



*EOG Resources, Inc.*  
5509 Champions Drive  
Midland, Texas 79706

July 8, 2019

EMNRD/OCD  
Attn: Jim Griswold  
South St Francis Dr.  
Santa Fe, NM 87505

Re: Form C-147 with accompanying documentation  
Gem Reuse Water Facility and Containment Pit

Dear Mr. Griswold,

Thank you for allowing EOG to continue to promote water reuse in the State of New Mexico for our operations. Please find attached C-147 form with accompanying documentation for the Gem Reuse Water Facility and Containment Pit.

Please do not hesitate to contact me with any questions, comments, or concerns.

Sincerely,

A handwritten signature in red ink that reads "Reese Martin".

Reese Martin  
Water Resources Manager  
EOG Resources, Inc.

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Form C-147  
Revised April 3, 2017

## Recycling Facility and/or Recycling Containment

Type of Facility:  Recycling Facility  Recycling Containment\*  
Type of action:  Permit  Registration  
 Modification  Extension  
 Closure  Other (explain) \_\_\_\_\_

\* At the time C-147 is submitted to the division for a Recycling Containment, a copy shall be provided to the surface owner.

Be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.  
Operator: EOG Resources, Inc. (For multiple operators attach page with information) OGRID #: OGRID #7377  
Address: 5509 Champions Dr. Midland, TX 79706  
Facility or well name (include API# if associated with a well): Gem Reuse Water Recycling Facility and Containment Pit  
OCD Permit Number: \_\_\_\_\_ (For new facilities the permit number will be assigned by the district office)  
U/L or Qtr/Qtr SW/NE Section 36 Township 25S Range 32E County: Lea  
Surface Owner:  Federal  State  Private  Tribal Trust or Indian Allotment

2.  
 **Recycling Facility:**  
Location of recycling facility (if applicable): Latitude 32.0888306° 32°05'19.790093" Longitude -103.6245939° -103°37'28.538131 NAD83  
Proposed Use:  Drilling\*  Completion\*  Production\*  Plugging\*  
*\*The re-use of produced water may NOT be used until fresh water zones are cased and cemented*  
 Other, requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.  
 Fluid Storage  
 Above ground tanks  Recycling containment  Activity permitted under 19.15.17 NMAC explain type \_\_\_\_\_  
 Activity permitted under 19.15.36 NMAC explain type: \_\_\_\_\_  Other explain \_\_\_\_\_  
 For multiple or additional recycling containments, attach design and location information of each containment  
 **Closure Report (required within 60 days of closure completion):**  Recycling Facility Closure Completion Date: \_\_\_\_\_

3.  
 **Recycling Containment:**  
 Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)  
Center of Recycling Containment (if applicable): Latitude 32.0902396° 32°05'24.862509" Longitude -103.6246033° -103°37'28.571777" NAD83  
 For multiple or additional recycling containments, attach design and location information of each containment  
 Lined  Liner type: Thickness 60 mil  LLDPE  HDPE  PVC  Other \_\_\_\_\_  
 String-Reinforced  
Liner Seams:  Welded  Factory  Other \_\_\_\_\_ Volume: 1MM bbl Dimensions: L 600 x W 600 x D 16 (inside)  
 Recycling Containment Closure Completion Date: \_\_\_\_\_

4.

**Bonding:**

Covered under bonding pursuant to 19.15.8 NMAC per 19.15.34.15(A)(2) NMAC (These containments are limited to only the wells owned or operated by the owners of the containment.)

Bonding in accordance with 19.15.34.15(A)(1). Amount of bond \$ \_\_\_\_\_ (work on these facilities cannot commence until bonding amounts are approved)

Attach closure cost estimate and documentation on how the closure cost was calculated.

5.

**Fencing:**

Four-foot height, four strands of barbed wire evenly spaced between one and four feet

Alternate. Please specify: Please see attached Variance Request Detail

6.

**Signs:**

12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers

Signed in compliance with 19.15.16.8 NMAC

7.

**Variiances:**

Justifications and/or demonstrations that the proposed variance will afford reasonable protection against contamination of fresh water, human health, and the environment.

*Check the below box only if a variance is requested:*

Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. If a Variance is requested, include the variance information on a separate page and attach it to the C-147 as part of the application.

**If a Variance is requested, it must be approved prior to implementation.**

8.

**Siting Criteria for Recycling Containment**

*Instructions: The applicant must provide attachments that demonstrate compliance for each siting criteria below as part of the application. Potential examples of the siting attachment source material are provided below under each criteria.*

<b>General siting</b>	
<b>Ground water is less than 50 feet below the bottom of the Recycling Containment.</b> NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. - Written confirmation or verification from the municipality; written approval obtained from the municipality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain. FEMA map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; aerial photo; satellite image	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

9.

**Recycling Facility and/or Containment Checklist:**

*Instructions: Each of the following items must be attached to the application. Indicate, by a check mark in the box, that the documents are attached.*

- Design Plan - based upon the appropriate requirements.
- Operating and Maintenance Plan - based upon the appropriate requirements.
- Closure Plan - based upon the appropriate requirements.
- Site Specific Groundwater Data -
- Siting Criteria Compliance Demonstrations -
- Certify that notice of the C-147 (only) has been sent to the surface owner(s)

10.

**Operator Application Certification:**

I hereby certify that the information and attachments submitted with this application are true, accurate and complete to the best of my knowledge and belief.

Name (Print): Reese Martin Title: Water Resource Manager

Signature:  Date: 7/8/2019

e-mail address: Reese\_Martin@eogresources.com Telephone: 432-686-3718

11.

OCD Representative Signature: \_\_\_\_\_ Approval Date: \_\_\_\_\_

Title: \_\_\_\_\_ OCD Permit Number: \_\_\_\_\_

OCD Conditions \_\_\_\_\_

Additional OCD Conditions on Attachment \_\_\_\_\_



## Variance Request for Bird Deterrent

Re: Gem Reuse Water Recycling Facility and Containment Pit

EOG Resources, Inc. would like to request the OCD's approval for a variance regarding bird deterrents at the location described above. EOG proposes to utilize the Bird-X Mega Blaster Pro, creating intermittent distress calls to create a "danger zone" that frightens native and or migrating birds and wildlife from the water recycling facility and containment pit area. Two units would be installed, each containing 2 built-in high output amplifiers and houses 20 speakers, capable of producing up to 125 decibels and a frequency range from 2,000 – 10,000 Hz.

Please note that EOG Resources, Inc. is currently utilizing this same bird deterrent, which was approved on OCD Permit No. 12

Please see details below.

### **Mega Blaster Pro – Specs:**

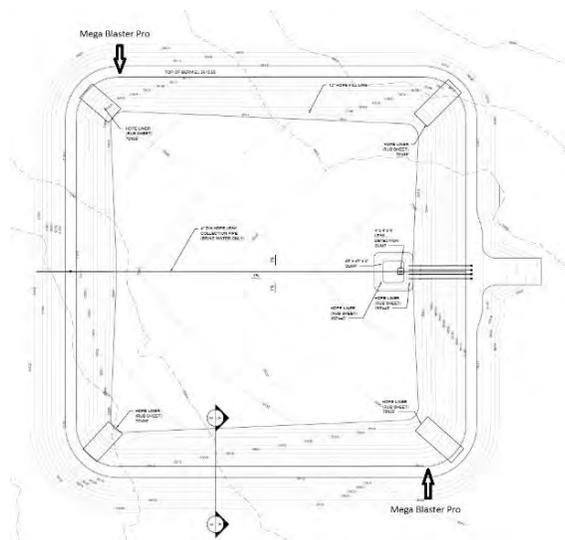
- Coverage: Up to 30 acres from single unit
- Box dimensions: Box 1: 23" x 18" x 16" (23 lbs., unit & speaker), Box 2: 32" x 24" x 5" (17 lbs., solar panel)
- Power Input: 12vDC (3 amps) via solar panel and battery
- Sound Pressure: up to 125 decibels
- Frequency: 2,000–10,000 Hz
- Library of predator calls



- Full customizable to the species of bird in our area of operation
- Compliance: UL & CE listed
- EPA Est. 075310-OR-001
- Included: Generating unit with two built-in high-output amplifiers, 20-speaker tower with audio cables, 40 watt solar panel, battery clips, & all mounting hardware
- The unit is typically mounted with a tripod pole setup. The tripod would be a typical sturdy tripod that would be used to support a large PA speaker. The pole that would fit into the top of the tripod that the speaker tower, control box and solar panel would mount to should be  $\frac{3}{4}$ " diameter and be 6-12 feet tall. The taller the pole the greater the distance the sound will travel.
- The effective range of the Mega Blaster Pro is 30 acres, in a circular coverage pattern around the 20-speaker tower with a radius of about 666 feet. The 20-speaker tower features 5 speakers pointing in each direction to create the even dispersal



This is the typical configuration EOG Resources is currently utilizing at the Southern Red Hills Water Recycling Facility and Containment Pit.





## Variance Request for Fencing

Re: Gem Reuse Water Recycling Facility and Containment Pit

EOG Resources, Inc. would like to request the OCD's approval for a variance regarding fencing at the location described above. EOG proposes to utilize a 6 foot galvanized chain link fence with 3 strands of barb wire on the top of the chain link fencing. The 3 strands of barb wire will be mounted on a galvanized barb bracket with a 45 degree angle pointing towards the outside of the location. Each post hole will be drilled via auger to ensure a consistent and accurate depth and will be set in concrete. Six 18" x 18" swinging gates will be installed at ground level for temporary waterlines to pass through. The gates will remain closed as depicted in the pictures below to ensure no wildlife can access the containment site when no waterlines are present.

Please note that EOG Resources, Inc. is currently utilizing this same fence design, which was approved on OCD Permit No. 12

Please see details below.



This is the typical configuration EOG Resources is currently utilizing at the Southern Red Hills Water Recycling Facility and Containment Pit.





# Gem Reuse Water Recycling Facility and Containment Pit

NMOCD Submittal – C147 Registration Application

June 8, 2019

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## Introduction

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EOG Resources respectfully requests registration of the herein described Reuse Water Recycling Facility and Containment Pit located in Lea County, New Mexico. The enclosed/attached information will demonstrate compliance with all rules as outlined in 19.15.34 NMAC.

## C-147 Detail

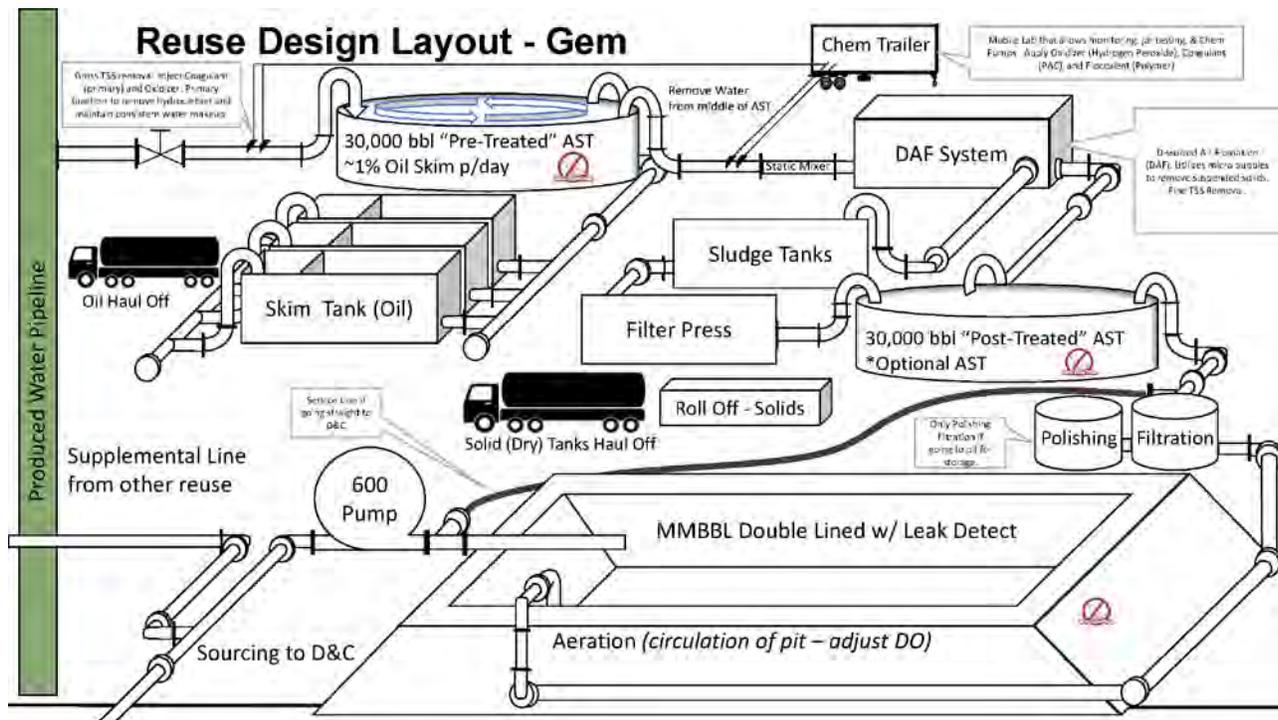
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### **Operator and Facility / Location Detail**

The proposed reuse water containment facility & containment pit, referred to as the Gem Reuse Water Recycling Facility and Containment Pit, will be owned and operated by EOG Resources, Inc. (EOG) and located in Township 25 South, Range 32 East, and Section 36 in southwestern Lea County.

### **Recycling Facility Detail**

The proposed containment pit will be located adjacent to the Gem Water Recycling Facility and will hold treated water for use in EOG hydraulic fracturing operations. As depicted in the attached schematic, the adjacent recycling facility will utilize advanced water treatment technologies to produce a clean brine effluent prior to storage and subsequent reuse. An oxidation and solids removal/filtering system will treat the incoming influent stream to internal standards sufficient for hydraulic fracturing reuse applications.



### Recycling Containment Detail

EOG Resources is proposing to construct a multi-liner containment pit utilizing leak detection systems to ensure an intact leak free barrier system. As depicted in the attached design plan and schematics, *Gem Containment Pond*, the proposed pit will incorporate standards that meet or exceed the required standards per 19.15.34.12 NMAC. The proposed recycle containment will be approximately 600 x 600 inside floor dimensions with 4:1 inside and outside berm grades. Approximate wall height will average 11ft from outside ground level to ensure no surface water run on will occur. The top of levee shall be approximately 20ft wide 2% outside sloping grade to ensure no surface water run on will occur. The containment pit floor and wall preparation will include laser finished grade free of rocks, debris and sharp edges, compacted to a density to ensure an unyielding base. At onset of pit construction, all vegetative material and top soil will be removed and stockpiled at the outside toe of the levee slopes. The interior liner system of the containment pit will

consist of a 10 ounce geotextile felt base layer to protect the secondary geomembrane liner from any protruding floor irregularities. The secondary geomembrane liner will be composed of 40 mil HDPE. Between the secondary and primary liners will consist of 200 mil geonet sloping to the leak detection trough. The primary liner consist of 60 mil HDPE liner. All liners will meet or exceed EPA SW-846 method 9090A. All seams will be oriented vertically with 4-6 inch liner overlap and all seam testing shall exceed all guidelines. As depicted in the attached design plan, *Gem Containment Pond*, the proposed containment pit will include a center aligned leak detection trough and collection sump completed with perforated pipe and pump casing allowing for installation of a leak detection pump system. Both inlet and discharge manifold systems, depicted in *Gem Containment Pond*, will be installed to prevent any liner damage from water entrance velocity or hose installation. Two audible bird deterrents will be utilized to deter any native birds and wildlife from the containment pit area.

### **Bonding**

EOG Resources will source and distribute reuse water for the Gem Reuse Water Recycling Facility and Containment Pit from wells solely operated by EOG. Therefore, attached are the details of Bond Number SUR0013939 – Megabond #OGB0959 – State of New Mexico Land Office Oil and Gas Minerals Division

## **Fencing**

Please see Variance detail.

## **Signage**

As shown in the attached example sign, EOG shall place the appropriate signage along the water recycling facility and containment pit perimeter that meets all guidelines established in 19.15.34.12 C NMAC.

*See List of Attachments*

## **Variances**

EOG Resources is seeking two variances as indicated in Section 7 of the C-147 registration form, to install two audible Mega Blaster Pro bird deterrents capable of covering up to 30 acres each. The second request is to enclose the perimeter with a 6 foot galvanized chain link fence with 3 strand 45 degree barbed wire arm toppers.

## **Siting Criteria for Recycling Containment**

Enclosed within this submittal are comprehensive third party reports detailing conformity to siting criteria described in Section 8 of the C-147 registration form; a detailed list and description of these attachments can be found in the subsequent section: *List of Attachments*.

## **Recycling Facility and Containment Checklist**

As indicated in Section 9 on the attached C-147 form, all the required attachments have been included on the submittal and certification of C-147 delivery to the landowner is acknowledged.

## List of Attachments

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### Attachments and Supporting Documents

- Water Containment Design and Engineered Drawing
- Water Containment Liner / Leak Detection Detail
- Bond Detail
- Signage Sample

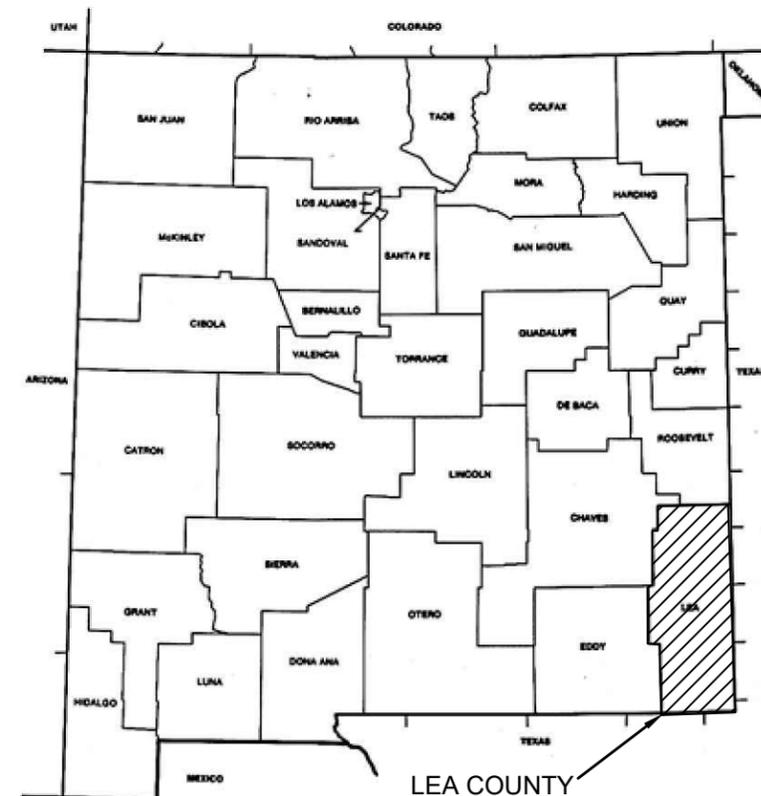


# EOG RESOURCES GEM CONTAINMENT POND CONSTRUCTION PLAN LEA COUNTY, NEW MEXICO

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SHEET 5	CUT/FILL 50' GRID
SHEET 6	SITE CROSS SECTION PROFILES
SHEET 7	DETAILS 1 OF 3
SHEET 8	DETAILS 2 OF 3
SHEET 9	DETAILS 3 OF 3

**GENERAL NOTES**

1. COORDINATE INFORMATION ARE BASED ON STATE PLANES COORDINATE, NEW MEXICO EAST ZONE (4726), NAD 83. THE CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES PRIOR TO PROCEEDING WITH CONSTRUCTION.
2. THE CONTRACTOR SHALL IDENTIFY AND LOCATE UTILITY LINES, MONITORING WELLS, SURVEY MONUMENTS, AND OTHER NEARBY STRUCTURES PRIOR TO PERFORMING WORK. UTILITIES, MONITORING WELLS, SURVEY MONUMENTS AND OTHER NEARBY STRUCTURES SHALL BE PROTECTED FROM DAMAGE DURING THIS WORK. ANY DAMAGE TO UTILITY LINES, MONITORING WELLS, SURVEY MONUMENTS, AND OTHER NEARBY STRUCTURES DURING THE WORK SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. COSTS ASSOCIATED WITH THESE REPAIRS SHALL INCLUDE THE ACTUAL REPAIR COSTS AND ANY ENGINEER OR SURVEY COSTS NECESSARY TO COMPLETE THE REPAIR.

