STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

CASE NO. 20570

APPLICATION

NGL Water Solutions Permian, LLC ("NGL"), OGRID No. 372338, through its undersigned attorneys, hereby makes this application to the Oil Conservation Division pursuant to the provisions of N.M. Stat. Ann. § 70-2-12, for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, NGL states as follows:

(1) NGL proposes to drill the Cobra SWD #2 well at a surface location 625 feet from the North line and 268 feet from the East line of Section 19, Township 25 South, Range 36 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well.

(2) NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 5,460' to 6,800'.

(3) NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 24,999 bbls per day.

(4) NGL anticipates using an average pressure of 810 psi for this well, and it requests that a maximum pressure of 1,092 psi be approved for the well.

(5) A proposed C-108 for the subject well is attached hereto in Attachment A.

(6) The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, NGL requests that this application be set for hearing before an Examiner of the Oil Conservation Division on June 13, 2019; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS
& SISK, P.A.

By: Deana M Bennett

Deana Bennett
Post Office Box 2168
500 Fourth Street NW, Suite 1000
Albuquerque, New Mexico 87103-2168
Telephone: 505.848.1800
Attorneys for Applicant

CASE NO. 20570 Application of NGL Water Solutions Permian, LLC for approval of salt water disposal well in Lea County, New Mexico. Applicant seeks an order approving disposal into the Silurian-Devonian formation through the Cobra SWD #2 well at a surface location 625 feet from the North line and 268 feet from the East line of Section 19, Township 25 South, Range 36 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 5,460' to 6,800'. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 24,999 bbls per day. Said location is 6.1 miles west of Jal, NM.

Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:

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: NGL WATER SOLUTIONS PERMIAN LLC **OGRID Number:** 372338
Well Name: COBRA SWD #2 **API:** TBD
Pool: SWD; DELAWARE **Pool Code:** 96100

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

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐NSL ☐NSP (PROJECT AREA) ☐NSP (PRORATION UNIT) ☐SD

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐DHC ☐CTB ☐PLC ☐PC ☐OLS ☐OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐WFX ☐PMX ☒SWD ☐IPI ☐EOR ☐PPR

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

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

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

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

4/29/2019
Date

CHRIS WEYAND
Print or Type Name

512-600-1764
Phone Number

Signature

CHRIS@LONQUIST.COM
e-mail Address

EXHIBIT
tabbies A

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: NGL WATER SOLUTIONS PERMIAN, LLC

ADDRESS: 1509 W WALL ST // STE 306 // MIDLAND, TX 79701

CONTACT PARTY: SARAH JORDAN PHONE: (432) 685-0005 x1989

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).

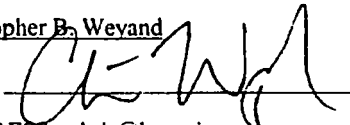
*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

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: Christopher B. Weyand TITLE: Consulting Engineer

SIGNATURE:  DATE: 4/29/2019

E-MAIL ADDRESS: chris@lonquist.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: NGL WATER SOLUTIONS PERMIAN, LLC

WELL NAME & NUMBER: COBRA SWD #2

WELL LOCATION: 625' FNL & 268' FEL | A | 19 | 25S | 36E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 24.000" Casing Size: 20.000"

Cemented with: 1,493 sx. *or* _____ ft³

Top of Cement: Surface Method Determined: Circulation

1st Intermediate Casing

Hole Size: 17.500" Casing Size: 13.375"

Cemented with: 2,528 sx. *or* _____ ft³

Top of Cement: Surface Method Determined: Circulation

2nd Intermediate Casing

Hole Size: 12.250" Casing Size: 9.625"

Cemented with: 544 sx. *or* _____ ft³

Top of Cement: Surface Method Determined: Circulation

Production Liner

Hole Size: 8.500"

Casing Size: 7.625"

Cemented with: 84 sx.

or _____ ft^3

Top of Cement: 5,375'

Method Determined: Logged

Injection Interval

5,460 feet to 6,800 feet

(Perforated)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 7" P110, TCPC 26#
Lining Material: NOV TK805 IPC & KC CBR

Type of Packer: Nickel coated injection packer

Packer Setting Depth: 5,360'

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

Additional Data

1. Is this a new well drilled for injection? ___X___Yes _____No

   If no, for what purpose was the well originally drilled? N/A

2. Name of the Injection Formation: Delaware

3. Name of Field or Pool (if applicable): SWD; DELAWARE

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, new drill.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
   Yates-Seven Rivers: 3,589'
   Lower Brushy Canyon: 7,800'
   Bone Spring: 8,073'
   Wolfcamp: 11,145'
   Strawn: 11,567'

NGL Energy Partners LP

NGL Cobra SWD #2

Location - Section 19, T25S, R36E
Lea County, NM

AFE Number -

TD - 6,875'

Directions to Site - Travel 6.8 miles from Jal NM along NM 128W. Turn left (south) and travel to location.
Lat/Long: 32.12287, -103.29757

Vertical Injection DMG Target

Rig - tbd

Estimated Drilling Cost -

GL - 3130'

Geologic Tops (MD ft)	Section	Problems	Bit/BHA	Mud	Casing	Logging	Cement (HOLD)	Injection String
Triassic - 28' Rustler Anhydrite - 1,351' **Surface TD - 1,400'**	**Surface - to Isolate the Aquifers** Drill 1400' of 24" Hole 0'-1400' Set and Cement 20" Casing	Loss Circulation Hole Cleaning Wellbore stability in the Red Beds Anhydrite in the Rustler	24" PDC Bit + 9-5/8" X 8" 7/8 4.0 Combo MM w/17" NBS + 1X8" DC + 17" IBS + 1X8" DC + SS + 4X8" DC's + X/O +5" HWDP	Spud Mud MW < 9.0 ppg	1400' of 20" 106.5# J55 STC Centralizers - bottom 2 joints and every 3rd jt thereafter, Cement basket at 200'	MWD Mudloggers onsite by drillout of surf shoe	**LEAD: 992 sx 13.7 ppg EXTANDACEM, 1.694 ft3/sk @ 75% Excess (1000' of fill)** **TAIL: 501sx 14.8 ppg HALCEM, 1.342 ft3/sk @ 75% Excess (400' of fill)**	S360' of 7" P110, TCPC 26# NOV TK80S IPC and KC CBR
Top of Salt - 1,494' Salado - 1,719' Base of Salt - 3,509' **1st Int TD - 3,550'**	**1st Intermediate to Isolate the Salt** Drill 2150' of 17-1/2" Hole 1400' - 3550' Set and Cement 13-3/8" Casing	Seepage Losses Possible H2S Anhydrite Salt Sections	17-1/2" Varel PDC Bit + 9-5/8"X 8" 7/8 4.0 Combo MM w/ 17" Steel NBS + 17" IBS + 2X8" DC's + Thruster + 4X8" DC's + 18X6" DC's + X/O + HWDP	Brine Water MW 9.0-10.0 ppg	5M A Section Casing Bowl 3550' of 13-3/8" 68# L80 BTC Centralizers - bottom jt, every 3rd joint in open hole and 2 jt inside the surface casing	MWD CBL of 13-3/8" casing if no circulation	**LEAD 537sx: 12.9 ppg HALCEM, 1.849 ft3/sk @ 50% Excess (1000' of fill)** **TAIL 1991 sx: 14.8 ppg HALCEM, 1.342 ft3/sk @ 50% Excess (2550' of fill)**	
Yates (E Delaware) - 3,589' **9-5/8" ECP/DV Tool - 3,650'** 7 Rivers (E Delaware) - 3,859' Queen (E Delaware) - 4,329' Grayburg (E Delaware) - 4,589' San Andres (E Del) - 4,979' Injection Packer 5,360' Liner Hanger PBR - 5375' **2nd Int TD - 5,400'**	**2nd Intermediate - to Isolate the Capitan Reef** Drill 1850' of 12-1/4" Hole 3550' - 5400" Set and Cement 9-5/8" Casing in 2 Stages	Loss Circulation in the Capitan Reef complex Possible H2S Anhydrite and Salt Sections	12-1/4" Smith XS 716S AxeBlade PDC Bit, sub, 8" 7/8 4.0 0.16 MM w/ 12" NBS, ALS Roller Reamer DeMag , UBHO sub, ALS 12" RR/UBHO/NMDC, 6 jts: 8" DC, X/O sub, 18 jts: 6" DC, X/O sub, 8" Drilling Jars HWDP + 5" DP to Surface	Saturated Brine MW < 9.5 ppg Freshwater contingency based upon Losses in CR	5M B Section 5400' of 9-5/8" 43.5# P110 BTC **ECP DV Tool set 100' below Previous Casing shoe** Centralizers - bottom jt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the 13-3/8" casing	MWD GR CBL of 9-5/8" casing if no cement is cirulated on 2nd stage	**Stage 2:** **TAIL 432sx: 13.7 ppg HALCEM C, 1.777 ft3/sk @ 30% Excess OH (From DV Tool - 1000' of fill)** **Stage 1 112sx:** 13.7 ppg HALCEM, 1.685 ft3/sk @ 30% Excess (TD to DV Tool)	Nickel coated injection packer set within 100' of injection zone
DMG (Sh Marker) - 5,409' Lamar Limestone - 5,410' Bell Canyon - 5,459' Cherry Canyon - 5,897' **Liner TD - 6,875'**	Drill 8-1/2" hole 5400' - 6875' Injection Interval: 5460' - 6800'	Seepage to Complete Loss Water Flows Some Anhydrite H2S possible Ballooning is possible in Cherry Canyon	8-1/2" Smith XS 716S AxeBlade PDC Bit, sub, 6-3/4" 7/8 5.7 MM w/ 8" NBS, UBHO sub, 8" NMIBS/UBHO/NMDC, Thruster, 18 jts: 6" DC 6" Drilling Jars HWDP + 5" DP to Surface	Freshwater MW 8.6 - 9.2 High visc. Sweeps and mud up for tight spots (<10 FL, 30-35 visc.)	1,500' of 7-5/8" 29.7ppf, L80 FJ Connection. Centralizers on each joint.	CBL of 9-5/8" during OH Logs (Triple Combo). CBL of 7-5/8" casing during Completion	Single Stage 84sx: 13.7 ppg HALCEM, 1.685 ft3/sk @ 30% Excess (TD to Liner Hanger)	

