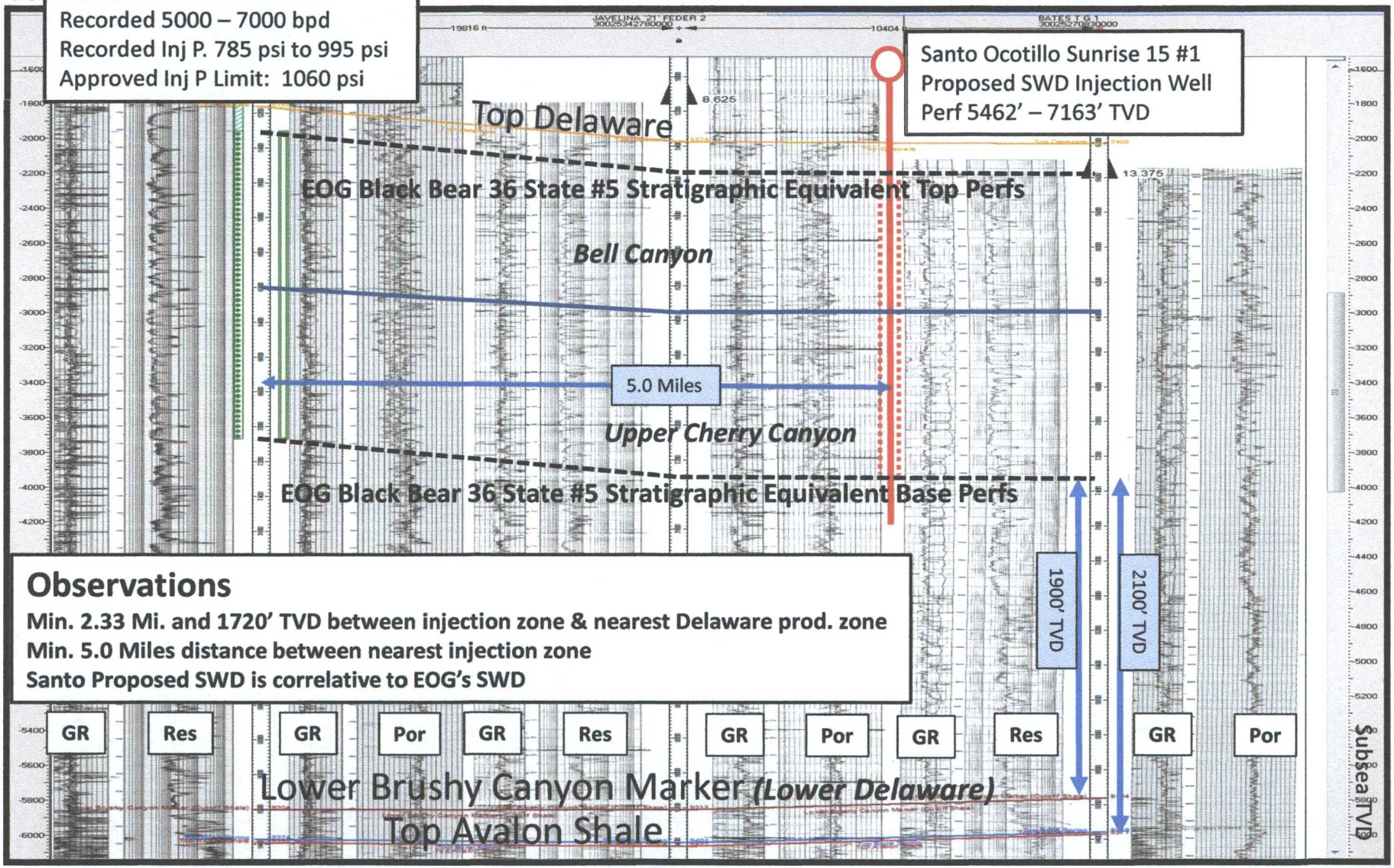


Regional Cross Section

EOG Black Bear 36 State #5
Delaware SWD Injection Well
API: 30-025-40585
Perf 5302' – 7070' TVD
Recorded 5000 – 7000 bpd
Recorded Inj P. 785 psi to 995 psi
Approved Inj P Limit: 1060 psi

A

A'