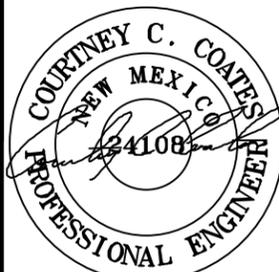


1400 EVERMAN PARKWAY, STE. 146  
FORT WORTH, TEXAS 76140  
TELEPHONE: (817) 744-7512  
FAX: (817) 744-7548  
WWW.TOPOGRAPHIC.COM

COVER SHEET

GEM CONTAINMENT POND

EOG RESOURCES



06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	N/A
SHEET:	1 OF 9
REVISION:	XXX
	XXX
	XXX

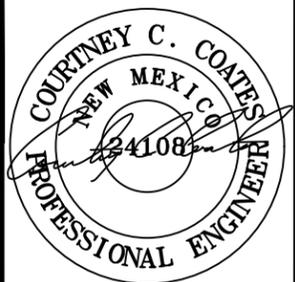


1400 EVERMAN PARKWAY, STE. 146  
 FORT WORTH, TEXAS 76140  
 TELEPHONE: (817) 744-7512  
 FAX: (817) 744-7548  
 WWW.TOPOGRAPHIC.COM

VICINITY MAP

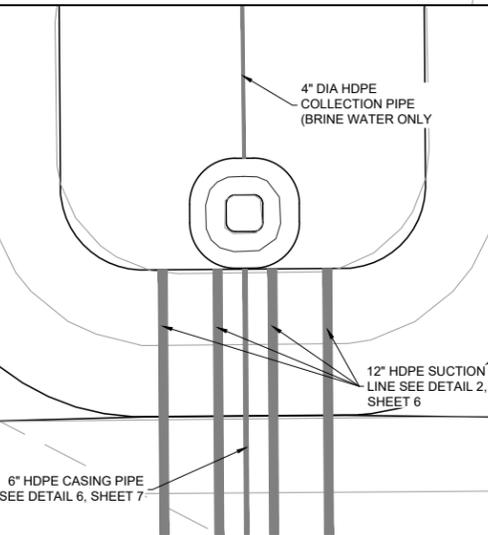
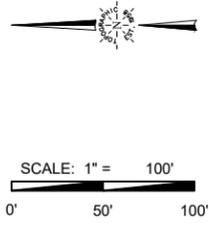
GEM CONTAINMENT POND

EOG RESOURCES



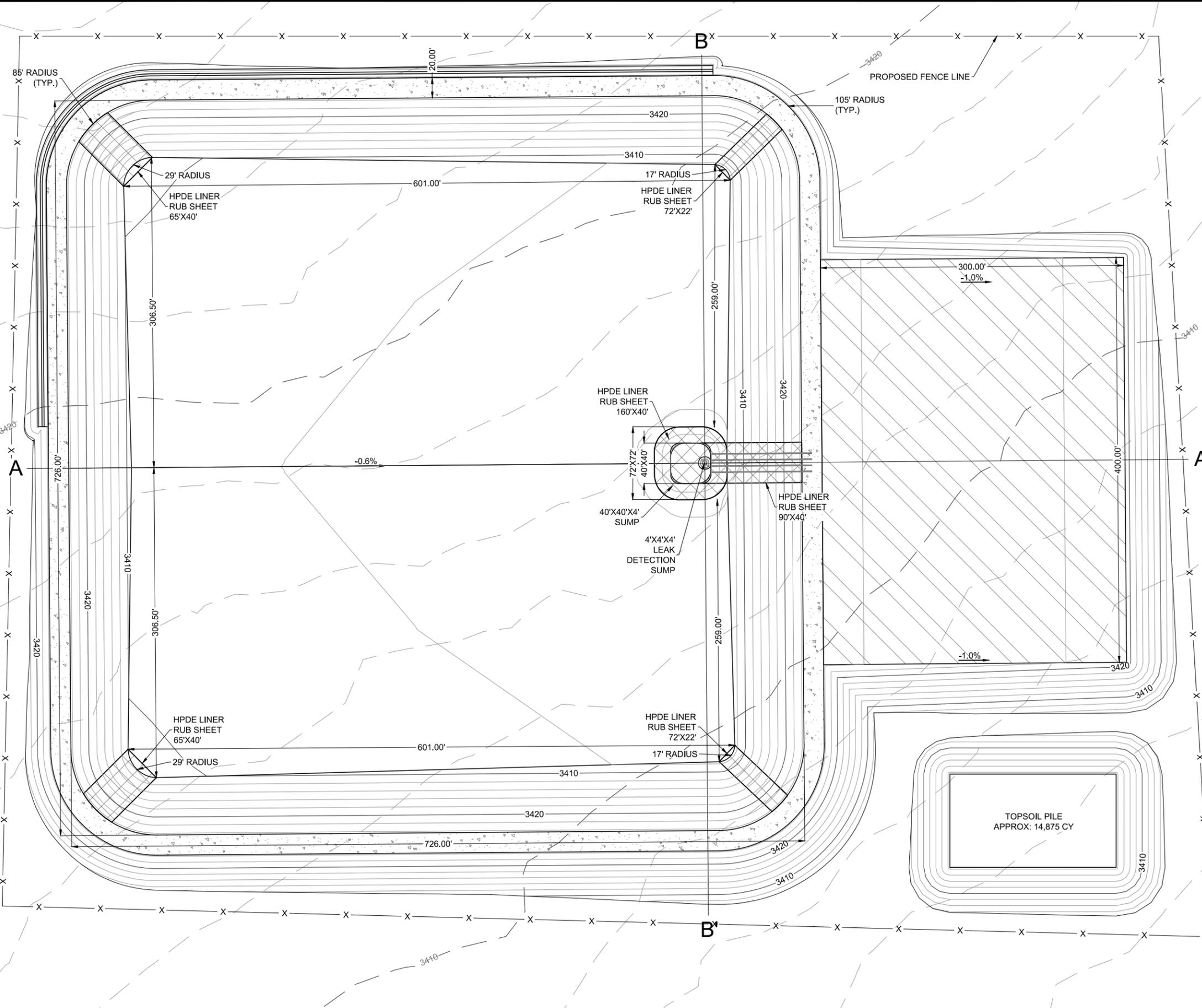
06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	N/A
SHEET:	2 OF 9
REVISION:	
XXX	XXXXXX
XXX	XXXXXX
XXX	XXXXXX



PIPE DETAIL  
1" = 20'

- CONSTRUCTION AREA = 23.32 ACRES
- EXISTING 2' CONTOUR
  - EXISTING 10' CONTOUR
  - PROPOSED 2' CONTOUR
  - PROPOSED 10' CONTOUR
  - FENCE LINE
  - PROPOSED BERM DRIVE
  - PROPOSED EQUIPMENT PAD
  - PROPOSED EQUIPMENT PAD



**TOPOGRAPHIC**  
LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, STE. 146  
FORT WORTH, TEXAS 76140  
TELEPHONE: (817) 744-7512  
FAX: (817) 744-7548  
WWW.TOPOGRAPHIC.COM

SITE EXHIBIT

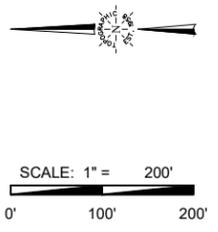
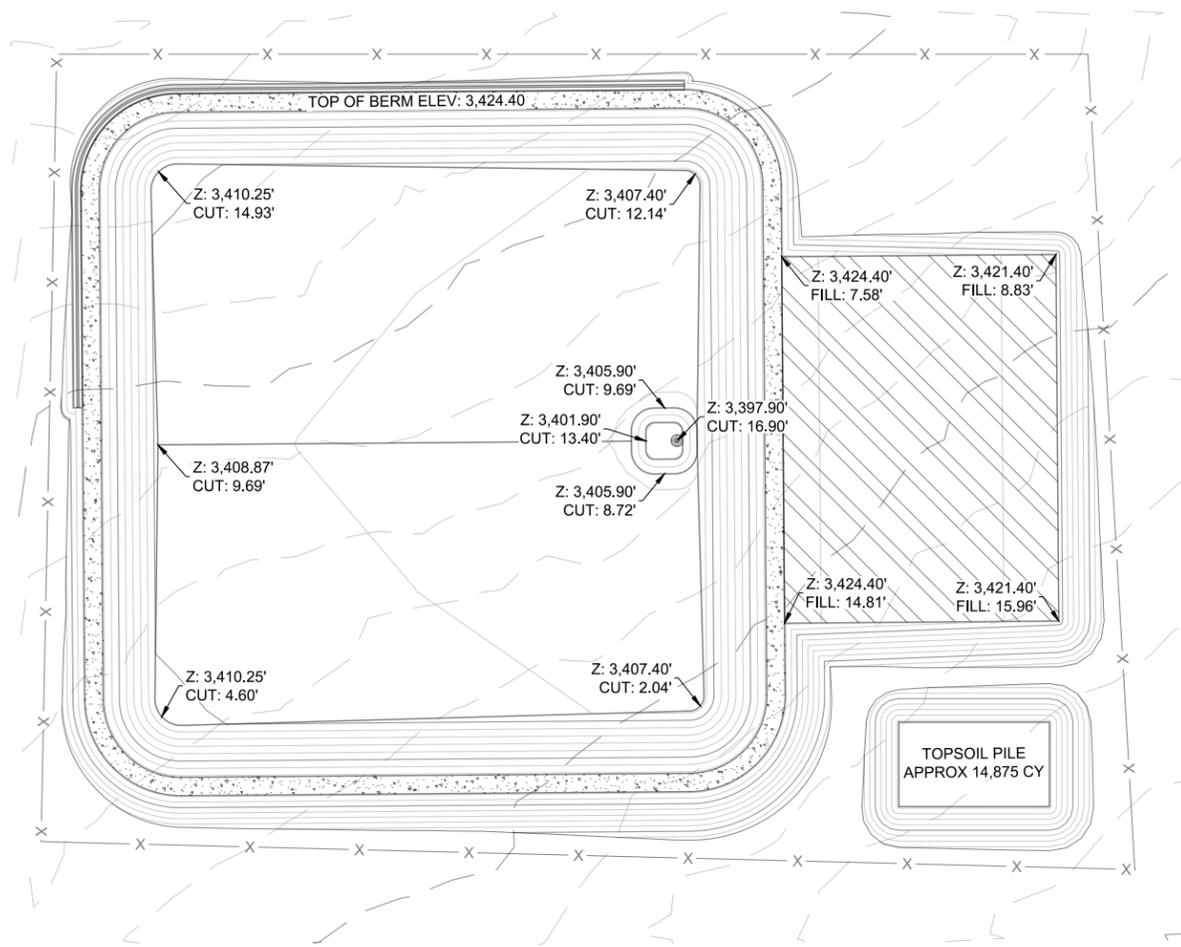
GEM CONTAINMENT POND

EOG RESOURCES

COURTNEY C. COATES  
NEW MEXICO  
PROFESSIONAL ENGINEER  
224108

06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	AS SHOWN
SHEET:	3 OF 9
REVISION:	
	XXX
	XXX
	XXX



- LEGEND:**
- EXISTING 2' CONTOUR
  - EXISTING 10' CONTOUR
  - PROPOSED 2' CONTOUR
  - PROPOSED 10' CONTOUR

GEM CONTAINMENT POND STAGE STORAGE					
ELEV	DEPTH (FT)	AREA (ACRES)	VOLUME (BBLS)	VOLUME (ACRE FT)	VOLUME (CY)
3,401.90	0.00	0.02	50.92	0.01	10.59
3,402.40	0.50	0.04	155.81	0.02	32.40
3,402.90	1.00	0.05	298.71	0.04	62.12
3,403.40	1.50	0.06	481.84	0.06	100.20
3,403.90	2.00	0.07	705.11	0.09	146.63
3,404.40	2.50	0.08	970.82	0.13	201.88
3,404.90	3.00	0.10	1,283.41	0.17	266.88
3,405.40	3.50	0.12	1,655.57	0.21	344.27
3,405.90	4.00	0.15	2,131.24	0.27	443.19
3,406.40	4.50	0.62	3,407.46	0.44	708.57
3,406.90	5.00	1.48	7,322.25	0.94	1,522.65
3,407.40	5.50	2.64	15,172.62	1.96	3,155.11
3,407.90	6.00	3.94	27,898.20	3.60	5,801.37
3,408.40	6.50	5.23	45,647.10	5.88	9,492.21
3,408.90	7.00	6.50	68,365.81	8.81	14,216.52
3,409.40	7.50	7.53	95,657.70	12.33	19,891.80
3,409.90	8.00	8.23	126,271.90	16.28	26,257.96
3,410.40	8.50	8.59	159,006.49	20.49	33,065.04
3,410.90	9.00	8.74	192,597.08	24.82	40,050.13
3,411.40	9.50	8.86	226,690.98	29.22	47,139.88
3,411.90	10.00	8.98	261,224.67	33.67	54,321.09
3,412.40	10.50	9.09	296,199.27	38.18	61,593.98
3,412.90	11.00	9.21	331,615.50	42.74	68,958.70
3,413.40	11.50	9.32	367,473.61	47.36	76,415.32
3,413.90	12.00	9.44	403,781.62	52.04	83,965.49
3,414.40	12.50	9.56	440,531.41	56.78	91,607.52
3,414.90	13.00	9.68	477,729.69	61.58	99,342.82
3,415.40	13.50	9.80	515,379.43	66.43	107,172.00
3,415.90	14.00	9.92	553,481.76	71.34	115,095.29
3,416.40	14.50	10.04	592,043.46	76.31	123,114.11
3,416.90	15.00	10.17	631,065.44	81.34	131,228.65
3,417.40	15.50	10.29	670,551.25	86.43	139,439.63
3,417.90	16.00	10.43	710,507.57	91.58	147,748.46
3,418.40	16.50	10.56	750,941.56	96.79	156,156.62
3,418.90	17.00	10.71	791,866.00	102.07	164,666.76
3,419.40	17.50	10.86	833,287.78	107.41	173,280.33
3,419.90	18.00	11.03	875,238.86	112.81	182,003.96
3,420.40	18.50	11.23	917,773.71	118.29	190,848.99
3,420.90	19.00	11.49	961,023.09	123.87	199,842.60
3,421.40	19.50	11.73	1,005,120.76	129.55	209,012.61
3,421.90	20.00	11.88	1,049,861.48	135.32	218,316.35
3,422.40	20.50	11.91	1,094,850.89	141.12	227,671.79
3,422.90	21.00	11.93	1,139,918.28	146.93	237,043.46
3,423.40	21.50	11.94	1,185,044.08	152.74	246,427.27
3,423.90	22.00	11.95	1,230,206.51	158.57	255,818.69
3,424.40	22.50	11.95	1,275,385.93	164.39	265,213.65

**EARTHWORK QUANTITIES**

CUT VOLUME: 142,250 YD<sup>3</sup>  
 FILL VOLUME: 125,640 YD<sup>3</sup>  
 TOPSOIL (6" STOCKPILED): 14,875 YD<sup>3</sup>  
 TOTAL EXPORT: 1,735 YD<sup>3</sup>  
 TOTAL GRADING AREA: 18.44 ACRES

\*VOLUMES ASSUME A FILL FACTOR OF 1.15

**POND SUMMARY**

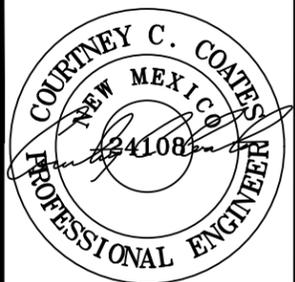
MAX VOLUME: 1,275,385.93 BBLS  
 MAX AREA: 11.95 ACRES  
 MAX ELEVATION OF POND: 3,424.40 FT  
 3' FREEBOARD ELEVATION: 3,421.40 FT  
 VOLUME AT FREEBOARD: 1,005,120.75 BBLS

Description	Unit Quantity	Unit
<b>Liner Areas</b>		
Out-Slope Area	94,275	SQ. FT.
Pond Area	545,250	SQ. FT.
Rub Sheet	16,300	SQ. FT.
<b>Piping</b>		
6" HDPE Casing Pipe	93	LN. FT.
4" HDPE Collection Pipe	636	LN. FT.
12" HDPE Suction line	410	LN. FT.
<b>Roads</b>		
Berm Drive (6" Gravel)	56,415	SQ. FT.
<b>Fence</b>		
6' Chainlink Fence	4,075	LN. FT.
<b>Mass Grading</b>		
Clearing and Grubbing	18.44	ACRE
Grading	142,250.00	CU. YD.

**TOPOGRAPHIC**  
 LOYALTY INNOVATION LEGACY

1400 EVERMAN PARKWAY, STE. 146  
 FORT WORTH, TEXAS 76140  
 TELEPHONE: (817) 744-7512  
 FAX: (817) 744-7548  
 WWW.TOPOGRAPHIC.COM

SITE CALCULATIONS  
 GEM CONTAINMENT POND  
 EOG RESOURCES



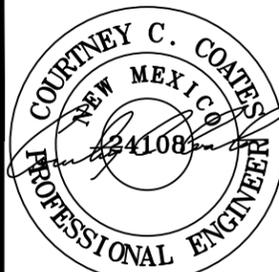
06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	1" = 200'
SHEET:	4 OF 9
REVISION:	
	XXX
	XXX
	XXX

CUT/FILL 50' GRID

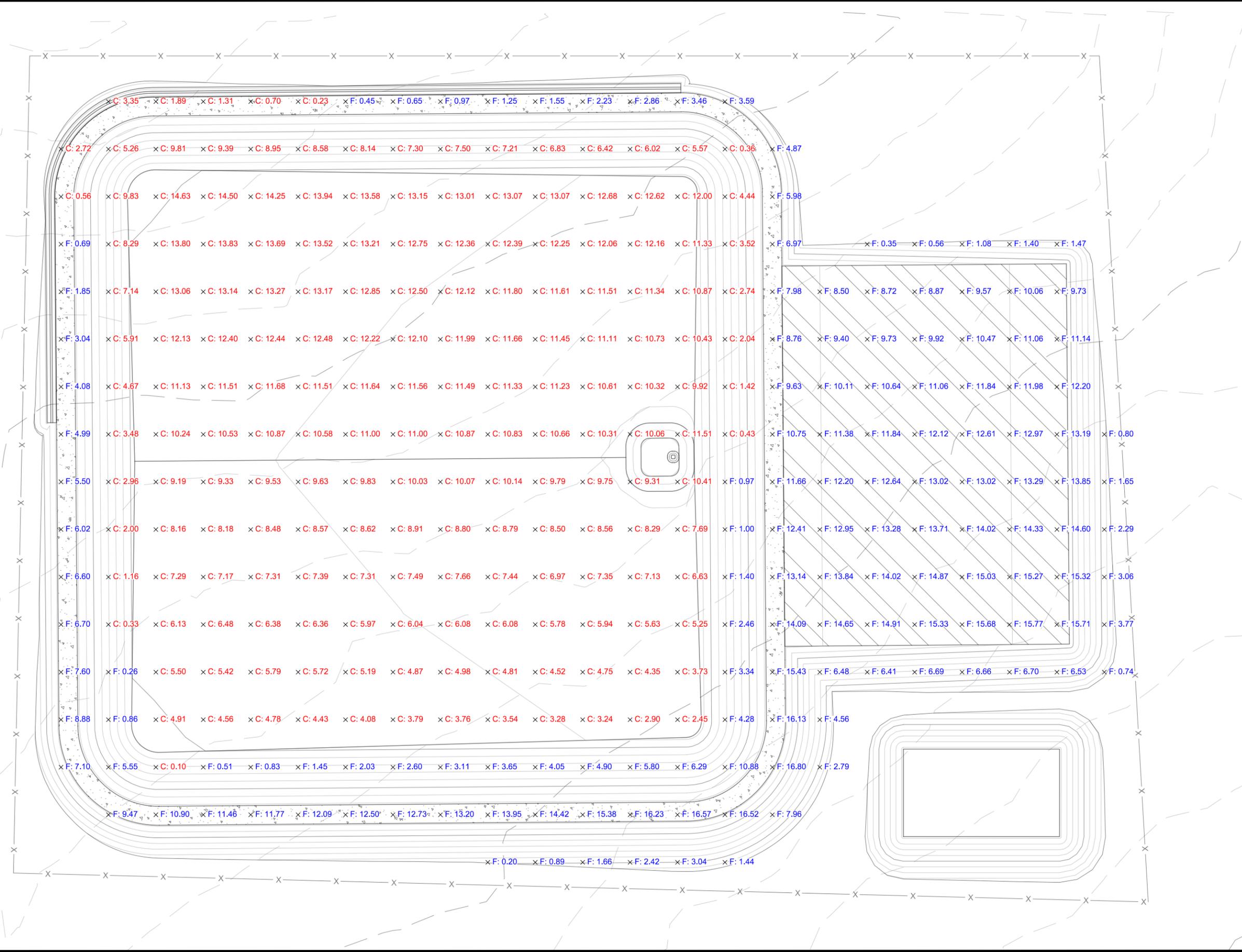
GEM CONTAINMENT POND

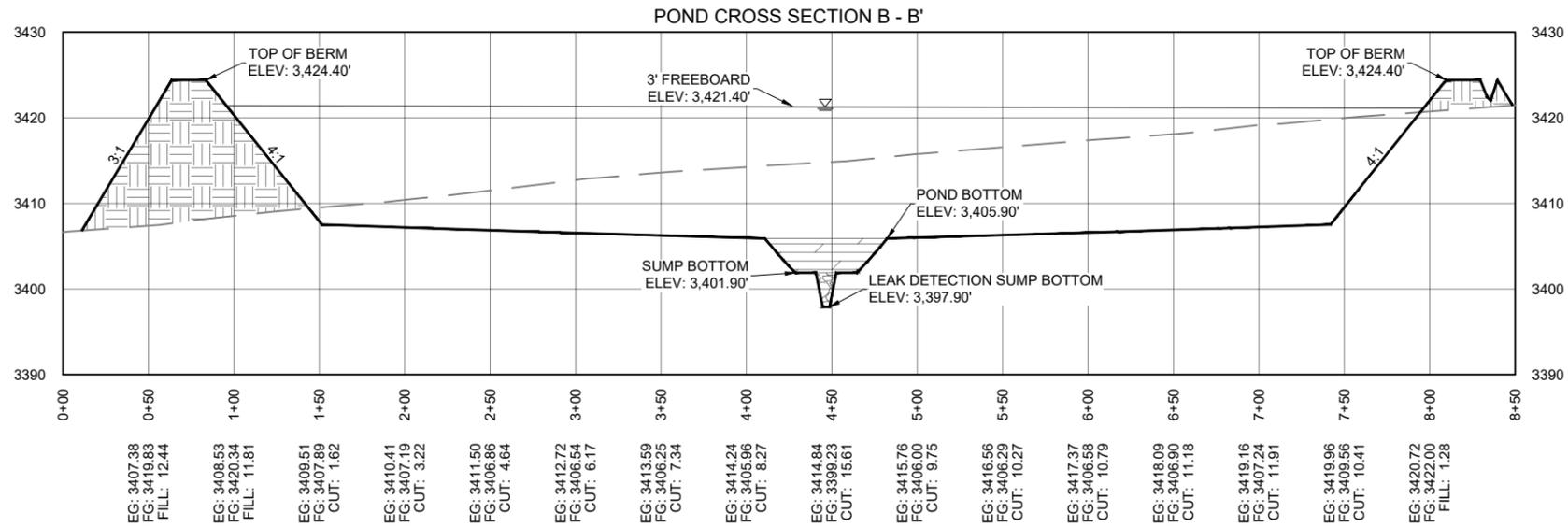
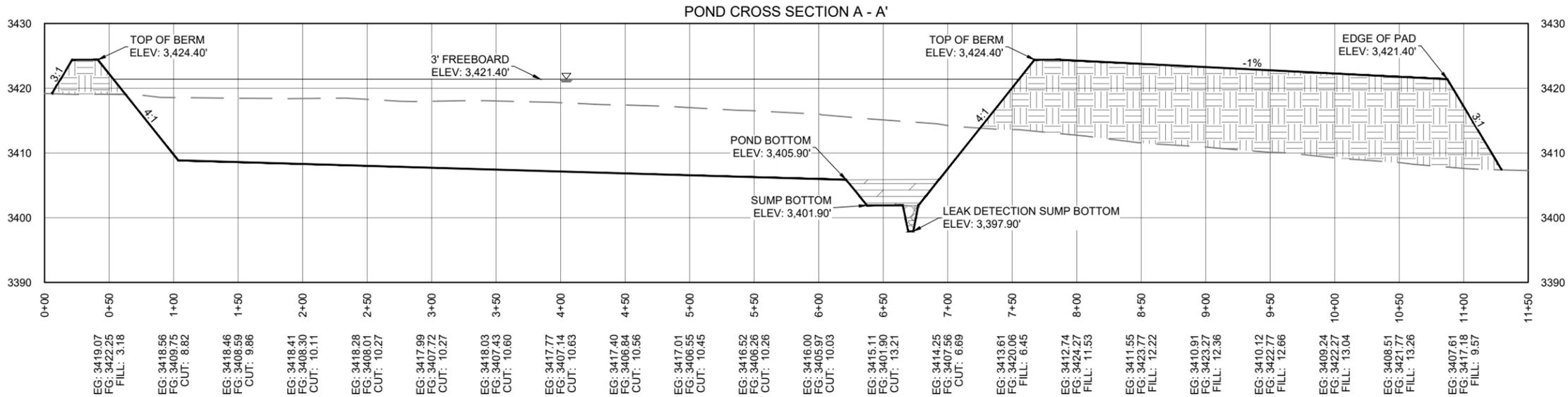
EOG RESOURCES