NGL Water Solutions Permian, LLC

Cobra SWD No. 2

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well information	
Lease Name	Cobra SWD
Well No.	2
Location	S-19 T-25S R-36E
Footage Location	625' FNL & 268' FEL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate 1	Intermediate 2	Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.500"	0.480"	0.545"	0.430"
ID	19.000"	12.415"	8.535"	6.765"
Drift ID	18.812"	12.259"	8.535"	6.640"
COD	21"	14.375"	10.625"	7.625"
Weight	106.5 lb/ft	68 lb/ft	43.5 lb/ft	29.7 lb/ft
Grade	J-55	L-80	P-110	L-80
Hole Size	24"	17.5"	12.25"	8.5"
Depth Set	1,400'	3,550'	5,400'	Top: 5,375' Bottom: 6,875'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate 1	Intermediate 2	Liner
Lead Cement	Extenda Cem	Halcem	Halcem	Halcem
Lead Cement Volume	992 sx	537 sx	Stage 1: 432 sx Stage 2: 77 sx	84 sx
Tail Cement	Halcem	Halcem	Halcem	N/A
Tail Cement Volume	501 sx	1,991 sx	Stage 1: N/A Stage 2: 34 sx	N/A
Cement Excess	75%	50%	30%	30%
TOC	Surface	Surface	Surface	5,375'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information	
OD	7"
WT	0.362"
ID	6.276"
Drift ID	6.151"
COD	7.875"
Weight	26 lb/ft
Grade	P-110 TCPC
Depth Set	5,360'

Tubing will be lined with NOV TK805 IPC with KC CBR.

4. Packer Description

Nickel coated injection packer

B. Completion Information

1. Injection Formation: Delaware Mountain Group
2. Gross Injection Interval: 5,460' – 6,800'

Completion Type: Perforated

3. Drilled for injection.
4. See the attached wellbore schematic.
5. Oil and Gas Bearing Zones within area of well:

Formation	Depth
Yates-Seven Rivers	3,589'
Lower Brushy Canyon	7,800'
Bone Spring	8,073'
Wolfcamp	11,145'
Strawn	11,567

VI. Area of Review

No wells within the area of review penetrate the proposed injection zone.

VII. Proposed Operation Data

1. Proposed Daily Rate of Fluids to be Injection:

   Average Volume: 20,000 BPD
   Maximum Volume: 24,999 BPD

2. Closed System

3. Anticipated Injection Pressure:

   Average Injection Pressure: 810 PSI (surface pressure)
   Maximum Injection Pressure: 1,092 PSI (surface pressure)

4. This will be a commercial injection well. The injection fluid is to be locally produced water. It is expected that the source water will predominantly be from the Bone Spring and Wolfcamp formations. Attached are produced water sample analyses taken from the closest wells that feature samples from the Delaware, Bone Spring, Wolfcamp, and Strawn formations.

5. The disposal interval is non-productive. No water samples are available from the surrounding area.

VIII. Geological Data

The Delaware Mountain Group (DMG) of the Delaware Basin comprises of Guadalupian-age arkosic to subarkosic sandstone, siltstone, and detrital limestone that was deposited in deep water, mainly during lowstand and early transgressive sea-level stages. The basin succession is formally divided into the Brushy Canyon, Cherry Canyon, and Bell Canyon Formations (descending order). Stratigraphic divisions within the Delaware Mountain Group are somewhat uncertain due to lithologic similarity and thus a lack of clear boundaries between the major formational intervals. The Delaware Basin during deposition of the Delaware Mountain Group was a deep-water basin bounded by carbonate-ramp (San Andres and Grayburg) and carbonate-rim (Goat Seep and Capitan) margins that developed on the western edge of the Central Basin Platform, the Northwest Shelf, and the Diablo Platform. The top of the interval is designated by another carbonate, the Lamar limestone included in the Bell Canyon Formation. The Bell Canyon contains carbonaceous silty sandstone along with clean, fine grained, massive friable sand. The Brushy Canyon and Cherry Canyon intervals consist of the following: (1) very fine to fine-grained arkosic to subarkosic sandstones, mostly massive in character, (2) very fine grained sandstones microlaminated with siltstones, (3) dark-colored organic siltstones (lutites), (4) carbonate beds (limestone or dolomite) more prevalent near shelf margins, and (5) black to dark gray, calcareous shales. Shale is notably rare in the section and is virtually absent from the Brushy Canyon Formation. Carbonate units (mainly limestone) are present in the upper Cherry Canyon and, especially, Bell Canyon intervals. Porosities and permeabilities in productive intervals range from 12–25% and 1–5 md, respectively, but occasional "streaks" of permeability of up to 200 md are sometimes present. These good porosities indicate a rock that is capable of taking water injection.

Isolation:
The nearly 350' of Lamar (Delaware) Limestone and the interbedded shales provide sufficient vertical separation between the Capitan Reef and Bell Canyon - Cherry Canyon to prevent upward migration of water into the Reef. The Delaware Mountain Group is composed predominately of sandstone and shales. All the Delaware members are interbedded, poorly consolidated, light gray sandstones and shales with occasional dense dolomite horizons. The lateral transmissivities of the sandstone beds are highly variable and often form effective barriers to the movement of hydrocarbons while allowing down-gradient movement of water. The transmissivity variations are fundamentally due to the very-fine grained nature of the sands and the local bounding shale, dolomite and/or silty shale horizons. Downward vertical separation between the Cherry Canyon and Brushy Canyon is sufficiently prevented by dense dolomite, limestone, and shale consisting of ~1000' of the above described lithology to prevent downward vertical migration from the Cherry Canyon into potential pay in the Brushy Canyon.