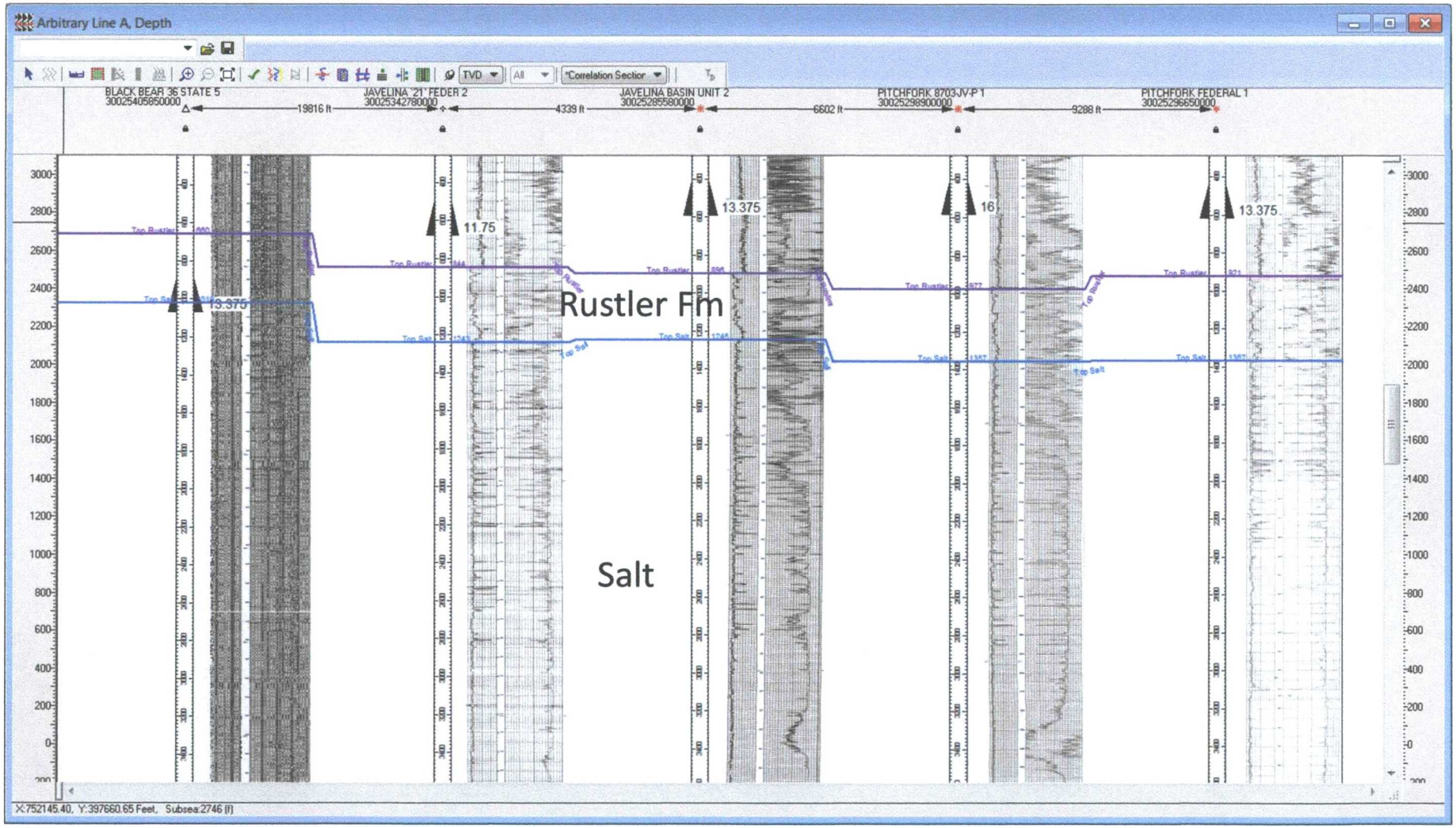
Santo Ocotillo Sunrise 15 #1
Proposed SWD Injection Well
Perf 5462' – 7163' TVD

Observations

Min. 2.33 Mi. and 1720' TVD between injection zone & nearest Delaware prod. zone
Min. 5.0 Miles distance between nearest injection zone
Santo Proposed SWD is correlative to EOG's SWD