06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	1" = 100'
SHEET:	5 OF 9
REVISION:	
	XXX
	XXX
	XXX



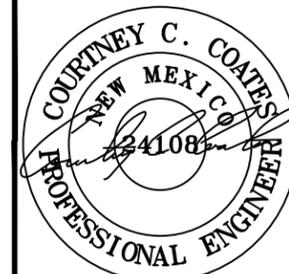


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**SITE CROSS SECTION PROFILES**

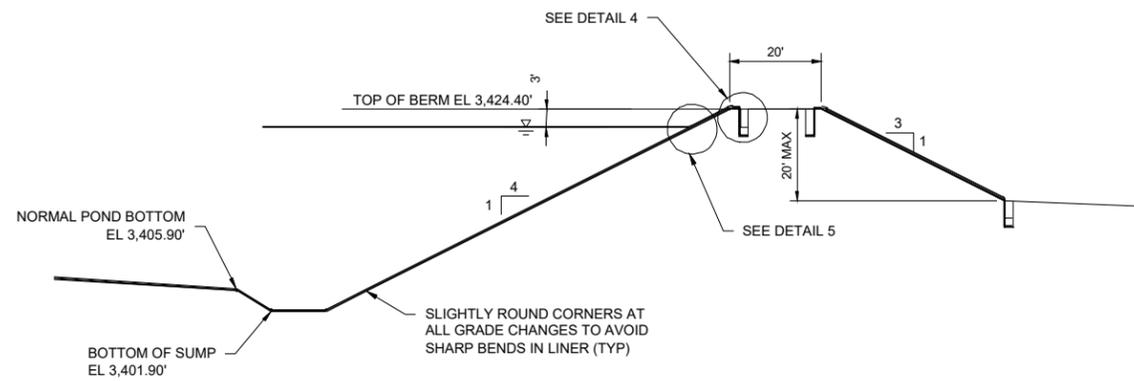
**GEM CONTAINMENT POND**

**EOG RESOURCES**

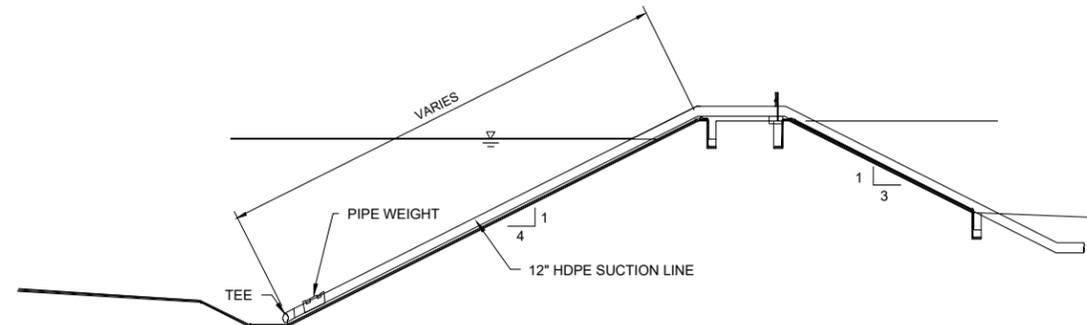


06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	N/A
SHEET:	6 OF 9
REVISION:	
	XXX
	XXX
	XXX

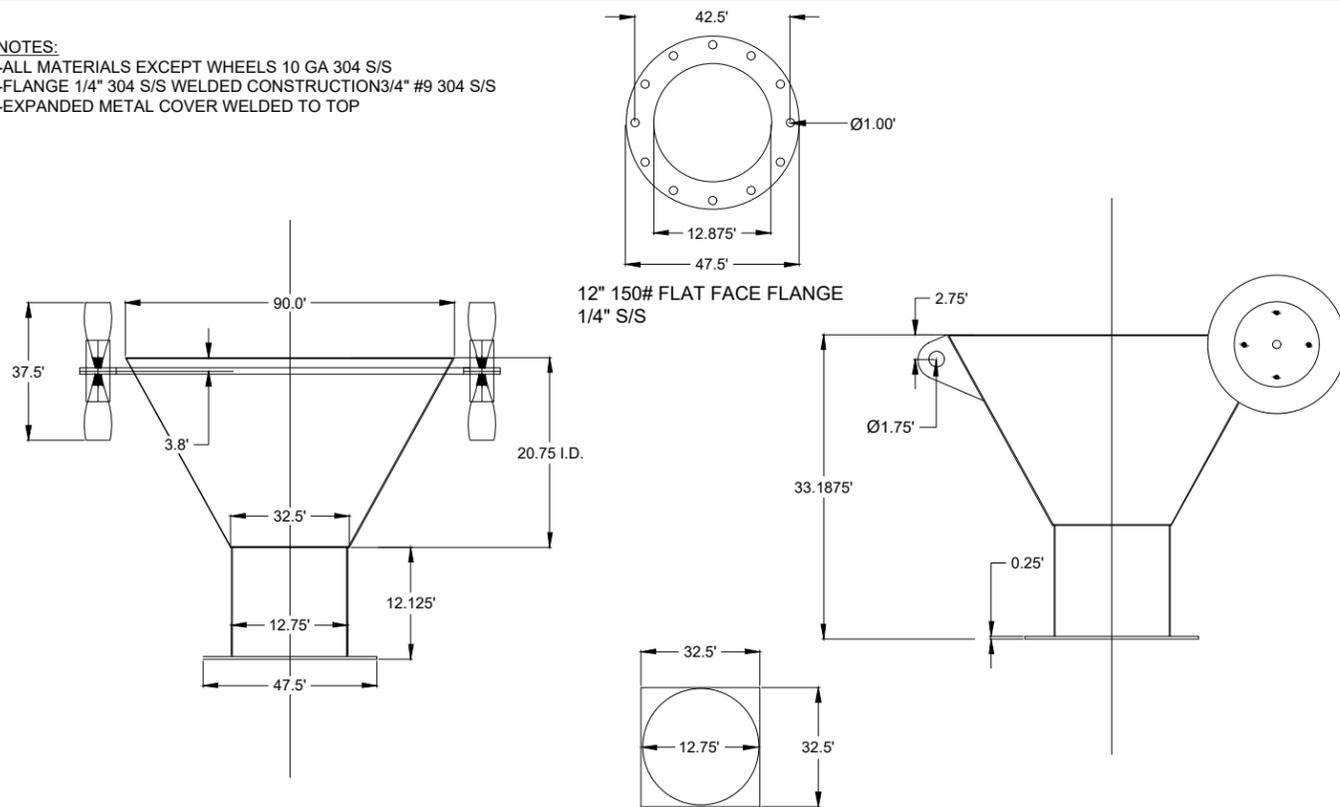


1 TYPICAL BERM SECTION  
NTS



2 SUCTION PIPE SECTION  
NTS

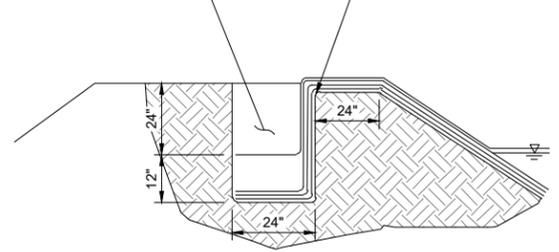
NOTES:  
-ALL MATERIALS EXCEPT WHEELS 10 GA 304 S/S  
-FLANGE 1/4" 304 S/S WELDED CONSTRUCTION 3/4" #9 304 S/S  
-EXPANDED METAL COVER WELDED TO TOP



3 SUCTION FUNNEL  
NTS

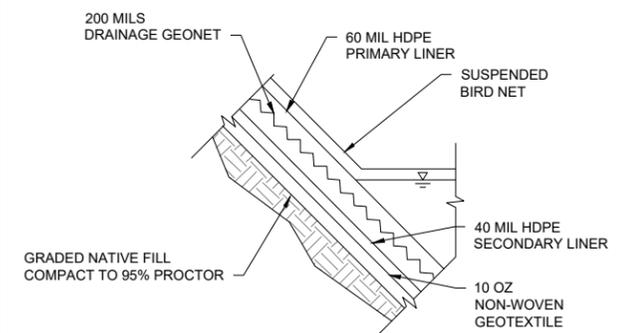
BACKFILL TRENCH WITH PREVIOUSLY EXCAVATED TRENCH MATERIAL COMPACT TO 95% PROCTOR

SLIGHTLY ROUND CORNERS AT ALL GRADE CHANGES TO AVOID SHARP BENDS IN LINER (TYP)

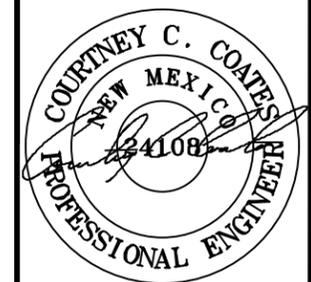


NOTES:  
1. AMOUNT OF LAYERS WILL VARY BY POND TYPE AND WHERE A RUB SHEET IS UTILIZED.

TYPICAL ANCHOR TRENCH  
NTS

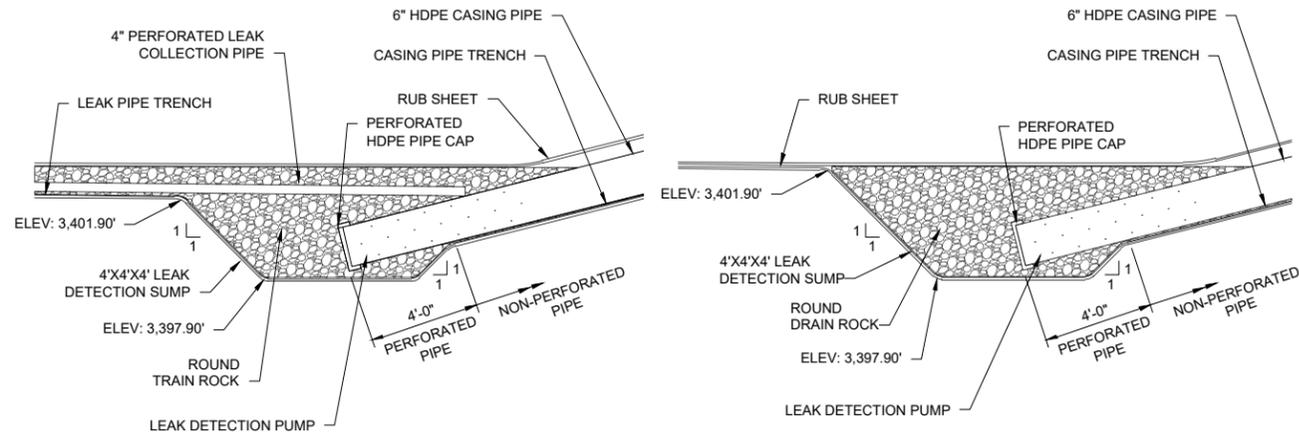


5 BRINE WATER LINER SYSTEM  
NTS



06/26/19

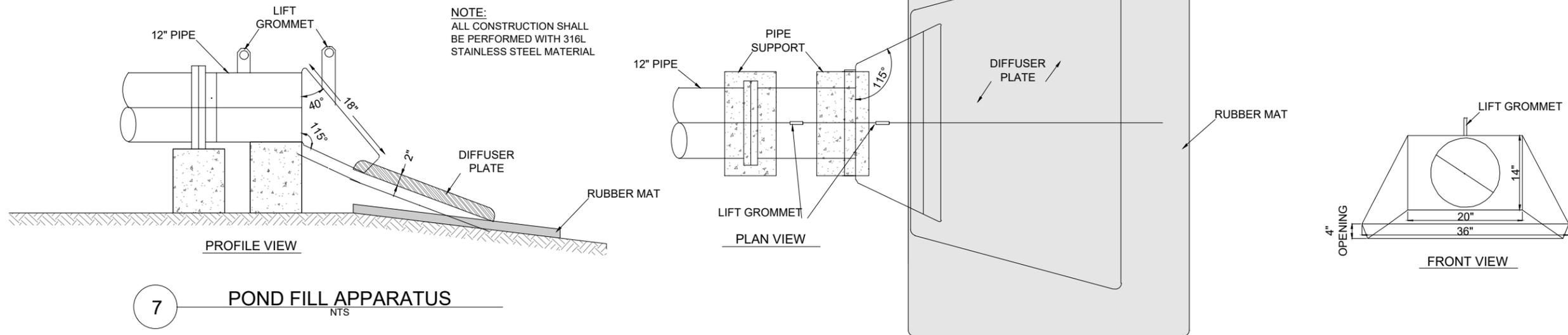
DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	N/A
SHEET:	7 OF 9
REVISION:	XXX
	XXX
	XXX



BRINE WATER SECTION

FRESH WATER SECTION

6 LEAK DETECTION SUMP  
NTS

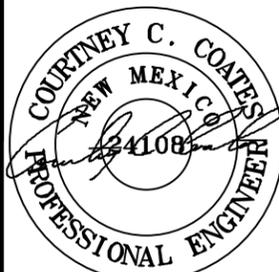


7 POND FILL APPARATUS  
NTS

DETAILS 2 OF 3

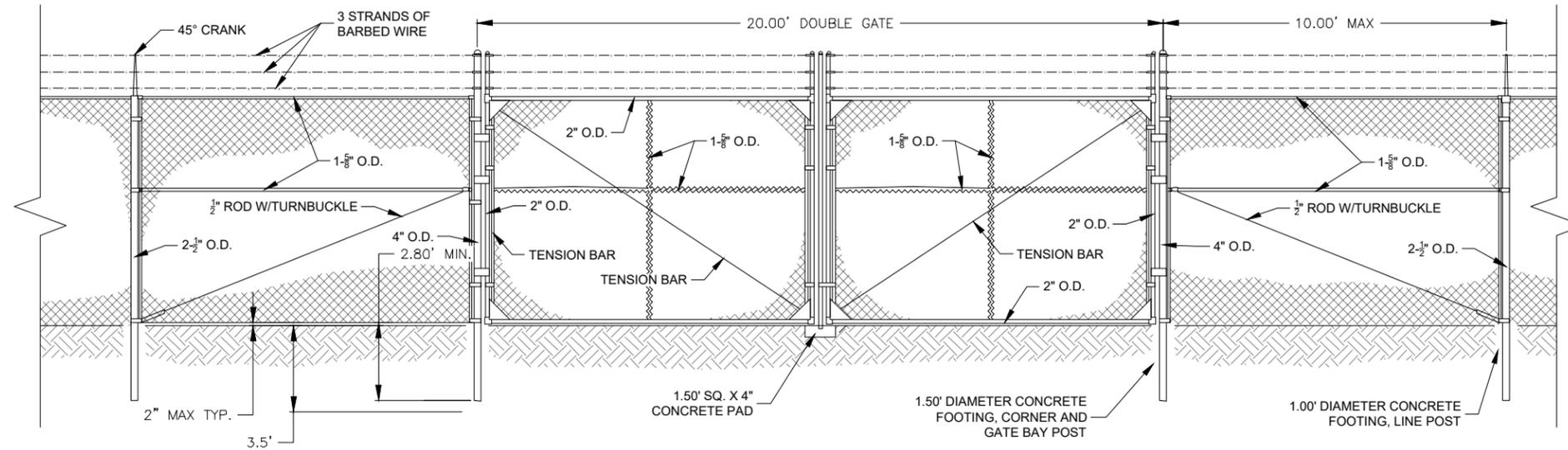
GEM CONTAINMENT POND

EOG RESOURCES

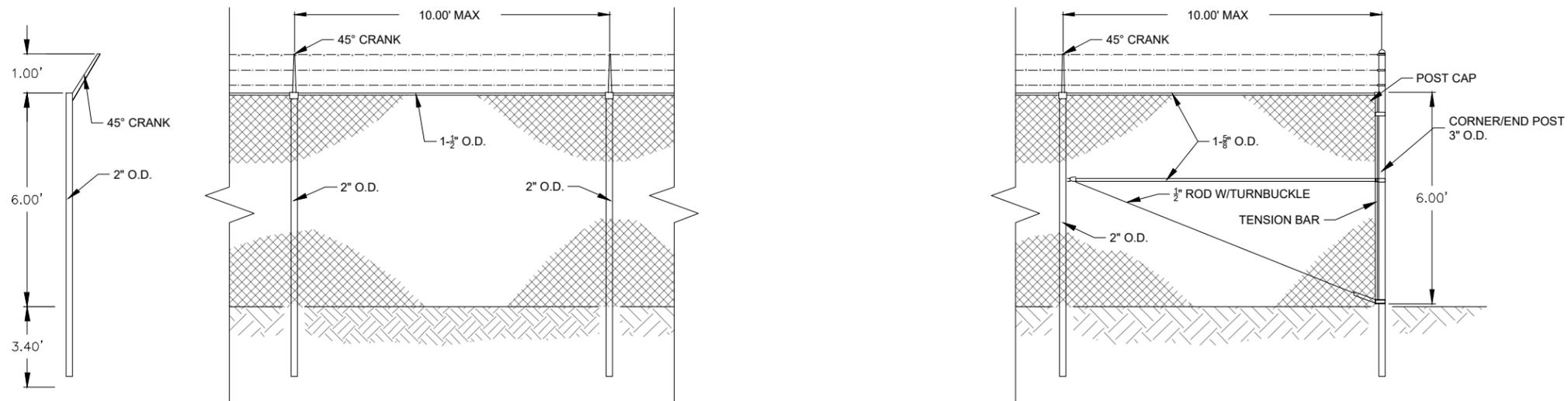


06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	N/A
SHEET:	8 OF 9
REVISION:	XXX
	XXX
	XXX



**GATE**



**UNREINFORCED SECTION**

**CORNER SECTION**

**PERMANENT 6' CHAINLINK FENCE WITH BARBED WIRE DETAIL**

8

NTS

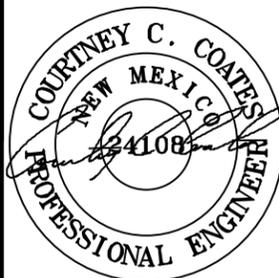


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DETAILS 3 OF 3

GEM CONTAINMENT POND

EOG RESOURCES



06/26/19

DATE:	06/26/19
DRAWN BY:	ARG
REVIEWED BY:	CCC
SCALE:	N/A
SHEET:	9 OF 9
REVISION:	
	XXX XX/XX/XX
	XXX XX/XX/XX
	XXX XX/XX/XX



- (1) Acceptance of pit construction for liner install:
  - a. Pit foundation and laterals properly compacted, smooth, and free of rocks/debris/sharp edges
  - b. Pit top wide enough to install an anchor trench, and provide adequate room for inspection/maintenance
  - c. Slope of interior subgrade, drainage lines and laterals per specs
- (2) Geomembrane Liner Layers
  - a. Geotextile
  - b. Secondary (lower) liner
  - c. Leak detection system
  - d. Primary (upper) liner
  - e. Anchor trench- Liner edges anchored in the bottom of a compacted earth-filled trench **>18"deep**
- (3) Geomembrane Properties
  - a. Primary: 60 mil HDPE, equivalent, or better
  - b. Secondary: 40 mil HDPE, equivalent, or better
  - c. Impervious, synthetic material resistant to UV, petroleum hydrocarbons, salts, and acidic and alkaline solutions
  - d. Comply with EPA SW-846 Method 9090A, or subsequent relevant publication
- (4) Geomembrane Install
  - a. Field- Welded Liner seams
    - i. Performed by Qualified Personnel
    - ii. Thermally seamed (hot wedge) with a double track weld to create air pocket
    - iii. **4-6" liner overlap**
    - iv. Number of seams minimized
    - v. Seams oriented seams up and down slopes
    - vi. **No horizontal seams <5' of the slope toe**
  - b. Geomembrane Testing
    - i. Performed by Qualified Personnel
    - ii. Non-destructive Air Channel Testing
    - iii. Destruct testing
    - iv. Vacuum Testing
    - v. Spark Testing

PO Box 1806  
Aledo, TX 76008  
P: (817) 441-1235  
F: (817) 441-1270  
[www.mustangenergyservices.com](http://www.mustangenergyservices.com)

- (5) Other installed items
  - i. Vents
  - ii. Rub Sheets
  - iii. Boots
  - iv. Sump aggregate
  - v. Solid/perforated pipes
  - vi. Escape Ladders
  - vii. Height Markers
  - viii. Conductive Liner
- (6) Leak Detection System
  - a. 200 mil or greater Geonet or Geocomposite drainage liner
  - b. Installed between upper/lower geomembrane liners
  - c. Piping collection system
  - d. Drainage, collection, and removal system sloped to facilitate the earliest possible leak detection
  - e. Pipe to convey collected fluids to a collection/disposal system located outside the permanent **pit's perimeter**

PO Box 1806  
Aledo, TX 76008  
P: (817) 441-1235  
F: (817)4411270

[www.mustangenergyservices.com](http://www.mustangenergyservices.com)



**RIDER**

To be attached to and form part of Bond No. SUR0013939.

Issued on behalf of EOG Resources, Inc as Principal, and in favor of Commissioner of Public Lands, New Mexico State Land Office as Obligee.

It is agreed that:

Bond is changed to include the following EOG Subsidiaries under State Land Bond No. OGB0959:

EOG Resources & Meridian Oil, EOG Resources & Mitchell Energy, EOG Resources & Murchison O&G, EOG Resources & Nortex G&O Co., EOG Resources & Read & Stevens, EOG Resources Marketing, Inc., EOG Resources Inc, Enron Oil and Gas Co., Enron Oil & Gas, EOG Resources & Internorth Inc, EOG Resources & Meridian Oil, EOG Resources & Sun Operating, Enron Oil & Gas Company, & EOG Resources

This rider shall become effective as of February 13, 2012

PROVIDED, however, that the liability of the Surety under the attached bond as changed by this Rider shall not be cumulative.

Signed, sealed and dated February 13, 2012.

By: Argonaut Insurance Company

Gina Rodriguez  
Attorney-in-Fact Gina Rodriguez

Accepted: Commissioner of Public Lands, New Mexico State Land Office

Obligee

EOG Resources, Inc

Principal

By: \_\_\_\_\_

By: Helen Y. Lim  
Helen Y. Lim, VP & Treasurer

**Argonaut Insurance Company**  
**225 W. Washington, 6th Floor**  
**Chicago, IL 60606**

AS-0026046

**POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the Argonaut Insurance Company, a Corporation duly organized and existing under the laws of the State of Illinois and having its principal office in the County of Cook, Illinois does hereby nominate, constitute and appoint:

Donald R. Gibson, Sandra Parker, Tannis Mattson, Melissa Haddick, Terri Morrison, Gina Rodriguez

its true and lawful agent and attorney-in-fact, to make, execute, seal and deliver for and on its behalf as surety, and as its act and deed any and all bonds, contracts, agreements of indemnity and other undertakings in suretyship provided, however, that the penal sum of any one such instrument executed hereunder shall not exceed the sum of:

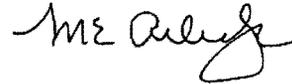
\$15,000,000.00

This Power of Attorney is granted and is signed and sealed under and by the authority of the following Resolution adopted by the Board of Directors of Argonaut Insurance Company:

"RESOLVED, That the President, Senior Vice President, Vice President, Assistant Vice President, Secretary, Treasurer and each of them hereby is authorized to execute powers of attorney, and such authority can be executed by use of facsimile signature, which may be attested or acknowledged by any officer or attorney, of the Company, qualifying the attorney or attorneys named in the given power of attorney, to execute in behalf of, and acknowledge as the act and deed of the Argonaut Insurance Company, all bond undertakings and contracts of suretyship, and to affix the corporate seal thereto."