A. Injection Zone: Delaware Mountain Group

Formation	Depth
Rustler	1,351'
Salado	1,719'
Yates	3,589'
Seven Rivers	3,859'
Queen	4,329'
Grayburg	4,589'
San Andres	4,979'
Delaware Mtn Group	5,409'
Lamar	5,410'
Bell Canyon	5,459'
Cherry Canyon	5,897'
Brushy Canyon	7,197'
Bone Spring	8,073'

B. Underground Sources of Drinking Water

Within 1-mile of the proposed Cobra SWD # 2 location, there are three water wells. One of these has been reported of having a depth of 505 ft and a water depth of 270 ft. Depths have not been reported for the other two wells. Water wells in the surrounding area have an average depth of 495 ft and an average water depth of 295 ft generally producing from the Santa Rosa. The upper Rustler may also be another USDW and will be protected. The reef and corresponding aquifer has been identified as a protectable water source, so an additional casing string will be set in the well.

IX. Proposed Stimulation Program

Stimulate with acid as needed.

X. Logging and Test Data on the Well

There are no logs or test data on the well. During the process of drilling and completion resistivity, gamma ray, and density logs will be run.

XI. Chemical Analysis of Fresh Water Wells

There are three water wells that exist within one mile of the well location. We were able to obtain water samples from two of these wells. Water sample analysis results are attached for water wells CP 00465 POD1 and CP 00179 POD1. A map showing the three water wells and Water Right Summary from the New Mexico Office of the State Engineer for water well CP 01170 POD5 are attached.

XII. Affirmative Statement of Examination of Geologic and Engineering Data

Based on the available engineering and geologic data we find no evidence of open faults or any other hydrologic connection between the disposal zone (in the proposed **Cobra SWD #2**) and any underground sources of drinking water.

NAME: John C. Webb

TITLE: Sr. Geologist

SIGNATURE: John C. Webb

DATE: 4/29/2019

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

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address	[2] OGRID Number
NGL WATER SOLUTIONS PERMIAN, LLC 1509 W WALL ST. STE 306 MIDLAND, TX 79701	372338
	[3] API Number TBD

[4] Property Code	[5] Property Name	[6] Well No.
	Cobra SWD	2

[7] Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
A	19	25S	36E	N/A	625'	NORTH	268'	EAST	LEA

[8] Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
	-	-	-		-	-	-	-	-

[9] Pool Information

Pool Name	Pool Code
SWD; DELAWARE	96100

Additional Well Information

[11] Work Type	[12] Well Type	[13] Cable/Rotary	[14] Lease Type	[15] Ground Level Elevation
N	SWD	R	Private	3,120'
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
N	6,875'	DELAWARE	TBD	ASAP
Depth to Ground water 295'	Distance from nearest fresh water well 250'		Distance to nearest surface water 1,300'	

☐ We will be using a closed-loop system in lieu of lined pits

[21] Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	106.5 lb/ft	1,400'	1,493	Surface
Intermediate 1	17.5"	13.375"	68 lb/ft	3,550'	2,528	Surface
Intermediate 2	12.25"	9.625"	43.5 lb/ft	5,400'	544	Surface
Liner	8.5"	7.625"	29.7 lb/ft	5,375' – 6,875'	84	5,375'
Tubing	N/A	7"	26 lb/ft	5,360'	N/A	N/A

Casing/Cement Program: Additional Comments

See attached schematic

[22] Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Hydraulic Blinds, Pipe	5,000 psi	4,000 psi	TBD – Schaffer/Cameron

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief **I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒, if applicable.** Signature:	OIL CONSERVATION DIVISION Approved By
Printed name: Christopher B. Weyand	Title:
Title: Consulting Engineer	Approved Date: / Expiration Date:
E-mail Address: chris@lonquist.com	
Date: 4/22/2019 Phone: (512) 600-1764	Conditions of Approval Attached

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	96100	SWD; DELAWARE

[4] Property Code	[5] Property Name	[6] Well Number
	COBRA SWD	2

[7] OGRID No.	[8] Operator Name	[9] Elevation
372338	NGL WATER SOLUTIONS PERMIAN, LLC	3120.00'±

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	19	25 S	36 E	N/A	625'	NORTH	268'	EAST	LEA

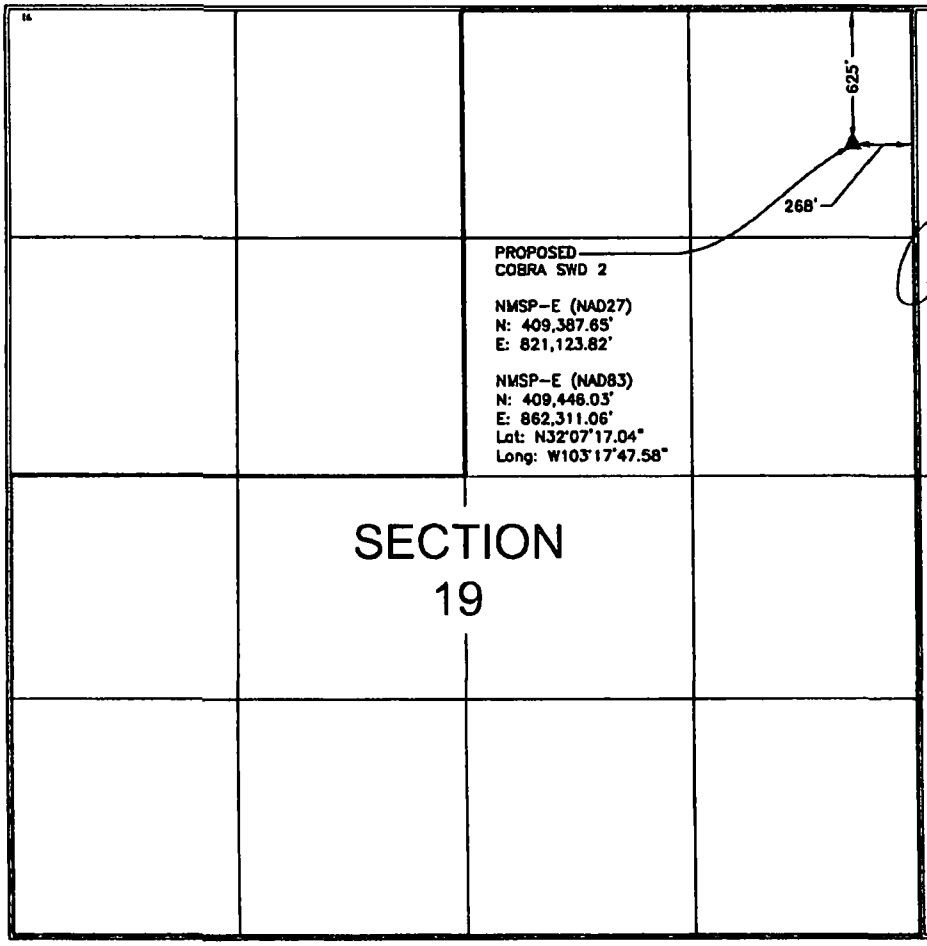
[11] Bottom Hole Location If Different From Surface

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

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

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

[16]



