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

January 2, 2018

EMNRD/OCD
Attn: Bradford Billings 1220
South St. Francis Dr.
Santa Fe, NM 87505

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

Dear Mr. Billings,

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 Galaxy Reuse Water Facility and Containment Pit.

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

Sincerely,

Dustin Kinder
EOG Resources, Water Resource Manager

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): Galaxy 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 NE / NW Section 16 Township 24S Range 33E County: Lea

Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.

☒ **Recycling Facility:**

Location of recycling facility (if applicable): Latitude 32.2214792 Longitude -103.5825816 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 32.2214836 Longitude -103.5808435 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.

Variances:

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.

General siting

Ground water is less than 50 feet below the bottom of the Recycling Containment. NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ 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	☐ Yes ☒ No ☐ NA
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division	☐ Yes ☒ No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map	☐ Yes ☒ No
Within a 100-year floodplain. FEMA map	☐ Yes ☒ 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	☐ Yes ☒ 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	☐ Yes ☒ 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	☐ Yes ☒ No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site	☐ Yes ☒ 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): Dustin Kinder Title: Water Resource Manager

Signature: _____ Date: 1/2/2018

e-mail address: dustin_kinder@eogresources.com Telephone: 817-806-0470

11.

OCD Representative Signature: _____ **Approval Date:** January 18, 2018

Title: Environmental Specialist **OCD Permit Number:** 1RF-25

☐ OCD Conditions _____

☐ Additional OCD Conditions on Attachment

fOY1801852871

pOY1801853298

Variance Request for Bird Deterrent

Re: Galaxy 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.

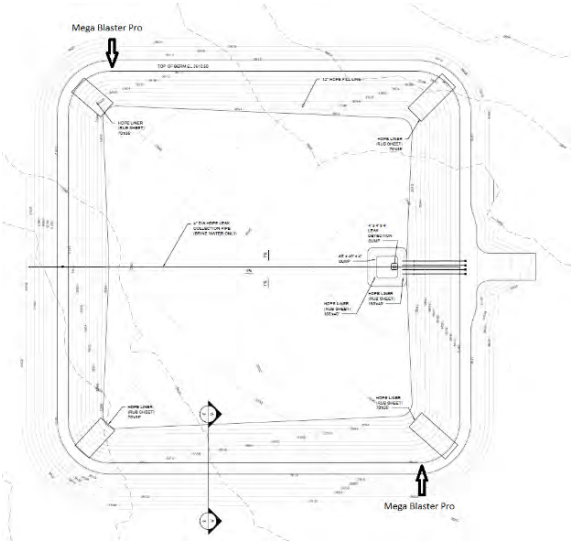
Mega Blaster Pro – Specs:

- 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 ¾" 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: Galaxy 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 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.

Galaxy Reuse Water Recycling Facility and Containment Pit

NMOCD Submittal – C147 Registration Application

January 2, 2018

Table of Contents

Introduction

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.

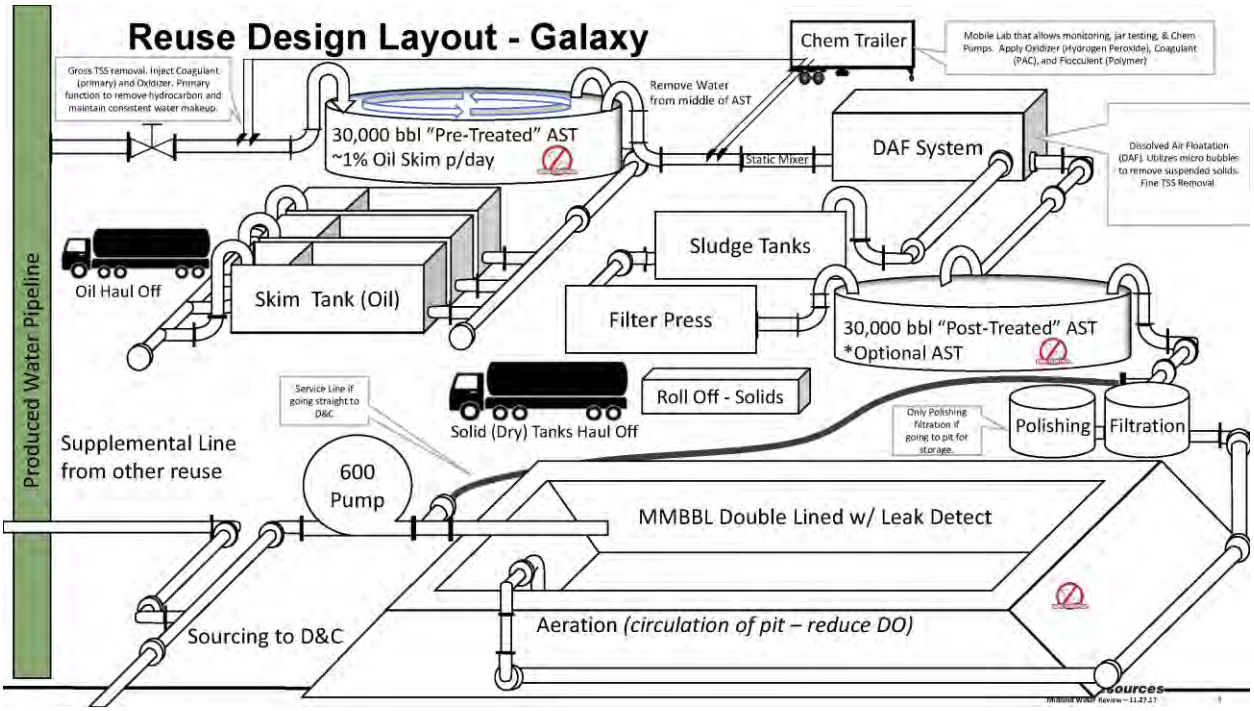
C-147 Detail

Operator and Facility / Location Detail

The proposed reuse water containment facility & containment pit, referred to as the Galaxy Reuse Water Recycling Facility and Containment Pit, will be owned and operated by EOG Resources, Inc. (EOG) and located in Township 24 South, Range 33 East, and Section 16 in southwestern Lea County.

Recycling Facility Detail

The proposed containment pit will be located adjacent to the Galaxy 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, *Galaxy_Pond_NAD83*, 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, *Galaxy_Pond_NAD83,* 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 *Galaxy_Pond_NAD83,* 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 Galaxy 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

Attachments and Supporting Documents

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

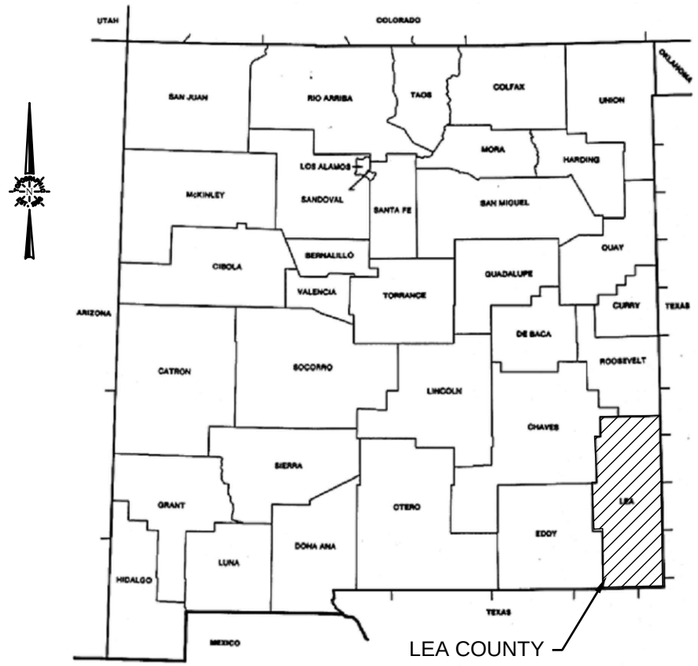
EOG RESOURCES
GALAXY AREA CONTAINMENT POND
PRELIMINARY PLAN
LEA COUNTY, NEW MEXICO

INDEX	
SHEET 1	COVER PAGE
SHEET 2	OVERALL SITE LAYOUT
SHEET 3	OPTION I POND LAYOUT
SHEET 4	OPTION II POND LAYOUT
SHEET 5	OPTION I POND CALCULATIONS
SHEET 6	OPTION II POND CALCULATIONS
SHEET 7	POND CROSS SECTION PROFILES
SHEET 8	DETAILS 1 OF 2
SHEET 9	DETAILS 2 OF 2

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.

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM



TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM

COVER SHEET

GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

REVISION:	
XXX	XX/XX/XXXX

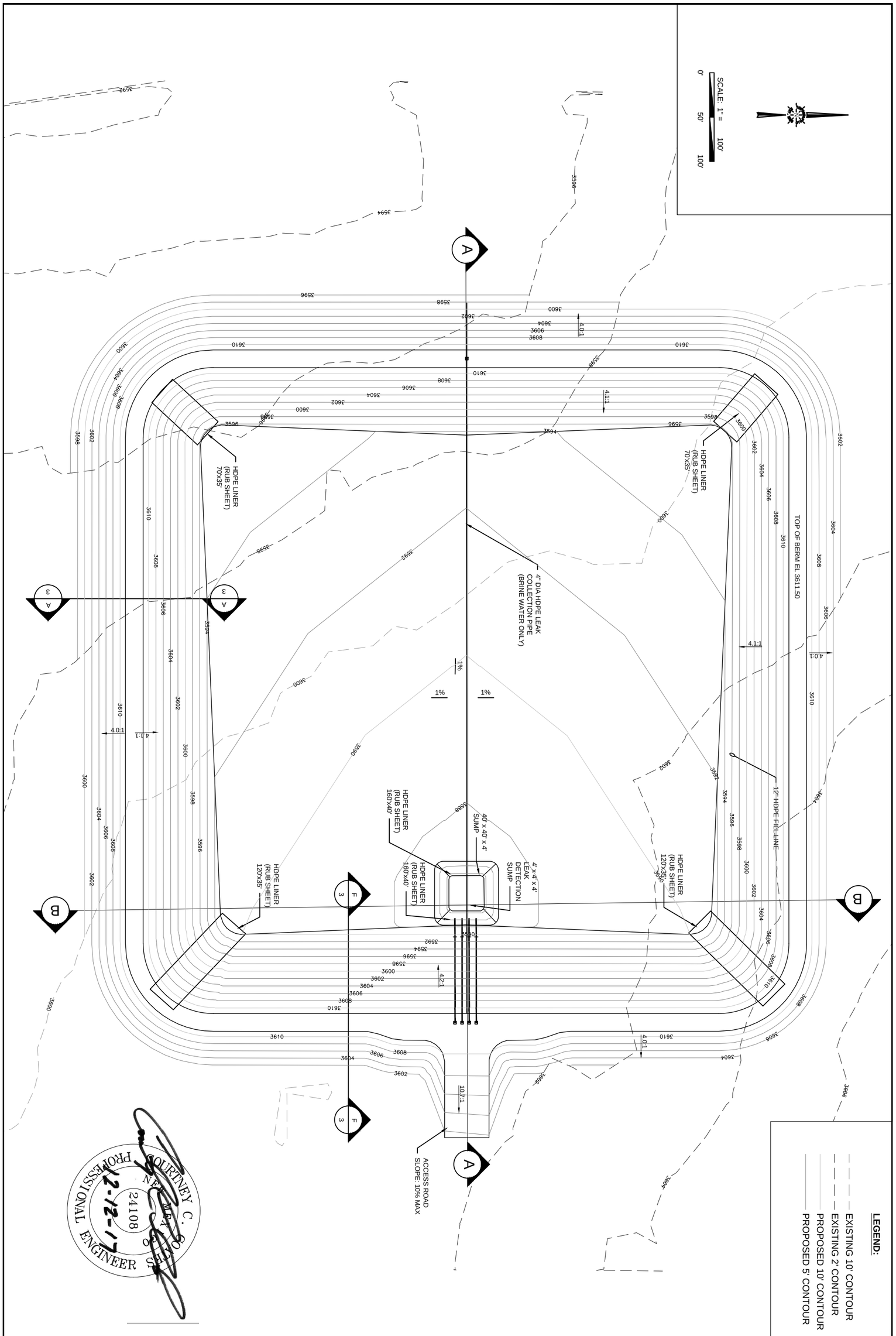
DATE: 12/1/17
FILE:GALAXY_POND_NAD83
DRAWN BY: CCC
REVIEWED BY: CCC
SCALE: N/A
SHEET: 1 OF 9

DATE: 12/1/17	REVISION:	
FILE: GALAXY_POND_NAD83	XXX	XX/XX/XXXX
DRAWN BY: CCC		
REVIEWED BY: CCC		
SCALE: 1"=2000'		
SHEET : 2 OF 9		

SITE LOCATION EXHIBIT

GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM



COURTNEY C. NEWLAND 24108 PROFESSIONAL ENGINEER STATE OF TEXAS 12-1-17

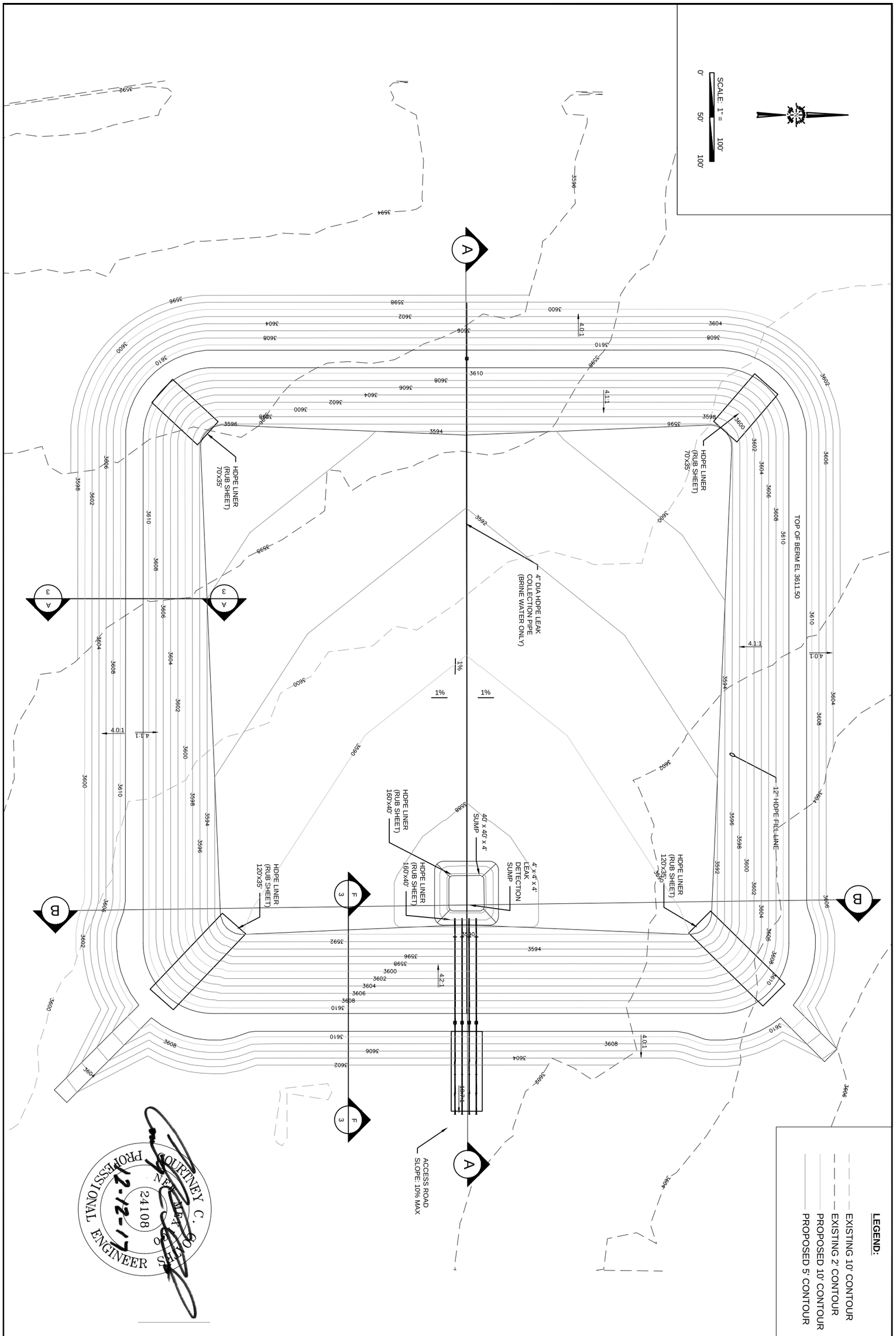
DATE:	12/1/17
FILE:	GALAXY_POND_NAD83
DRAWN BY:	CCC
REVIEWED BY:	CCC
SCALE:	1"=100'
SHEET :	3 OF 9