IN WITNESS WHEREOF, Argonaut Insurance Company has caused its official seal to be hereunto affixed and these presents to be signed by its duly authorized officer on the 15th day of September, 2008.

Argonaut Insurance Company



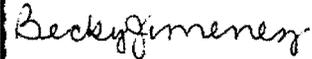
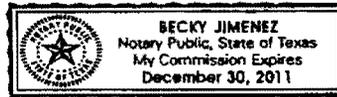
By: \_\_\_\_\_

Michael E. Arledge President

STATE OF TEXAS  
COUNTY OF BEXAR SS:

On this 15th day of September, 2008 A.D., before me, a Notary Public of the State of Texas, in and for the County of Bexar, duly commissioned and qualified, came THE ABOVE OFFICER OF THE COMPANY, to me personally known to be the individual and officer described in, and who executed the preceding instrument, and he acknowledged the execution of same, and being by me duly sworn, deposed and said that he is the officer of the said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority and direction of the said corporation, and that Resolution adopted by the Board of Directors of said Company, referred to in the preceding instrument is now in force.

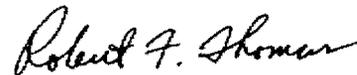
IN TESTIMONY WHEREOF, I have hereunto set my hand, and affixed my Official Seal at the County of Bexar, the day and year first above written.



(Notary Public)

I, the undersigned Officer of the Argonaut Insurance Company, Illinois Corporation, do hereby certify that the original POWER OF ATTORNEY of which the foregoing is a full, true and correct copy is still in full force and effect and has not been revoked.

IN WITNESS WHEREOF, I have hereunto set my hand, and affixed the Seal of said Company, on the 13<sup>th</sup> day of February 2012



Robert F. Thomas Vice President

ONLINE Version

**NEW MEXICO STATE LAND OFFICE – Oil, Gas, and Minerals Division**  
**BOND FOR CONTRACT PERFORMANCE AND SURFACE OR IMPROVEMENT DAMAGE**  
**Surface Improvement Damage Megabond**

BOND NO. SUR0013000  
(For use of Surety Company)

BOND NO. \_\_\_\_\_  
(For use of State Land Office)

Know all men by these presents

EOG Resources, Inc., P.O. Box 4362, Houston, TX 77210-4362, as **Principal**,  
and Argonaut Insurance Company, as **Surety**, a corporation organized,

existing and doing business under and by virtue of the laws of the State of Illinois and  
authorized to transact a surety business in the State of New Mexico, are held and firmly bound unto the New Mexico  
Commissioner of Public Lands in the sum of **Twenty-five Thousand Dollars (\$25,000)** for the following uses:

1. For the use and benefit of the Commissioner, to secure the performance of said Principal as lessee under one or more state leases or permits for minerals, oil and gas, coal or geothermal resources or as holder under one or more state rights-of-way or easements which Principal has heretofore executed or may hereafter execute with the Commissioner; and

2. For the use and benefit of the Commissioner, state surface lessees, state land contract purchasers, state patentees, and their successors and assigns, to pay for damages to the surface of lands subject to a state lease or permit for minerals, oil and gas, coal or geothermal resources or a state right-of-way or easement held by Principal, or for damages to surface improvements located thereon, suffered by reason of Principal's operations under a state lease or permit for minerals, oil and gas, coal or geothermal resources or under a state right-of-way or easement.

For the payment of said sum, well and truly to be made, Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

The conditions of the foregoing obligations are:

1. If the above bound Principal or its successors or assigns shall well and truly perform and keep all terms, covenants, conditions, and requirements of all state leases for minerals, oil and gas, coal or geothermal resources and of all state rights-of-way and easements heretofore or hereafter executed by the Commissioner and Principal, including the payment of royalties when due and compliance with all established mining plans; and

2. If Principal or its successors or assigns shall in all respects make good and sufficient recompense, satisfaction or payment to the Commissioner of Public Lands for damages to the surface of lands subject to a state lease or permit for minerals, oil and gas, coal or geothermal resources or a state right-of-way or easement held by Principal and for damages to livestock, water, crops, tangible improvements or surface improvements of any kind located thereon suffered by reason of Principal's operations under such state lease, permit, right-of-way or easement heretofore or hereafter executed by the Commissioner and Principal;

THEN, the obligation to pay the sum of Twenty-five Thousand Dollars (\$25,000) shall be null and void.

If, however, Principal shall default or otherwise fail in performance under such state lease, permit, right-of-way or easement, including the failure to pay royalties when due or to comply with established mining plans, or if Principal shall fail or refuse to make good and sufficient recompense, satisfaction or payment to the Commissioner for damages to the surface of the above designated lands or to improvements located thereon, then the obligation to pay said sum shall remain in full force and effect.

The liability of Surety upon this bond shall not expire upon the termination of any state lease or permit or any

renewal or extension thereof for minerals, oil and gas, coal or geothermal resources or any state right-of-way or easement or any renewal or extension thereof which Principal or its successors or assigns has heretofore executed or may hereafter execute with the Commissioner, but shall be and remain in full force and effect until released in writing by the Commissioner of Public Lands.

Principal and Surety further agree that in the event an action is brought on this bond and a court of competent jurisdiction determines Principal or Surety is in breach of the agreements contained in this bond, Principal or Surety or both of them shall pay to the Commissioner the costs associated with the recovery of the amounts due hereunder, including reasonable attorneys' fees.

This bond is executed pursuant to the laws of the State of New Mexico, including Sections 19-8-24, 19-9-12, 19-10-26, 19-13-19, and 46-6-1 through -9, NMSA 1978.

The premium for which this bond is written is One Hundred Thirteen and No/100----- Dollars.

In witness whereof we hereunto set our hands this 30th day of January, 20 12.

EOG Resources, Inc.  
PRINCIPAL  
P.O. Box 4362, Houston, TX 77210-4362 **BB**  
Address  
BY [Signature]  
Signature Helen Y. Lim, VP & Treasurer

Title  
(Note: Principal, if corporation, affix  
Corporate seal here.)

Argonaut Insurance Company  
SURETY  
225 W. Washington, 6th Floor, Chicago, IL 60606  
Address  
BY [Signature]  
Attorney-in-Fact Signature  
Gina Rodriguez

(Note: Corporate surety, affix  
Corporate seal here.)

**ACKNOWLEDGMENT FORM FOR NATURAL PERSONS**

STATE OF \_\_\_\_\_ )  
 ) ss.  
COUNTY OF \_\_\_\_\_ )

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
before me personally appeared \_\_\_\_\_, to me known to  
be the person(s) described in and who executed the same as (his, her, their) free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year in this certificate first above written.

\_\_\_\_\_  
My commission expires      Notary Public name      Signature, notary  
  
(Notary Seal)

ACKNOWLEDGMENT FORM FOR CORPORATION

STATE OF TEXAS )  
 ) ss.  
COUNTY OF HARRIS )

On this 19th day of January, 20 12,  
before me personally appeared Helen Y. Lim, to me personally known, who, being by  
me duly sworn, did say that s/ he is VP & Treasurer of EOG Resources, Inc.  
and that this instrument was signed and sealed on behalf of said corporation by authority of its board of directors, and  
acknowledged said instrument to be the free act and deed of said corporation.

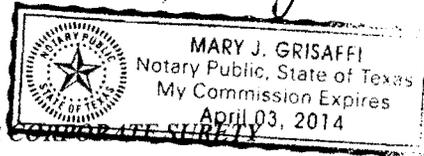
IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year in this certificate first above written.

April 3, 2014  
My commission expires

Mary J. Grisaffi  
Notary Public name

*Mary J. Grisaffi*  
Signature notary

(Notary Seal)



ACKNOWLEDGMENT FORM FOR CORPORATE SURETY

STATE OF TEXAS )  
 ) ss.  
COUNTY OF Harris )

On this 30th day of January, 20 12,  
before me personally appeared Gina Rodriguez, to me personally known, who, being  
by me duly sworn, did say that s/ he is Attorney-in-Fact of Argonaut Insurance Company  
and that this instrument was signed and sealed on behalf of said corporation by authority of its board of directors, and  
acknowledged said instrument to be the free act and deed of said corporation.

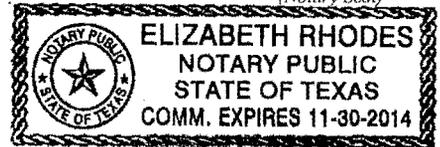
IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year in this certificate first  
above written.

11-30-2014  
My commission expires

Elizabeth Rhodes  
Notary Public name

*Elizabeth Rhodes*  
Signature, notary

(Notary Seal)



Note: Corporate surety, attach power of attorney.

APPROVED this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

COMMISSIONER OF PUBLIC LANDS

NOTE: File before development or operations are commenced, with:

Commissioner of Public Lands  
New Mexico State Land Office, OGMD  
P.O. Box 1148 or 310 Old Santa Fe Trail  
Santa Fe, New Mexico 87504-1148 Santa Fe, NM 87501-2708

**Argonaut Insurance Company  
225 W. Washington, 6th Floor  
Chicago, IL 60606**

AS-0026041

**POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the Argonaut Insurance Company, a Corporation duly organized and existing under the laws of the State of Illinois and having its principal office in the County of Cook, Illinois does hereby nominate, constitute and appoint:

Donald R. Gibson, Sandra Parker, Tannis Mattson, Melissa Haddick, Terri Morrison, Gina Rodriguez

its true and lawful agent and attorney-in-fact, to make, execute, seal and deliver for and on its behalf as surety, and as its act and deed any and all bonds, contracts, agreements of indemnity and other undertakings in suretyship provided, however, that the penal sum of any one such instrument executed hereunder shall not exceed the sum of:

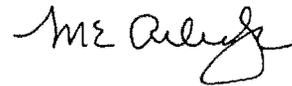
\$15,000,000.00

This Power of Attorney is granted and is signed and sealed under and by the authority of the following Resolution adopted by the Board of Directors of Argonaut Insurance Company:

"RESOLVED, That the President, Senior Vice President, Vice President, Assistant Vice President, Secretary, Treasurer and each of them hereby is authorized to execute powers of attorney, and such authority can be executed by use of facsimile signature, which may be attested or acknowledged by any officer or attorney, of the Company, qualifying the attorney or attorneys named in the given power of attorney, to execute in behalf of, and acknowledge as the act and deed of the Argonaut Insurance Company, all bond undertakings and contracts of suretyship, and to affix the corporate seal thereto."

IN WITNESS WHEREOF, Argonaut Insurance Company has caused its official seal to be hereunto affixed and these presents to be signed by its duly authorized officer on the 15th day of September, 2008.

Argonaut Insurance Company



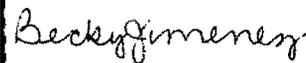
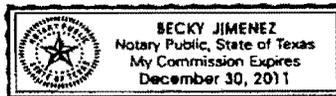
By: \_\_\_\_\_

Michael E. Arledge President

STATE OF TEXAS  
COUNTY OF BEXAR SS:

On this 15th day of September, 2008 A.D., before me, a Notary Public of the State of Texas, in and for the County of Bexar, duly commissioned and qualified, came THE ABOVE OFFICER OF THE COMPANY, to me personally known to be the individual and officer described in, and who executed the preceding instrument, and he acknowledged the execution of same, and being by me duly sworn, deposed and said that he is the officer of the said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority and direction of the said corporation, and that Resolution adopted by the Board of Directors of said Company, referred to in the preceding instrument is now in force.

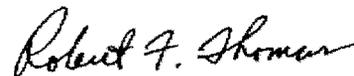
IN TESTIMONY WHEREOF, I have hereunto set my hand, and affixed my Official Seal at the County of Bexar, the day and year first above written.



(Notary Public)

I, the undersigned Officer of the Argonaut Insurance Company, Illinois Corporation, do hereby certify that the original POWER OF ATTORNEY of which the foregoing is a full, true and correct copy is still in full force and effect and has not been revoked.

IN WITNESS WHEREOF, I have hereunto set my hand, and affixed the Seal of said Company, on the 30th day of January 2012



Robert F. Thomas Vice President



EOG Resources, Inc.  
1111 Bagby  
Sky Lobby 2  
Houston, Texas 77002

Date: 1-12-2012

P.O. Box 4362  
Houston, Texas 77210-4362

**Requestor:** Roger Motley **Division:** Midland  
**Telephone:** 432-686-3642 **Fax:** 432-686-3733

**Principal** (Name & Address of EOG Entity, if other than EOG Resources, Inc.):  
EOG Resources, Inc.  
P.O. Box 4362  
Houston, TX 77210 4362

**Obligee** (Name & Physical Address of Party requiring bond) **Phone:**  
Commissioner of Public Lands  
New Mexico State Land Office – Right of Way Division  
310 Old Santa Fe Trail  
Santa Fe, New Mexico  
**Effective Date of Bond:** 1-30-2012 **Date Bond Required:** 1-20-2012  
**Amount of Bond:** \$25,000  
**Bond Type:**  
Performance \_\_\_\_\_  
License/Permit \_\_\_\_\_  
Road Crossing \_\_\_\_\_  
Right of Way \_\_\_\_\_  
Oil & Gas Drilling \_\_\_\_\_  
Plugging & Surface Restoration \_\_\_\_\_  
**Other:** Surface Improvement Damage Megabond  
(If court bond, please provide a copy of judgment and bond form)

**Bond Description:** (Road, mileage, Well #, Location, County, etc)  
This Megabond will cover all operations by EOG Resources, Inc. on our State of New Mexico leases.

**Other Comments/Information:**

**Deliver completed Bonds by Fed Ex To:**  
Requestor Roger Motley, Midland Division Land Dept.  
Obligee Nick Jaramillo, New Mexico State Land Office – Right of Way Division  
310 Old Santa Fe Trail  
Santa Fe, New Mexico 78501-2708



**GEM REUSE WATER PIT**

**Sw4/ NE4 SEC. 36 - T25S-R32E**

**LEA COUNTY, NM**

**LAT: 32°05'19.790093" LONG: -103°37'28.538181"**

**EMERGENCY CONTACT:**

**575-392-6947**

**CAUTION**

**PPE  
REQUIRED**

**DANGER**

**H<sub>2</sub>S  
MAY BE PRESENT**

**DANGER**

**NO  
SMOKING**

**NOTICE**

**AUTHORIZED  
PERSONNEL ONLY**



# Operating and Maintenance Plan

## GEM REUSE WATER CONTAINMENT PIT

### 1. Overview

The attached plan details the operational requirements regarding the Gem Reuse Water Containment Pit. In addition, the required reporting and inspections as well as the appropriate actions/notifications are listed.

### 2. Purpose

The attached plan implements the operational requirement as outlined by NMOCD under 19.15.34 NMAC. Application of this plan will ensure the reuse water containment pit is operated in a manner that minimizes any risk to health, safety, and environment.

### 3. Operational Requirements

Below are the operational requirements that must be adhered to at all times. Deviation from these requirements is prohibited.

- Inlet flow
  - Recycling facility effluent stream water must meet all water quality norms before water is introduced into the containment pit. These norms are to include no detected oil in the stream.
  - Inlet water may only be introduced into the containment pit via the diffuser manifold as to not cause any stress or damage to the liner system.
  - A minimum of 3ft of freeboard will be maintained in the reuse water containment pit at all times.
- Effluent Flow
  - Effluent water may only exit the reuse water containment via the permanent discharge header system; no external hoses or pipes may be placed into the pit at any time
  - Effluent water may only be transferred to EOG Resources' completion operations; no transfer to 3<sup>rd</sup> parties is allowed
  - Effluent water may only be transferred through an EOG leak detection transfer system; all protocols and procedures regarding the automated leak detection system must be followed



- Volume Reporting
  - All influent and effluent volumes are to be logged daily. These volumes are to be tracked via inbound and outbound mag meters and tracked via paper and SCADA systems
- Site Inspection
  - The pit and surrounding area are to be inspected daily while water is contained within the pit. These inspections are to include all inlet/outlet piping, berms, exposed liner, surrounding grounds and fencing
- Leak Detection Testing
  - Leak detection testing shall be conducted daily. Testing shall include starting the leak detection sump pump to determine if any fluid has collected in the collection sump. The sump pump shall be run for a minimum of 5 minutes to allow for inlet flow. If any flow is detected the proper notification to the Hobbs NMOCD will occur and drainage will commence

#### 4. Daily Reporting & Inspections

- List of Daily Reporting and Inspections to be completed:
  - Influent and Effluent Volume Reporting
  - Site and Containment Pit Inspection
  - Leak Detection

#### 5. Notifications

In the event of a leak detection denoting a compromised liner below the water level, notice shall be provided to be the Hobbs division office of the NMCOD within 48 hours of detection.

District 1  
1625 N. French Drive  
Hobbs, New Mexico 88240  
OFFICE: (575) 393-6161 FAX: (575) 393-0720  
EMERGENCY NUMBER - MOBILE: (575) 370-3186  
Business Hours:  
7:00 AM-12:00 PM and 1:00 - 4:00 PM  
Monday through Friday

#### 6. Associated Forms

- List of Associated forms for Operating and Maintenance Plan
  - NA



# Water Containment Closure Plan

## GEM REUSE WATER CONTAINMENT PIT

### 1. Overview

The attached plan details the requirements regarding the closure of the Gem Reuse Water Containment Pit. In addition, the required sampling and reporting obligations are detailed.

### 2. Purpose

The attached plan implements the closure requirement as outlined by NMOCD under 19.15.34.14 NMAC. Application of this plan will ensure the reuse water containment pit is closed and reclamation is completed in a manner that minimizes any risk to health, safety, and environment.

### 3. Closure Requirements

- Containment Pit Drainage
  - All reuse water remaining in the containment pit shall be removed from the impoundment within 60 days operations cessation. The removed fluids will then be transferred a division approved disposal facility. Records of all removal, transfer and disposal activities shall be retained for inclusion in the final closure report submittal.
- Liner Material Removal and Disposal
  - Removal of the liner shall be conducted in manner that minimizes any risk of soil disturbance to the surface within and surrounding the containment. The removed liner material will then be transferred to and disposed of at a division approved disposal facility. Records of all removal, transfer and disposal activities shall be retained for inclusion in the final closure report submittal.
- Soil Sampling
  - Soil sampling shall be conducted at the locations depicted in the below schematic, Sampling Point Diagram, by a qualified third party contractor and analyzed at NELAC certified laboratory.
  - If any contaminant concentration is higher than the parameters listed in Table 1 in 19.15.34.14 NMAC, notice shall be provided the Hobbs NMOCD office before proceeding with closure.
  - If all sample concentrations are less than or equal to the parameters listed in Table 1 in 19.15.34.14 NMAC, then closure can proceed, backfilling with non-waste containing, uncontaminated, earthen material

- Sampling Diagram



- Site Reclamation and Re-vegetation
  - Following closure, reclamation of the containment's location can commence and ensure that it is returned to a safe and stable location that blends with the surrounding undisturbed area. Topsoils and subsoils shall be replaced to original positions and contoured to achieve erosion free long term stability and preservation of surface water flow patterns.
  - The disturbed area shall then be reseeded in the first favorable growing season following closure of the containment. The surface area shall be restored to the condition that existed prior to the construction of the containment



- Reclamation of all disturbed areas no longer in use shall be considered complete when all ground surface disturbing activities at the site have been completed and a uniform vegetative cover has been established that reflects a life form ratio of +/- 50% of pre-disturbance levels and a total percent plant cover of at least 70% of pre-disturbance levels, excluding noxious weeds.

#### 4. Closure and Reclamation Report Submittal / Notice

- Closure Report
  - Within 60 days of closure completion, EOG shall submit a closure report on form C-147 to the NMOCD Hobbs office, including required attachments, to document all closure activities including sampling results and the details of any backfilling, capping or covering.
  - The closure report shall certify that all information in the report and attachments is correct and that EOG has complied with all applicable closure requirements and conditions specified in the division rules or directives
  - Reclamation Notice
  - EOG shall notify the NMOCD Hobbs office when all reclamation and re-vegetation are complete

#### 5. Notifications

In the event of any deviance from this closure plan or exceeding of a sampling constituent, notice shall be provided to the NMOC Hobbs office.

District 1  
1625 N. French Drive  
Hobbs, New Mexico 88240  
OFFICE: (575) 393-6161 FAX: (575) 393-0720  
EMERGENCY NUMBER - MOBILE: (575) 370-3186  
Business Hours:  
7:00 AM-12:00 PM and 1:00 - 4:00 PM  
Monday through Friday

#### 6. Associated Forms

- List of Associated forms for containment pit closure
  - NA

# SOIL BORING / MONITOR WELL LOG

Project:	<b>GEM REUSE PIT</b>	Drilling Company:	<b>WHITE DRILLING</b>
Project Number:	—	Driller:	<b>DALLAS RADAR</b>
Client:	<b>EOG RESOURCES</b>	Drilling Method:	<b>AIR ROTARY</b>
Boring / Well Number:	<b>B-1</b>	Bore Hole Diameter:	<b>5"</b>
Total Depth:	<b>75</b>	Screen: Diam. ___ Length ___ Slot Size ___	
Surface Elevation:	<b>N/A</b>	Casing: Diam. ___ Length ___ Type ___	
Geologist:	—	Date Drilled:	<b>05/02/2019</b>
Latitude:	—	Drill Rig:	<b>FAILING 1500 AIR ROTARY RIG</b>

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER		Qp (tsf)	DEPTH SCALE
					1st 6"	2nd 6"		
	[Symbol: Diagonal Lines]		TAN SILTY SAND					
5		SS	TAN CALICHE	37				
10		SS		73				
5		SS	TAN SANDY CALICHE	37				
20		SS		84				
5		SS	RED SANDSTONE WITH SOFT SAND LAYERS	50/5"				
30		SS		50/2"				
5		SS	RED SANDSTONE	50/ 1/2"				
40		SS		50/ 1/2"				
CONTINUED ON NEXT SHEET								
<p><b>NOTE</b> NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.</p>								

# SOIL BORING / MONITOR WELL LOG

Project: **GEM REUSE PIT**  
 Project Number: **---**  
 Client: **EOG RESOURCES**  
 Boring / Well Number: **B-1 (CONT.)**  
 Total Depth: **75**  
 Surface Elevation: **N/A**  
 Geologist: **---**  
 Latitude: **---**

Drilling Company: **WHITE DRILLING**  
 Driller: **DALLAS RADAR**  
 Drilling Method: **AIR ROTARY**  
 Bore Hole Diameter: **5"**  
 Screen: Diam. **---** Length **---** Slot Size **---**  
 Casing: Diam. **---** Length **---** Type **---**  
 Date Drilled: **05/02/2019**  
 Drill Rig: **FAILING 1500 AIR ROTARY RIG**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER		Qp (tsf)	DEPTH SCALE	
					1st 6"	2nd 6"			
5	•••••	SS	RED SANDSTONE	50/0"					
50	•••••	SS		50/ 1/2"					
5	•••••	SS		50/ 1/4"					
60	•••••	SS		50/ 1/2"					
5	•••••	SS		50/0"					
70	•••••	SS		50/1"					
5	•••••	SS		50/0"					
TOTAL DEPTH OF BORING 75 FEET									
<p><b>NOTE</b>            NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.</p>									



8 May 2019

Mr. Dustin Kinder  
EOG Resources, Inc.  
5509 Champions Drive  
Midland, TX 79706

**Re: Comprehensive Resource Review – Gem State Com Water Reuse Pit  
Lea County, New Mexico**

Dear Mr. Kinder:

Goshawk Environmental Consulting, Inc. (Goshawk) conducted a comprehensive desktop resource review and limited field investigations for the Gem State Com Water Reuse Pit in Lea County, New Mexico. This resource review included Waters of the US (WATERS), Threatened or Endangered (T/E) Species, and Cultural Resources. These investigations evaluated the potential presence of any protected resources, the approximate size and location of identified protected resources, and associated development constraints within the proposed Water Reuse Pit. Goshawk also conducted a cultural resources archival review and survey for the site.