[17] 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: 4/29/2019

Chris Weyand
Printed Name

chris@lonquist.com
E-mail Address

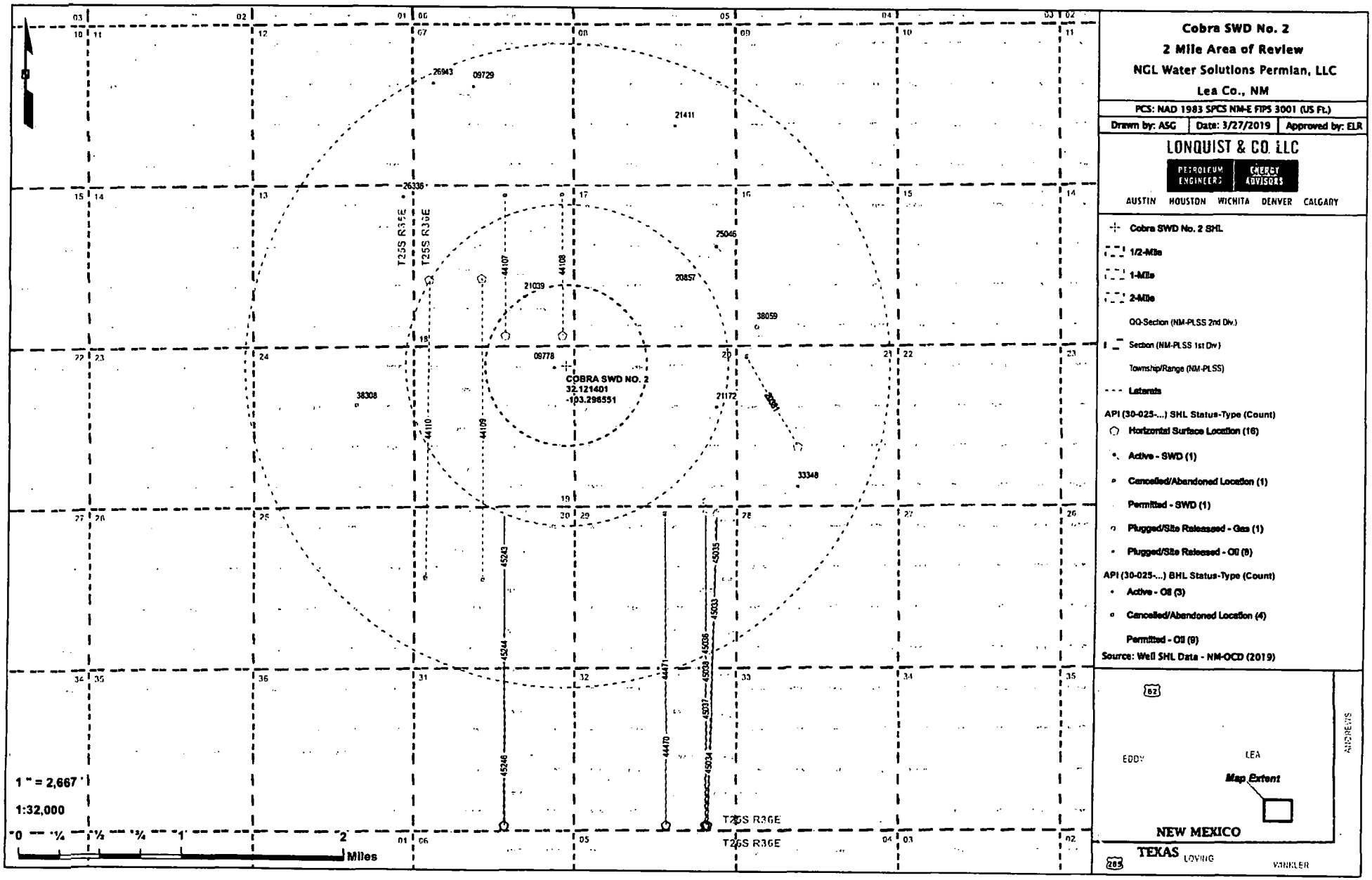
[18] SURVEYOR CERTIFICATION

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 supervision, and that the same is true and correct to the best of my belief.

03/03/2019
Date of Survey

Signature and Seal of Professional Surveyor: Billy W. Barr Jr. NEW MEXICO 25114 PROFESSIONAL SURVEYOR