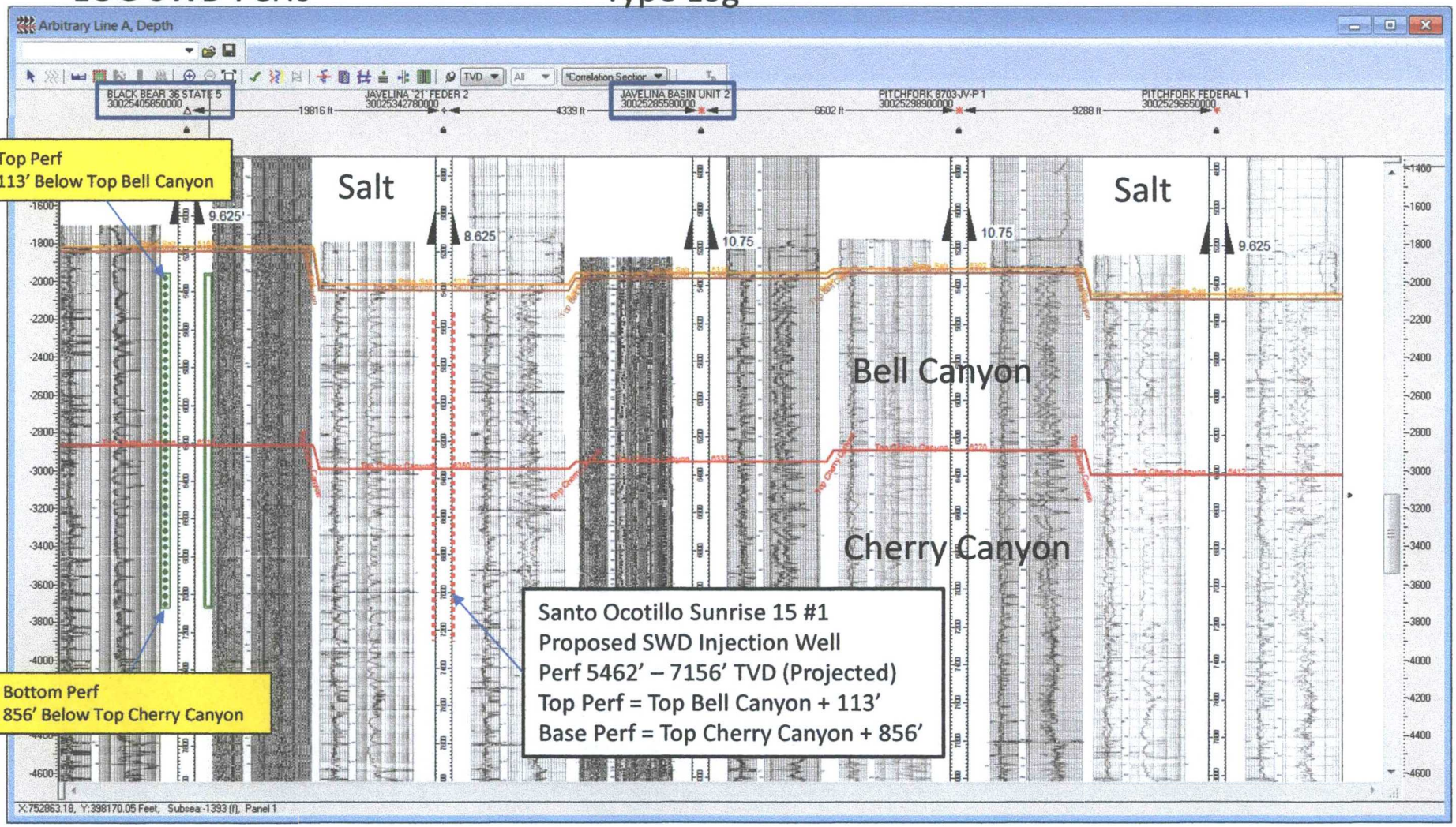
Cross Section – Upper Section

B **B'**



Cross Section – Lower Section

B Analog EOG SWD Perfs Type Log B'



Attachments for

XIII.

Proof of Notice

Santo Operating Ocotillo Sunrise #1
Proposed SWD
API No. Pending

Santo Operating, LLC
Offset Operator and Surface Owner Notification

Date mailed	Document Mailed	Well Name	Method of Mailing	Return Receipt Number	Mailed to	Address	City	State	ZIP code	Notified Party
	SWD notification	Ocotillo Sunrise SWD # 001	Certified		BC Operating Inc.	P.O. Box 50620	Midland	TX	79710	Offset Operator
	SWD notification	Ocotillo Sunrise SWD # 001	Certified		Black Mountain Operating, LLC	500 Main Street, Suite 1200	Fort Worth	TX	76102	Offset Operator
	SWD notification	Ocotillo Sunrise SWD # 001	Certified		Talon Oil and Gas	1225 Greenville Ave., Suite 900	Dallas	TX	75243	Offset Operator
	SWD notification	Ocotillo Sunrise SWD # 001	Certified		EOG Resources	P.O. Box 2267	Midland	TX	79702	Offset Operator
	SWD notification	Ocotillo Sunrise SWD # 001	Certified		Marathon Oil Company	200 N. Loraine Street	Midland	TX	79701	Offset Operator
	SWD notification	Ocotillo Sunrise SWD # 001	Certified ✓		Mark and Annette McCloy Revocable Living Trust of 2014 dated October 15, 2014	P.O. Box 1076	Jal	NM	88252	Surface owner

I certify that the above parties have been mailed a copy of the C-108 application via certified mail. Certified mail receipt number are recorded above.

Name: Loren Diede

Signature: [signature]

Title: Agent for Santo

Date: June 17, 2017

6/6/2017
LD/SMA ref 5E26068

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

EOG Resources
PO Box 2267
Midland, TX
79702

9590 9402 0010 5071 5276 81

2. Article Number *(Transfer from service label)*

7016 0910 0001 2365 2610

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☑ Addressee

B. Received by *(Printed Name)*

S Berry

C. Date of Delivery

6-21-17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, April 2015 PSN 7530-02-000-9053 — Domestic Return Receipt

---

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Black Mountain Operating LLC
500 Main St, Ste 1200
Ft Worth, TX 76102

9590 9402 1292 5285 9259 74

2. Article Number *(Transfer from service label)*

7016 0910 0001 2365 2641

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

6 21

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 — Domestic Return Receipt

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SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

BC Operating
PO Box 50030
Midland, TX 79710

9590 9402 1292 5285 9259 50

2. Article Number *(Transfer from service label)*

7016 0910 0001 2365 2634

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X Ray Calhoun

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

6/20/17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☐ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☑ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 — Domestic Return Receipt

[redacted]

■ Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

A.
X ☐ Agent ☐ Addressee
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

2. Article Number *(Transfer from service label)*
7015 0640 0006 4935 3485

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if

☐ Agent

1. Article Addressed to:
Mark & Annette McCloy Trust
P.O. Box 1076
Jal, NM 88252

delivery different item
If YES, enter delivery address below: ☐ No

9590 9403 0547 5173 2998 89

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
Insured Mail Restricted Delivery (over $500)
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

2. Article Number *service label)*
7016 0910 0001 2365 2603

rm ll 2015 PSN 7530-02-000-9053 Domestic Return R

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if

☐ Agent
Addressee
Date of

1. Article Addressed to:
Oil Co.
5555 San Felipe St.
Houston TX 77056-2723

D. Is delivery address different Item ☐ Yes
If YES, enter delivery address below: ☐ No

9590 9403 0547 5173 2999 19

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Insured Mail
Insured Mail Restricted Delivery (over $500)
Priority Mail Express®
Registered Mail™
Re d Mail Restricted De pt for
Signature Confirmation™
Signature Confirmation Restricted Delivery