REVISION:	
XXX	XX/XX/XXXX

OPTION #1

GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM



COURTNEY C. NEWMAN
24108
PROFESSIONAL ENGINEER
12-12-17

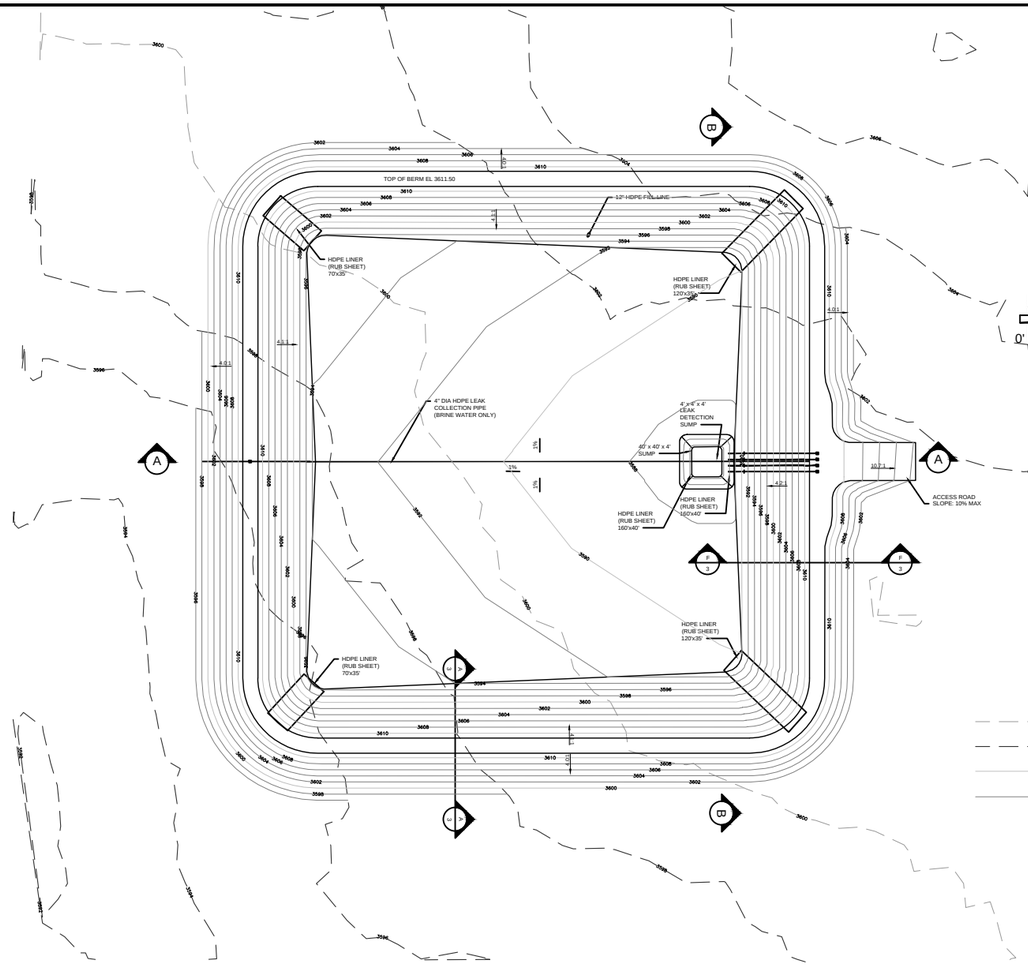
DATE:	12/1/17
FILE:	GALAXY_POND_NAD83
DRAWN BY:	CCC
REVIEWED BY:	CCC
SCALE:	1"=100'
SHEET :	4 OF 9

REVISION:	
XXX	XX/XX/XXXX

OPTION #2

GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM



LEGEND:

- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- PROPOSED 10' CONTOUR
- PROPOSED 5' CONTOUR

EARTHWORK QUANTITIES

CUT VOLUME:	120,356 YD^3
FILL VOLUME:	104,160 YD^3
TOPSOIL (6" STOCKPILED):	13,555 YD^3
TOTAL EXPORT(IMPORT):	2,640 YD^3
TOTAL GRADING AREA:	16.80 ACRES

*VOLUMES ASSUME A FILL FACTOR OF 1.20

COURTNEY C. COLES NEW MEXICO 24108 PROFESSIONAL ENGINEER 12-12-17

POND SUMMARY

MAX VOLUME:	1,440,633 BBLS
MAX AREA:	12.04 ACRES
MAX ELEVATION OF POND:	3,611.50 FT
2' FREEBOARD ELEVATION:	3,609.5 FT
VOLUME AT FREEBOARD:	1,256,251 BBLS

STAGE STORAGE TABLE

ELEV	AREA (ACRES)	VOLUME (BBLS)	VOLUME (AC-FT)	VOLUME (CY)	
3,580.47	0.00	0.00	0.00	0.00	SUB-GRADE VOLUME 197,723.37 BBLS - 25.22 AC-FT SHOWN GRAPHICALLY LEFT
3,580.50	0.00	0.09	0.00	0.02	
3,581.00	0.00	1.90	0.00	0.39	
3,581.50	0.00	4.54	0.00	0.93	
3,582.00	0.00	8.25	0.00	1.70	
3,582.50	0.00	13.16	0.00	2.71	
3,583.00	0.00	19.40	0.00	3.99	
3,583.50	0.00	27.15	0.00	5.59	
3,584.00	0.00	36.63	0.00	7.54	
3,584.47	0.00	47.38	0.01	9.75	
3,584.50	0.04	52.04	0.01	10.71	
3,585.00	0.04	209.95	0.03	43.20	
3,585.50	0.05	399.24	0.05	82.15	
3,586.00	0.06	622.99	0.08	128.19	
3,586.50	0.07	883.89	0.11	181.87	
3,587.00	0.08	1,184.39	0.15	243.70	
3,587.50	0.09	1,526.99	0.19	314.19	
3,588.00	0.10	1,914.63	0.24	393.96	
3,589.00	0.38	3,825.66	0.49	787.17	
3,589.50	0.70	5,955.54	0.76	1,225.42	
3,590.00	1.11	9,501.43	1.21	1,955.03	
3,590.50	1.59	14,777.23	1.88	3,040.58	
3,591.00	2.15	22,099.98	2.82	4,547.32	
3,591.50	2.78	31,755.40	4.05	6,534.03	
3,592.00	3.41	43,891.05	5.60	9,031.08	
3,592.50	4.06	58,532.91	7.47	12,043.81	
3,593.00	4.70	75,688.56	9.65	15,573.78	
3,593.50	5.34	95,363.25	12.16	19,622.07	
3,594.00	5.99	117,565.39	14.99	24,190.41	
3,594.50	6.59	142,212.08	18.14	29,261.75	
3,595.00	7.10	169,044.63	21.56	34,782.85	
3,595.50	7.53	197,723.37	25.22	40,683.82	
3,596.00	7.87	227,911.15	29.07	46,895.30	BREACH VOLUME 1,242,910.59 BBLS - 158.52 AC-FT SHOWN GRAPHICALLY LEFT
3,596.50	8.13	259,269.73	33.07	53,347.68	
3,597.00	8.28	291,437.67	37.17	59,966.60	
3,597.50	8.40	324,147.96	41.34	66,697.11	
3,598.00	8.52	357,325.52	45.57	73,523.77	
3,598.50	8.64	390,973.85	49.86	80,447.29	
3,599.00	8.76	425,096.02	54.22	87,468.32	
3,599.50	8.89	459,696.72	58.63	94,587.80	
3,600.00	9.01	494,779.45	63.10	101,806.47	
3,600.50	9.13	530,345.05	67.64	109,124.50	
3,601.00	9.26	566,395.92	72.24	116,542.37	
3,601.50	9.38	602,933.37	76.90	124,060.36	
3,602.00	9.51	639,960.71	81.62	131,679.16	
3,602.50	9.63	677,482.55	86.40	139,399.70	
3,603.00	9.76	715,501.68	91.25	147,222.57	
3,603.50	9.89	754,016.57	96.17	155,147.44	
3,604.00	10.02	793,030.44	101.14	163,174.99	
3,604.50	10.15	832,552.52	106.18	171,307.10	
3,605.00	10.28	872,585.57	111.29	179,544.36	
3,605.50	10.41	913,128.85	116.46	187,886.59	
3,606.00	10.54	954,184.70	121.69	196,334.30	
3,606.50	10.67	995,759.49	127.00	204,888.78	
3,607.00	10.80	1,037,857.23	132.37	213,550.87	
3,607.50	10.94	1,080,480.04	137.80	222,321.00	
3,608.00	11.07	1,123,630.92	143.31	231,199.78	
3,608.50	11.21	1,167,308.41	148.88	240,186.92	
3,609.00	11.34	1,211,513.66	154.51	249,282.65	
3,609.50	11.48	1,256,251.46	160.22	258,487.95	2 FT FREEBOARD
3,610.00	11.62	1,301,525.18	165.99	267,803.54	
3,610.50	11.76	1,347,343.83	171.84	277,231.24	
3,611.00	11.90	1,393,713.38	177.75	286,772.30	
3,611.50	12.04	1,440,633.97	183.74	296,426.74	

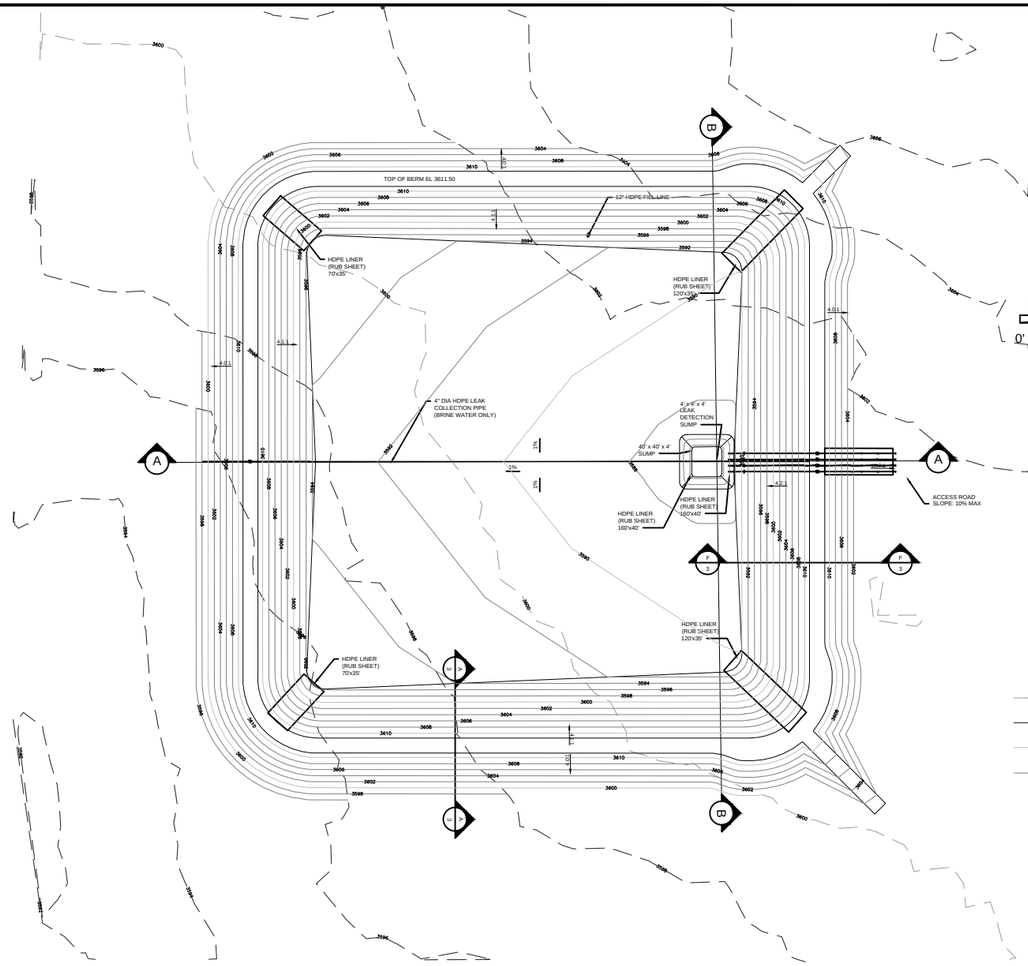
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE (817) 744-7543 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM

STAGESTORAGE/GRADING CALCULATIONS

OPTION #1 CONTAINMENT POND FOR EOG RESOURCES

REVISION:	
XXX	XX/XX/XXXX

DATE: 12/1/17
FILE:GALAXY_POND_NAD83
DRAWN BY: CCC
REVIEWED BY: CCC
SCALE: 1"=200'
SHEET : 5 OF 9



LEGEND:

- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- PROPOSED 10' CONTOUR
- PROPOSED 5' CONTOUR

COURTNEY C. COATES
NEW MEXICO
24108
12-12-17
PROFESSIONAL ENGINEER

EARTHWORK QUANTITIES

CUT VOLUME:	120,356 YD^3
FILL VOLUME:	105,026 YD^3
TOPSOIL (6" STOCKPILED):	13,635 YD^3
TOTAL EXPORT(IMPORT):	1,695 YD^3
TOTAL GRADING AREA:	16.90 ACRES

*VOLUMES ASSUME A FILL FACTOR OF 1.20

POND SUMMARY

MAX VOLUME:	1,440,633 BBLS
MAX AREA:	12.04 ACRES
MAX ELEVATION OF POND:	3,611.50 FT
2' FREEBOARD ELEVATION:	3,609.5 FT
VOLUME AT FREEBOARD:	1,256,251 BBLS