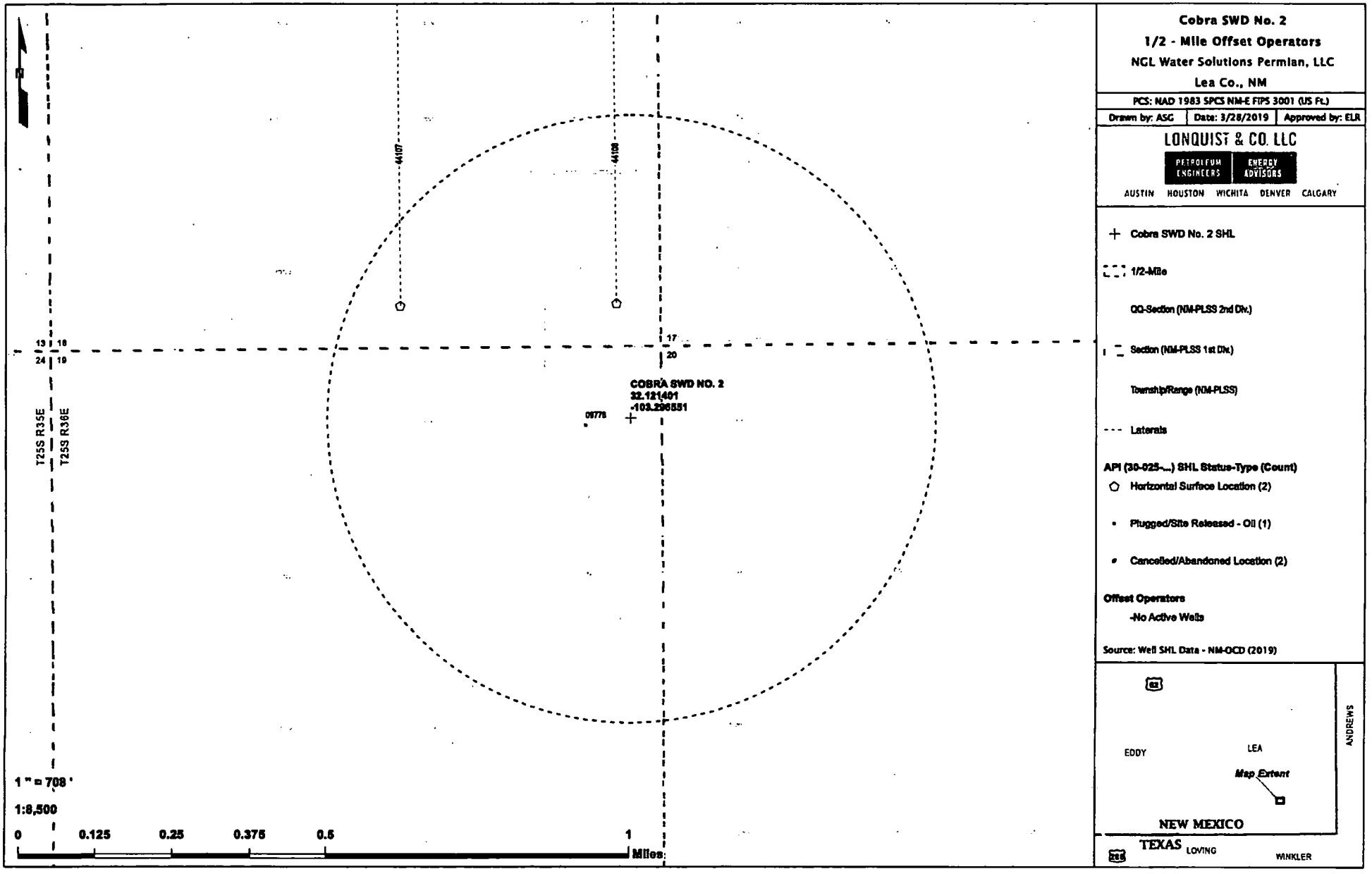
25114
Certificate Number


Cobra SWD No. 2
2 Mile Area of Review
NGL Water Solutions Permian, LLC
Lea Co., NM
PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft.)
Drawn by: ASG
Date: 3/27/2019
Approved by: ELR
LONQUIST & CO. LLC
PETROLEUM ENGINEERS
ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY
Cobra SWD No. 2 SHL
1/2-Mile
1-Mile
2-Mile
QQ-Section (NM-PLSS 2nd Div.)
Section (NM-PLSS 1st Div)
Township/Range (NM-PLSS)
Laterals
API (30-025-...) SHL Status-Type (Count)
Horizontal Surface Location (16)
Active - SWD (1)
Cancelled/Abandoned Location (1)
Permitted - SWD (1)
Plugged/Site Released - Gas (1)
Plugged/Site Released - Oil (9)
API (30-025-...) BHL Status-Type (Count)
Active - Oil (3)
Cancelled/Abandoned Location (4)
Permitted - Oil (9)
Source: Well SHL Data - NM-OCD (2019)
COBRA SWD NO. 2
32.121401
-103.298551
T25S R35E
T25S R36E
T26S R36E
T26S R36E
26943
09729
21411
26336
25046
20857
21039
38059
09778
38308
21172
33348
44107
44108
44110
44109
45243
45244
45246
44471
44470
45035
45033
45036
45037
45034
1 " = 2,667 '
1:32,000
0 ¼ ½ ¾ 1 2 Miles
82
285
EDDY
LEA
Map Extent
NEW MEXICO
TEXAS
LOVING
WINKLER
ANDREWS

Cobra SWD No. 2

1/2 - Mile Area of Review List

API (30-025-...)	WELL NAME	WELL TYPE	STATUS	OPERATOR	TVD (FT.)	LATITUDE (NAD83 DD)	LONGITUDE (NAD83 DD)	DATE DRILLED
09778	PRE-ONGARD WELL #001	O	P	PRE-ONGARD WELL OPERATOR	3891	32.12124250000	-103.29780580000	1/1/1900
44108	SHIFT FEE WCB #001C	O	C	ONEENERGY PARTNERS OPERATING, LLC	0	32.12416500000	-103.29691400000	12/31/9999
44107	BRANDY FEE WCB #001C	O	C	ONEENERGY PARTNERS OPERATING, LLC	0	32.12417500000	-103.30298600000	12/31/9999



Cobra SWD No. 2
1/2 - Mile Offset Operators
NGL Water Solutions Permian, LLC
Lea Co., NM

PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft.)

Drawn by: ASG	Date: 3/28/2019	Approved by: ELR

LONQUIST & CO. LLC
PETROLEUM ENGINEERS | ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY

- Cobra SWD No. 2 SHL
- 1/2-Mile
- QQ-Section (NM-PLSS 2nd Div.)
- Section (NM-PLSS 1st Div.)
- Township/Range (NM-PLSS)
- Laterals

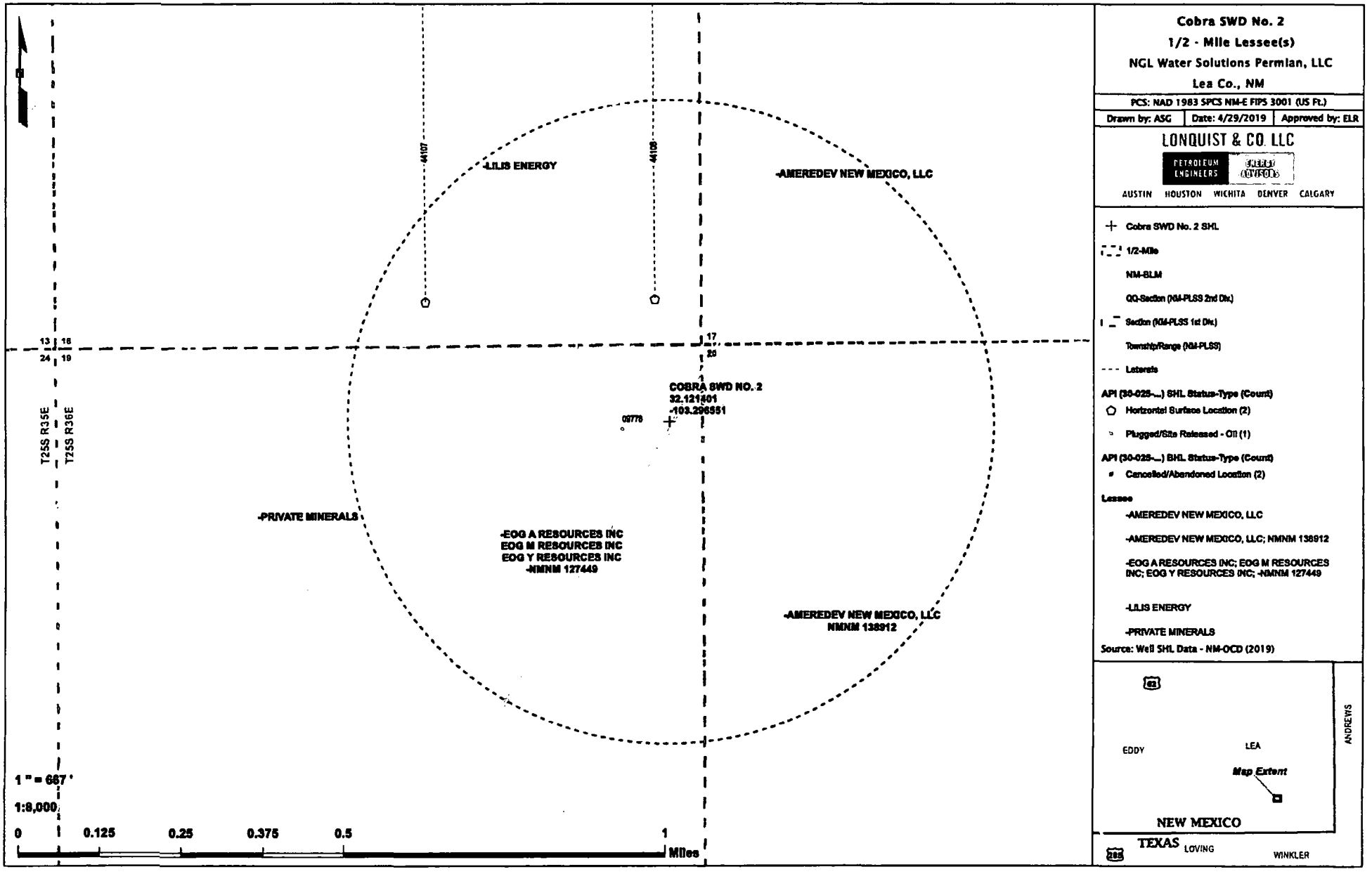
API (30-025-...) SHL Status-Type (Count)

- Horizontal Surface Location (2)
- Plugged/Site Released - Oil (1)
- Cancelled/Abandoned Location (2)

Offset Operators

-No Active Wells

Source: Well SHL Data - NM-OCD (2019)



Cobra SWD No. 2

1/2 - Mile Lessee(s)

NGL Water Solutions Permian, LLC

Lea Co., NM

PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft.)