**INTRODUCTION**

The Gem State Com Water Reuse Pit will include a double-lined water pit with leak detection, a tanker offload and storage area, a reuse water treatment facility, and freshwater blending system. The site is approximately 1,224 feet long (north–south), 911 feet wide (east–west), and encompasses approximately 25.6 acres. The site is generally located in a very rural portion of Lea County, where land use is primarily cattle ranching and oil/gas exploration and production.

**WATERS REVIEW**

**REGULATORY BACKGROUND AND METHODOLOGY**

Investigations to identify potential WATERS within the proposed Gem State Com Water Reuse Pit included a resource review, followed by a field investigation. The resource review included inspection of available United States Geological Survey (USGS) 7.5-minute topographic quadrangles for Paduca Breaks East and Paduca Breaks West, New Mexico; recent digital aerial orthoimagery; and the Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO). The field investigation was performed in accordance with US Army Corps of Engineers (USACE) guidelines, utilizing the *Corps of Engineers Wetlands Delineation Manual – Technical Report Y-87-1* (January 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) – ERDC/EL TR-08-28* (September 2008).

The jurisdictional status of identified features was determined based on 33 CFR 328.3(a), along with the US Army Core of Engineers (USACE)–Environmental Protection Agency (EPA) joint guidance on Clean Water Act (CWA) jurisdiction, following the US Supreme Court’s decision in *Rapanos v. United States* and *Carabell v. United States*. Current guidance states that the USACE and EPA will assert jurisdiction over (1) traditionally navigable waters (TNWs) and all wetlands adjacent to TNWs; (2) relatively permanent waters (RPWs), which include non-navigable tributaries of TNWs that typically flow year-



round or have continuous flow at least seasonally, and all wetlands that are directly abutting RPWs; and (3) other water bodies, such as non-RPWs, wetlands adjacent to non-RPWs, and wetlands adjacent to, but not directly abutting, an RPW that are analyzed and determined to have a significant nexus with a TNW. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW.

## LITERATURE REVIEW

### **Topographic Map**

The topographic quadrangle (Appendix A, Figure 1) indicates the Gem State Com Water Reuse Pit is entirely within grasslands (white background). The terrain is slightly sloping, with elevations ranging from approximately 3,400 feet above mean sea level (AMSL) to approximately 3,430 feet AMSL. Drainage occurs by overland sheet flow in a generally south-southwest direction. There are no mapped water features within the proposed site. The closest water feature is the origination point of a tributary, located approximately 2,172 feet to the west, that flows into Bobcat Draw. The Gem State Com Water Reuse Pit is within the Lower Pecos River Watershed. The nearest direct line point to the Pecos River is approximately 19 miles southwest. There are no improvements mapped within the site; however, two unimproved roads, a jeep trail, and two fence lines are mapped in the vicinity of the site.

### **Aerial Orthoimagery**

The aerial orthoimagery (Appendix A, Figure 2) indicates the Gem State Com Water Reuse Pit is within relatively open rangeland, which is dominated by shrubs. The tributary indicated in the topographic map, as well as several other tributaries, are visible west of the proposed site. The unimproved roads and jeep trail indicated in the topographic map are evident in the aerial orthoimagery. The fence line, however, is not visible. Other oil/gas development (well pads, lease roads, pipelines, etc.) is indicated in the vicinity of the proposed site.

### **Soils**

The NRCS SSURGO spatial data (Appendix A, Figure 3) indicate the soil map unit underlying the Gem State Com Water Reuse Pit is the Simona-Upton association (SR). The primary soil components of this map unit are Simona fine sandy loam and Upton gravelly loam. These soils are well-drained with moderate to moderately rapid permeability. Runoff is very slow to high. None of the primary components of these soils are listed as hydric soils.

## FIELD INVESTIGATION

A field investigation was conducted on 8 January 2019 in order to determine the presence of potential WATERS within the Gem State Com Water Reuse Pit. The site was traversed on foot. The site conditions are generally consistent with those depicted on the topographic map and aerial orthoimagery described above. The site is slightly sloping with sparse shrubland vegetation. Vegetation within the site consists primarily of honey mesquite (*Prosopis glandulosa*), broom snakeweed (*Gutierrezia sarothrae*), Spanish dagger (*Yucca gloriosa*), doveweed (*Croton setigerus*), and creosote bush (*Larrea tridentata*).

Surface water run-off from the site is likely very rare. Drainage occurs primarily by overland sheet flow toward the south-southwest. No evidence of any Ordinary High Water Mark (OHWM) or standing water



was found within the site. Additionally, no flowing watercourse, lake bed, sinkhole, or playa exhibiting an OHWM are found on the site or within 300 feet of the site. A search in the general vicinity of the site did not reveal any seeps, springs, wetlands, or water wells within 500 feet of the site.

#### REGULATORY DEVELOPMENT CONSTRAINTS

It is Goshawk's opinion that construction of the Gem State Com Water Reuse Pit will not impact any WATERS. It is important to note that only the USACE has the authority to make a formal determination defining its jurisdictional limits under the CWA. Approved jurisdictional determinations are made by the USACE in accordance with internal policies and procedures in place at that time, and on a case-by-case basis using information at its disposal (such as other permits in the local area and case law) that may not be readily available to the public. Therefore, Goshawk's opinion should not be considered authoritative and cannot wholly eliminate uncertainty regarding the USACE's jurisdictional limits.

#### THREATENED OR ENDANGERED SPECIES

##### REGULATORY BACKGROUND AND METHODOLOGY

The Endangered Species Act prohibits any action that causes a "take" of any listed T/E species. "Take" is defined as harm or harassment, including hunting, wounding, killing, trapping, and the capture or collection of individuals of listed species. The law also protects against the degradation or loss of vital habitat for listed species. The United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service are the regulatory authorities for federally listed T/E species.

State-listed T/E species are protected under New Mexico Wildlife Conservation Act (17-2-41). The New Mexico Department of Game and Fish (NMDGF) has the authority to establish a list of fish and wildlife species that are endangered or threatened. Unlike the federal Act, the state's regulation makes no provision for the protection of wildlife species from indirect take (e.g., destruction of habitat or unfavorable management practices); rather, it protects from the unlawful killing, trade, or transportation of state-listed species. Therefore, the state-listed species are only a potential development constraint if listed species are determined to be currently occupying the site.

Literature and agency file searches were conducted to identify the potential occurrence of any federally and state-listed T/E species near the Gem State Com Water Reuse Pit. An internet search of the USFWS *Information, Planning, and Conservation System* (IPaC) was conducted for Lea County to identify federally listed T/E species "that should be considered as part of an effects analysis" for the site. Additionally, a report from the NMDGF Biota Information System of New Mexico (BISON-M) was obtained and reviewed for Lea County.

#### RESOURCE REVIEW

The T/E species listed in the IPaC Trust Resource Report for Lea County is the northern aplomado falcon (*Falco femoralis*). Critical habitat for this species is not designated within the Gem State Com Water Reuse Pit or the immediate vicinity.

The state-listed T/E species on NMDGF BISON-M County List for Lea County, dated 26 April 2019, includes the bald eagle (*Haliaeetus leucocephalus*), aplomado falcon, peregrine falcon (*Falco*



*peregrinus*), least tern, broad-billed hummingbird (*Cynanthus latirostris*), Bell's vireo (*Vireo bellii*), Baird's sparrow (*Ammodramus bairdii*), and dunes sagebrush lizard (*Sceloporus arenicolus*).

#### DEVELOPMENT CONSTRAINTS

The northern aplomado falcon is listed for many South New Mexico counties (including Lea County) and West Texas counties within its historic range. Historically, the falcon utilized open desert grasslands and/or savannas, where scattered shrubs and trees provide roosting and nesting locations. Although the proposed site is within shrublands, the land uses of this area (heavy cattle grazing and oil/gas production) likely precludes the northern aplomado falcon from utilizing the site.

State regulations prohibit the taking, possession, transportation, or sale of any state-listed T/E species. Because Lea County has the potential to support state-listed T/E species, care should be taken to avoid direct impacts (including harassment, harm, killing, and/or collection) to any species that may inhabit the site. The state-listed birds would have the ability to leave the site during active construction to avoid impacts. However, the dunes sagebrush lizard is ground-dwelling and relatively slow-moving, which makes it more susceptible to impacts during construction activities than other state-listed species. The dunes sagebrush lizard is more commonly found in the northern and eastern portions of Lea County. The site lacks suitable habitat for the dunes sagebrush lizard.

The lack of habitat for the northern aplomado falcon and the dunes sagebrush lizard, coupled with the current land use, makes it highly unlikely that these species are utilizing the site. Furthermore, only the dunes sagebrush lizard would be susceptible to direct impacts during construction of the site. Care should be taken to avoid harassment, harm, killing, and/or collecting of the dunes sagebrush lizard. No further investigations relative to T/E species are recommended.

#### CULTURAL RESOURCES DESKTOP REVIEW

##### REGULATORY BACKGROUND AND METHODOLOGY

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires Federal agencies to consider the effects of their actions on historic properties and provide the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on their projects. Historic properties are defined as archaeological sites, standing structures, or other historic resources listed in, or eligible for listing in, the National Register of Historic Places (NRHP). The New Mexico Prehistoric and Historic Sites Preservation Act and the New Mexico Cultural Properties Act provide protection of archaeological sites (prehistoric and historic) listed in the State Register of Cultural Properties or on the NRHP.

The regulatory process seeks to determine if a project will have an "effect" upon historic properties. The term "effect" is defined as an "alteration to the characteristics of historic property qualifying it for inclusion in, or eligibility for, the National Register (of Historic Places)." An effect is "adverse" when it will endanger those qualities that make the property eligible for inclusion on the NRHP.

Goshawk performed a Class I archival review to evaluate the potential for historic properties present near the Gem State Com Water Reuse Pit. The Archaeological Records Management Section's New Mexico Cultural Resources Information System (NMCRIIS) online database, geospatial data obtained from the



US Bureau of Land Management (BLM) Carlsbad Field Office, and the Natural Resources Conservation Service Web Soil Survey were utilized for the review. Following the archival review, a Class III Archaeological Survey was conducted for the site with a 100-foot buffer around the water reuse pit and a 50-foot buffer around the lease road.

#### ARCHIVAL REVIEW

##### ***Nearby Archaeological Sites***

According to NMCRIS, one previously recorded archaeological site is located within 1,640 feet (500 meters [m]) of the project area. The nearest previously documented archaeological site (LA #45729) is approximately 1,416.8 feet (431.8 m) northeast of the survey area. Archaeological site LA #45729 was originally documented in 1983 by New Mexico Archaeological Services, Inc., during NCMRIS Activity #12019. It was documented as a prehistoric occupation of unknown affiliation. Six hearth features were identified at the site; the artifact assemblage consisted of lithic debitage and fire-cracked rock. No information was available on NMCRIS regarding the site's eligibility for listing on the National Register of Historic Places (NRHP) or designation as a State Antiquities Landmark (SAL).

##### ***National Register Properties***

No NRHP-listed properties have been recorded near the proposed site. According to the NMCRIS database, the nearest NRHP-listed property is the Pope's Wells Site (LA# 69016), which is approximately 17 miles southwest of the proposed reuse site. This site consists of the remains of a camp and well site that was part of efforts to establish a water well in the area in the 1850's.

##### ***Soils Analysis***

Soils mapped within the proposed site consisted of Simona and Upton association. Simona-Upton association soils are moderately deep gravelly loams overlying cemented material. Simona-Upton association soils are derived from calcareous eolian deposits derived from sedimentary rock. These soils exhibit a moderate potential to contain temporally stratified deposits. Considering the soils present, there is a moderate probability for the presence of significant cultural resources sites within the proposed Gem State Com Reuse Site.

#### ARCHAEOLOGICAL SURVEY

Goshawk performed a cultural resources survey on 8 January 2019 for the Gem State Com Water Reuse Pit with a 100-foot buffer around the water reuse pit and a 50-foot (15-meter) buffer around the lease road, encompassing a total of 49.84 acres (Appendix A, Figure 4). Transects were walked at 50-foot (15-meter) intervals over the entire survey area. The project area terrain was relatively flat, active rangeland and sloped slightly south-southwest. The surface was composed of loose sand with intermittent exposures of caliche. Surface visibility was high, averaging 60-80%. The intensive survey yielded no cultural material.

#### DEVELOPMENT CONSTRAINTS

The cultural resources archival review determined there is a moderate probability for the presence of significant prehistoric resources within the site. No other cultural material or archaeological sites were identified within the survey area. No impacts to cultural resources are expected.



**SUMMARY**

Based on the results of the Resource Review, it is Goshawk's opinion that the construction of the Gem State Com Water Reuse Pit is unlikely to impact any sensitive natural resources, including WATERS and T/E species. Based on the negative results from the cultural resources survey, it is Goshawk's opinion that the site does not contain significant cultural resources. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be immediately halted, and a qualified archaeologist should be notified. If you have any questions or desire additional information, please contact our office.

Sincerely,



Natasia Mitchell  
Environmental Specialist/Ecologist



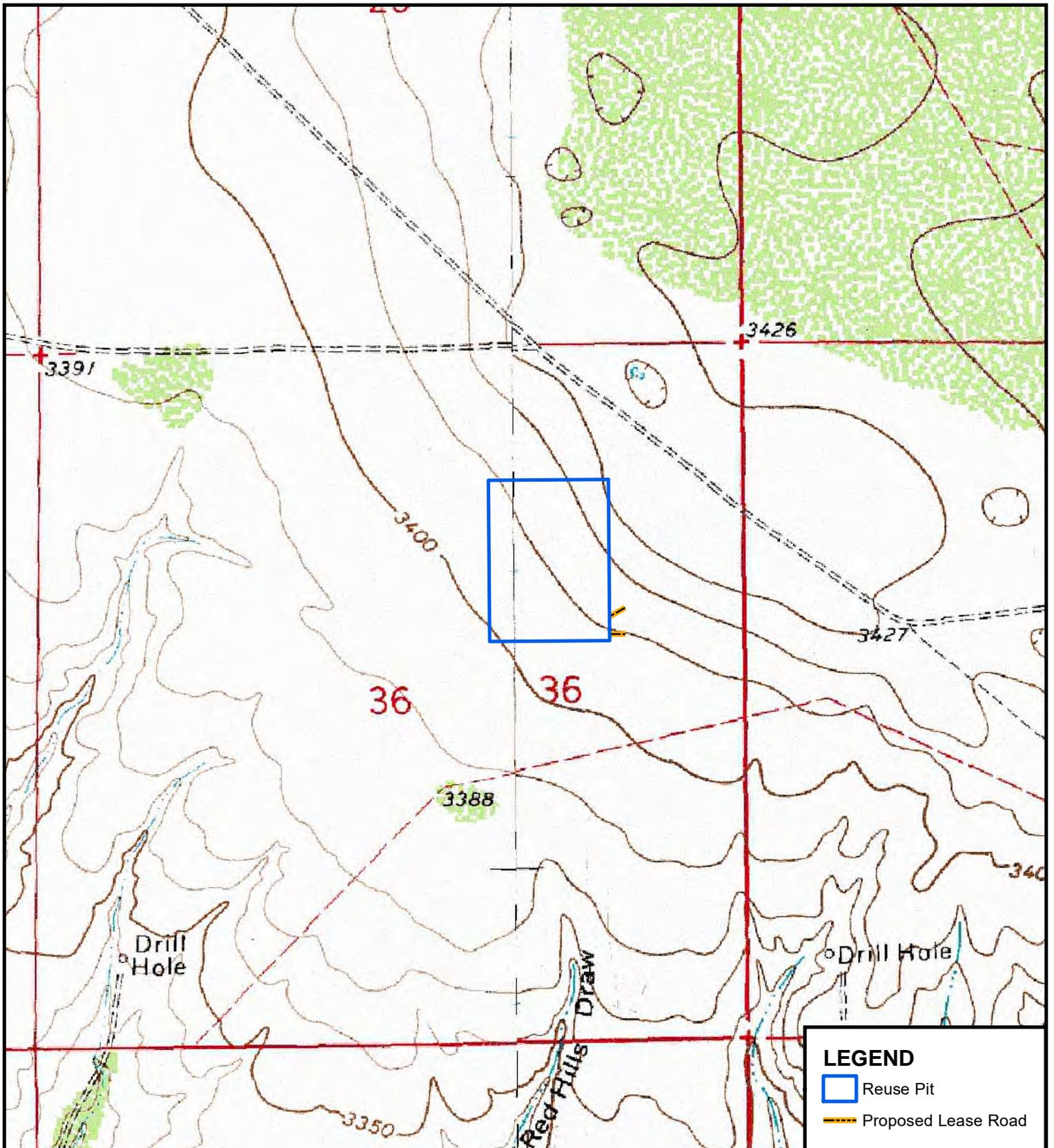
Mallory Miller  
Archaeological Technician

Cc: Michael Yemm, EOG Resources, Inc.  
Galan Kelley, EOG Resources, Inc.  
Wesley Moss, EOG Resources, Inc.



**APPENDIX A**  
**FIGURES**





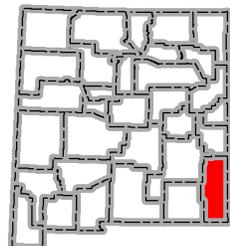
Map Source: USGS, Paduca Breaks East and Paduca Breaks West, New Mexico Quadrangles.

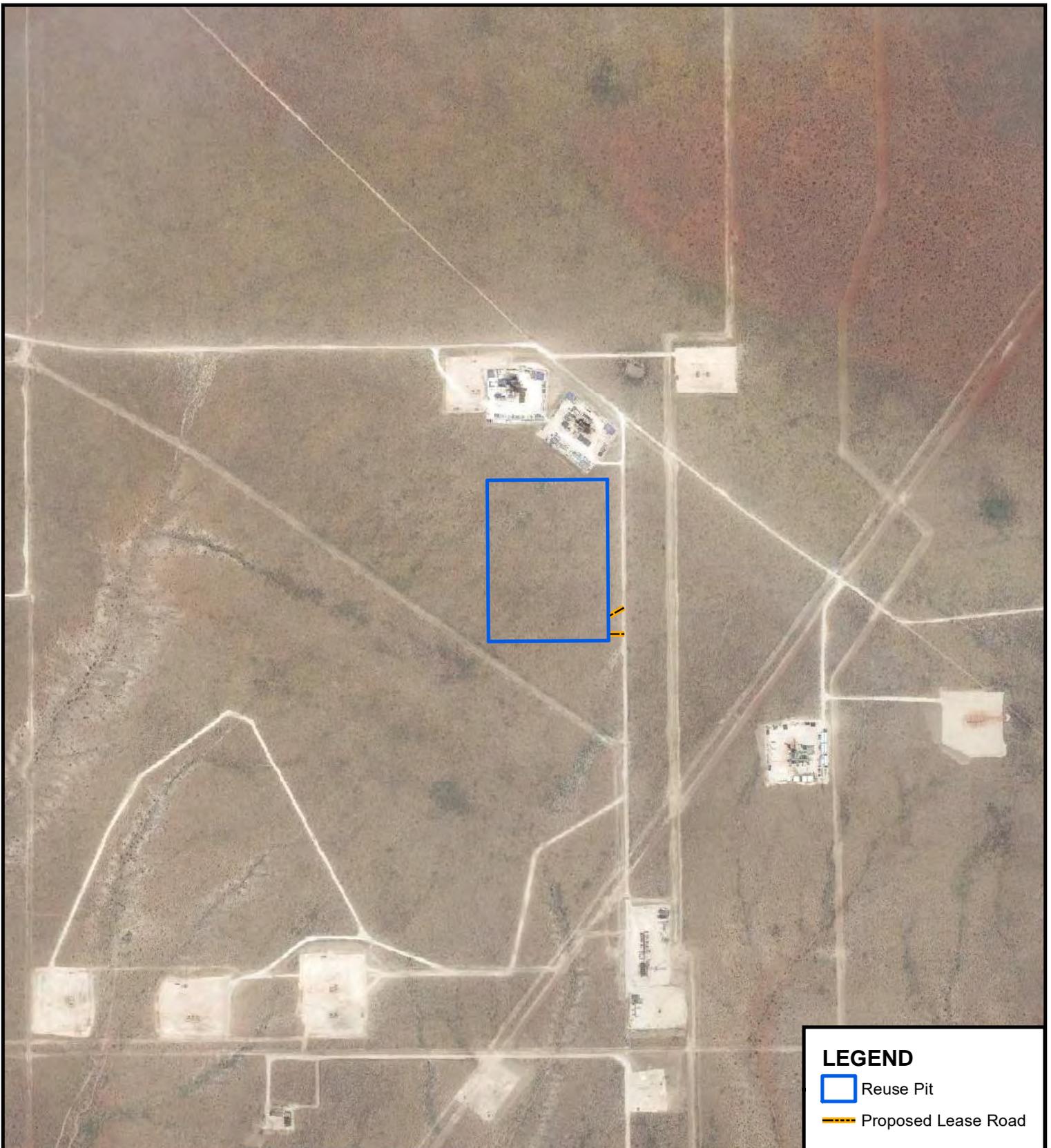
Date: 26 April 2019

0 500 1,000 Feet

**Figure 1**  
USGS Topographic Map  
Lea County, New Mexico

**Gem State Com Reuse Pit**  
T25S, R32E; Section 36





**LEGEND**

- Reuse Pit
- Proposed Lease Road

Map Source: EOG's Spatial on Demand.  
Global Imagery: DigitalGlobe Most Recent.