STAGE STORAGE TABLE

ELEV	AREA (ACRES)	VOLUME (BBLS)	VOLUME (AC-FT)	VOLUME (CY)	
3,580.47	0.00	0.00	0.00	0.00	
3,580.50	0.00	0.09	0.00	0.02	
3,581.00	0.00	1.90	0.00	0.39	
3,581.50	0.00	4.54	0.00	0.93	
3,582.00	0.00	8.25	0.00	1.70	
3,582.50	0.00	13.16	0.00	2.71	
3,583.00	0.00	19.40	0.00	3.99	
3,583.50	0.00	27.15	0.00	5.59	
3,584.00	0.00	36.63	0.00	7.54	
3,584.47	0.00	47.38	0.01	9.75	
3,584.50	0.04	52.04	0.01	10.71	
3,585.00	0.04	209.95	0.03	43.20	
3,585.50	0.05	399.24	0.05	82.15	
3,586.00	0.06	622.99	0.08	128.19	
3,586.50	0.07	883.89	0.11	181.87	
3,587.00	0.08	1,184.39	0.15	243.70	
3,587.50	0.09	1,526.99	0.19	314.19	
3,588.00	0.10	1,914.63	0.24	393.96	
3,589.00	0.38	3,825.66	0.49	787.17	
3,589.50	0.70	5,955.54	0.76	1,225.42	
3,590.00	1.11	9,501.43	1.21	1,955.03	
3,590.50	1.59	14,777.23	1.88	3,040.58	
3,591.00	2.15	22,099.98	2.82	4,547.32	
3,591.50	2.78	31,755.40	4.05	6,534.03	
3,592.00	3.41	43,891.05	5.60	9,031.08	
3,592.50	4.06	58,532.91	7.47	12,043.81	
3,593.00	4.70	75,688.56	9.65	15,573.78	
3,593.50	5.34	95,363.25	12.16	19,622.07	
3,594.00	5.99	117,565.39	14.99	24,190.41	
3,594.50	6.59	142,212.08	18.14	29,261.75	
3,595.00	7.10	169,044.63	21.56	34,782.85	
3,595.50	7.53	197,723.37	25.22	40,683.82	SUB-GRADE VOLUME 197,723.37 BBLS - 25.22 AC-FT SHOWN GRAPHICALLY LEFT
3,596.00	7.87	227,911.15	29.07	46,895.30	
3,596.50	8.13	259,269.73	33.07	53,347.68	
3,597.00	8.28	291,437.67	37.17	59,966.60	
3,597.50	8.40	324,147.96	41.34	66,697.11	
3,598.00	8.52	357,325.52	45.57	73,523.77	
3,598.50	8.64	390,973.85	49.86	80,447.29	
3,599.00	8.76	425,096.02	54.22	87,468.32	
3,599.50	8.89	459,696.72	58.63	94,587.80	
3,600.00	9.01	494,779.45	63.10	101,806.47	
3,600.50	9.13	530,345.05	67.64	109,124.50	
3,601.00	9.26	566,395.92	72.24	116,542.37	
3,601.50	9.38	602,933.37	76.90	124,060.36	
3,602.00	9.51	639,960.71	81.62	131,679.16	
3,602.50	9.63	677,482.55	86.40	139,399.70	
3,603.00	9.76	715,501.68	91.25	147,222.57	
3,603.50	9.89	754,016.57	96.17	155,147.44	
3,604.00	10.02	793,030.44	101.14	163,174.99	
3,604.50	10.15	832,552.52	106.18	171,307.10	
3,605.00	10.28	872,585.57	111.29	179,544.36	
3,605.50	10.41	913,128.85	116.46	187,886.59	
3,606.00	10.54	954,184.70	121.69	196,334.30	
3,606.50	10.67	995,759.49	127.00	204,888.78	
3,607.00	10.80	1,037,857.23	132.37	213,550.87	
3,607.50	10.94	1,080,480.04	137.80	222,321.00	
3,608.00	11.07	1,123,630.92	143.31	231,199.78	
3,608.50	11.21	1,167,308.41	148.88	240,186.92	
3,609.00	11.34	1,211,513.66	154.51	249,282.65	
3,609.50	11.48	1,256,251.46	160.22	258,487.95	2 FT FREEBOARD
3,610.00	11.62	1,301,525.18	165.99	267,803.54	BREACH VOLUME 1,242,910.59 BBLS - 158.52 AC-FT SHOWN GRAPHICALLY LEFT
3,610.50	11.76	1,347,343.83	171.84	277,231.24	
3,611.00	11.90	1,393,713.38	177.75	286,772.30	
3,611.50	12.04	1,440,633.97	183.74	296,426.74	

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE (817) 744-7527 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM

STAGESTORAGE/GRADING CALCULATIONS

OPTION #2 CONTAINMENT POND

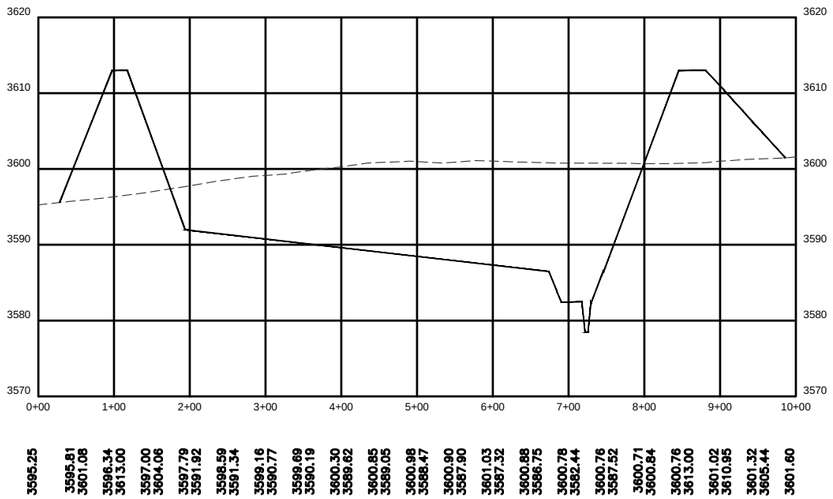
FOR

EOG RESOURCES

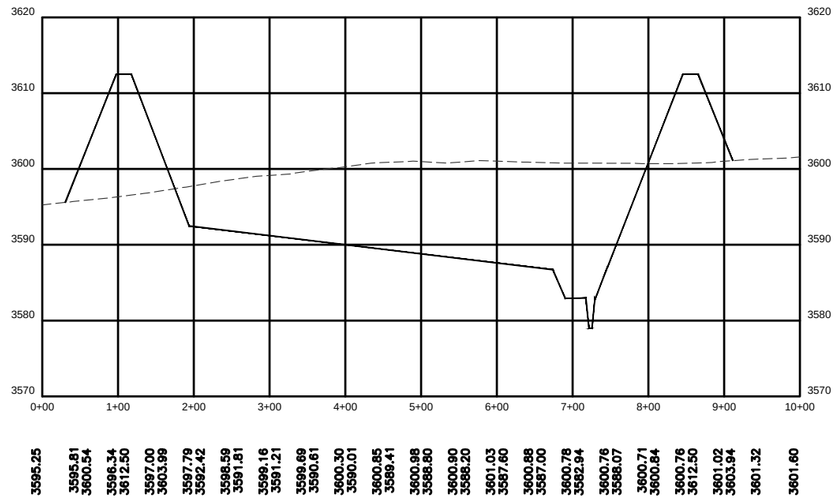
REVISION:	
XXX	XX/XX/XXXX

DATE: 12/1/17
FILE: GALAXY_POND_NAD83
DRAWN BY: CCC
REVIEWED BY: CCC
SCALE: 1"=200'
SHEET: 6 OF 9

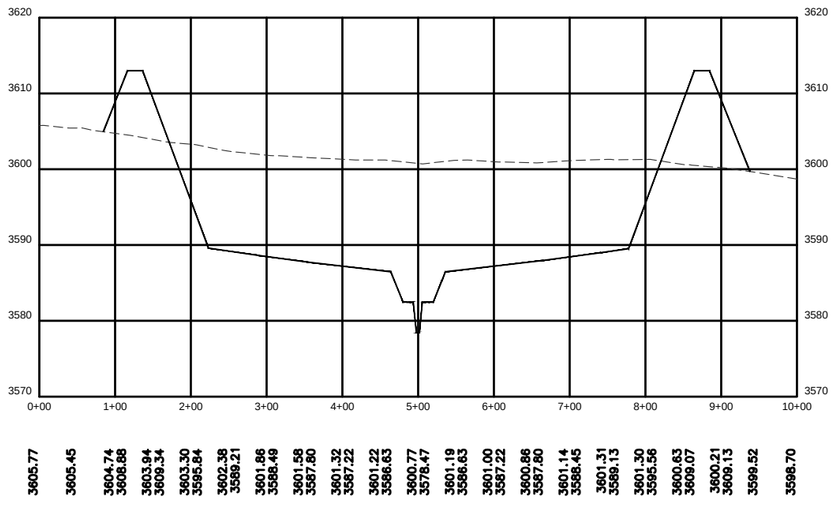
OPTION #1 SECTION A-A



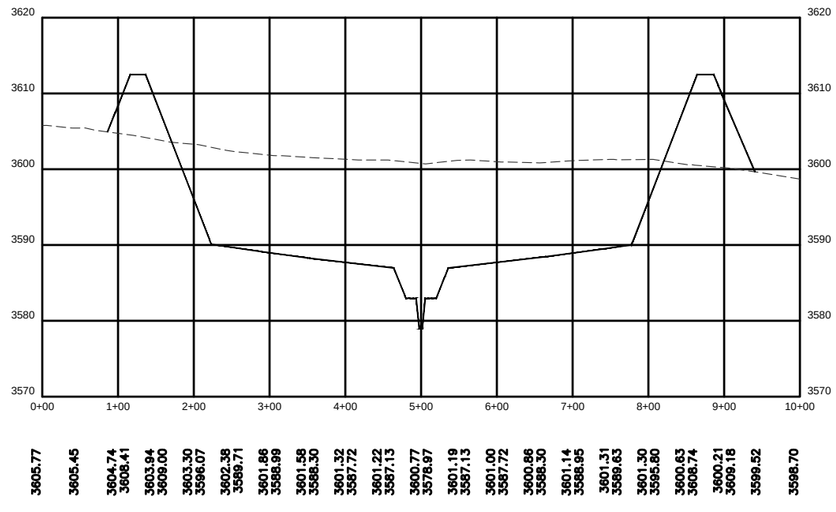
OPTION #2 SECTION A-A



OPTION #1 SECTION B-B



OPTION #2 SECTION B-B



SCALE: 1" = 200'
0' 100' 200'
HORIZONTAL SCALE

SCALE: 1" = 20'
0' 10' 20'
VERTICAL SCALE

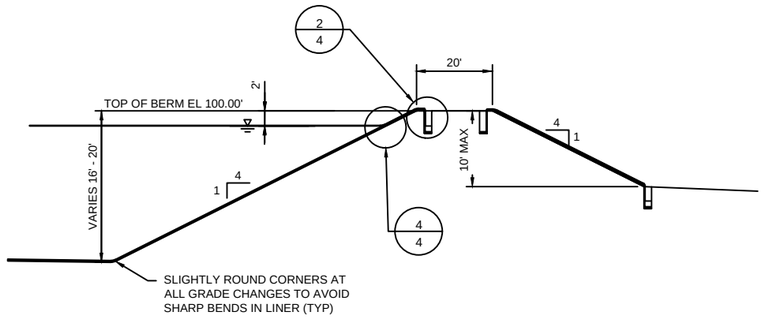
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE (817) 744-7527 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM

PROPOSED CROSS SECTIONS

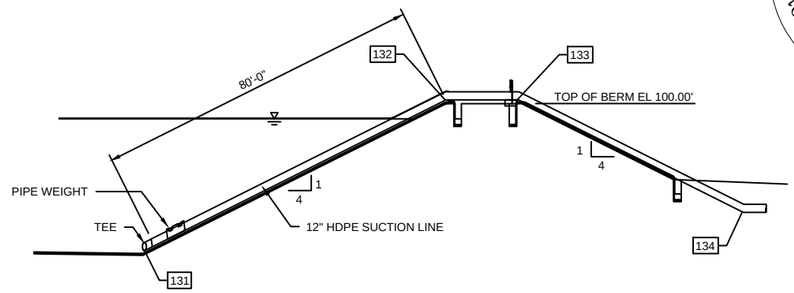
GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

REVISION:	
XXX	XX/XX/XXXX

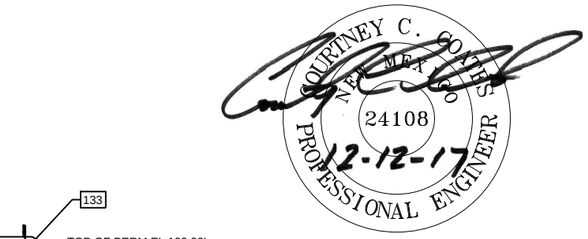
DATE: 12/1/17
FILE:GALAXY_POND_NAD83
DRAWN BY: CCC
REVIEWED BY: CCC
SCALE: 1"=100'
SHEET : 7 OF 9



A TYPICAL BERM SECTION
NTS

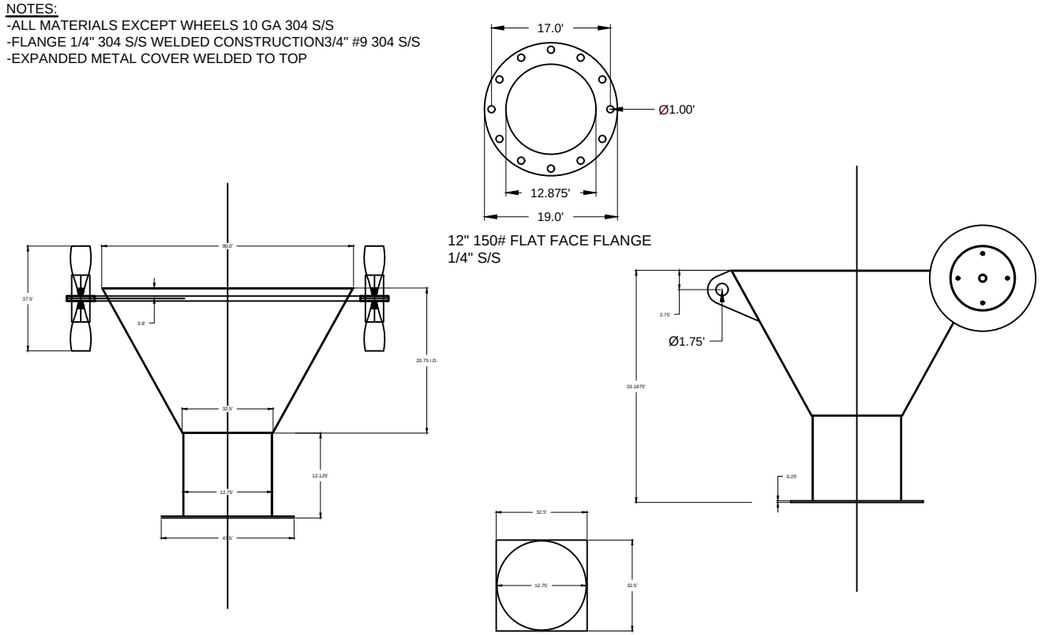


F SUCTION PIPE SECTION
NTS

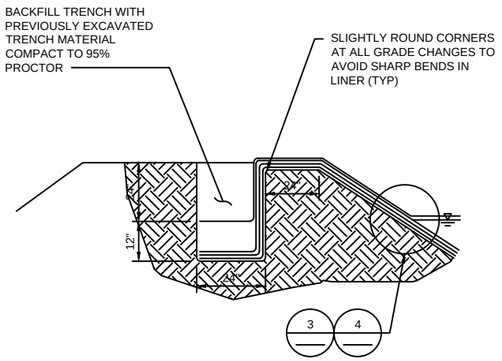


TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE (817) 744-7527 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM

NOTES:
-ALL MATERIALS EXCEPT WHEELS 10 GA 304 S/S
-FLANGE 1/4" 304 S/S WELDED CONSTRUCTION3/4" #9 304 S/S
-EXPANDED METAL COVER WELDED TO TOP



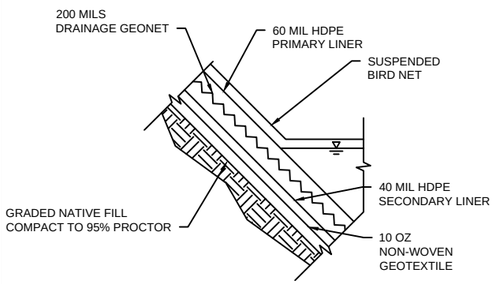
1 SUCTION FUNNEL
NTS



NOTES:

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

2 TYPICAL ANCHOR TRENCH
NTS
SHEET 3



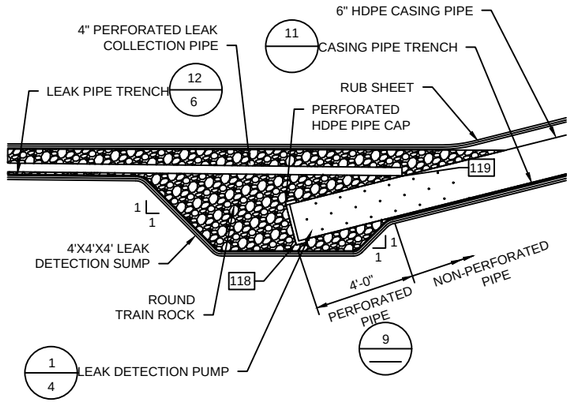
4 BRINE WATER LINER SYSTEM
NTS
SHEET 3

DETAILS 1 OF 2

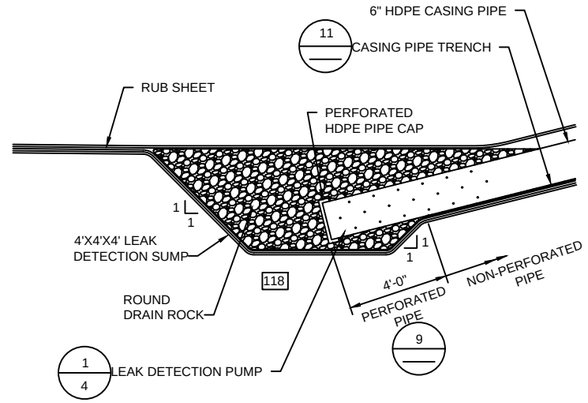
GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

REVISION:	
XXX	XX/XX/XXXX

DATE: 12/1/17
FILE: GALAXY_POND_NAD83
DRAWN BY: CCC
REVIEWED BY: CCC
SCALE: N/A
SHEET : 8 OF 9

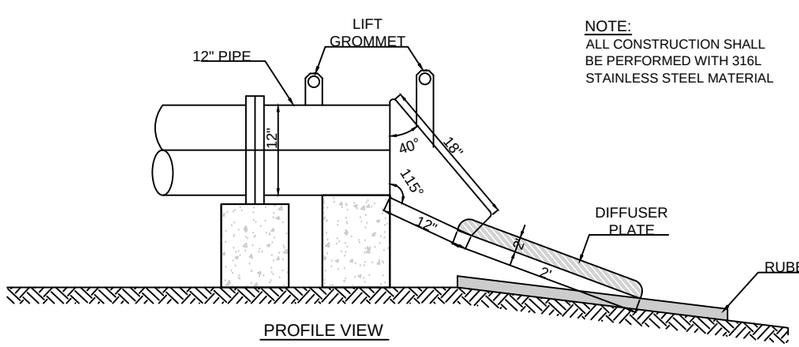


BRINE WATER SECTION



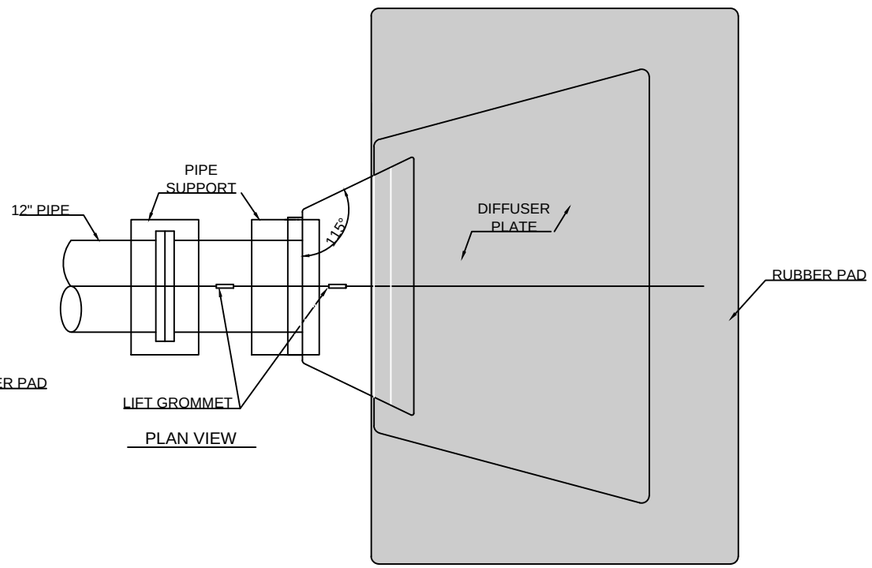
FRESH WATER SECTION

10 LEAK DETECTION SUMP
NTS

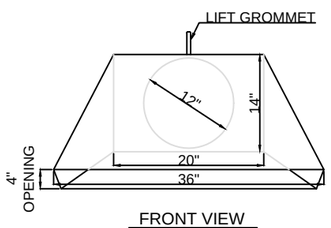


PROFILE VIEW

NOTE:
ALL CONSTRUCTION SHALL BE PERFORMED WITH 316L STAINLESS STEEL MATERIAL



PLAN VIEW



FRONT VIEW

20 POND FILL APPARATUS
NTS

COURTNEY C. COATES
NEW MEXICO
24108
PROFESSIONAL ENGINEER
12-12-17

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE (817) 744-7527 • FAX (817) 744-7548
WWW.TOPOGRAPHIC.COM

DETAILS 2 OF 2

GALAXY AREA CONTAINMENT POND
FOR
EOG RESOURCES

REVISION:	
XXX	XX/XX/XXXX

DATE: 12/1/17
FILE: GALAXY_POND_NAD83
DRAWN BY: CCC
REVIEWED BY: CCC
SCALE: N/A
SHEET: 9 OF 9

(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

(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

ARGO SURETY

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

Attorney-in-Fact Gina Rodriguez

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

Obligee

By: _____

EOG Resources, Inc

Principal

By: _____
Helen Y. Lim, VP & Treasurer

AS-0026046

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

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.

BECKY JIMENEZ
Notary Public, State of Texas
My Commission Expires
December 30, 2011

Becky Jimenez

(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 13th day of February 2012

Robert F. Thomas Vice President

THIS DOCUMENT IS NOT VALID UNLESS PRINTED ON SHADED BACKGROUND WITH BLUE SERIAL NUMBER IN THE UPPER RIGHT HAND CORNER. IF YOU HAVE QUESTIONS ON AUTHENTICITY OF THIS DOCUMENT CALL (210) 321 - 8400.

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. SUR0013[redacted]
(For use of Surety C[redacted])

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
Address
BY _____
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 _____
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*
Signature notary
(Notary Seal)

MARY J. GRISAFFI
Notary Public, State of Texas
My Commission Expires
April 03, 2014

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*
Signature, notary
(Notary Seal)

ELIZABETH RHODES
NOTARY PUBLIC
STATE OF TEXAS
COMM. EXPIRES 11-30-2014

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*

AS-0026041

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

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.

BECKY JIMENEZ
Notary Public, State of Texas
My Commission Expires
December 30, 2011

_____
(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

THIS DOCUMENT IS NOT VALID UNLESS PRINTED ON SHADED BACKGROUND WITH BLUE SERIAL NUMBER IN THE UPPER RIGHT HAND CORNER. IF YOU HAVE QUESTIONS ON AUTHENTICITY OF THIS DOCUMENT CALL (210) 321 - 8400.

eog resources

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

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

Date: *1-12-2012*

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

Notes:
Will measure approx. 48” (w) x 48” (h)

Operating and Maintenance Plan

GALAXY REUSE WATER CONTAINMENT PIT

1. Overview

The attached plan details the operational requirements regarding the Galaxy 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 3rd 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 is 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

GALAXY REUSE WATER CONTAINMENT PIT

1. Overview

The attached plan details the requirements regarding the closure of the Galaxy 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 ration 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 / MONITORING WELL LOG

PROJECT: Jal, NM - Pit Sites
PROJECT NUMBER: 700438.209.01
CLIENT: EOG Resources
BORING / WELL NUMBER: Galaxy - SB2
TOTAL DEPTH: 75
SURFACE ELEVATION:
GEOLOGIST: Jason Hafliger
LATITUDE:

DRILLING COMPANY: Talon/LPE
DRILLER: Ronnie Rodriguez
DRILLING METHOD: Hollow Stem Auger/Continuous Core
BORE HOLE DIAMETER: 6"
SCREEN: Diam. ___ Length _____ Slot Size _____
CASING: Diam. ____ Length _____ Type _____
DATE DRILLED: 11/30/2017
LONGITUDE:

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	Pt. Sample ID:	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
0								0
			SB2-1'		0'-5'		Silty Sand - Top Soil to Caliche @ 6" Dry - No Moisture Red Brown	
5								5
			SB2-6' SB2-7'		5'-10'		Caliche - Hard Pan Dry - No Moisture Tan/White	
10								10
			SB2-11'		10'-15'		Caliche - Hard Pan Dry - No Moisture Tan/White	
15								15
			SB2-16' SB2-17'		15'-20'		Caliche - Hard Pan Dry - No Moisture Tan/White	
20								20
			SB2-21' SB2-22'		20'-25'		Caliche - Sandstone @ 22' Dry - No Moisture Tan/White	
25								25
			SB2-26'		25'-30'		Sandstone Dry - No Moisture Tan/Pink	
30								30
							Caliche w/ Gravel	

REMARKS:

THIS BORING LOG SHOULD NOT BE USED SEPERATE FROM THE ORIGINAL REPORT

TALON LPE

SOIL BORING / MONITORING WELL LOG

PROJECT: Jal, NM - Pit Sites
PROJECT NUMBER: 700438.209.01
CLIENT: EOG Resources
BORING / WELL NUMBER: Galaxy - SB2
TOTAL DEPTH: 75
SURFACE ELEVATION:
GEOLOGIST: Jason Hafliger
LATITUDE:

DRILLING COMPANY: Talon/LPE
DRILLER: Ronnie Rodriguez
DRILLING METHOD: Hollow Stem Auger/Continuous Core
BORE HOLE DIAMETER: 6"
SCREEN: Diam. ___ Length _____ Slot Size _____
CASING: Diam. ____ Length _____ Type _____
DATE DRILLED: 11/30/2017
LONGITUDE:

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	Pt. Sample ID:	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
35			SB2-31'		30'-35'		Dry - No Moisture Tan/Gray Pcpt.	35
40			SB2-36' SB2-37'		35'-40'		Sandstone - Slow Penetration Dry - No Moisture Yellowish Red *staining	40
45			SB2-41' SB2-42'		40'-45'		Sandstone - showing Clay Lens Dry - Low Moisture	45
50			SB2-46'		45'-50'		Sandstone - showing Clay lens Dry - Low Moisture Yellowish Red	50
55			SB2-51' SB2-52' SB2-53'		50'-55'		Sandstone - showing clay Dry - Low Moisture Light Yellow Red	55
60			SB2-56' SB2-57'		55'-60'		Sandtone w/clays Dry - Low Moisture Light Yellowish Red	60
							Sandstone w/clays Dry - Low Moisture	

REMARKS:

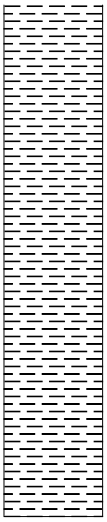
THIS BORING LOG SHOULD NOT BE USED SEPERATE FROM THE ORIGINAL REPORT

TALON LPE

SOIL BORING / MONITORING WELL LOG

PROJECT: Jal, NM - Pit Sites
PROJECT NUMBER: 700438.209.01
CLIENT: EOG Resources
BORING / WELL NUMBER: Galaxy - SB2
TOTAL DEPTH: 75
SURFACE ELEVATION:
GEOLOGIST: Jason Hafliger
LATITUDE:

DRILLING COMPANY: Talon/LPE
DRILLER: Ronnie Rodriguez
DRILLING METHOD: Hollow Stem Auger/Continuous Core
BORE HOLE DIAMETER: 6"
SCREEN: Diam. ___ Length _____ Slot Size _____
CASING: Diam. ____ Length _____ Type _____
DATE DRILLED: 11/30/2017
LONGITUDE:

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	Pt. Sample ID:	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
65			SB2-61'		60'-65'		Light Yellowis Red	65
70					65'-70'		Sandstone w/clays Dry - Low Moisture Light Yellowish Red	70
75					70'-75'	75'	Sandstone w/clays Dry - Low Moisture Light Yellowish Red	75
80							Bottom of Hole	80
85								85
90								90

REMARKS:

THIS BORING LOG SHOULD NOT BE USED SEPERATE FROM THE ORIGINAL REPORT

1 December 2017

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

Re: Comprehensive Resource Review – Galaxy Water Reuse Site
Lea County, New Mexico

Dear Mr. Kinder:

Goshawk Environmental Consulting, Inc. (Goshawk) conducted a comprehensive desktop resource review and limited field investigations for the Galaxy Reuse Site in Lea County, New Mexico. This resource review included Waters of the US (WATERS), Threatened or Endangered (T/E) Species, and Cultural Resources. The purpose of these investigations was to evaluate whether the proposed water reuse site contained any protected resources; the approximate size and location of identified protected resources; and associated development constraints, if applicable. Goshawk also conducted a cultural resources archival review and survey for the site. All figures are in Appendix A.