2. Article Number *(Transfer from service label)*
7015 0640 0006 4935 3478

PS Form 3811, April 2015 PSN 7530-02-000-9053 Domestic Return Receipt

[redacted]

l Express®
Mail™
Mail Restricted
eipt
ie
ondi ion™
ondi ion
Delivery

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if

1. Article Addressed to:

A.
☐ Agent
C. of
from item 1? Yes
If YES, enter address below: No

3. Service Type
☐ Adult Signature
☐ Ad Restricted Delivery
☐ Ce
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☐ ms Restricted Delivery
Priority Mail Express®
Registered Mail™
Re d Mail Restricted
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ise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

2. *from service label)*
7016 0910 0001 2365 2641

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if

☐ Agent

1. Article Addressed

Name) C. Date of Delivery

Is delivery address different from item 1? Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Ad Restricted Delivery
☐ Ce
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ ured Mail Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Re d Mail Restricted
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ise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

2. Article Number *(Transfer from label)*
7016 0910 0001 2365 2634

1, July 2015 PSN 7530-02-000-9053

Souder, Miller & Associates ♦ 401 W. Broadway ♦ Farmington, NM 87401
(505) 325-7535 ♦ (800) 519-0098 ♦ fax (505) 326-0045

June 12, 2017

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

TO: OFFSET OPERATORS/LEASEHOLD OWNERS AND SURFACE OWNERS
(See attached Notification List)

RE: Santo Operating, LLC
Form C-108 (Application for Authorization to Inject
Santo Operating, LLC,
Ocotillo Sunrise SWD # 001
API No. – Pending
2630' FSL & 2310 FEL, UL J, Section 15, T25S, R34E
Lat, 32.130489 N, Long, 103.456763 W (NAD 83)
Lea County, New Mexico

Ladies and Gentlemen:

Enclosed please find a copy of Oil Conservation Division Form C-108 (Application for Authorization to Inject) for the **Santo Operating, LLC Ocotillo Sunrise SWD # 001.** You are being provided a copy of the application as an offset operator/leaseholder or as the owner of the surface where the proposed well is located. Santo Operating, LLC proposes to drill the Santo Operating, LLC Ocotillo Sunrise SWD # 001 and utilize the well as a produced water disposal well. Injection is to occur into the Bell Canyon and Upper Cherry Canyon (Delaware) formations through the perforated interval from approximately 5462 feet to 7163 feet. This SWD well will not be a commercial disposal well. The water to be injected will be from Santo Operating, LLC production.

No action is required on your part. Objections must be filed with the New Mexico Oil Conservation Division, 1220 South St. Francis Drive, Santa Fe, New Mexico 87505, within 15 days of the date receipt of this notice.

If you should have any questions, please contact either:
Loren Diede, Souder Miller and Associates (505) 334-8867
Austin Weyant, Souder Miller and Associates (575) 689-7040

Sincerely,

Loren L Diede
Souder Miller and Associates (agent)

Encl.

LEA COUNTY LEGAL NOTICE

Santo Operating, LLC, P.O. Box 1020, Artesia, New Mexico 88211 is filing a Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division ("Division") seeking administrative approval to utilize its proposed Santo Operating Ocotillo Sunrise SWD # 001 (API No. pending), to be drilled 2630' from the South line and 2310' from the East line (UL J) of Section 15, Township 25 South, Range 34 East, NMPM, Lea County, New Mexico (15.8 miles west of Jal, NM), as a produced water disposal well in the Bell Canyon and Cherry Canyon (Delaware) formations. Injection is to occur through the perforated interval from approximately 5462 feet to 7156 feet.

Produced water from the Wolfcamp formation originating from Santo Operating, LLC operated wells in this area will be injected into the Santo Operating, LLC Ocotillo Sunrise SWD # 001 well at average and maximum rate of 2000 and 6000 barrels of water per day respectively. The average and maximum injection pressures will be determined from a step rate test run after the well is drilled and stimulated.

Interested parties must file objection with the New Mexico Oil Conservation Division, 1220 S. St. Francis Drive, Santa Fe, New Mexico 87505, within 15 days of the date of this publication.

Contact Information for Santo Operating, LLC is:

- Loren Diede (agent) Souder Miller and Associates, 401 West Broadway, Farmington, NM 87401, Office Phone (505) 325-7535
- Austin Weyant (agent) Souder Miller and Associates, 201 S. Halagueno, Carlsbad, NM 88220 Office phone (575) 689-7040

LEGAL NOTICE
June 13, 2017

LEA COUNTY LEGAL NOTICE

Santo Operating, LLC, P.O. Box 1020, Artesia, New Mexico 88211 is filing a Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division ("Division") seeking administrative approval to utilize its proposed Santo Operating Ocotillo Sunrise SWD # 001 (API No. pending) to be drilled 2630' from the South line and 2310' from the East line (UL J) of Section 15, Township 25 South, Range 34 East, NMPM, Lea County, New Mexico (15.8 miles west of Jal, NM) and complete the well as a produced water disposal well in the Bell Canyon and Cherry Canyon (Delaware) formations. Injection is to occur through the perforated interval from approximately 5462 feet to 7156 feet.

Produced water from the Wolfcamp formation originating from Santo Operating, LLC operated wells in this area will be injected into the Santo Operating, LLC Ocotillo Sunrise SWD # 001 well at average and maximum rate of 2000 and 6000 barrels of water per day respectively. The average and maximum injection pressures will be determined from a step rate test run after the well is drilled and stimulated.