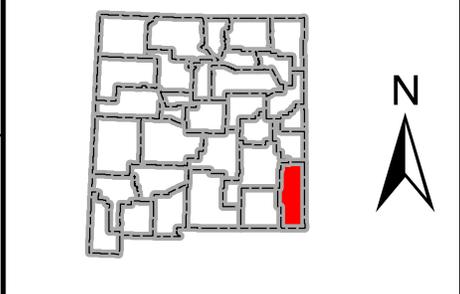
0      500      1,000 Feet

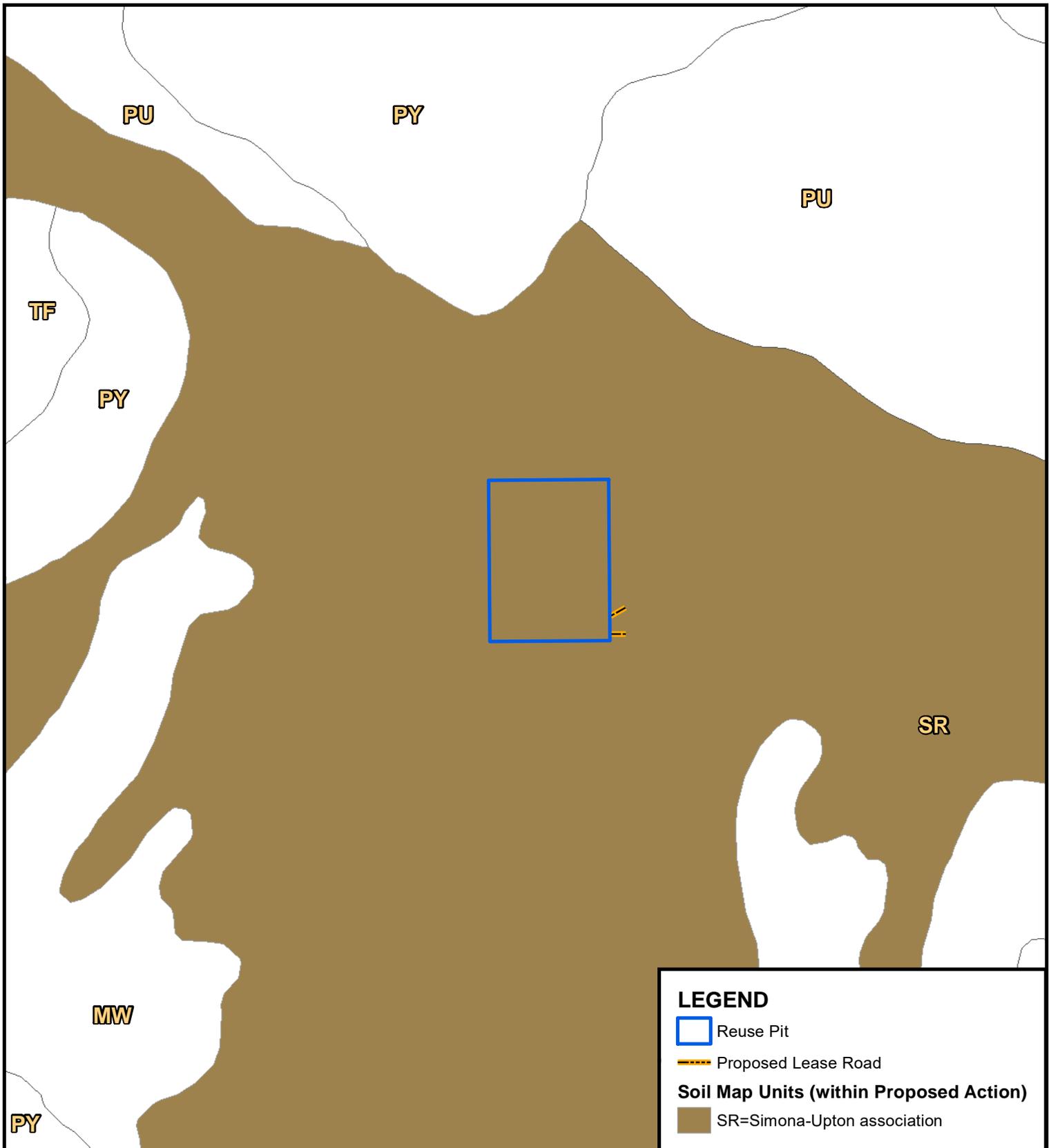


**Figure 2**  
Aerial Orthoimagery  
Lea County, New Mexico

**Gem State Com Reuse Pit**  
T25S, R32E; Section 36

Date: 26 April 2019





Map Source: USDA/NRCS - National Geospatial Center of Excellence. Soil Survey Geographic (SSURGO) database, Lea County, NM.

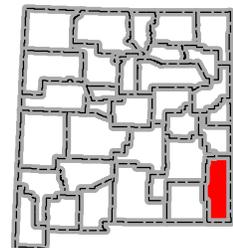
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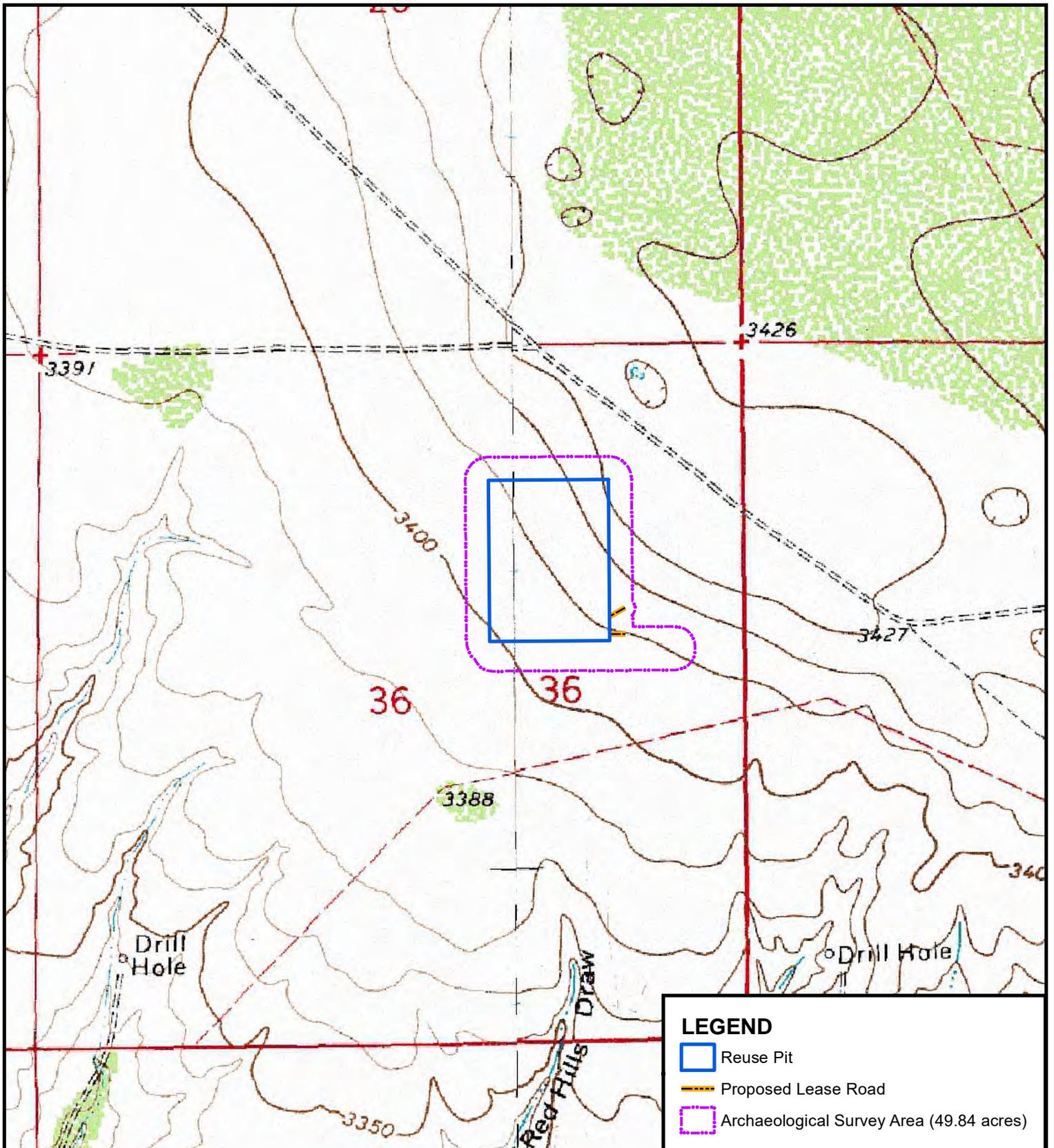


**Figure 3**  
NRCS SSURGO Soils Map  
Lea County, New Mexico

**Gem State Com Reuse Pit**  
T25S, R32E; Section 36

Date: 26 April 2019





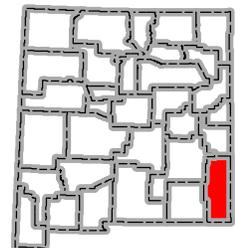
Map Source: USGS, Paduca Breaks East and Paduca Breaks West, New Mexico Quadrangles.

Date: 26 April 2019

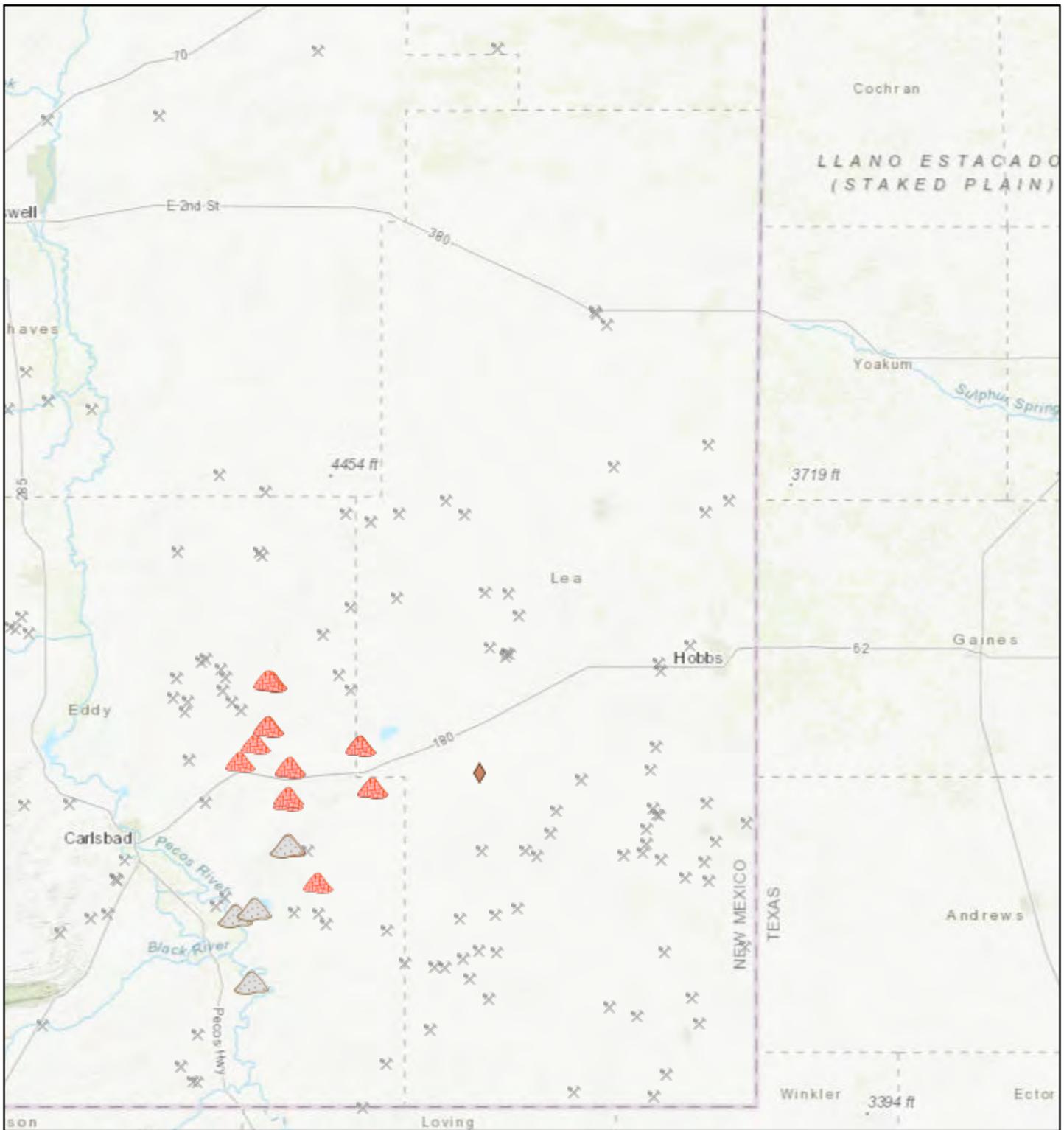
0 500 1,000 Feet

**Figure 4**  
Archaeological Survey Area Map  
Lea County, New Mexico

**Gem State Com Reuse Pit**  
T25S, R32E; Section 36



# Active Mines in New Mexico

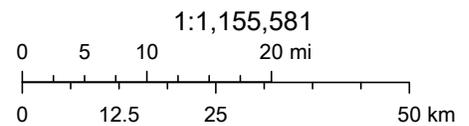


4/26/2019, 10:11:58 AM

Registered Mines

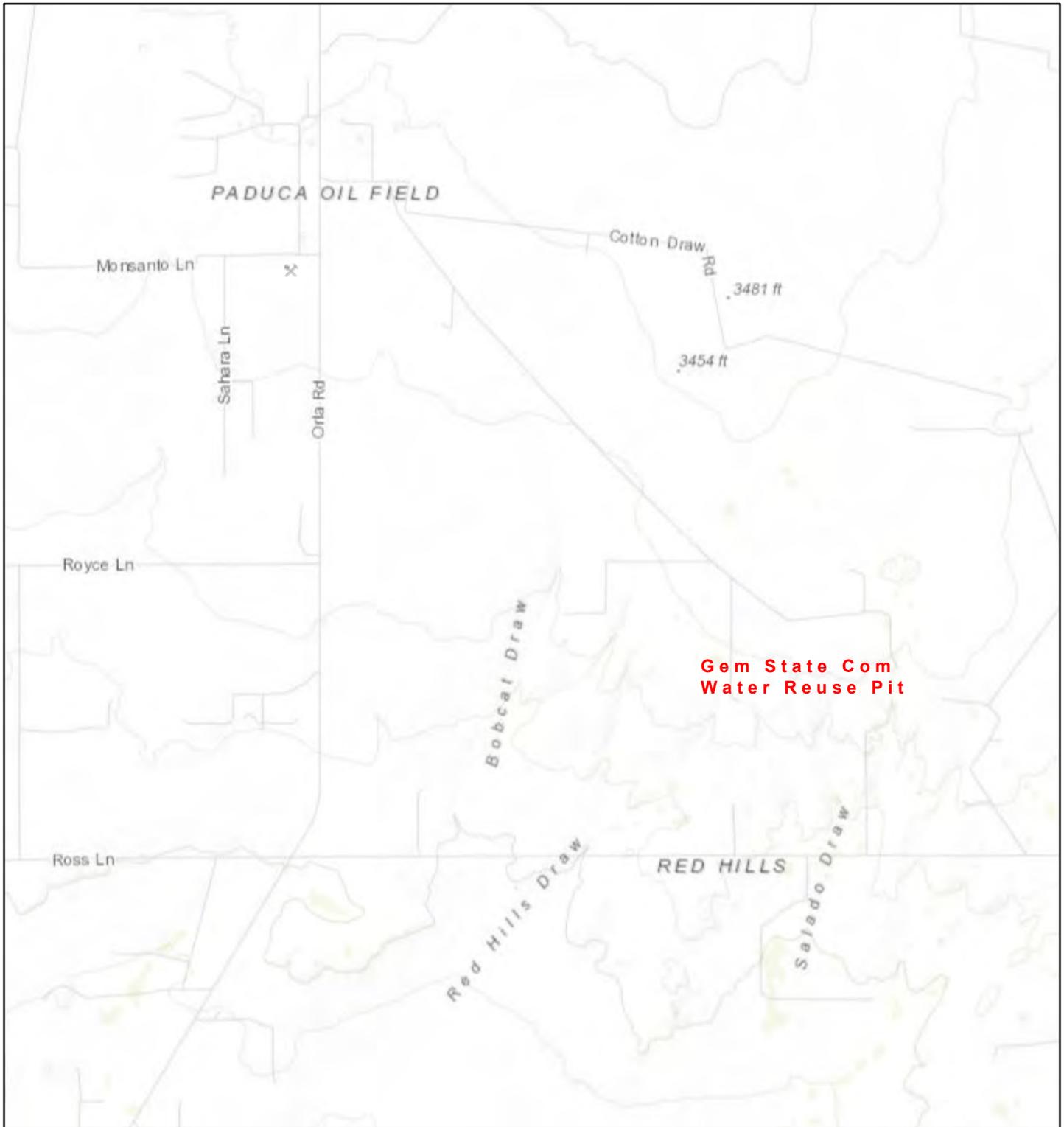
- × Aggregate, Stone etc.

- × Aggregate, Stone etc.
- × Aggregate, Stone etc.
- ◆ Industrial Minerals (Other)
- ▲ Potash
- ▲ Salt



Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

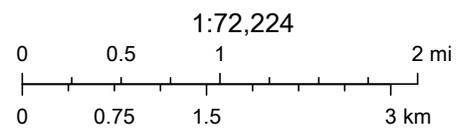
# Active Mines in New Mexico



4/26/2019, 10:25:54 AM

## Registered Mines

x Aggregate, Stone etc.



Bureau of Land Management, Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA



May 14, 2019

#5E27959

Mr. Dustin Cole Kinder  
EOG Resources, Inc.  
421 West 3<sup>rd</sup> Street, Suite 150  
Fort Worth, TX 46102

**Subject: C-147 Recycling Containment Permit Siting Criteria Attachment, Proposed Gem Recycling Facility, Lea County, New Mexico**

Dear Mr. Kinder:

Souder, Miller & Associates (SMA) is pleased to submit the enclosed C-147 Siting Criteria Explanation and supporting documentations for the proposed Gem Recycling Containment Pond to be constructed in southeastern Lea County, New Mexico. The proposed recycling containment will be composed of a lined pond with an approximate capacity of 27.5 million gallons, and located in Township 25S, Range 32E, NE/4 of Section 23, located south of U.S. Highway 128 and east of County Road 1 (Orla Road).

Below are details on the siting criteria in Section 8 of the C-147 permit. Supporting documentation are included in the Appendices indicated in each siting criteria explanation. Information obtained from the supporting documentation was confirmed during a site visit by Lyndsey Bradshaw and Melodie Sanjari with SMA on May 7, 2019.

### **8.1 Groundwater is less than 50 feet below the bottom of the recycling containment**

The facility is located near the western boundary of a large geologic feature called the Monument Draw Trough, a structure formed by infilling of collapse structures that has resulted in a very thick package (in excess of 500 feet) of alluvial sediments overlying Triassic-aged redbed units, including the Chinle Formation and the Santa Rosa Sandstone (Nicholson & Clebsch, 1961). Near the proposed facility, the alluvium is estimated to be approximately 500 feet thick and is referred to as the Pecos Valley Alluvium. Production from the Pecos Valley Alluvium is very good, with well productions ranging from 100 to over 300 gallons per minute.

Groundwater, as indicated by lithologic logs from recent drilling activities near the site (location indicated on Figure 1), was not encountered at depths above 75 feet below ground surface (bgs), suggesting the maximum groundwater elevation in the area is 3,340 feet above mean sea level (amsl). The proposed facility is located at an elevation of approximately 3,415 feet amsl, and the base of the containment pond will be installed to a maximum depth of 20 feet bgs, or an elevation of approximately 3,395 ft amsl. As such, groundwater is present at an elevation greater than 55 feet from below the bottom of the proposed facility. Supporting information from nearby New Mexico Office of the State Engineer (NMOSE) registered wells, United States Geological Society (USGS) monitoring wells, and recent lithology logs are included as Appendix A. The exact borehole coordinates from the recent drilling activities are: LAT N32.0898611, LONG W-103.6246028.

### **8.2 Facility is located within municipal boundary or within a defined fresh water well field**

The facility is located approximately 25.3 miles from the nearest municipality (City of Jal) in an area consisting predominantly of oil and gas development. The proposed facility is not within any defined freshwater field as no municipal water wells are present near the facility location. A vicinity map of the proposed facility on a USGS topographic map is included as Figure 1. A map indicating the location of wells registered with the NMOSE is included as Appendix A.

### **8.3 Facility is located within an area overlying a subsurface mine**

Information from the USGS Topographic map covering the location of the facility, as well as, a map from the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) indicates that no subsurface mines or quarries are present within the facility boundaries. There are no quarries or subsurface mines within a one (1) mile radius of the facility boundaries. A vicinity map of the facility on a USGS topographic map is included as Figure 1. A map indicating the location of active mines from the EMNRD website is included as Appendix B.

### **8.4 Facility is located within an unstable area**

The facility is located in generally flat, slightly sloping topography with no nearby mapped faults. The USGS Seismic hazard map places the region as a low-risk area for potential earthquakes or other seismic hazards. As such, SMA believes the facility is not located in an unstable area. A vicinity map of the facility on a USGS topographic map is included as Figure 1, and a geologic map of the area with known faults is included as Figure 3. A seismic hazards map is included as Appendix C.

### **8.5 Facility is located within a 100-year floodplain**

The facility is located within Federal Emergency Management Agency (FEMA) Zone D in an area that is not covered by printed flood maps. Information from the FEMA Floodplain online database indicates that no known 100-year floodplains are present within 10 miles of the facility. A screenshot of the proposed facility area from the online FEMA Floodplain database is included as Appendix D.

### **8.6 Facility is located within 300 feet of a continuously flowing watercourse or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake**

The nearest continually flowing watercourse, as indicated on the USGS topographic map, is over 15 miles from the proposed facility boundary; the nearest ephemeral water course is located approximately 2,221 feet to the west of the proposed facility. No Lakebeds and/or sinkholes are located within 3 miles of the facility. A vicinity map of the facility on a USGS topographic map is included as Figure 1, and an aerial photo of the project area is included as Figure 2. The absence of watercourses, lakebeds, sinkholes, and playa lakes in the near vicinity of the proposed facility was confirmed by a site visit conducted by Lyndsey Bradshaw and Melodie Sanjari with SMA on May 7, 2019.

### **8.7 Facility is located within 1,000 feet of an existing residence, school, hospital, institution, or church at time of initial inspection**

The facility is located over 3 miles from the nearest private residence. The closest facilities to the proposed facility are existing oil field tank batteries and well pads surrounding the facility. A vicinity map of the facility on a USGS topographic map is included as Figure 1, and an aerial photo of the project area is included as Figure 2. The absence of residences, schools, hospitals, churches, or institutions in the vicinity

of the proposed facility was confirmed by a site visit conducted by Lyndsey Bradshaw and Melodie Sanjari with SMA on May 7, 2019.