INTRODUCTION

The Galaxy Water Reuse Site will include a double-lined water pit with leak detection, a tanker off load and storage area, a reuse water treatment facility, and freshwater blending system. The site is approximately 1,225 feet long (east to west) and 910 feet wide (north to south) and encompasses approximately 25.59 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 Galaxy Water Reuse Site 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 quadrangle for Bell Lake, New Mexico; recent digital aerial orthoimagery; and the Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO). Field investigations were 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 (Figure 1) indicates the Galaxy Water Reuse Site is within grasslands (white background). The terrain is gently sloping, with elevations ranging from 3,600 feet above mean sea level (AMSL) in the northwest corner to 3,590 feet AMSL in the southwest corner. Drainage occurs by overland sheet flow toward the southwest. The nearest potential WATERS is Bell Lake located approximately 4,700 feet to the north and upgradient from the site. There are no mapped tributaries within the watershed of the site. The Galaxy Water Reuse Site is within the Lower Pecos River Watershed. The nearest direct line point to the Pecos River is approximately 23 miles west. There are no improvements noted on the site. There is no indication of any potential WATERS within the boundary of the site.

Aerial Orthoimagery

The natural color aerial orthoimagery (Figure 2) indicates the Galaxy Water Reuse Site is within relatively open shrublands. There are several caliche oil/gas pads and roads immediately to the north of the site. There are no potential WATERS indicated on or near the site.

Soils

The NRCS SSURGO spatial data (Figure 3) indicate the soil map units underlying the Galaxy Water Reuse Site are (by prevalence): Berino-Cacique loamy fine sands association (BE) and Pyote and Maljamar fines sands (PU). The primary soil components of these maps units are Berino loamy fine sand, Cacique sandy loam, Pyote fine sand, and Maljamar fine sand. None of the primary components of these soils are listed as hydric soils.

FIELD INVESTIGATION

A field investigation was conducted on 19 September 2017 in order to determine the presence of potential WATERS within the Galaxy Water Reuse Site. The site was traversed on-foot. The site conditions are generally consistent with those depicted on the topographic map and aerial orthoimagery described above. Topographically, the site is flat to gently sloping. Vegetation within the site consists of broom snakeweed (*Gutierrezia sarothrae*), honey mesquite (*Prosopis glandulosa*), prickly pear (*Opuntia* sp.), soapweed yucca (*Yucca glauca*), and dove weed (*Croton texensis*) with some short and mid grasses intermixed.

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

Literature and agency file searches were conducted to identify the potential occurrence of any federally and state-listed T/E species near the Galaxy Water Reuse Site. 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 the 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 Galaxy Water Reuse Site or immediate vicinity.

The state-listed T/E species on NMDGF BISON-M County List for Lea County dated 1 December 2017 include: bald eagle (*Haliaeetus leucocephalus*), aplomado falcon, peregrine falcon (*Falco peregrinus*), artic peregrine falcon (*Falco peregrinus tundrius*), 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 southern 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. Since 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 likely to be impacted by construction activities than are 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, coupled with the current land use, makes it highly unlikely that this species is 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 Officer (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 on or eligible for listing on 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 Galaxy Water Reuse Site. The Archaeological Records Management Section’s New Mexico Cultural Resources Information System (NMCRIS) online database, geospatial data obtained from the BLM CFO, 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 and 100-foot buffer around the site.

ARCHIVAL REVIEW

Nearby Archaeological Sites

According to NMCRIS, there are no previously recorded archaeological sites within the Galaxy Reuse Site. There nearest recorded archaeological sites are LA# 186992 and LA# 182107 located approximately 1,640 feet southwest and 2,000 feet northeast of the Galaxy Reuse Site, respectively. Archaeological site LA# 186992 was documented in 2016 during NMCRIS Activity# 137158 by Statistical Research, Inc. The site was documented as a multicomponent unspecified prehistoric site. The prehistoric artifact assemblage consisted of lithic debitage, fire cracked rock, and a single bead, but no diagnostic aboriginal artifacts were identified. In 2016, the site was deemed not eligible for listing on the NRHP by the recorder and assigned an unevaluated status during state agency review and SHPO review in 2017. Archaeological site LA# 182107 was documented in June 2015 during NMCRIS Activity# 133550 by APAC. The site was documented as a multicomponent Mogollon site. The prehistoric artifact assemblage consisted of lithic debitage, ceramics, and burned rock. In 2016, the site was deemed not eligible for listing on the NRHP by the recorder and assigned an unevaluated status during state agency review and SHPO review in 2017.

National Register Properties

No NRHP-listed properties have been recorded near the proposed site. According to the NRHP online database, the nearest NRHP-listed property is the Laguna Plata Archaeological District, located 41.3 miles north-northwest of the proposed site. The Laguna Plata Archaeological District is a collection of prehistoric habitation sites spread across roughly 4,500 acres.

Soils Analysis

Soils mapped within the proposed site consist of Berino-Cacique loamy fine sands and Pyote and Maljamar fine sands. The Berino series consists of very deep, loamy, fine sands that formed in mixed alluvium. These soils are typically found on level to undulating plains, fan terraces, piedmont slopes, and valley floors. They are well-drained with very slow runoff and moderate permeability. Cacique sandy loam formed in sandy sediments and are typically found on level to nearly level basin floors. These soils are moderately deep and well-drained. Runoff is medium, and permeability is moderate. Both the Pyote/Maljimar series are deep, wind-blown sands or loams found on undulating plains and low hills east of the Pecos River. They are well-drained to excessively drained with negligible runoff. Considering the soils present, there is a moderate probability for the presence of cultural resources within the proposed Galaxy Reuse Site.

ARCHAEOLOGICAL SURVEY

Goshawk performed a cultural resources survey on 19 September 2017 for the Galaxy Water Reuse Site and 100-foot archaeological survey buffer, encompassing a total of 36.11 acres (Figure 4). Transects were walked at 50-foot intervals over the entire survey area. The site is situated upon compact sands with gravel inclusions. Terrain is relatively flat to gently sloping with low coppice dunes 1-2 feet tall. 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. This determination was based on the types of previously

documented prehistoric sites present in the vicinity, the soils present, and the topographic relief. However, no cultural material or archaeological sites were identified during the cultural resources survey. No impacts to cultural resources would be expected by the Galaxy Water Reuse Pit.

SUMMARY

Based on the results of the Resource Review, it is Goshawk's opinion that the construction of the Galaxy Water Reuse Site 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 prehistoric 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 contract our office.

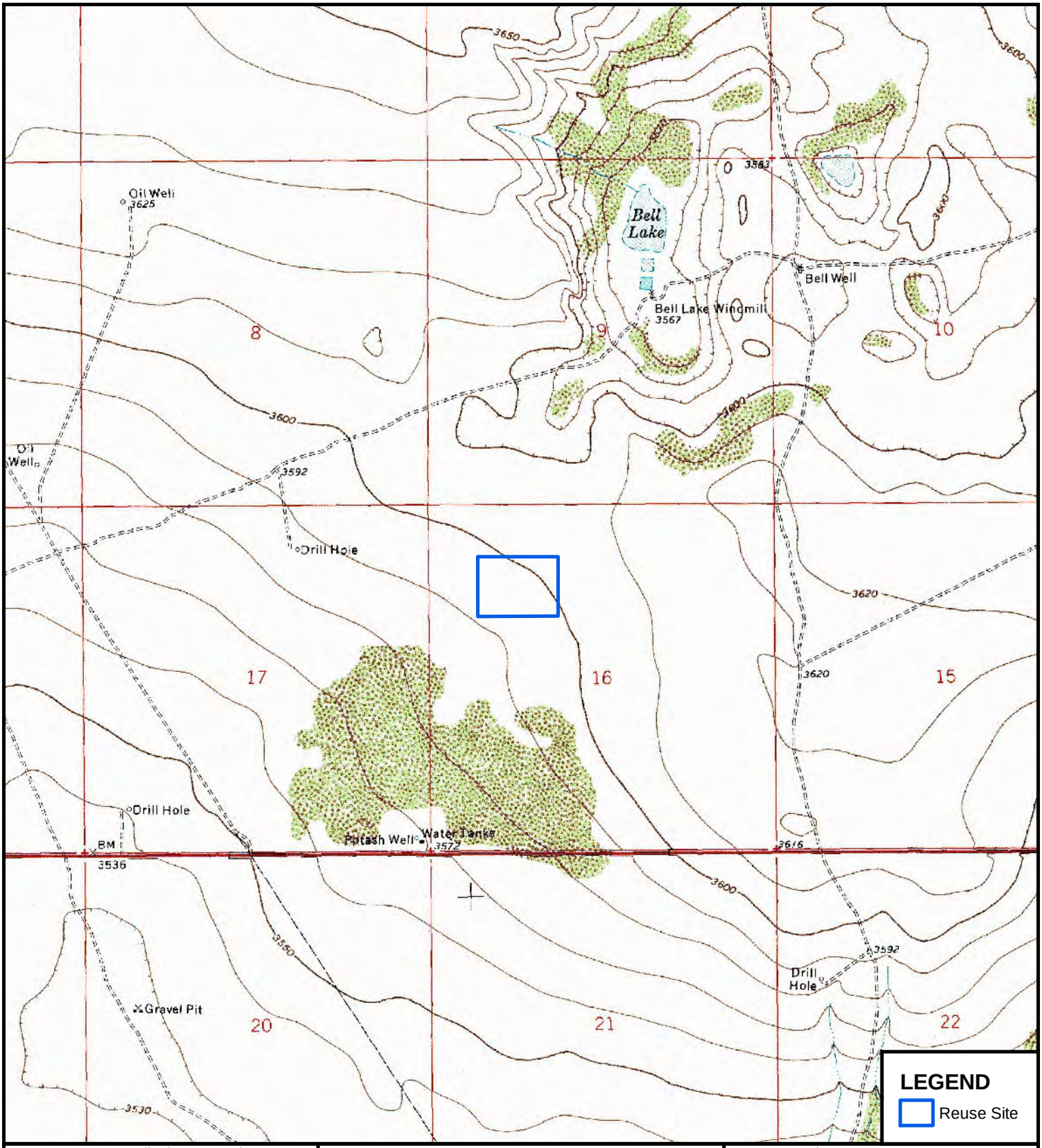
Sincerely,

Zane N. Homesley
President

Reign Clark
Cultural Resources Director

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

APPENDIX A
FIGURES



Map Source: USGS, Bell Lake, New Mexico Quadrangle.

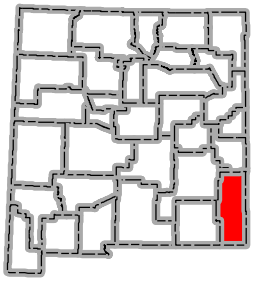
0 1,000 2,000 Feet

Figure 1
USGS Topographic Map
Lea County, New Mexico

Galaxy Water Reuse Site

T24S; R33E; Section 16

Date: 1 December 2017



N

GOSHAWK
ENVIRONMENTAL CONSULTING, INC.

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

0 1,000 2,000 Feet

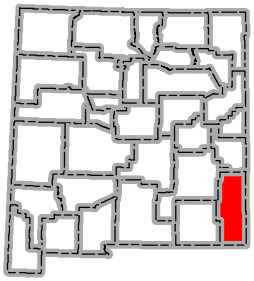
GOSHAWK
ENVIRONMENTAL CONSULTING, INC.

Figure 2
Aerial Orthoimagery
Lea County, New Mexico

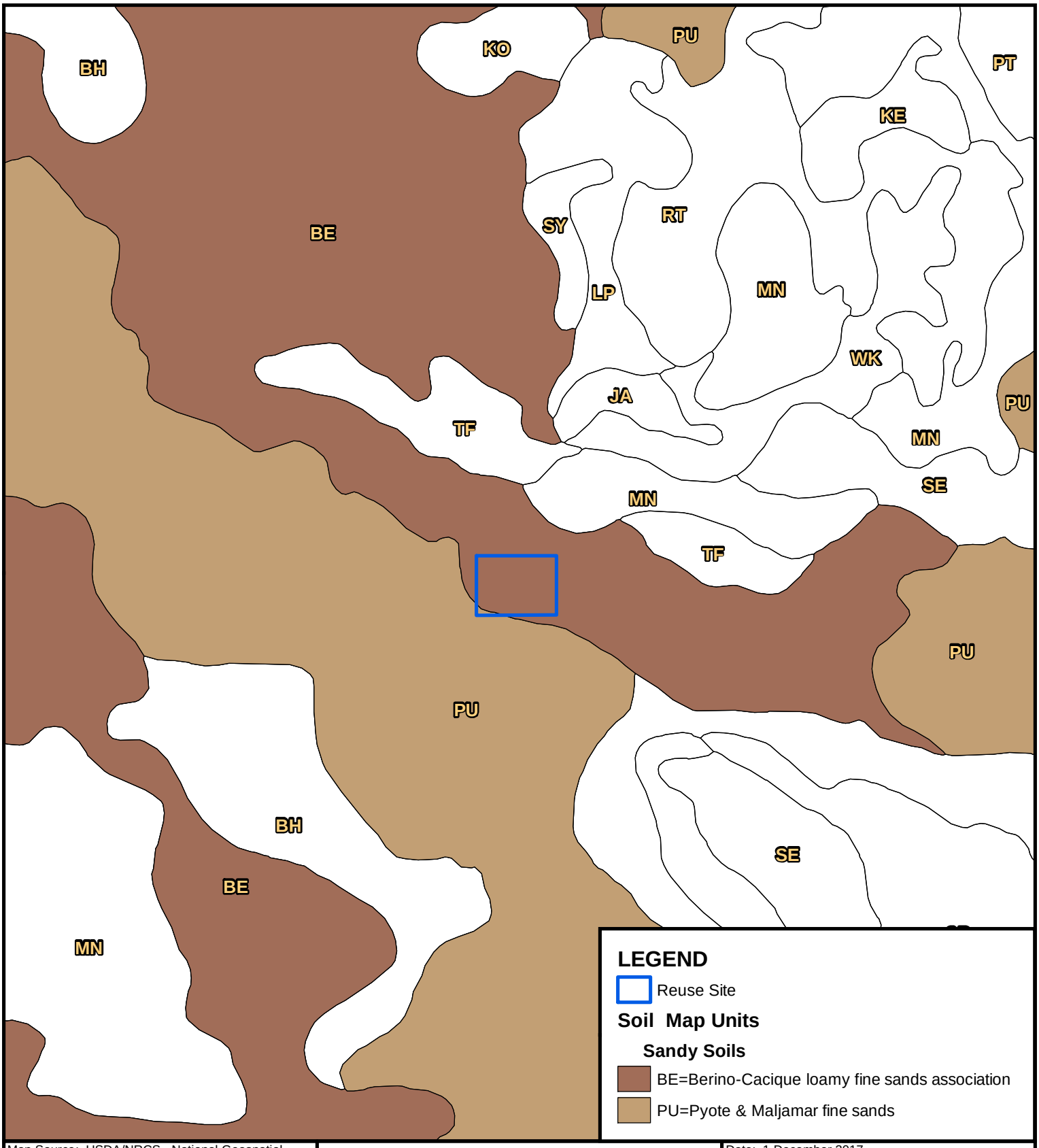
Galaxy Water Reuse Site

T24S; R33E; Section 16

Date: 1 December 2017



N



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

0 1,000 2,000 Feet

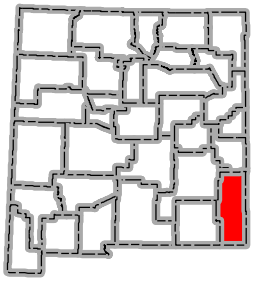
GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 3
NRCS SSURGO Soils Map
Lea County, New Mexico