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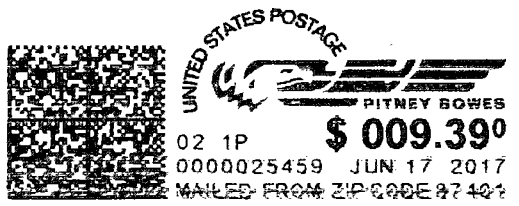
Contact Information for Santo Operating, LLC is:

- Loren Diede (agent) Souder Miller and Associates, 401 West Broadway, Farmington, NM 87401, Office Phone (505) 325-7535
- Austin Weyant (agent) Souder Miller and Associates, 201 South Halagueno Street, Carlsbad, NM 88211, Office phone (575) 689-7040

#31848

CERTIFIED MAIL®

7016 0910 0001 2365 2603



SMA
Civil / Environmental
Scientists & Engineers

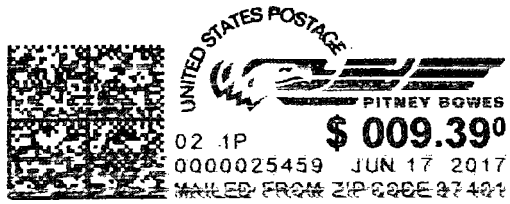
Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-004

TO:

Mark and Annette McCloy
Revocable Living Trust
P.O. Box 1076
Jal, NM 88252

CERTIFIED MAIL

7116 0910 0001 2365 2597



SMA
Civil/Environmental
Scientists & Engineers

Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-00

TO:

Marathon Oil Company
200 N. Loraine Street
Midland, TX 79701

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7016 0910 0001 2365 2610

UNITED STATES POSTAGE
PITNEY BOWES
02 1P $ 009.39⁰
0000025459 JUN 17 2017
MAILED FROM ZIP CODE 87401

SMA
Civil/Environmental
Scientists & Engineers

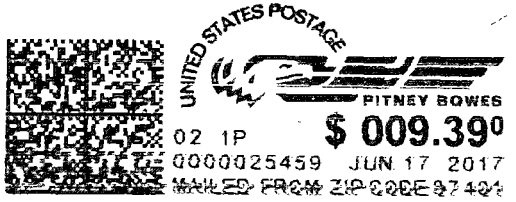
Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-004

TO:

EOG Resources
P.O. Box 2267
Midland, TX 79702

CERTIFIED MAIL

0910 0001 2365 2641



SMA
Civil/Environmental
Scientists & Engineers

Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-00

TO:

Black Mountain Operating, LLC
500 Main Street, Suite 1200
Fort Worth, TX 76102

CERTIFIED MAIL

7016 0910 0001 2365 2627

UNITED STATES POSTAGE
PITNEY BOWES
02 1P $ 009.39⁰
0000025459 JUN 17 2017
MAILED FROM ZIP CODE 87401

SMA
Civil/Environmental
Scientists & Engineers

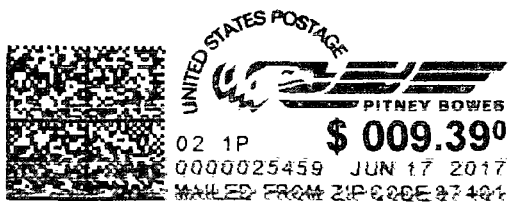
Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-004

TO:

Talon Oil and Gas
1225 Greenville Ave., Suite 900
Dallas, TX 75243

CERTIFIED MAIL

7016 0910 0001 2365 2634



SMA
Civil/Environmental
Scientists & Engineers

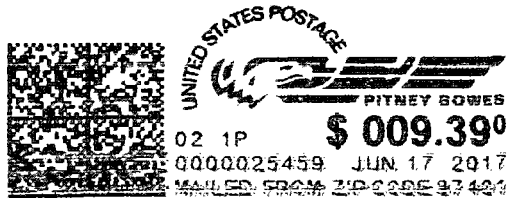
Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-00

TO:

BC Operating
P.O. Box 50620
Midland, TX 79710

CERTIFIED MAIL

7015 0640 0006 4935 3508



SMA
Civil/Environmental
Scientists & Engineers

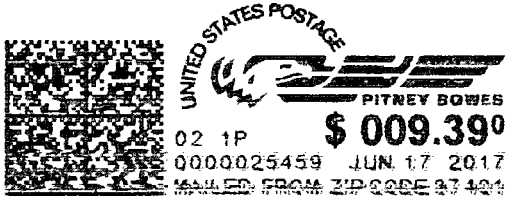
Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-004

TO:

Santo Petroleum
Attn: Karen J. Leishman
PO Box 1020
Artesia, NM 88210

CERTIFIED MAIL

0640 0006 4935 3515



SMA
Civil/Environmental
Scientists & Engineers

Souder, Miller & Associates
401 W. Broadway
FARMINGTON, NM 87401
505-325-7535 * FAX 505-326-0045

TO:

NMOCD
Attn: Phillip Goetze
1220 South St. Francis Drive
Santa Fe, NM 87505

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
June 13, 2017
and ending with the issue dated
June 13, 2017.

Publisher

Sworn and subscribed to before me this 13th day of June 2017.