**8.8 Facility is located within 500 feet of a spring or fresh water well in existence at time of initial inspection**

The nearest freshwater well registered with the NMOSE or USGS is located approximately 2.0 miles to the northeast of the proposed facility. No springs are indicated on USGS topographic maps within 1,000 feet of the proposed facility. A vicinity map of the facility on a USGS topographic map is included as Figure 1, and an aerial photo of the project area indicating the location of registered wells is included as Figure 2. Supporting information from nearby NMOSE wells and the USGS monitoring wells is included as Appendix A. The absence of springs or drinking water wells in the vicinity of the proposed facility was confirmed by a site visit conducted by Lyndsey Bradshaw and Melodie Sanjari with SMA on May 7, 2019.

**8.9 Facility is located within 500 feet of a wetland**

The nearest wetland as mapped by the United States Fish and Wildlife Service is approximately 1 mile from the proposed facility. A map prepared by the United States Fish and Wildlife Service (USFWS) online wetland database is included as Appendix E. The absence of potential wetlands in the vicinity of the proposed facility was confirmed by a site visit conducted by Lyndsey Bradshaw and Melodie Sanjari with SMA on May 7, 2019.

If you have any questions, please do not hesitate to call me at 505-215-6569 or to e-mail me at [Curtis.Pattillo@soudermiller.com](mailto:Curtis.Pattillo@soudermiller.com).

Sincerely,

**Souder, Miller and Associates**



Curtis Pattillo  
Project Scientist

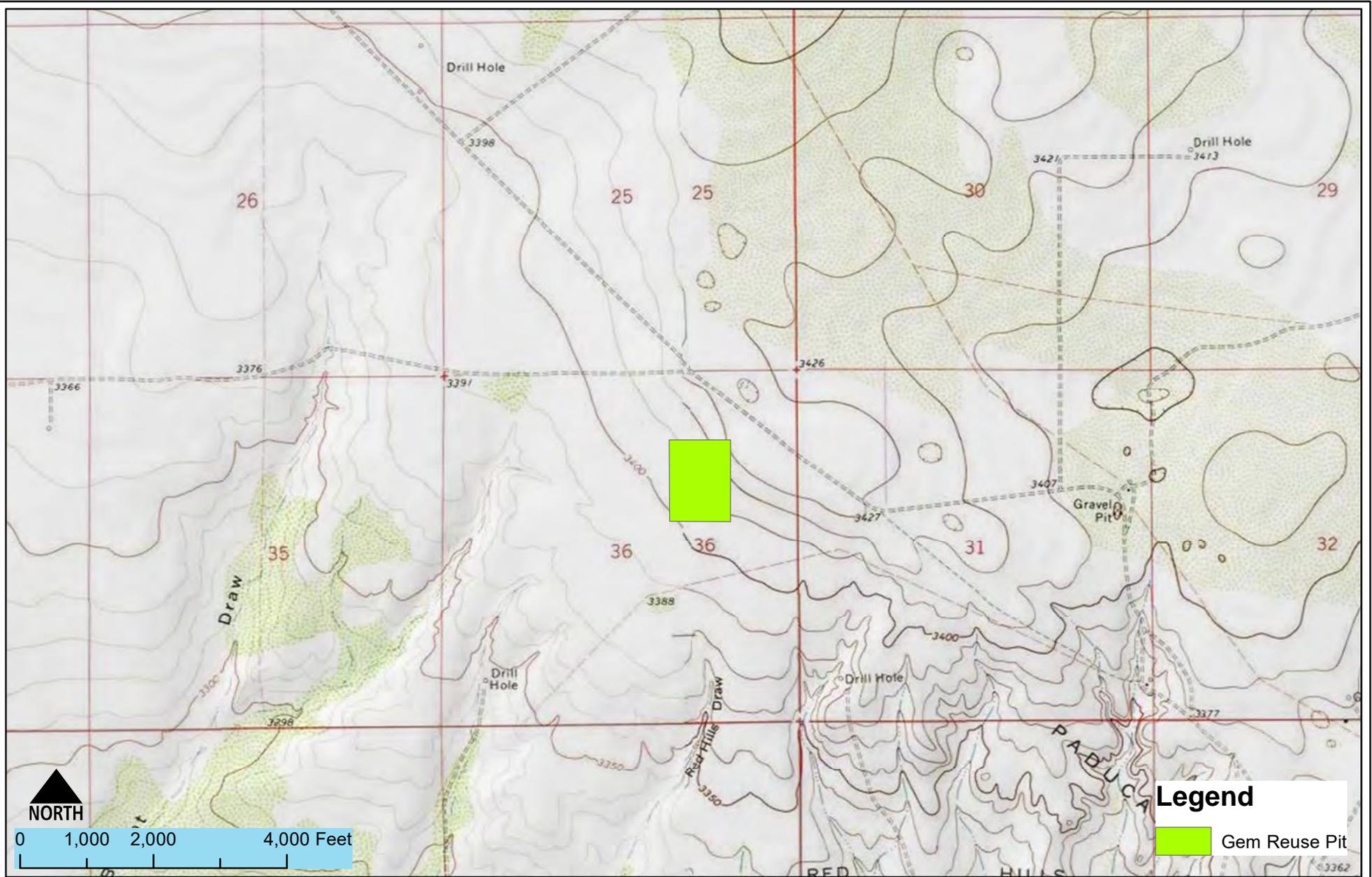


R. Jay Vanlandingham, R.G.  
Senior Geoscientist

- Enclosures:
- Figure 1: Vicinity Map on USGS Topographic Quad
  - Figure 2: Site Aerial Photo
  - Figure 3: Geologic Map of Proposed Facility Area
  - Appendix A: Groundwater & Well Information (NMOSE & USGS)
  - Appendix B: Active Mine/Quarry Map (NM EMNRD)
  - Appendix C: USGS Seismic Hazard Map
  - Appendix D: FEMA Floodplain Information
  - Appendix E: Wetlands & Critical Habitat Map (USFWS)



## Figures



**SITE MAP - TOPOGRAPHICAL MAP  
EOG GEM RECYCLING FACILITY  
S23, R32E T25S, LEA COUNTY, NM.**

Figure 1

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Drawn	_____	Curtis Pattillo
Checked	_____	
Approved	_____	



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**SITE MAP - AERIAL MAP  
EOG GEM RECYCLING FACILITY  
S23, R32E T25S, LEA COUNTY, NM.**

Figure 2

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Checked	_____	
Approved	_____	

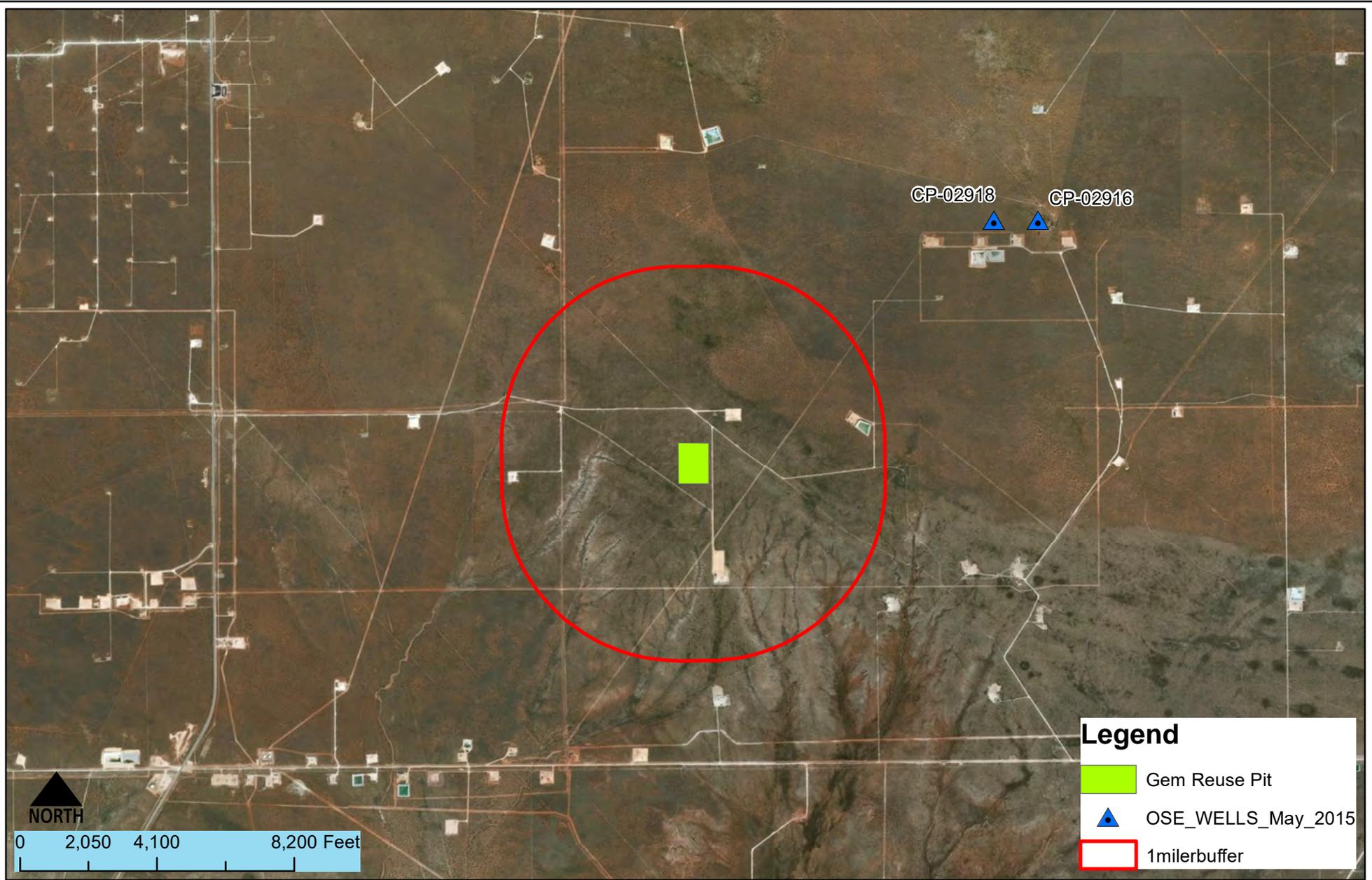


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## **Appendix A**

# **Groundwater & Well Information (NMOSE & USGS)**



**Legend**

- Gem Reuse Pit
- OSE\_WELLS\_May\_2015
- 1milerbuffer

**SITE MAP - NMOSE & USGS MAP  
EOG GEM RECYCLING FACILITY  
S23, R32E T25S, LEA COUNTY, NM.**

APPENDIX A

Date Saved: 4/30/2019	By: _____	Date: _____	Revisions	Descr: _____
	By: _____	Date: _____		Descr: _____
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Checked	_____	
Approved	_____	



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# SOIL BORING / MONITOR WELL LOG

Project:	<b>GEM REUSE PIT</b>	Drilling Company:	<b>WHITE DRILLING</b>
Project Number:	—	Driller:	<b>DALLAS RADAR</b>
Client:	<b>EOG RESOURCES</b>	Drilling Method:	<b>AIR ROTARY</b>
Boring / Well Number:	<b>B-1</b>	Bore Hole Diameter:	<b>5"</b>
Total Depth:	<b>75</b>	Screen: Diam. ___ Length ___ Slot Size ___	
Surface Elevation:	<b>N/A</b>	Casing: Diam. ___ Length ___ Type ___	
Geologist:	—	Date Drilled:	<b>05/02/2019</b>
Latitude:	—	Drill Rig:	<b>FAILING 1500 AIR ROTARY RIG</b>

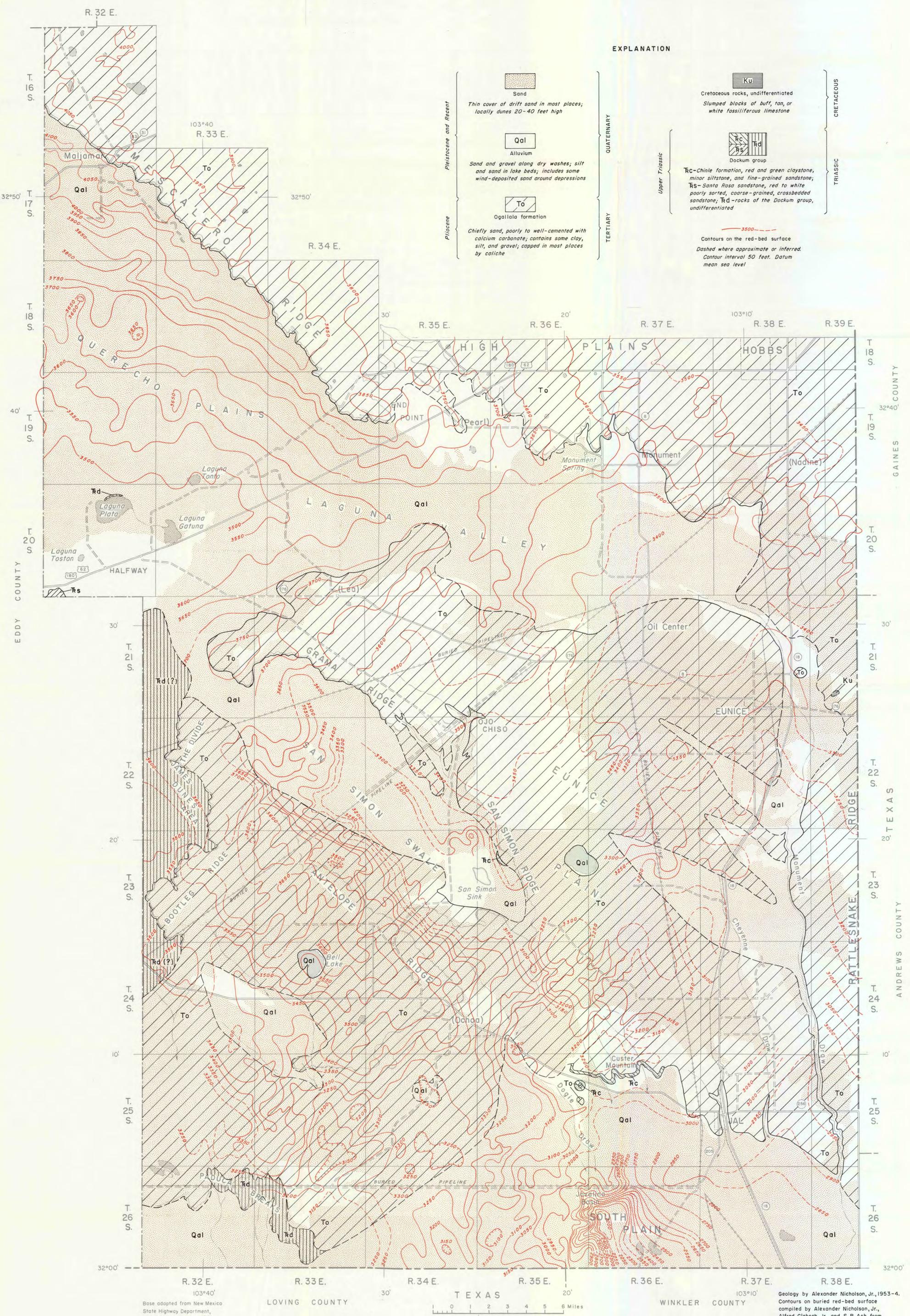
DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER		Qp (tsf)	DEPTH SCALE
					1st 6"	2nd 6"		
	[Symbol: Diagonal Lines]		TAN SILTY SAND					
5		SS	TAN CALICHE	37				
10		SS		73				
5		SS	TAN SANDY CALICHE	37				
20		SS		84				
5		SS	RED SANDSTONE WITH SOFT SAND LAYERS	50/5"				
30		SS		50/2"				
5		SS	RED SANDSTONE	50/ 1/2"				
40		SS		50/ 1/2"				
CONTINUED ON NEXT SHEET								
<p><b>NOTE</b> NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.</p>								

# SOIL BORING / MONITOR WELL LOG

Project: **GEM REUSE PIT**  
 Project Number: **---**  
 Client: **EOG RESOURCES**  
 Boring / Well Number: **B-1 (CONT.)**  
 Total Depth: **75**  
 Surface Elevation: **N/A**  
 Geologist: **---**  
 Latitude: **---**

Drilling Company: **WHITE DRILLING**  
 Driller: **DALLAS RADAR**  
 Drilling Method: **AIR ROTARY**  
 Bore Hole Diameter: **5"**  
 Screen: Diam. **---** Length **---** Slot Size **---**  
 Casing: Diam. **---** Length **---** Type **---**  
 Date Drilled: **05/02/2019**  
 Drill Rig: **FAILING 1500 AIR ROTARY RIG**

DEPTH IN FEET	SYMBOL	SAMPLE	MATERIAL DESCRIPTION	N-BLOWS PER FOOT	TEXAS CONE PENETROMETER		Qp (tsf)	DEPTH SCALE	
					1st 6"	2nd 6"			
5	•••••	SS	RED SANDSTONE	50/0"					
50	•••••	SS		50/ 1/2"					
5	•••••	SS		50/ 1/4"					
60	•••••	SS		50/ 1/2"					
5	•••••	SS		50/0"					
70	•••••	SS		50/1"					
5	•••••	SS		50/0"					
TOTAL DEPTH OF BORING 75 FEET									
<p><b>NOTE</b>            NO GROUNDWATER WAS PRESENT DURING OR AT COMPLETION OF DRILLING ACTIVITIES.</p>									



**EXPLANATION**

Pleistocene and Recent	[Sand symbol]	Sand <i>Thin cover of drift sand in most places; locally dunes 20-40 feet high</i>	QUATERNARY	}	CRETACEOUS
	[Qal symbol]	Qal Alluvium <i>Sand and gravel along dry washes; silt and sand in lake beds; includes some wind-deposited sand around depressions</i>			
Pliocene	[To symbol]	To Ogallala formation <i>Chiefly sand, poorly to well-cemented with calcium carbonate; contains some clay, silt, and gravel; capped in most places by caliche</i>	TERTIARY	}	TRIASSIC
	[Rc, Rs, Rd symbols]	Rc-Rs-Rd Dockum group <i>Rc-Chinle formation, red and green claystone, minor siltstone, and fine-grained sandstone; Rs-Santa Rosa sandstone, red to white poorly sorted, coarse-grained, crossbedded sandstone; Rd-rocks of the Dockum group, undifferentiated</i>			
			[Ku symbol]		
			Cretaceous rocks, undifferentiated <i>Slumped blocks of buff, tan, or white fossiliferous limestone</i>		

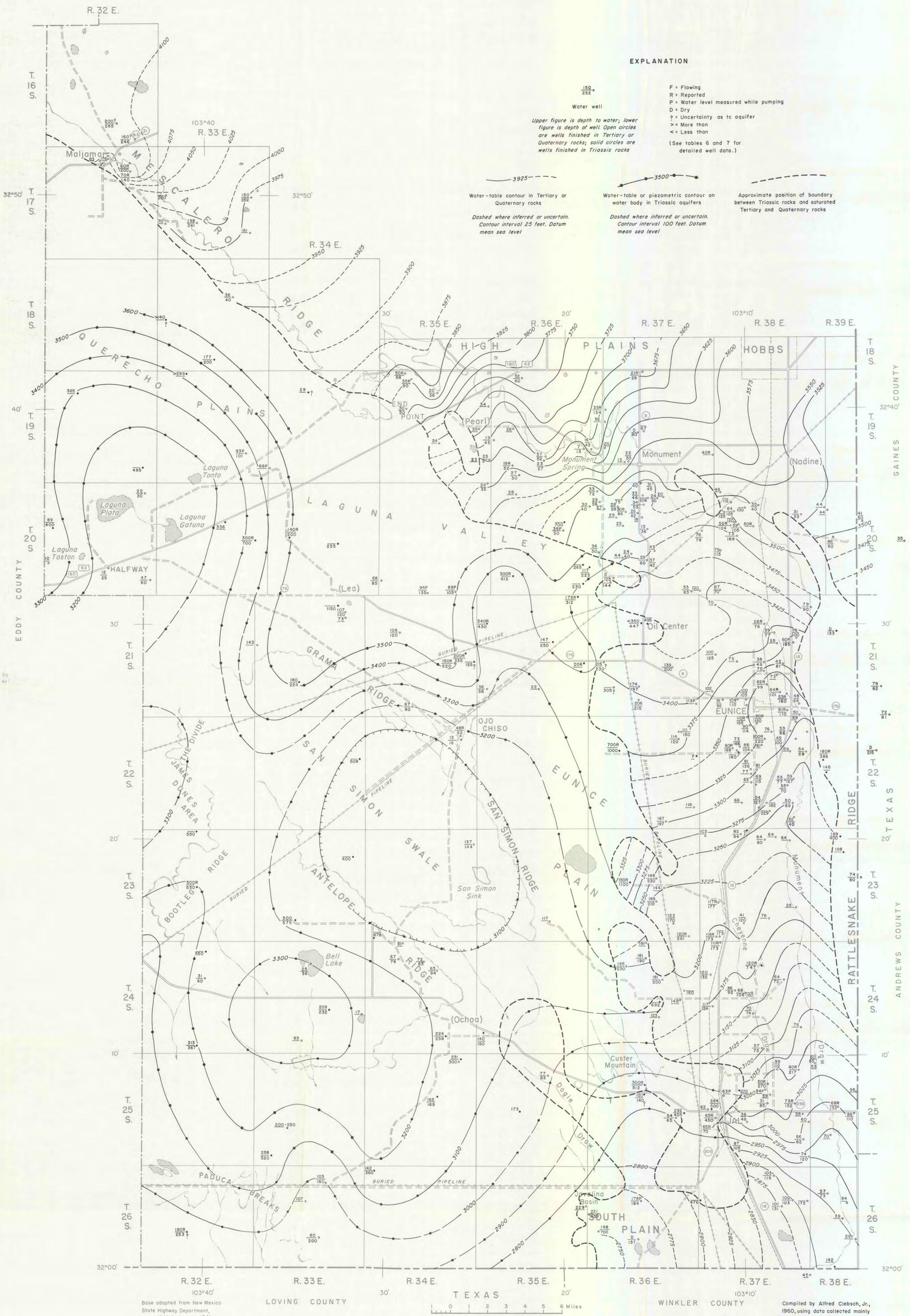
— 3500 —  
 Contours on the red-bed surface  
 Dashed where approximate or inferred.  
 Contour interval 50 feet. Datum mean sea level

Base adapted from New Mexico State Highway Department, general highway map, 1941.

0 1 2 3 4 5 6 Miles

Geology by Alexander Nicholson, Jr., 1953-4.  
 Contours on buried red-bed surface compiled by Alexander Nicholson, Jr., Alfred Clebsch, Jr., and S.R. Ash from shot-hole logs, 1960.