Drawn by: ASG	Date: 4/29/2019	Approved by: ELR

LONQUIST & CO. LLC

PETROLEUM ENGINEERS | GEOLOGY CONSULTANTS

AUSTIN HOUSTON WICHITA DENVER CALGARY

- Cobra SWD No. 2 SHL
- 1/2-Mile
- NM-BLM
- QQ-Section (NM-PLSS 2nd Div.)
- Section (NM-PLSS 1st Div.)
- Township/Range (NM-PLSS)
- Laterals

API (30-025-...) SHL Status-Type (Count)

- Horizontal Surface Location (2)
- Plugged/Site Released - Oil (1)

API (30-025-...) BHL Status-Type (Count)

- Cancelled/Abandoned Location (2)

Lessee

-AMEREDEV NEW MEXICO, LLC

-AMEREDEV NEW MEXICO, LLC; NMNM 138912

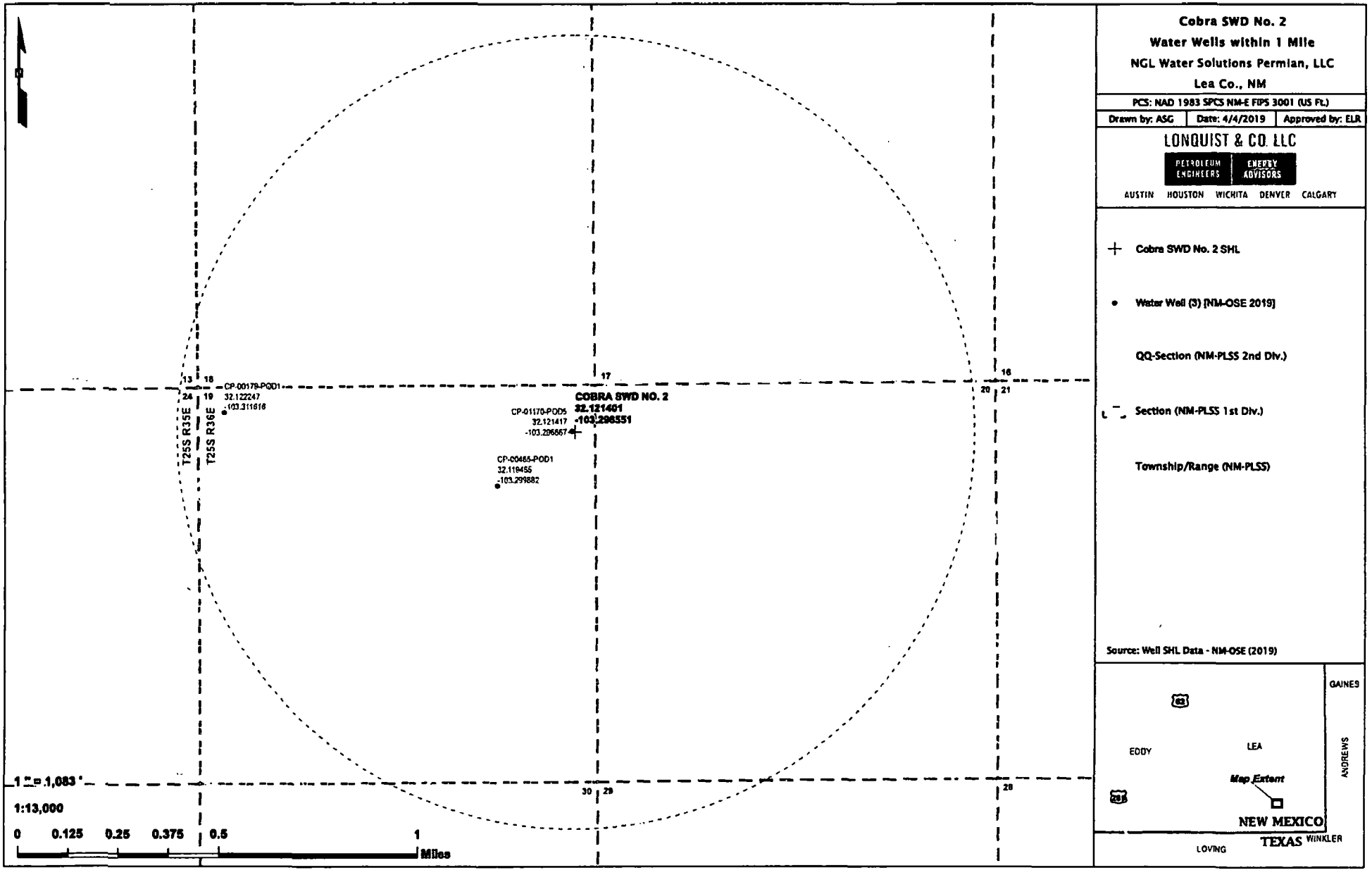
-EOG A RESOURCES INC; EOG M RESOURCES INC; EOG Y RESOURCES INC; -NMNM 127449

-LILIS ENERGY

-PRIVATE MINERALS

Source: Well SHL Data - NM-OCD (2019)

Cobra SWD #2: Offsetting Produced Water Analysis														
wellname	api	county	formation	ph	tds_mgL	sodium_mgL	calcium_mgL	iron_mgL	magnesium_mgL	manganese_mgL	chloride_mgL	bicarbonate_mgL	sulfate_mgL	co2_mgL
BELL LAKE UNIT #009	3002520261	LEA	BONE SPRING		204652						130000	512	260	
THISTLE UNIT #071H	3002542425	Lea	BONE SPRING 1ST SAND	5.6	171476.3	55363.2	9140	40.4	1023	1.1	104576.4	244	560	770
BELL LAKE 19 STATE #004H	3002541517	Lea	BONE SPRING 2ND SAND	6.3		76378	6238	11	834	0	131397	159	670	200
BELL LAKE 19 STATE #003H	3002541516	Lea	BONE SPRING 2ND SAND	6.7		59599	7326	11	942	0.69	108190	171	680	230
SALADO DRAW 6 FEDERAL #001H	3002541293	Lea	BONE SPRING 3RD SAND	6.7	95604	31066	3196	10	394	0.5	59071	183	0	100
SALADO DRAW 6 FEDERAL #001H	3002541293	Lea	BONE SPRING 3RD SAND	7			3289	0.3	474.5	0.38		219.6		300
NORTH EL MAR UNIT #057	3002508440	LEA	DELAWARE		259554						163000	61	253	
GOEDEKE #002	3002508407	LEA	DELAWARE		293925						184000	85	210	
PRONGHORN AHO FEDERAL #001	3002526496	LEA	STRAWN	5.5			20.1	0	12.2		35.5	61.1	48.8	
SNAPPING 2 STATE #014H	3001542688	EDDY	WOLFCAMP	7.3	81366.4	26319.4	2687.4	26.1	326.7		50281.2		399.7	100


Cobra SWD No. 2
Water Wells within 1 Mile
NGL Water Solutions Permian, LLC
Lea Co., NM
PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft.)
Drawn by: ASG
Date: 4/4/2019
Approved by: ELR
LONQUIST & CO. LLC
PETROLEUM ENGINEERS
ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY
Cobra SWD No. 2 SHL
Water Well (3) [NM-OSE 2019]
QQ-Section (NM-PLSS 2nd Div.)
Section (NM-PLSS 1st Div.)
Township/Range (NM-PLSS)
Source: Well SHL Data - NM-OSE (2019)
COBRA SWD NO. 2
32.121461
-103.296551
CP-01170-POD5
32.121417
-103.296667
CP-00179-POD1
32.122247
-103.311616
CP-00465-POD1
32.119455
-103.299882
T25S R35E
T25S R36E
1 " = 1,083 '
1:13,000
0 0.125 0.25 0.375 0.5 1
Miles
GAINES
ANDREWS
EDDY
LEA
Map Extent
NEW MEXICO
TEXAS
LOVING
WINKLER

New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64	Q16	Q4	Sec	Tws	Rng	(NAD83 UTM in meters) X	Y
	CP 01170 POD5	2	2	2	19	25S	36E	660687	3555164

Driller License:	1607	**Driller Company:**	DURAN DRILLING		
Driller Name:	DURAN, LUIS (TONY)				
Drill Start Date:	10/28/2014	**Drill Finish Date:**	11/04/2014	**Plug Date:**	
Log File Date:	02/19/2015	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	35 GPM
Casing Size:	8.00	**Depth Well:**	505 feet	**Depth Water:**	270 feet

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

October 18, 2018

CHRIS WEYAND

Lonquist Field Services, LLC

3345 Bee Cave Road, Suite 201

Austin, TX 78746

RE: COBRA

Enclosed are the results of analyses for samples received by the laboratory on 10/11/18 15:50.