Business Manager

My commission expires
January 29, 2019
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-19

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

LEGAL LEGAL

LEGAL NOTICE
June 13, 2017

LEA COUNTY LEGAL NOTICE

Santo Operating, LLC, P.O. Box 1020, Artesia, New Mexico 88211 is filing a Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division ("Division") seeking administrative approval to utilize its proposed Santo Operating Ocotillo Sunrise SWD # 001 (API No. pending) to be drilled 2630' from the South line and 2310' from the East line (UL J) of Section 15, Township 25 South, Range 34 East, NMPM, Lea County, New Mexico (15.8 miles west of Jal, NM) and complete the well as a produced water disposal well in the Bell Canyon and Cherry Canyon (Delaware) formations. Injection is to occur through the perforated interval from approximately 5462 feet to 7156 feet.

Produced water from the Wolfcamp formation originating from Santo Operating, LLC operated wells in this area will be injected into the Santo Operating, LLC Ocotillo Sunrise SWD # 001 well at average and maximum rate of 2000 and 6000 barrels of water per day respectively. The average and maximum injection pressures will be determined from a step rate test run after the well is drilled and stimulated.

Interested parties must file objection with the New Mexico Oil Conservation Division, 1220 S. St. Francis Drive, Santa Fe, New Mexico 87505, within 15 days of the date of this publication.

Contact information for Santo Operating, LLC is:
- Loren Diede (agent) Souder Miller and Associates, 401 West Broadway, Farmington, NM 87401, Office Phone (505) 325-7535
- Austin Weyant (agent) Souder Miller and Associates, 201 South Halagueno Street, Carlsbad, NM 88211, Office phone (575) 689-7040

#31848

49100784 00194855

ACCOUNTS PAYABLE
SOUDER, MILLER & ASSOCIATES
3451 CANDELARIA RD NE, STE D
ALBUQUERQUE, NM 87107

FORM C-108 Technical Review Summary [Prepared by reviewer and included with application; V16.2]

DATE RECORD: First Rec: 06/20/17 **Admin Complete:** 06/29/17 **or Suspended:** EOG Protest 06/29/17 Add. Request/Reply: EOG Settlement 09/12/17

ORDER TYPE: WFX / PMX / (SWD) Number: 1710 Order Date: 12/15/17 Legacy Permits/Orders: NA

Well No. 1 Well Name(s): Octillo Sunrise SWD

API : 30-0 25 - Pending Spud Date: TBD New or Old (EPA): New (*UIC Class II Primacy 03/07/1982*)

Footages 2630' FSL / 2310' FEL Lot - or Unit J Sec 15 Tsp 25S Rge 34E County Lea

General Location: ~14 mi. west of Jal / south of SR128 Pool: SWD; Bell Canyon-Cherry Canyon Pool No.: 96802

BLM 100K Map: Jal Operator: Santo Operating LLC OGRID: 371502 Contact: L. Diede / SMA

COMPLIANCE RULE 5.9: Total Wells: 0 Inactive: 0 **Fincl Assur:** Yes Compl. Order? No **IS 5.9 OK?** Yes **Date:** 12/15/17

WELL FILE REVIEWED ✓ Current Status: No APD - no well file Blanket Bond → Proposed WC wells cancelled by Santo

WELL DIAGRAMS: NEW: Proposed ✓ or **RE-ENTER:** Before Conv. ○ After Conv. ○ Logs in Imaging: None

Planned Rehab Work to Well: NA

Well Construction Details	Sizes (in) Borehole / Pipe	Setting Depths (ft)	Stage Tool	Cement Sx or Cf	Cement Top and Determination Method
Planned ✓ or Existing Surface	17½ / 13⅜	0 to 1352 (Salado: needs to change)		1409	Circulate to surf
Planned ✓ or Existing Interm/Prod	12¼ / 9⅝	0 to 5150	None	2013	Circulate to surface
Planned ✓ or Existing Interm/Prod	8¾ / 7	0 to 7325	None	1257 (?)	CBL (?) / Circulate
Planned or Existing Prod/Liner	—	—	—	—	
Planned or Existing Liner	—	—	—	—	—
Planned ✓ or Existing OH / PERF	8¾ / 7	5462' to 7156'	Inj Length		

Injection Lithostratigraphic Units:	Depths (ft)	Injection or Confining Units	Tops
Adjacent Unit: Litho. Struc. Por.		Rustler	
Confining Unit: Litho Struc. Por.		Salado / Castile	1252' / 5055'
Proposed Inj Interval TOP:	5462	Bell Canyon	5349
Proposed Inj Interval BOTTOM:	7156	Cherry Canyon	6300
Confining Unit: Litho Struc. Por.	(7825)	Brushy Canyon	(7825)
Adjacent Unit: Litho. Struc. Por.		Bone Spring	

Completion/Operation Details:

Drilled TD — PBTD —

NEW TD 7325 NEW PBTD —

NEW Open Hole ○ or NEW Perfs ✓

Tubing Size 3½ in. Inter Coated? Yes

Proposed Packer Depth 5362 ft

Min. Packer Depth 5362 (100-ft limit)

Proposed Max. Surface Press. 1092 psi

Admin. Inj. Press. 1092 (0.2 psi per ft)

AOR: Hydrologic and Geologic Information

POTASH: R-111-P No Noticed? NA **BLM Sec Ord** No **WIPP** No Noticed? NA **Salt/Salado T:** ±1250 B: ±5080 **NW: Cliff House fm** NA