**PLATE 1. GEOLOGIC MAP OF SOUTHERN LEA COUNTY, NEW MEXICO**



**EXPLANATION**

150°  
 252°  
 Water well  
 Upper figure is depth to water; lower figure is depth of well. Open circles are wells finished in Tertiary or Quaternary rocks; solid circles are wells finished in Triassic rocks  
 F = Flowing  
 R = Reported  
 P = Water level measured while pumping  
 D = Dry  
 ? = Uncertainty as to aquifer  
 > = More than  
 < = Less than  
 (See tables 6 and 7 for detailed well data.)

3925  
 Water-table contour in Tertiary or Quaternary rocks  
 Dashed where inferred or uncertain. Contour interval 25 feet. Datum mean sea level  
 3500  
 Water-table or piezometric contour on water body in Triassic aquifers  
 Dashed where inferred or uncertain. Contour interval 100 feet. Datum mean sea level  
 Approximate position of boundary between Triassic rocks and saturated Tertiary and Quaternary rocks

Base adapted from New Mexico State Highway Department, general highway map, 1941.

0 1 2 3 4 5 6 Miles

Compiled by Alfred Clebsch, Jr., 1960, using data collected mainly by Alexander Nicholson, Jr., in 1953 and 1954.

**PLATE 2. GROUND-WATER MAP OF SOUTHERN LEA COUNTY, NEW MEXICO**

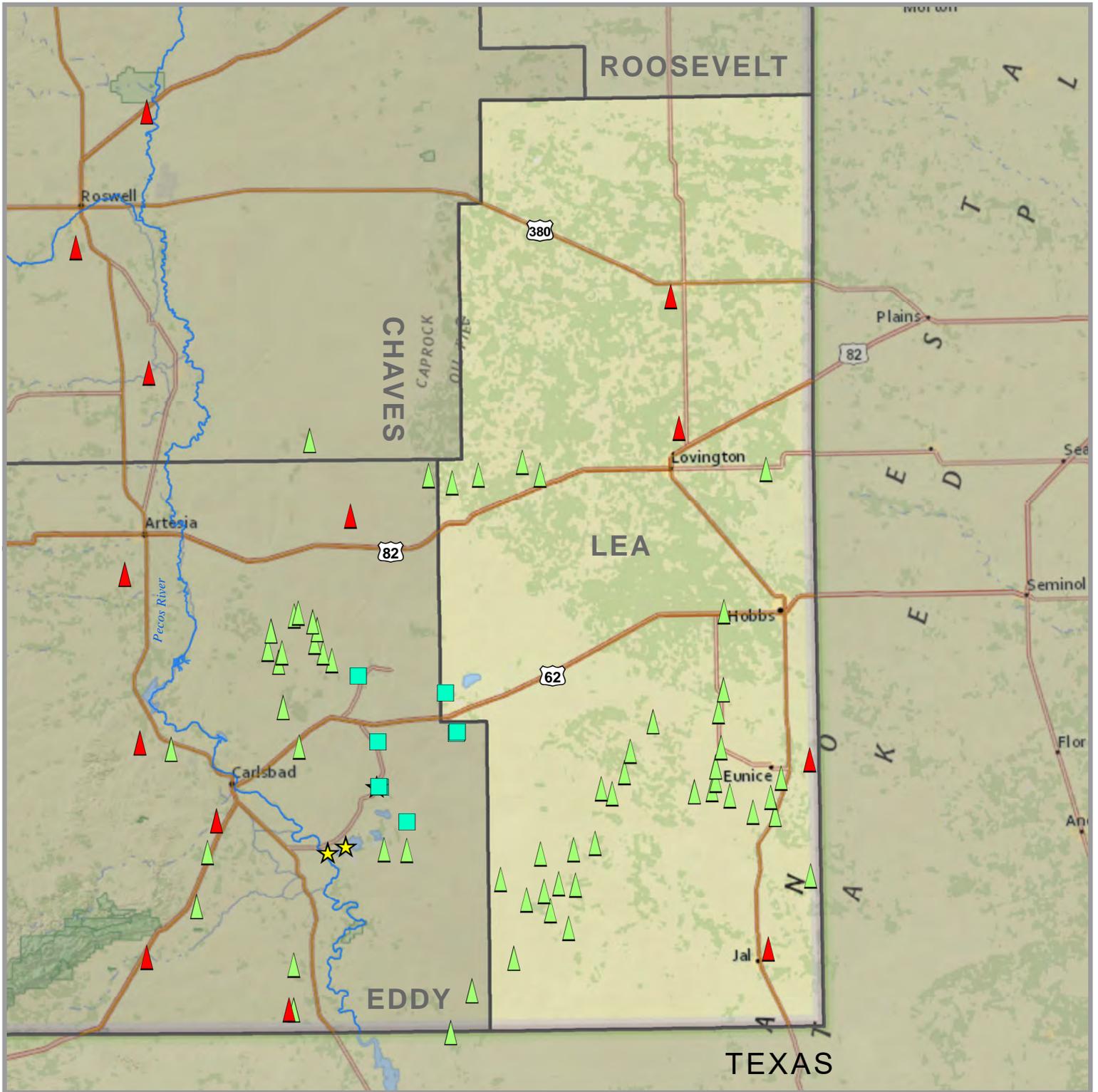


## **Appendix B**

### **Active Mine/Quarry Map (NM EMNRD)**



# Active Mines in Lea County, New Mexico, December 2017



### Metals

- Coal
- Potash
- Copper / Molybdenum
- Gold & Silver
- Iron
- Uranium

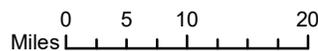
### Industrial Minerals

- Calcite
- Gemstone
- Gypsum
- Humate
- Perlite
- Pumice
- Salt
- Silica / Flux / Silver
- Zeolites

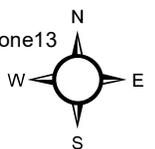
### Aggregate & Stone

- Aggregate
- Caliche
- Clay & Shale
- Dimension & Flagstone
- Limestone
- Red Dog
- Scoria
- Travertine

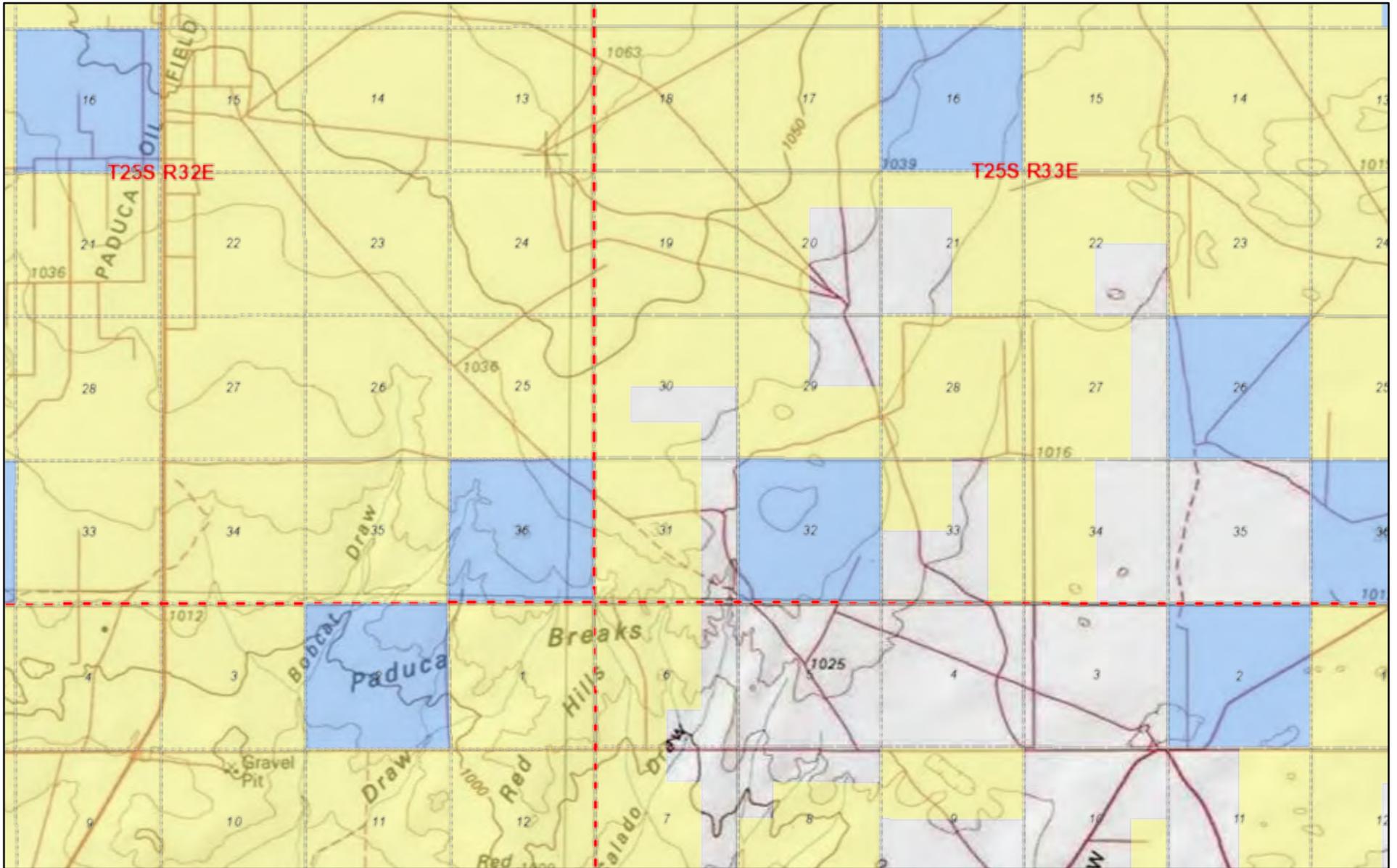
Data: November 2018 database query, Mining & Minerals Division, Mine Registration, Reporting & Safeguarding Program.  
 Basemap: Esri National Geographic. Map: Linda S. DeLay, GISP



NAD 83 UTM NM Zone13



# Active Mines in New Mexico

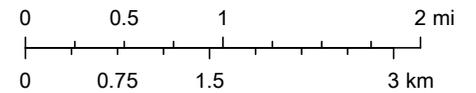


4/30/2019, 1:20:30 PM

Registered Mines

✕ Aggregate, Stone etc.

1:72,224



U.S. Bureau of Land Management - New Mexico State Office, Copyright:©

EMNRD MMD GIS Coordinator

NM Energy, Minerals and Natural Resources Department (<http://nm-emnrd.maps.arcgis.com/apps/webappviewer/index.html?id=1b5e577974664d689b47790897ca2795>)

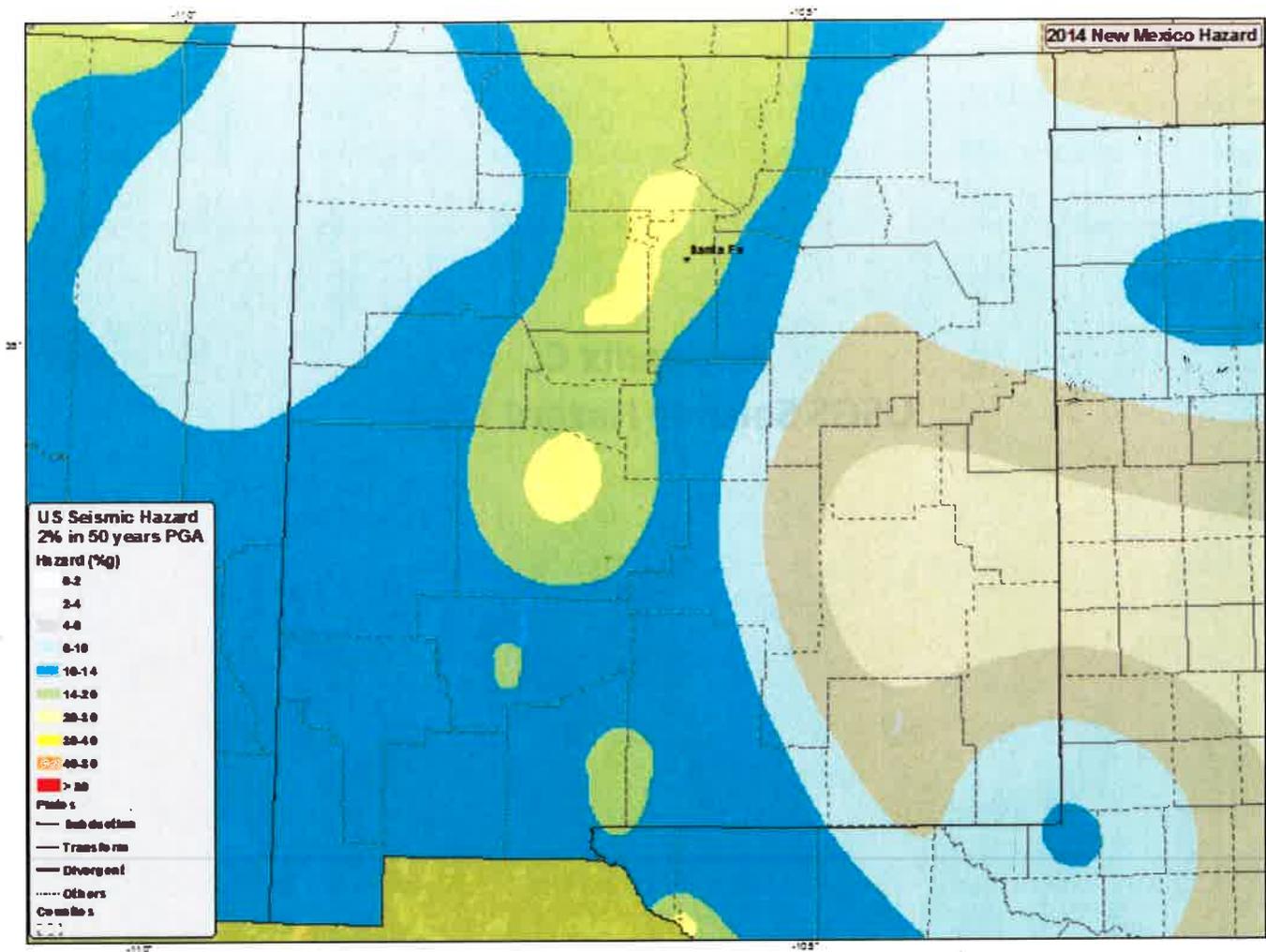


## **Appendix C**

# **USGS Seismic Hazard Map**

# Information by Region - New Mexico

## 2014 Seismic Hazard Map

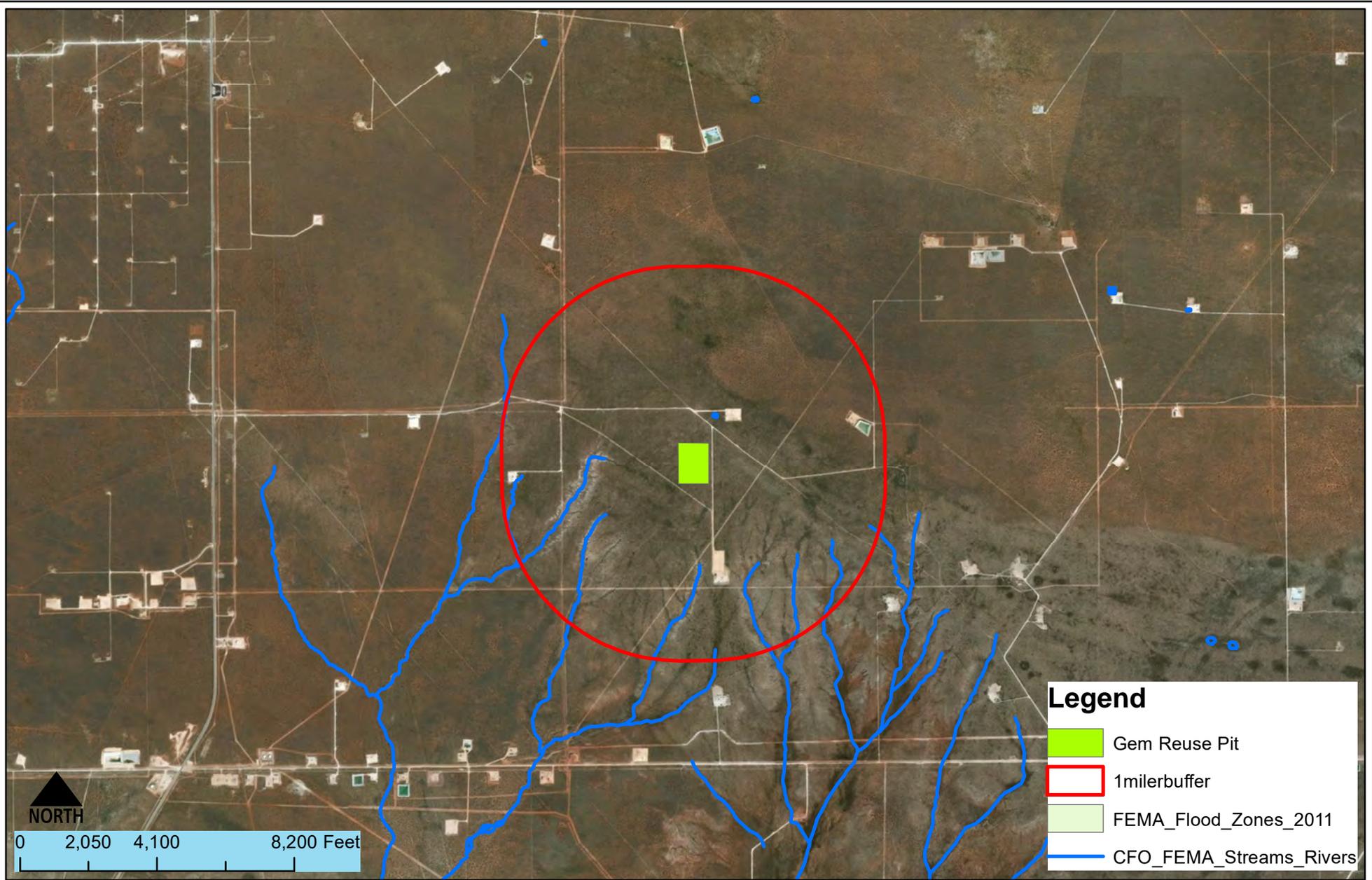


[USGS National Seismic Hazard Maps](#)



## **Appendix D**

# **FEMA Floodplain Information**



**Legend**

- Gem Reuse Pit
- 1milerbuffer
- FEMA\_Flood\_Zones\_2011
- CFO\_FEMA\_Streams\_Rivers

**SITE MAP - FEMA FLOODPLAIN & RIVERS, STREAMS MAP  
EOG GEM RECYCLING FACILITY  
S23, R32E T25S, LEA COUNTY, NM.**

APPENDIX D

Date Saved: 4/30/2019	By: _____	Date: _____	Revisions	Descr: _____
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Checked	_____	
Approved	_____	

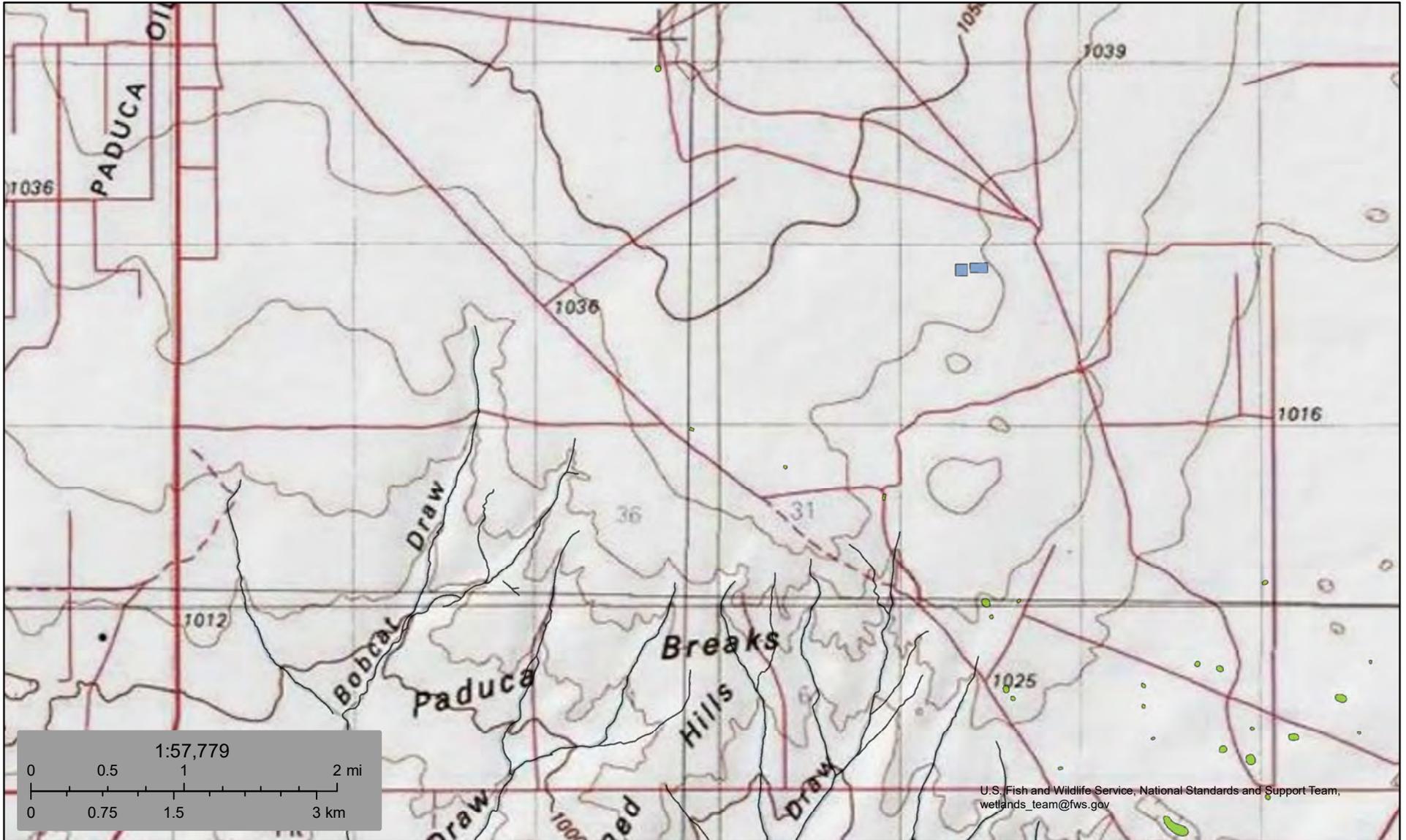


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## **Appendix E**

# **Wetlands & Critical Habitat Map (USFWS)**



April 30, 2019

### Wetlands

- |   |                                |   |                                   |   |          |
|---|--------------------------------|---|-----------------------------------|---|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland       |  | Lake     |
|  | Estuarine and Marine Wetland   |  | Freshwater Forested/Shrub Wetland |  | Other    |
|   |                                |  | Freshwater Pond                   |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.