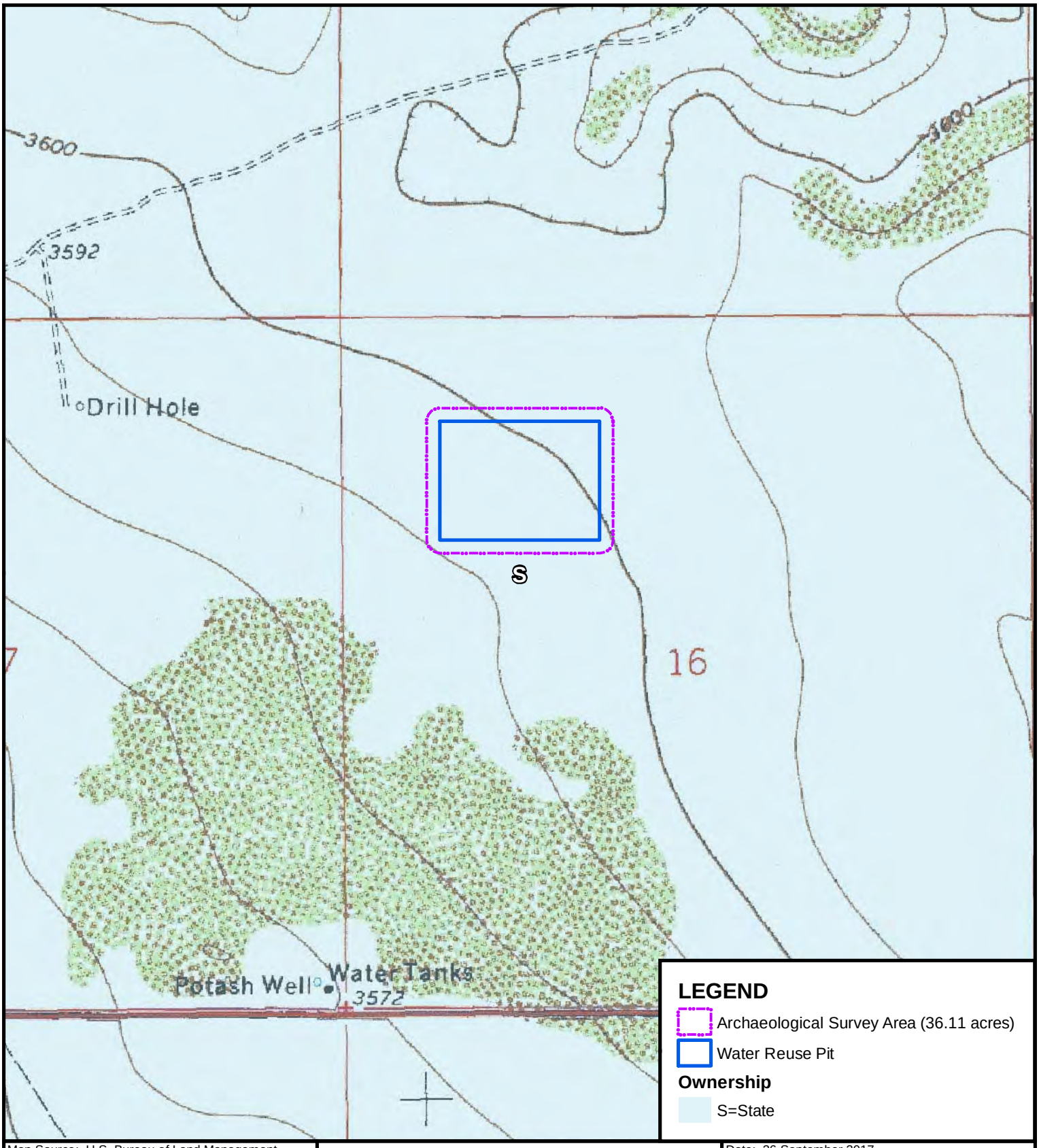
Galaxy Water Reuse Site

T24S; R33E; Section 16

Date: 1 December 2017



N



Map Source: U.S. Bureau of Land Management - New Mexico State Office - GIS Data Download. USGS, Bell Lake, New Mexico Quadrangle.

0 500 1,000 Feet

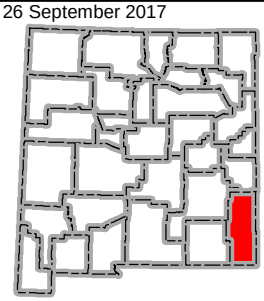
GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 4
Archaeological Survey Map
Lea County, New Mexico

Galaxy Water Reuse Site

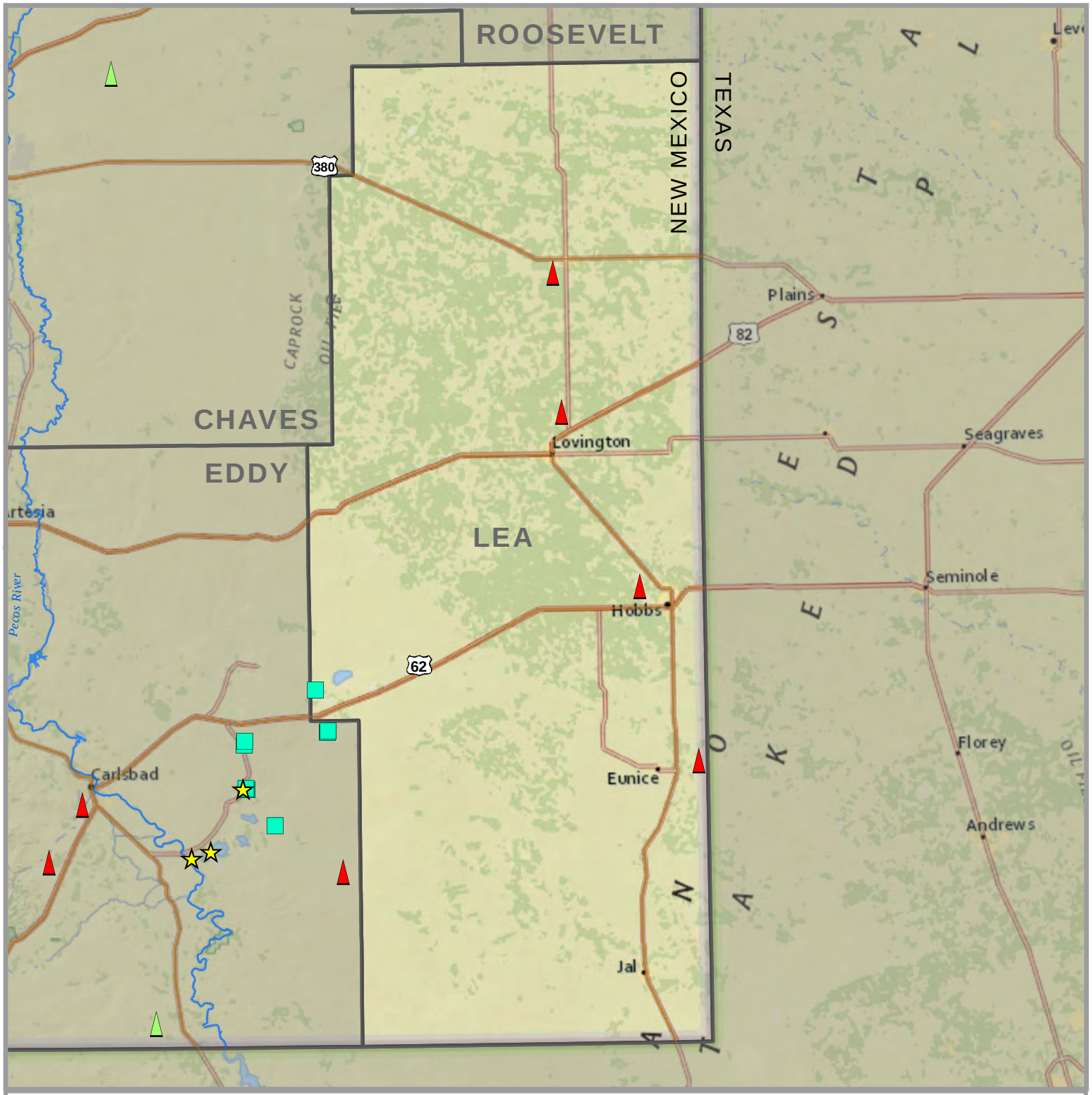
T24S; R33E; Section 16

Date: 26 September 2017



N

Active Mines in Lea County, New Mexico, November 2014



Metals

Coal
Potash
Copper
Gold & Silver
Molybdenum

Industrial Minerals

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

Aggregate & Stone

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

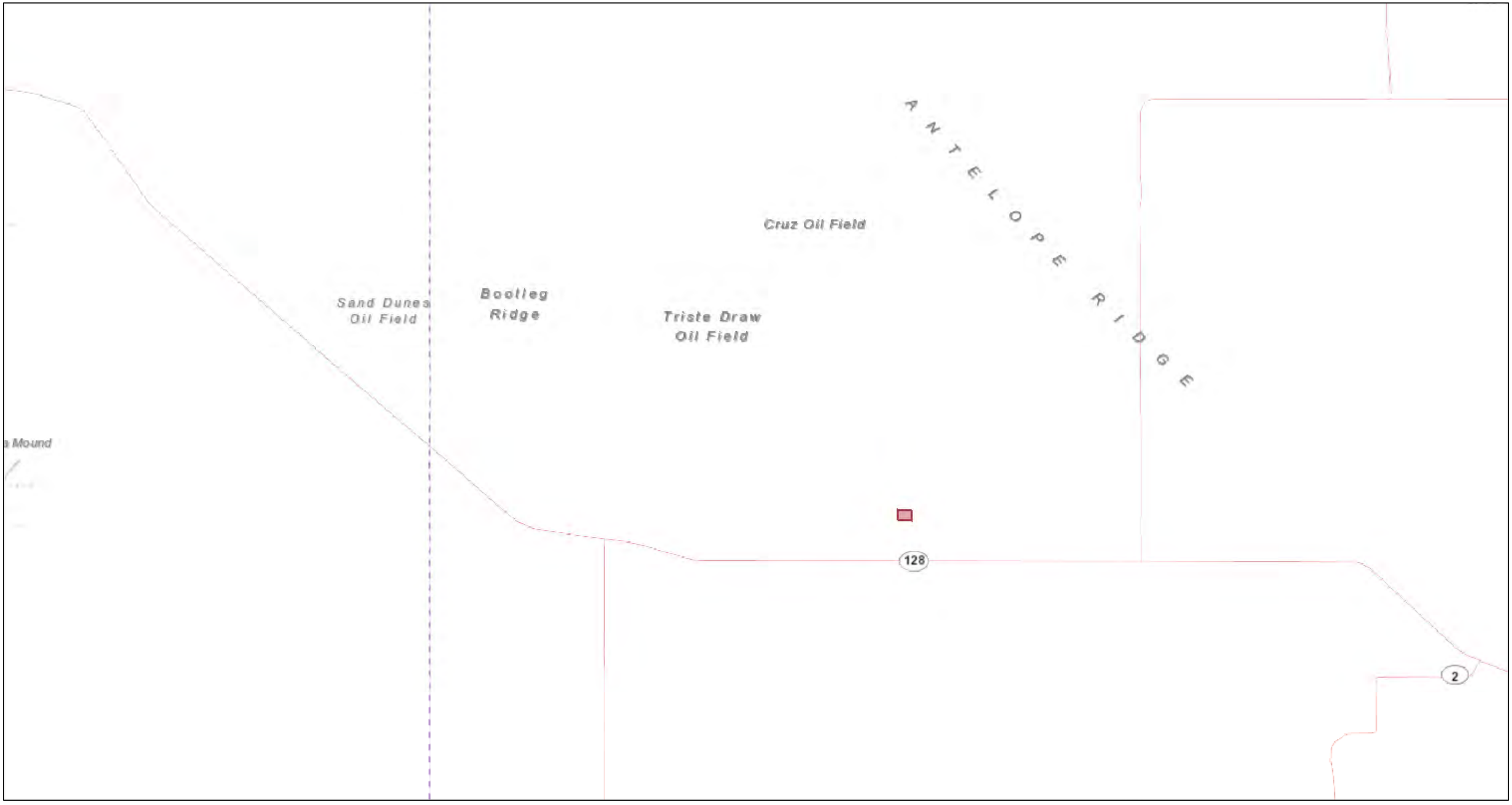
Data: November 2014 database query, Mining & Minerals Division, Mine Registration, Reporting & Safeguarding Program.
Basemap: Esri ArcGIS Online, National Geographic.
Map: Linda S. DeLay, GISP

NAD 83 UTM NM Zone13

N
W
E
S

0 5 10 20
Miles

Active Mines in New Mexico



December 2, 2017

1:125,000

0 1.25 2.5 5 mi

0 2.25 4.5 9 km

Sources: Esri, DeLorme, USGS, NPS
Sources: Esri, USGS, NOAA

NM EMNRD ITO GIS

BLM and RGIS, of course | RGIS, CadNSDI, TRD, J R Jenks | Sources: Esri, USGS, NOAA | Sources: Esri, DeLorme, USGS, NPS |

Souder, Miller & Associates ♦ 3451 Candelaria Road NE, Suite D
Albuquerque, NM 87107-1948 ♦ (505) 299-0942 ♦ (877) 299-0942 ♦ fax (505) 293-3430

December 7, 2017 #5E26751

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

Subject: **C-147 Recycling Containment Permit Siting Criteria Attachment, Proposed Galaxy 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 Galaxy Recycling Containment Pond to be constructed in southwestern 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 be located in Township 24S, Range 33E, NW/4 of Section 16 between Bell Lake Road and U.S. Highway 128.

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 Austin Weyant with SMA on December 7, 2017.

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

The regional geology near the proposed recycling containment pond consists of a thin layer of quaternary alluvium and windblown sand (typically less than 100 feet) overlying Triassic-aged redbed units, including the Chinle Formation and the Santa Rosa Sandstone. In southwestern Lea County, the most commonly utilized regional aquifer occurs within the Triassic redbeds, with the most productive aquifer consisting of the Santa Rosa Sandstone. Near the proposed facility, the top of the redbed formations are anticipated to be found at depths ranging from 40-75 feet. Groundwater elevation in a well approximately 2 miles southwest of the site was 209 feet below ground surface (elevation of 3,400 feet above mean sea level), with a flow direction to the southeast (Nicholson & Clebsch, 1961).