FRESH WATER: Aquifer Rustler Max Depth <850' **HYDRO AFFIRM STATEMENT By Qualified Person** ✓

NMOSE Basin: Carlsbad **CAPITAN REEF:** thru ___ adj ___ NA ✓ **No. GW Wells in 1-Mile Radius?** 2 FW Analysis? Yes

Disposal Fluid: Formation Source(s) Wolfcamp Analysis? Yes On Lease ○ Operator Only ✓ or Commercial ○

Disposal Interval: Inject Rate (Avg/Max BWPD): 2000 / 6000 Protectable Waters? Low Probability Source: Salinity Calc System: Closed or Open

HC Potential: Producing Interval? No Formerly Producing? No Method: Logs/DST/P&A/Other Need mudlog 2-Mi Radius Pool Map ✓

AOR Wells: 1/2-M Radius Map and Well List? Yes **No. Penetrating Wells:** 0 [AOR Horizontals: — AOR SWDs: —]

Penetrating Wells: No. Active Wells 0 Num Repairs? — on which well(s)? — Diagrams? NA

Penetrating Wells: No. P&A Wells 0 Num Repairs? — on which well(s)? — Diagrams? NA

NOTICE: Newspaper Date 06/13/17 Mineral Owner Fee Surface Owner Fee - McCloy N. Date 06/17/17

RULE 26.7(A): Identified Tracts? Yes Affected Persons: EOG / Talon / BC Operating / Black Mtn / Marathon N. Date 06/17/17

Order Conditions: Issues: DMG interval [pressure / HC potential]; HC potential; future use as commercial

Additonal COAs: Restrict disposal to operator only; mudlog - Salinity; SRT prior to commencing injection; Cement * Casing needs to be reviewed at District

eog resources
P.O. Box 2267, Midland, Texas 79702
Phone: (432) 686-3600 Fax: (432) 686-3773

September 12, 2017

New Mexico Oil Conservation Division
ATTN: Hearing Examiner
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Santo Operating, LLC
Administrative SWD Application (Form C-108)
Ocotillo Sunrise SWD #001
API # - Pending
2630' FSL & 2310' FEL, UL J, Section 15, T25S, R34E
Lat, 32.130489 N, Long, 103.456763 W (NAD 83)
Lea County, New Mexico

To Whom It May Concern:

By letter dated June 29, 2017 EOG Resources, Inc. ("EOG") protested the Ocotillo Sunrise SWD #001 application by Santo Operating, LLC ("Santo"). EOG and Santo have come to an agreement that will allow Santo to operate the proposed SWD without interfering with EOG's operations. Accordingly, EOG hereby withdraws its objection to the above application.

If you have any questions or comments, please feel free to contact me at (432) 686-3633 or via email at brian_levea@eogresources.com.

Sincerely,

EOG Resources, Inc.

Brian Levea

McMillan, Michael, EMNRD

From: McMillan, Michael, EMNRD
Sent: Thursday, June 29, 2017 4:41 PM
To: 'Loren Diede'
Cc: Goetze, Phillip, EMNRD; Lowe, Leonard, EMNRD; Jones, William V, EMNRD; Brown, Maxey G, EMNRD; Whitaker, Mark A, EMNRD
Subject: Protest of Application to Inject- Ocotillo Operating Ocotillo Sunrise SWD Well No. 1 J-15 T25S R34E

RE: Ocotillo Sunrise SWD Well No. 1 (API 30-025-pending; Appl. No. pMAM1717136579) – Unit J, Section 15, T. 25 S., R. 34 E., NMPM, Lea County, New Mexico.

Mr. Diede:

OCD was notified that EOG Resources, Inc. is protesting this application for approval of a salt water disposal well. EOG Resources, Inc. has been identified as an affected person for the proposed salt-water disposal well. Therefore, you are being notified that if Santo Operating, LLC wishes for this application to be considered, it must either go to hearing or may be reviewed administratively if the protest is withdrawn as a result of a negotiated resolution with this party. The application will be retained by OCD, but suspended from further administrative review. Please contact OCD once you have made a decision regarding the application within the next 30 days. If the protest remains after 30 days, OCD will initiate the process for the application to be reviewed at hearing. Please contact me with any questions regarding this matter.

Contact for EOG Resources, Inc.
Brian Levea
Senior Landman
PO Box 2267
Midland, Texas
e-mail: Brian_Levea@eogresources.com
Phone: 432.683.3633

Michael McMillan
1220 South St. Francis
Santa Fe, New Mexico
505-476-3448
Michael.mcmillan@state.nm.us

eog resources

P.O. Box 2267, Midland, Texas 79702
Phone: (432) 686-3600 Fax: (432) 686-3773

June 29, 2017

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

RE: **Santo Operating, LLC**
Administrative SWD Application (Form C-108)
Ocotillo Sunrise SWD #001
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Lea County, New Mexico

To Whom It May Concern:

EOG Resources, Inc. objects to the above application because it may adversely affect its operations on offsetting acreage.

Sincerely,

EOG RESOURCES, INC.

Brian Levea
Landman Sr. – Midland Division
(432) 686-3633
brian_levea@eogresources.com

eog resources

P.O. Box 2267, Midland, Texas 79702
Phone: (432) 686-3600 Fax: (432) 686-3773

June 29, 2017

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

RECEIVED OCD
2017 JUN 29 P 1:50

RE: **Santo Operating, LLC**
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RECEIVED OCD
2017 JUN 29 P 1:50

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EOG Resources, Inc. objects to the above application because it may adversely affect its operations on offsetting acreage.