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

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

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

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
CP - 00465- POD 1	H802919-01	Water	11-Oct-18 11:51	11-Oct-18 15:50
CP - 00179- POD 1	H802919-02	Water	11-Oct-18 12:35	11-Oct-18 15:50

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

CP - 00465- POD 1

H802919-01 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Alkalinity, Bicarbonate	**88.0**		5.00	mg/L	1	8101003	AC	15-Oct-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8101003	AC	15-Oct-18	310.1	
Chloride*	**140**		4.00	mg/L	1	8101118	AC	15-Oct-18	4500-Cl-B	
Conductivity*	**3140**		1.00	uS/cm	1	8101210	AC	15-Oct-18	120.1	
pH*	**6.56**		0.100	pH Units	1	8101210	AC	12-Oct-18	150.1	
Resistivity	**3.18**			Ohms/m	1	8101210	AC	15-Oct-18	120.1	
Specific Gravity @ 60° F	**0.9997**		0.000	[blank]	1	8101512	AC	15-Oct-18	SM 2710F	
Sulfate*	**1540**		250	mg/L	25	8101601	AC	16-Oct-18	375.4	
TDS*	**2740**		5.00	mg/L	1	8101117	AC	15-Oct-18	160.1	
Alkalinity, Total*	**72.0**		4.00	mg/L	1	8101003	AC	15-Oct-18	310.1	
Sulfide, total	**0.116**		0.0100	mg/L	1	8101513	AC	15-Oct-18	376.2	
Green Analytical Laboratories										
Total Recoverable Metals by ICP (E200.7)										
Barium*	**0.055**		0.050	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Calcium*	**383**		0.100	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Iron*	**90.1**		0.050	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Magnesium*	**114**		0.200	mg/L	2	B810148	AES	17-Oct-18	EPA200.7	
Potassium*	**5.93**		1.00	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Sodium*	**222**		1.00	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

CP - 00179- POD 1

H802919-02 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Alkalinity, Bicarbonate	**278**		5.00	mg/L	1	8101506	AC	15-Oct-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8101506	AC	15-Oct-18	310.1	
Chloride*	**116**		4.00	mg/L	1	8101118	AC	15-Oct-18	4500-Cl-B	
Conductivity*	**1580**		1.00	uS/cm	1	8101210	AC	15-Oct-18	120.1	
pH*	**8.34**		0.100	pH Units	1	8101210	AC	12-Oct-18	150.1	
Resistivity	**6.33**			Ohms/m	1	8101210	AC	15-Oct-18	120.1	
Specific Gravity @ 60° F	**0.9978**		0.000	[blank]	1	8101512	AC	15-Oct-18	SM 2710F	
Sulfate*	**419**		83.3	mg/L	8.33	8101601	AC	16-Oct-18	375.4	
TDS*	**1010**		5.00	mg/L	1	8101117	AC	15-Oct-18	160.1	
Alkalinity, Total*	**228**		4.00	mg/L	1	8101506	AC	15-Oct-18	310.1	
Sulfide, total	<0.0100		0.0100	mg/L	1	8101513	AC	15-Oct-18	376.2	
Green Analytical Laboratories										
Total Recoverable Metals by ICP (E200.7)										
Barium*	<0.050		0.050	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Calcium*	**62.4**		0.100	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Iron*	<0.050		0.050	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Magnesium*	**67.5**		0.100	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Potassium*	**11.9**		1.00	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	
Sodium*	**194**		1.00	mg/L	1	B810148	AES	17-Oct-18	EPA200.7	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8101003 - General Prep - Wet Chem										
Blank (8101003-BLK1)				Prepared & Analyzed: 10-Oct-18						
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	10.0	5.00	mg/L							
Alkalinity, Total	8.00	4.00	mg/L							
LCS (8101003-BS1)				Prepared & Analyzed: 10-Oct-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120			
Alkalinity, Total	260	10.0	mg/L	250		104	80-120			
LCS Dup (8101003-BSD1)				Prepared & Analyzed: 10-Oct-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	305	12.5	mg/L				80-120	4.02	20	
Alkalinity, Total	250	10.0	mg/L	250		100	80-120	3.92	20	
Batch 8101117 - Filtration										
Blank (8101117-BLK1)				Prepared: 12-Oct-18 Analyzed: 15-Oct-18						
TDS	ND	5.00	mg/L							
LCS (8101117-BS1)				Prepared: 12-Oct-18 Analyzed: 15-Oct-18						
TDS	518		mg/L	527		98.3	80-120			
Duplicate (8101117-DUP1)		Source: H802850-03		Prepared: 12-Oct-18 Analyzed: 15-Oct-18						
TDS	397000	5.00	mg/L		401000			1.16	20	
Batch 8101118 - General Prep - Wet Chem										
Blank (8101118-BLK1)				Prepared: 11-Oct-18 Analyzed: 12-Oct-18						
Chloride	ND	4.00	mg/L							

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8101118 - General Prep - Wet Chem										
LCS (8101118-BS1)				Prepared: 11-Oct-18 Analyzed: 12-Oct-18						
Chloride	104	4.00	mg/L	100		104	80-120			
LCS Dup (8101118-BSD1)				Prepared: 11-Oct-18 Analyzed: 12-Oct-18						
Chloride	104	4.00	mg/L	100		104	80-120	0.00	20	
Batch 8101210 - General Prep - Wet Chem										
LCS (8101210-BS1)				Prepared & Analyzed: 12-Oct-18						
pH	7.08		pH Units	7.00		101	90-110			
Conductivity	504		uS/cm	500		101	80-120			
Duplicate (8101210-DUP1)		**Source: H802918-01**		Prepared: 12-Oct-18 Analyzed: 15-Oct-18						
Conductivity	1270	1.00	uS/cm		1270			0.00	20	
pH	7.71	0.100	pH Units		7.66			0.651	20	
Resistivity	7.87		Ohms/m		7.87			0.00	20	
Batch 8101506 - General Prep - Wet Chem										
Blank (8101506-BLK1)				Prepared & Analyzed: 15-Oct-18						
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	15.0	5.00	mg/L							
Alkalinity, Total	12.0	4.00	mg/L							
LCS (8101506-BS1)				Prepared & Analyzed: 15-Oct-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120			
Alkalinity, Total	260	10.0	mg/L	250		104	80-120			

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8101506 - General Prep - Wet Chem										
LCS Dup (8101506-BSD1)				Prepared & Analyzed: 15-Oct-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120	0.00	20	
Alkalinity, Total	260	10.0	mg/L	250		104	80-120	0.00	20	
Batch 8101512 - General Prep - Wet Chem										
Duplicate (8101512-DUP1)		**Source: H802918-01**		Prepared & Analyzed: 15-Oct-18						
Specific Gravity @ 60° F	0.9970	0.000	[blank]		0.9958			0.126	20	
Batch 8101513 - General Prep - Wet Chem										
Blank (8101513-BLK1)				Prepared & Analyzed: 15-Oct-18						
Sulfide, total	ND	0.0100	mg/L							
Batch 8101601 - General Prep - Wet Chem										
Blank (8101601-BLK1)				Prepared & Analyzed: 16-Oct-18						
Sulfate	ND	10.0	mg/L							
LCS (8101601-BS1)				Prepared & Analyzed: 16-Oct-18						
Sulfate	22.3	10.0	mg/L	20.0		111	80-120			
LCS Dup (8101601-BSD1)				Prepared & Analyzed: 16-Oct-18						
Sulfate	23.2	10.0	mg/L	20.0		116	80-120	3.83	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: COBRA Project Number: 32.122226 / - 103.298003 Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 18-Oct-18 10:57