Groundwater, as indicated by lithology 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 3,520 feet above mean sea level (amsl). The proposed facility is located at an elevation of approximately 3,595 feet above mean sea level, and the base of the containment pond will be installed to a maximum depth of 20 feet bgs, or an elevation of approximately 3,575 ft amsl. As such, groundwater is present at an elevation over 50 feet from below the bottom of the Recycling Containment. 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 N32.2214725; LONG W103.5813686.

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

The facility is located over 20 miles from the nearest municipality (City of Jal) in an area consisting predominantly of oil and gas development, and is not within any defined freshwater field as no municipal water wells are present near the facility location. A vicinity map of the 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 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 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 a 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 10 miles from the proposed facility boundary; the nearest ephemeral water course is located approximately 1.4 miles to the north of the proposed facility. No lakebeds, sinkholes, or playa lakes are within 200 feet of the facility. Bell Lake is present approximately 1.0 mile north 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 is included as Figure 2. The absence of watercourses, lakebeds, sinkholes, and playa lakes in the vicinity of the proposed facility was confirmed by a site visit conducted by Mr. Austin Weyant of SMA on December 7, 2017.

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 1 mile from the nearest private residence. The closest facilities to the proposed facility are existing oil field tank batteries and well pads located to the north. 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 Mr. Austin Weyant of SMA on December 7, 2017.

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 2,500 feet to the north 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 Mr. Austin Weyant of SMA on December 7, 2017.

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 present approximately 1.0 mile to the north of the proposed facility. A map prepared by the US FWS 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 Mr. Austin Weyant of SMA on December 7, 2017.

If you have any questions, please do not hesitate to call me at 505-299-0942 or to e-mail me at matthew.earthman@soudermiller.com .

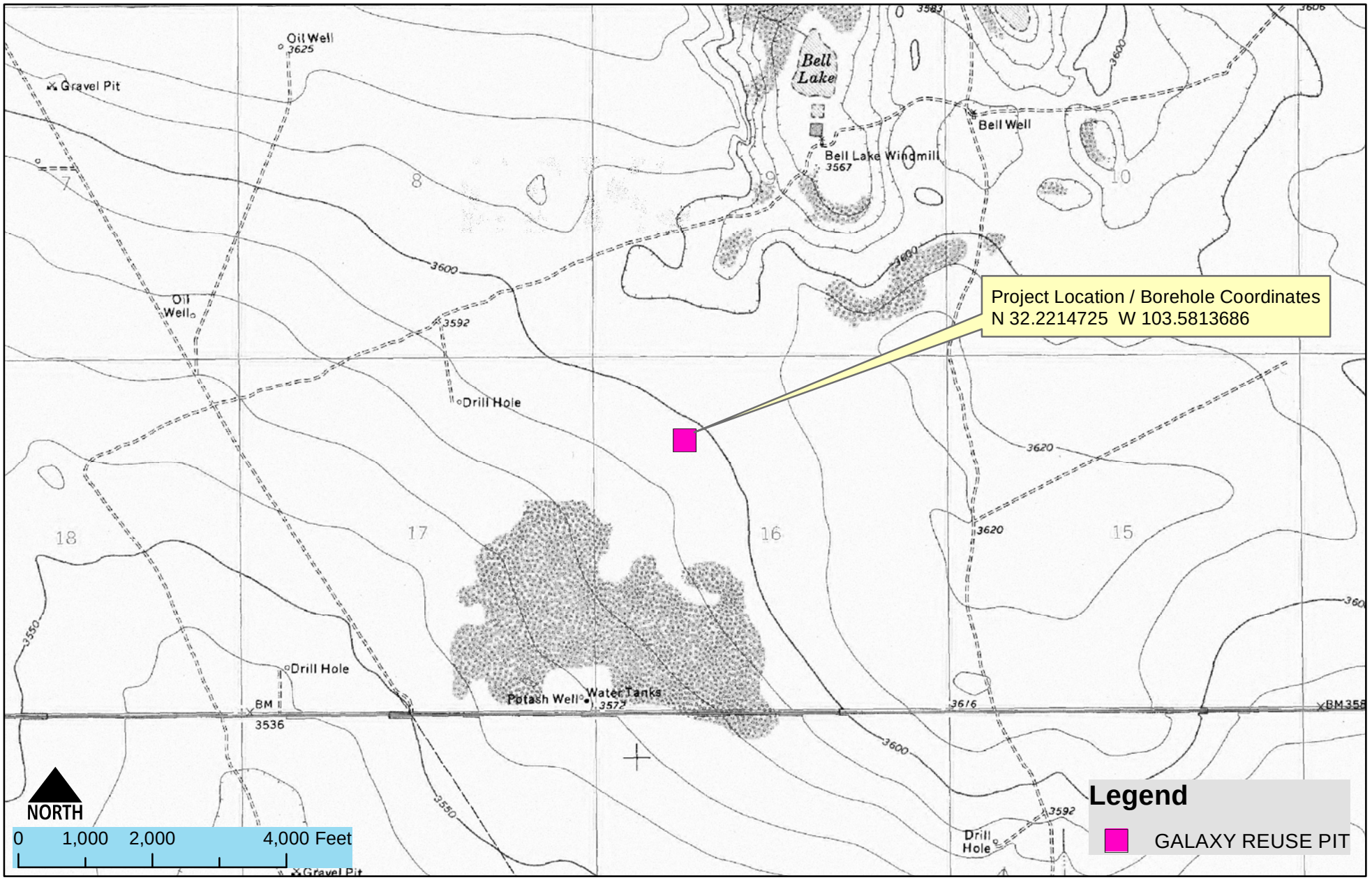
Sincerely,
SOUDER, MILLER AND ASSOCIATES

Matthew A. Earthman, P.G.
Project 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 (US FWS)

Figures



SITE MAP - TOPOGRAPHICAL MAP
EOG GALAXY RECYCLING FACILITY
S16 R33E T24S, LEA COUNTY, NM.

Figure 1

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

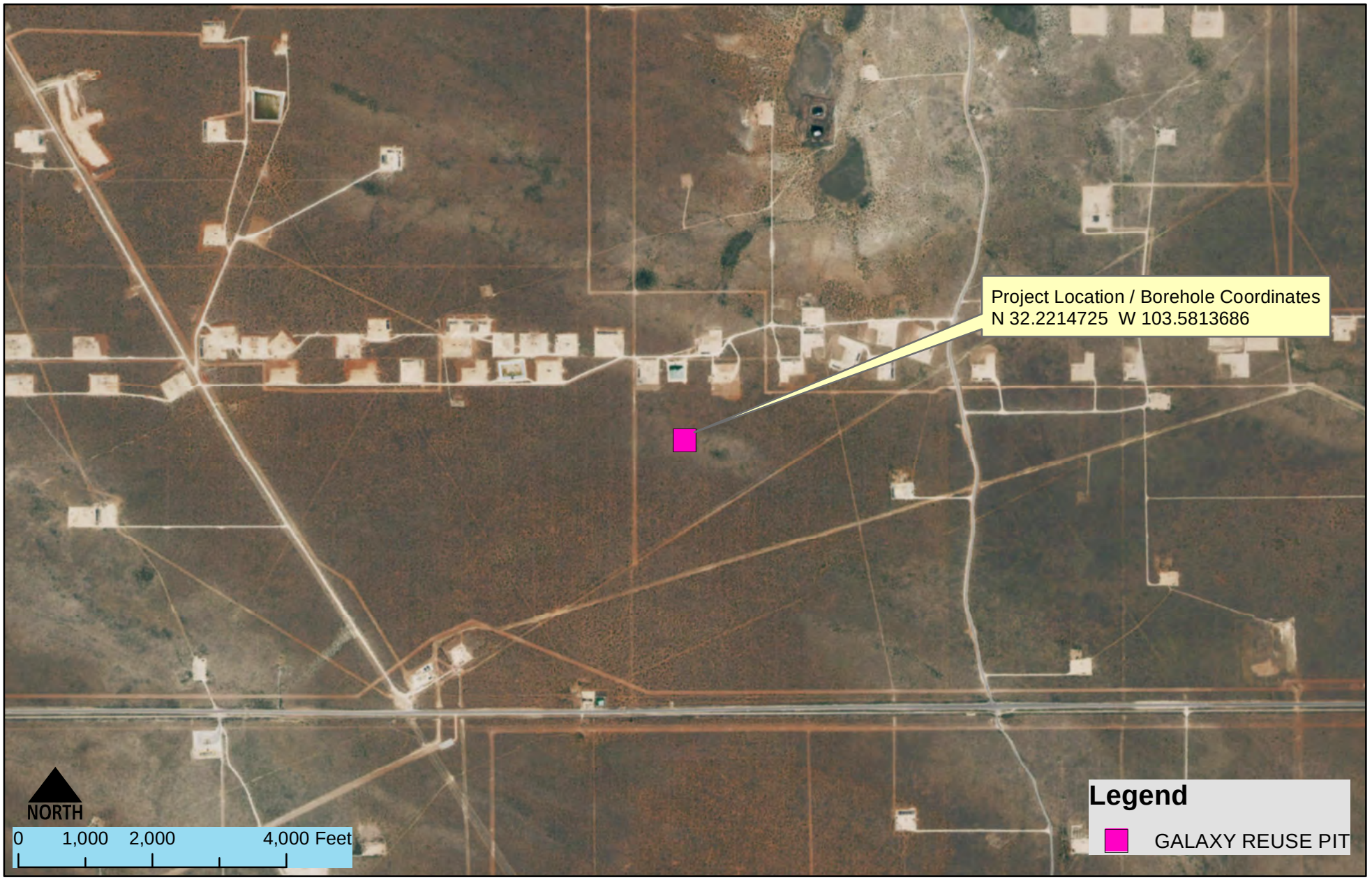
Drawn Curtis Pattillo
Checked
Approved

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

Date Saved: 12/7/2017

Copyright 2015 Souder, Miller & Associates - All Rights Reserved

Document: P:\5-EOG Reuse Pits\BG1 - Mars\OSE Wells.mxd



SITE MAP - AERIAL PHOTOGRAPH
EOG GALAXY RECYCLING FACILITY
S16 R33E T24S, LEA COUNTY, NM.

Figure 2

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

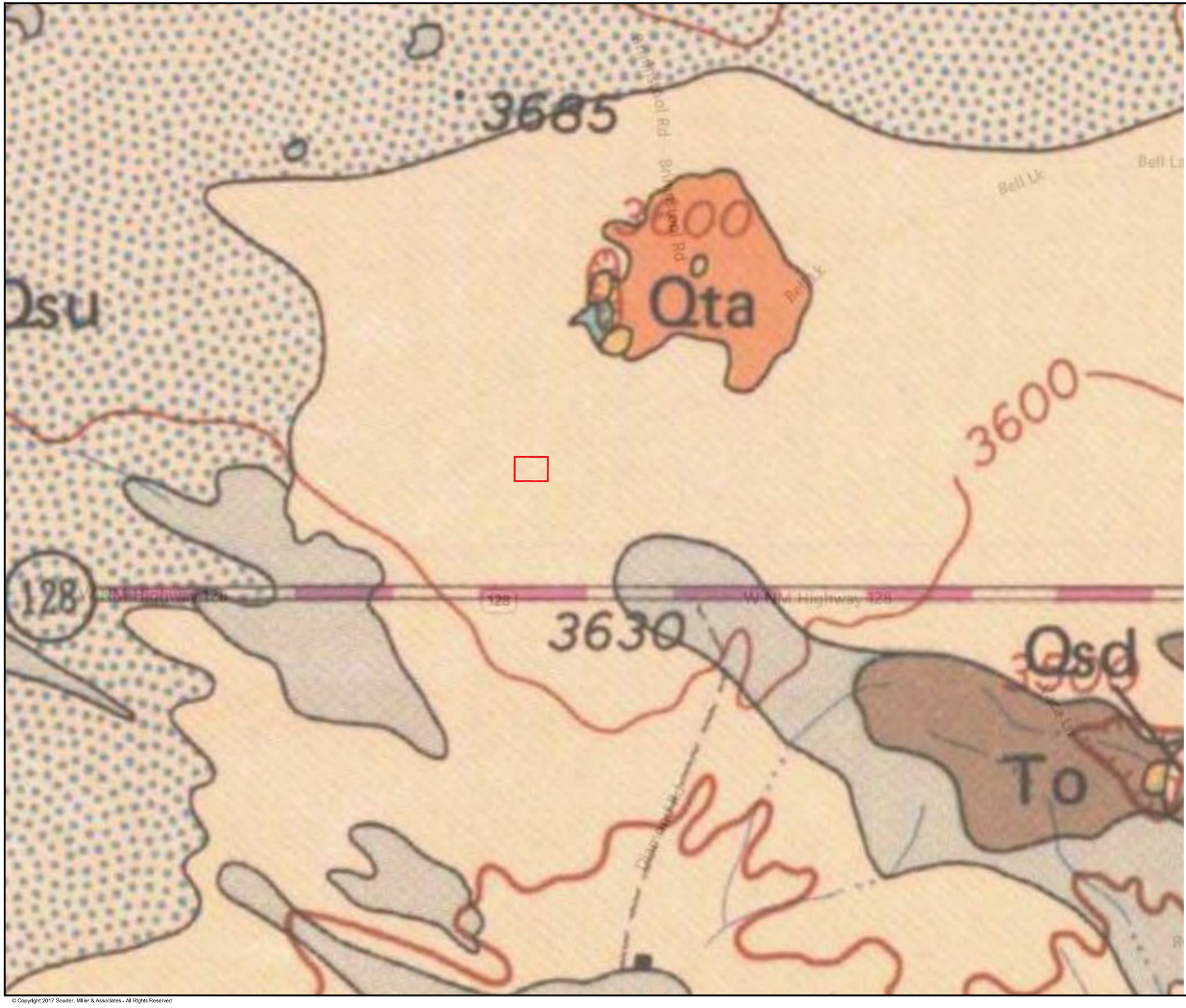
Date Saved: 12/7/2017

Copyright 2015 Souder, Miller & Associates - All Rights Reserved

Drawn Curtis Pattillo
Checked
Approved

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

Document: P:\5-EOG Reuse Pits\BG1 - Mars\OSE Wells.mxd



EXPLANATION

- Mine Waste
- Alluvium
- Eolian deposits
- Windblown sand
- Playa deposits
- Caliche
- Alluvium and other Quaternary deposits
- Colluvial deposits
- Fluvatile terrace deposits
- Pond deposits
- Pleistocene surficial deposits undivided
- Other Quaternary deposits
- Gatuña Formation
- Tahoka Formation
- Windblown cover sand
- Ogallala Formation
- Fort Terrett Formation and Fredericksburg Group
- Antlers Sand
- Santa Rosa Sandstone, Chinle Formation, and Dockum Group undivided
- Dewey Lake Redbeds and Rustler Formation
- Diapirs and collapse structures

Approximate Facility Outline

N

0 1500 3000 6000

SCALE: 1" = 3000'

Rev #	Date	Description

SOUDER, MILLER & ASSOCIATES
401 West Broadway Avenue
Farmington, NM 87401
Phone (505) 325-7535 Toll-Free (800) 519-0098 Fax (505) 326-0045
Serving the Southwest & Rocky Mountains
www.soudermiller.com