Sincerely,

EOG RESOURCES, INC.

Brian Levea
Landman Sr. – Midland Division
(432) 686-3633
brian_levea@eogresources.com

Goetze, Phillip, EMNRD

From: Gallegos, Denise, EMNRD
Sent: Thursday, December 14, 2017 12:41 PM
To: Goetze, Phillip, EMNRD
Subject: RE: Santo Operating LLC Bonding Status

Santo Operating LLC OGRID#371502 has a blanket bond in place. I don't see anything for the OGRID# you gave me.

Thank you,

Denise A. Gallegos
Compliance Officer/Bond Administrator
Oil Conservation Division
Energy, Minerals & Natural Resources Department
1220 South Saint Francis Drive
Santa Fe, NM 87505
Office: 505.476.3453
Fax: 505.476.3462

From: Goetze, Phillip, EMNRD
Sent: Thursday, December 14, 2017 12:16 PM
To: Gallegos, Denise, EMNRD <Denise.Gallegos@state.nm.us>
Subject: Santo Operating LLC Bonding Status

Denise:

Does Santo Operating LLC (ORID 371592) have a blanket bond or any type of FA instrument in place? When you can. Thanks. PRG

Phillip Goetze, PG
Engineering Bureau, Oil Conservation Division
New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive, Santa Fe, NM 87505
Direct: 505.476.3466
E-mail: phillip.goetze@state.nm.us

eog resources
P.O. Box 2267, Midland, Texas 79702
Phone: (432) 686-3600 Fax: (432) 686-3773

August 2, 2017

Santo Operating, LLC
P.O. Box 1020
Artesia, New Mexico 88211

RE: Letter Agreement Regarding Santo Operating, LLC's Ocotillo Sunrise SWD #001

Gentlemen:

Pursuant to our recent conversations, this letter agreement (this "Agreement") is intended to evidence an agreement between EOG Resources, Inc. ("EOG") and Santo Operating, LLC ("Santo") regarding Santo's Application for Authorization to Inject (the "Application") into the Ocotillo Sunrise SWD #001 (the "SWD") well located in Section 15, T25S, R34E, Lea County, New Mexico, and EOG's protest of the Application due to the proximity of the SWD to EOG's planned development. (EOG and Santo, individually referred to hereafter as a "Party," and collectively as the "Parties"). The geological interval within the SWD into which Santo intends to dispose produced water, as set forth in the Application, shall hereinafter be referred to as the "Injection Zone". In return for the mutual agreements set forth below and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree to the following terms:

1. Within two (2) business days of the execution of this Agreement, EOG shall withdraw its protest to the Application, subject to the following:

   a. EOG will provide Santo written notice for any proposed well that shall penetrate the Injection Zone at a location within a half (.5) mile radius of the surface location for the SWD ("EOG Near Offset Well"), at which time Santo agrees to discontinue all injection operations into the SWD, for the period of time at least five (5) days prior to EOG spudding the well until such time that EOG notifies Santo within twenty-four (24) hours of the first to occur of either the isolation of the Injection Zone behind pipe or the abandonment of the EOG Near Offset Well. In EOG's original notice to Santo, it agrees to provide an estimate of the number of days during which EOG anticipates Santo's required curtailment of injection into the SWD.

   b. EOG will provide Santo written notice for any proposed well that shall penetrate the Injection Zone at a location within a one (1) mile radius of the surface location for the SWD but at a location further than a half (.5) mile from the surface location of the SWD ("EOG Far Offset Well"). Upon receipt of such notice, Santo shall have the option but not the obligation to discontinue all injection operations into the SWD, as provided in paragraph 1(a) above. However, should EOG encounter problems, as determined in EOG's sole discretion, while an EOG Far Offset Well is being drilled with an open hole exposed to the Injection Zone , Santo agrees to immediately discontinue all injection operations into the SWD, within twenty-four (24) hours after being notified by EOG. Santo thereafter agrees to not resume injection until EOG has notified Santo within twenty-four (24) hours of the first to occur of either the isolation of the Injection Zone behind pipe or the abandonment of the EOG Far Offset Well.

   c. EOG agrees to make a good faith effort to cooperate with Santo to minimize the time during which Santo is required to curtail injection into the SWD pursuant to Sections 1(a) and 1(b).

2. The terms and conditions of this Agreement shall be binding upon and shall inure to the benefit of the Parties hereto and to their respective heirs, devisees, legal representatives, successors and assigns.

3. This Agreement shall remain in full force and effect until the earlier occurrence of either: i) the termination of EOG's leases within a one (1) mile radius of the SWD or (ii) the plugging of the SWD.

4. Each Party has had substantial input into the drafting and preparation of this Agreement and has had the opportunity to exercise business discretion in relation to the negotiation of the details of the Agreement.

If you are in agreement with these terms, please indicate your acceptance and agreement by executing in the space below. Should you have any questions, please feel free to contact me at 432-686-3633 or via email at brian_levea@eogresources.com.

Sincerely,

Brian Levea

AGREED TO AND ACCEPTED THIS 8 DAY OF Sept, 2017.

By: Ezra Yacob
Title: Sr VP & Gen Counsel

AGREED TO AND ACCEPTED THIS 8th DAY OF September, 2017.

By: Hanson Yates
Title: Vice President