Total Recoverable Metals by ICP (E200.7) - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B810148 - Total Rec. 200.7/200.8/200.2										
Blank (B810148-BLK1)				Prepared: 16-Oct-18 Analyzed: 17-Oct-18						
Sodium	ND	1.00	mg/L							
Calcium	ND	0.100	mg/L							
Iron	ND	0.050	mg/L							
Magnesium	ND	0.100	mg/L							
Barium	ND	0.050	mg/L							
Potassium	ND	1.00	mg/L							
LCS (B810148-BS1)				Prepared: 16-Oct-18 Analyzed: 17-Oct-18						
Potassium	8.35	1.00	mg/L	8.00		104	85-115			
Iron	4.08	0.050	mg/L	4.00		102	85-115			
Magnesium	20.5	0.100	mg/L	20.0		102	85-115			
Calcium	4.21	0.100	mg/L	4.00		105	85-115			
Barium	2.01	0.050	mg/L	2.00		101	85-115			
Sodium	3.31	1.00	mg/L	3.24		102	85-115			
LCS Dup (B810148-BSD1)				Prepared: 16-Oct-18 Analyzed: 17-Oct-18						
Barium	2.02	0.050	mg/L	2.00		101	85-115	0.685	20	
Sodium	3.29	1.00	mg/L	3.24		101	85-115	0.794	20	
Iron	4.03	0.050	mg/L	4.00		101	85-115	1.08	20	
Potassium	8.28	1.00	mg/L	8.00		104	85-115	0.800	20	
Magnesium	20.6	0.100	mg/L	20.0		103	85-115	0.694	20	
Calcium	4.21	0.100	mg/L	4.00		105	85-115	0.0872	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: NGL	**BILL TO**
Project Manager:	P.O. #:
Address:	Company:
City: State: Zip:	Attn:
Phone #: Fax #:	Address:
Project #: Project Owner:	City:
Project Name: COBRA	State: Zip:
Project Location: 32.122226 / -103.298003	Phone #:
Sampler Name: R. Hernandez	Fax #:

ANALYSIS REQUEST: Scale, T. Sulfide

Lab I.D. (FOR LAB USE ONLY) H802919	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	Scale	T. Sulfide
1	CP-00465-POD 1												10-11	11:51	✓	✓
2	CP-00179-POD 1												10-11	12:35	✓	✓

Relinquished By: R Hernandez	Date: 10-11-18 Time: 3:50	Received By: Tamara Oldaker	Phone Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other: 5.6 #97	Sample Condition Cool Intact ☑ Yes ☐ No ☑ Yes ☐ No	CHECKED BY: (Initials) TO	REMARKS: Rush!

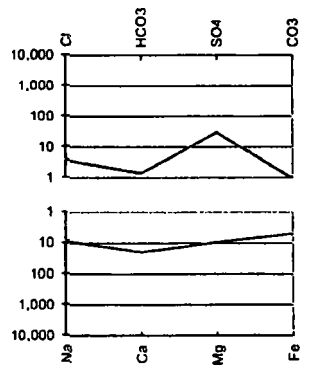
† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL LABORATORIES
SCALE INDEX WATER ANALYSIS REPORT

Company	: LONQUIST FIELD SERVICES, LLC	Date Sampled	: 10/11/18
Lease Name	: COBRA	Company Rep.	: CHRIS WEYAND
Well Number	: CP-00465-POD 1 (H802919-01)		
Location	: 32.122226 / -103.298003		

ANALYSIS						
1. pH	6.56					
2. Specific Gravity @ 60/60 F.	0.9997					
3. CaCO3 Saturation Index @ 80 F.	+0.080	'Calcium Carbonate Scale Possible'				
@ 140 F.	+0.780	'Calcium Carbonate Scale Possible'				
Dissolved Gasses						
4. Hydrogen Sulfide	0.116	PPM				
5. Carbon Dioxide	ND	PPM				
6. Dissolved Oxygen	ND	PPM				
Cations		/	Eq. Wt.	=	MEQ/L	
7. Calcium (Ca++)	383.00	/	20.1	=	19.05	
8. Magnesium (Mg++)	114.00	/	12.2	=	9.34	
9. Sodium (Na+)	222	/	23.0	=	8.54	
10. Barium (Ba++)	0.055	/	68.7	=	0.00	
Anions						
11. Hydroxyl (OH-)	0	/	17.0	=	0.00	
12. Carbonate (CO3=)	0	/	30.0	=	0.00	
13. Bicarbonate (HCO3-)	88	/	61.1	=	1.44	
14. Sulfate (SO4=)	1,540	/	48.8	=	31.56	
15. Chloride (Cl-)	140	/	35.5	=	3.94	
Other						
16. Total Iron (Fe)	90.100	/	18.2	=	4.95	
17. Total Dissolved Solids	2,740					
18. Total Hardness As CaCO3	1,426.0					
19. Calcium Sulfate Solubility @ 90 F.	1,650					
20. Resistivity (Measured)	3.180	Ohm/Meters	@ 77	Degrees (F)		

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	1.44	=	117
CaSO4	68.07	X	17.61	=	1,199
CaCl2	55.50	X	0.00	=	0
Mg(HCO3)2	73.17	X	0.00	=	0
MgSO4	60.19	X	9.34	=	562
MgCl2	47.62	X	0.00	=	0
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	4.60	=	327
NaCl	58.46	X	3.94	=	231

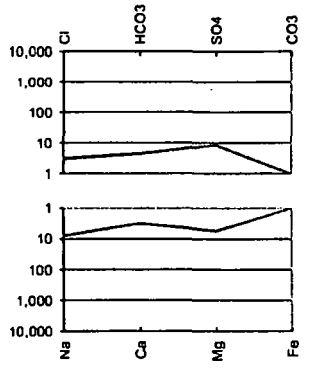
ND = Not Determined

CARDINAL LABORATORIES
SCALE INDEX WATER ANALYSIS REPORT

Company	: LONQUIST FIELD SERVICES, LLC	Date Sampled	: 10/11/18
Lease Name	: COBRA	Company Rep.	: CHRIS WEYAND
Well Number	: CP-00179-POD1 (H802919-02)		
Location	: 32.122226 / -103.298003		

	ANALYSIS					
1.	pH	8.34				
2.	Specific Gravity @ 60/60 F.	0.9978				
3.	CaCO3 Saturation Index @ 80 F.	-0.208				
	@ 140 F.	+0.492	'Calcium Carbonate Scale Possible'			
	Dissolved Gasses					
4.	Hydrogen Sulfide	0.000	PPM			
5.	Carbon Dioxide	ND	PPM			
6.	Dissolved Oxygen	ND	PPM			
	Cations		/	Eq. Wt.	=	MEQ/L
7.	Calcium (Ca++)	62.40	/	20.1	=	3.10
8.	Magnesium (Mg++)	67.50	/	12.2	=	5.53
9.	Sodium (Na+)	194	/	23.0	=	7.77
10.	Barium (Ba++)	0.000	/	68.7	=	0.00
	Anions					
11.	Hydroxyl (OH-)	0	/	17.0	=	0.00
12.	Carbonate (CO3=)	0	/	30.0	=	0.00
13.	Bicarbonate (HCO3-)	278	/	61.1	=	4.55
14.	Sulfate (SO4=)	419	/	48.8	=	8.59
15.	Chloride (Cl-)	116	/	35.5	=	3.27
	Other					
16.	Total Iron (Fe)	0.000	/	18.2	=	0.00
17.	Total Dissolved Solids	1,010				
18.	Total Hardness As CaCO3	434.0				
19.	Calcium Sulfate Solubility @ 90 F.	1,337				
20.	Resistivity (Measured)	6.330	Ohm/Meters	@ 77	Degrees (F)	

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	3.10	=	252
CaSO4	68.07	X	0.00	=	0
CaCl2	55.50	X	0.00	=	0
Mg(HCO3)2	73.17	X	1.45	=	106
MgSO4	60.19	X	4.09	=	246
MgCl2	47.62	X	0.00	=	0
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	4.50	=	320
NaCl	58.46	X	3.27	=	191

ND = Not Determined