GEOLOGIC MAP OF PROPOSED FACILITY AREA GALAXY REUSED PIT LEA, COUNTY, NEW MEXICO

Designed	Drawn	Checked
CP	DJB	RSA

Date: December 2017

Scale: Horiz: 1" = 3000'
Vert: N/A

Project No: 5E25872

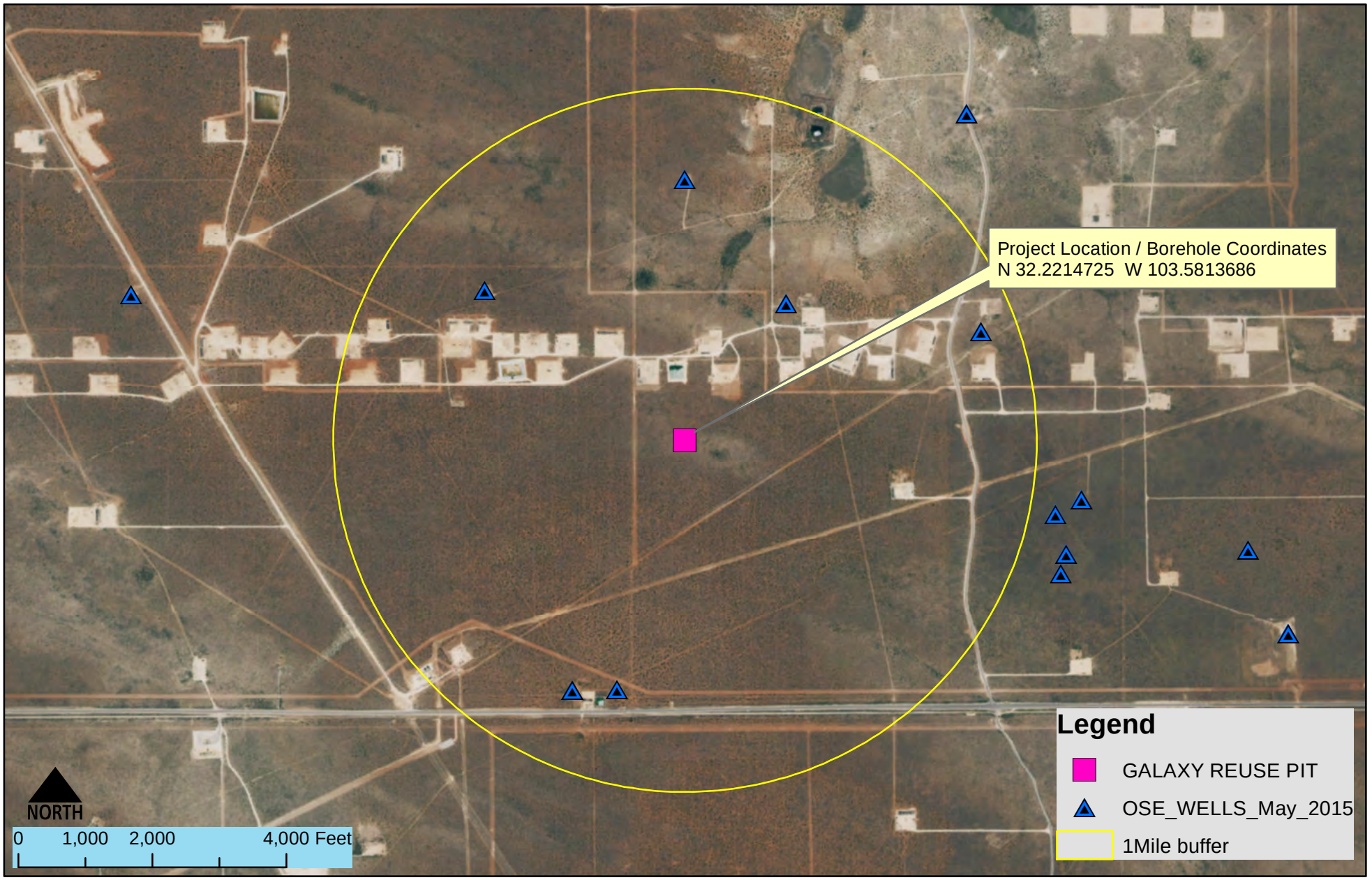
FIGURE 3

© Copyright 2017 Souder, Miller & Associates - All Rights Reserved

P:\5-TopoLandSurv Red Hills C-147 Assistance (5E25872)\CAD\Civil\5E25872 ExhibitsA.dwg, DJB, 12/7/2017 1:47 PM

Souder, Miller & Associates ♦ 3451 Candelaria Road NE, Suite D
Albuquerque, NM 87107-1948 ♦ (505) 299-0942 ♦ (877) 299-0942 ♦ fax (505) 293-3430

Appendix A
Groundwater & Well Information (NMOSE & USGS)



SITE MAP - OSE Well Locations
EOG GALAXY RECYCLING FACILITY
S16 R33E T24S, LEA COUNTY, NM.

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

Drawn Curtis Pattillo
Checked
Approved

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

Copyright 2015 Souder, Miller & Associates - All Rights Reserved

Date Saved: 12/7/2017

Document: P:\5-EOG Reuse Pits\BG1 - Mars\OSE Wells.mxd

SOIL BORING / MONITORING WELL LOG

PROJECT: Jal, NM - Pit Sites
PROJECT NUMBER: 700438.209.01
CLIENT: EOG Resources
BORING / WELL NUMBER: Galaxy - SB2
TOTAL DEPTH: 75
SURFACE ELEVATION:
GEOLOGIST: Jason Hafliger
LATITUDE:

DRILLING COMPANY: Talon/LPE
DRILLER: Ronnie Rodriguez
DRILLING METHOD: Hollow Stem Auger/Continuous Core
BORE HOLE DIAMETER: 6"
SCREEN: Diam. ___ Length _____ Slot Size _____
CASING: Diam. ____ Length _____ Type _____
DATE DRILLED: 11/30/2017
LONGITUDE:

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	Pt. Sample ID:	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
0								0
			SB2-1'		0'-5'		Silty Sand - Top Soil to Caliche @ 6" Dry - No Moisture Red Brown	
5								5
			SB2-6' SB2-7'		5'-10'		Caliche - Hard Pan Dry - No Moisture Tan/White	
10								10
			SB2-11'		10'-15'		Caliche - Hard Pan Dry - No Moisture Tan/White	
15								15
			SB2-16' SB2-17'		15'-20'		Caliche - Hard Pan Dry - No Moisture Tan/White	
20								20
			SB2-21' SB2-22'		20'-25'		Caliche - Sandstone @ 22' Dry - No Moisture Tan/White	
25								25
			SB2-26'		25'-30'		Sandstone Dry - No Moisture Tan/Pink	
30								30
							Caliche w/ Gravel	

REMARKS:

THIS BORING LOG SHOULD NOT BE USED SEPERATE FROM THE ORIGINAL REPORT

TALON LPE

SOIL BORING / MONITORING WELL LOG

PROJECT: Jal, NM - Pit Sites
PROJECT NUMBER: 700438.209.01
CLIENT: EOG Resources
BORING / WELL NUMBER: Galaxy - SB2
TOTAL DEPTH: 75
SURFACE ELEVATION:
GEOLOGIST: Jason Hafliger
LATITUDE:

DRILLING COMPANY: Talon/LPE
DRILLER: Ronnie Rodriguez
DRILLING METHOD: Hollow Stem Auger/Continuous Core
BORE HOLE DIAMETER: 6"
SCREEN: Diam. ___ Length _____ Slot Size _____
CASING: Diam. ____ Length _____ Type _____
DATE DRILLED: 11/30/2017
LONGITUDE:

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	Pt. Sample ID:	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
35			SB2-31'		30'-35'		Dry - No Moisture Tan/Gray Pcpt.	35
40			SB2-36' SB2-37'		35'-40'		Sandstone - Slow Penetration Dry - No Moisture Yellowish Red *staining	40
45			SB2-41' SB2-42'		40'-45'		Sandstone - showing Clay Lens Dry - Low Moisture	45
50			SB2-46'		45'-50'		Sandstone - showing Clay lens Dry - Low Moisture Yellowish Red	50
55			SB2-51' SB2-52' SB2-53'		50'-55'		Sandstone - showing clay Dry - Low Moisture Light Yellow Red	55
60			SB2-56' SB2-57'		55'-60'		Sandtone w/clays Dry - Low Moisture Light Yellowish Red	60
							Sandstone w/clays Dry - Low Moisture	

REMARKS:

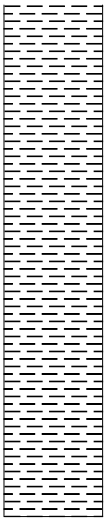
THIS BORING LOG SHOULD NOT BE USED SEPERATE FROM THE ORIGINAL REPORT

TALON LPE

SOIL BORING / MONITORING WELL LOG

PROJECT: Jal, NM - Pit Sites
PROJECT NUMBER: 700438.209.01
CLIENT: EOG Resources
BORING / WELL NUMBER: Galaxy - SB2
TOTAL DEPTH: 75
SURFACE ELEVATION:
GEOLOGIST: Jason Hafliger
LATITUDE:

DRILLING COMPANY: Talon/LPE
DRILLER: Ronnie Rodriguez
DRILLING METHOD: Hollow Stem Auger/Continuous Core
BORE HOLE DIAMETER: 6"
SCREEN: Diam. ___ Length _____ Slot Size _____
CASING: Diam. ____ Length _____ Type _____
DATE DRILLED: 11/30/2017
LONGITUDE:

DEPTH (FT.)	Soil Symbol	WELL CONSTRUCTION	Pt. Sample ID:	SAMPLES	SAMPLE INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT.)
65			SB2-61'		60'-65'		Light Yellowis Red	65
70					65'-70'		Sandstone w/clays Dry - Low Moisture Light Yellowish Red	70
75					70'-75'	75'	Sandstone w/clays Dry - Low Moisture Light Yellowish Red	75
80							Bottom of Hole	80
85								85
90								90

REMARKS:

THIS BORING LOG SHOULD NOT BE USED SEPERATE FROM THE ORIGINAL REPORT

EXPLANATION

Pleistocene and Recent — QUATERNARY

Qal — Alluvium

Sand and gravel along dry washes; silt and sand in lake beds; includes some wind-deposited sand around depressions

Pliocene — TERTIARY

To — Ogallala formation

Chiefly sand, poorly to well-cemented with calcium carbonate; contains some clay, silt, and gravel; capped in most places by caliche

Upper Triassic — TRIASSIC

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*

Dockum group

Ku — Cretaceous rocks, undifferentiated

Slumped blocks of buff, tan, or white fossiliferous limestone

CRETACEOUS

TRIASSIC

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.

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 shothole 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.

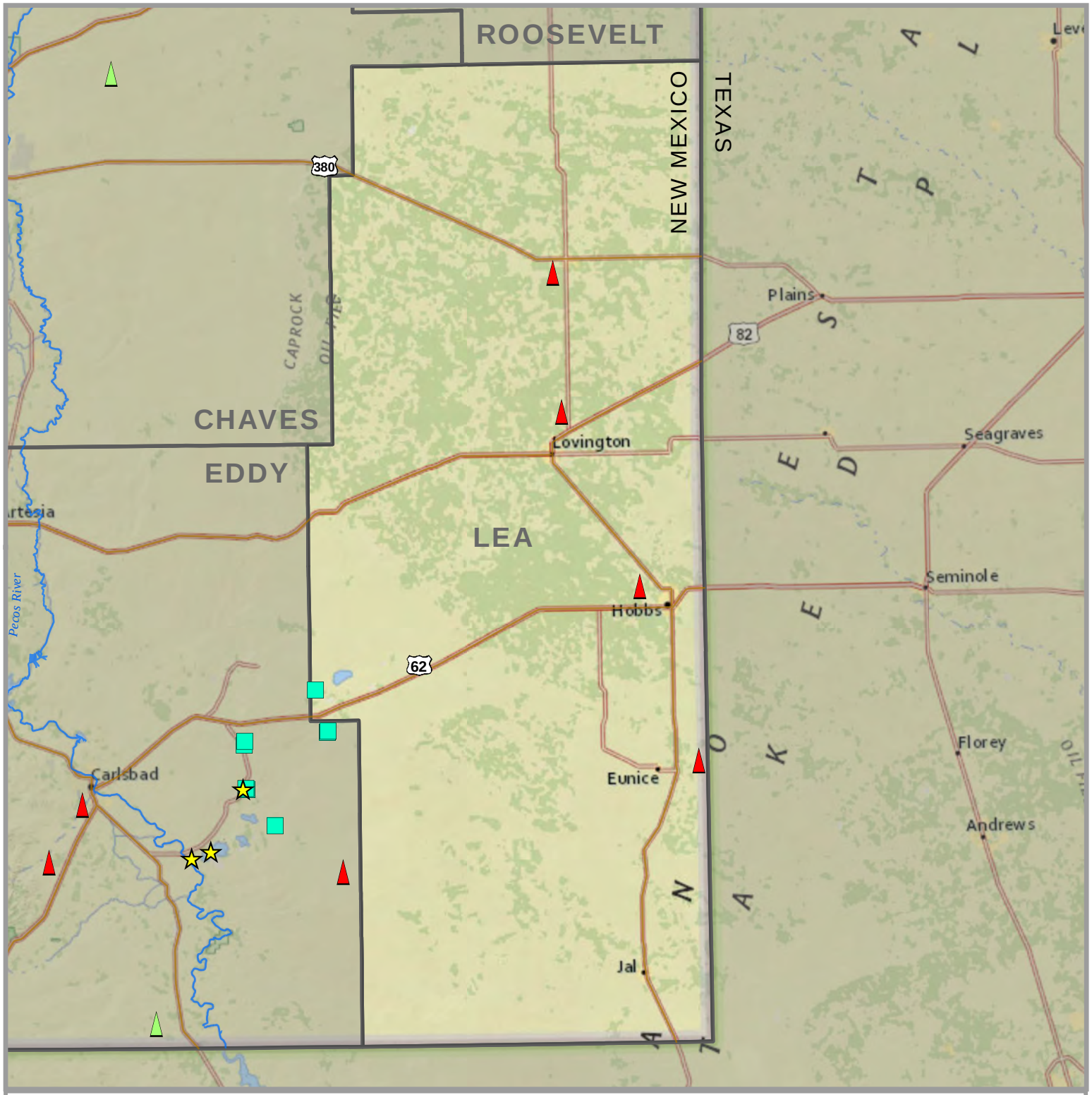
Compiled by Alfred Clebsch, Jr., 1960, using data collected mainly by Alexander Nicholson, Jr., in 1953 and 1954.

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

Souder, Miller & Associates ♦ 3451 Candelaria Road NE, Suite D
Albuquerque, NM 87107-1948 ♦ (505) 299-0942 ♦ (877) 299-0942 ♦ fax (505) 293-3430

Appendix B
Active Mine/Quarry Map (NM EMNRD)

Active Mines in Lea County, New Mexico, November 2014



Metals

Coal
Potash
Copper
Gold & Silver
Molybdenum

Industrial Minerals

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

Aggregate & Stone

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

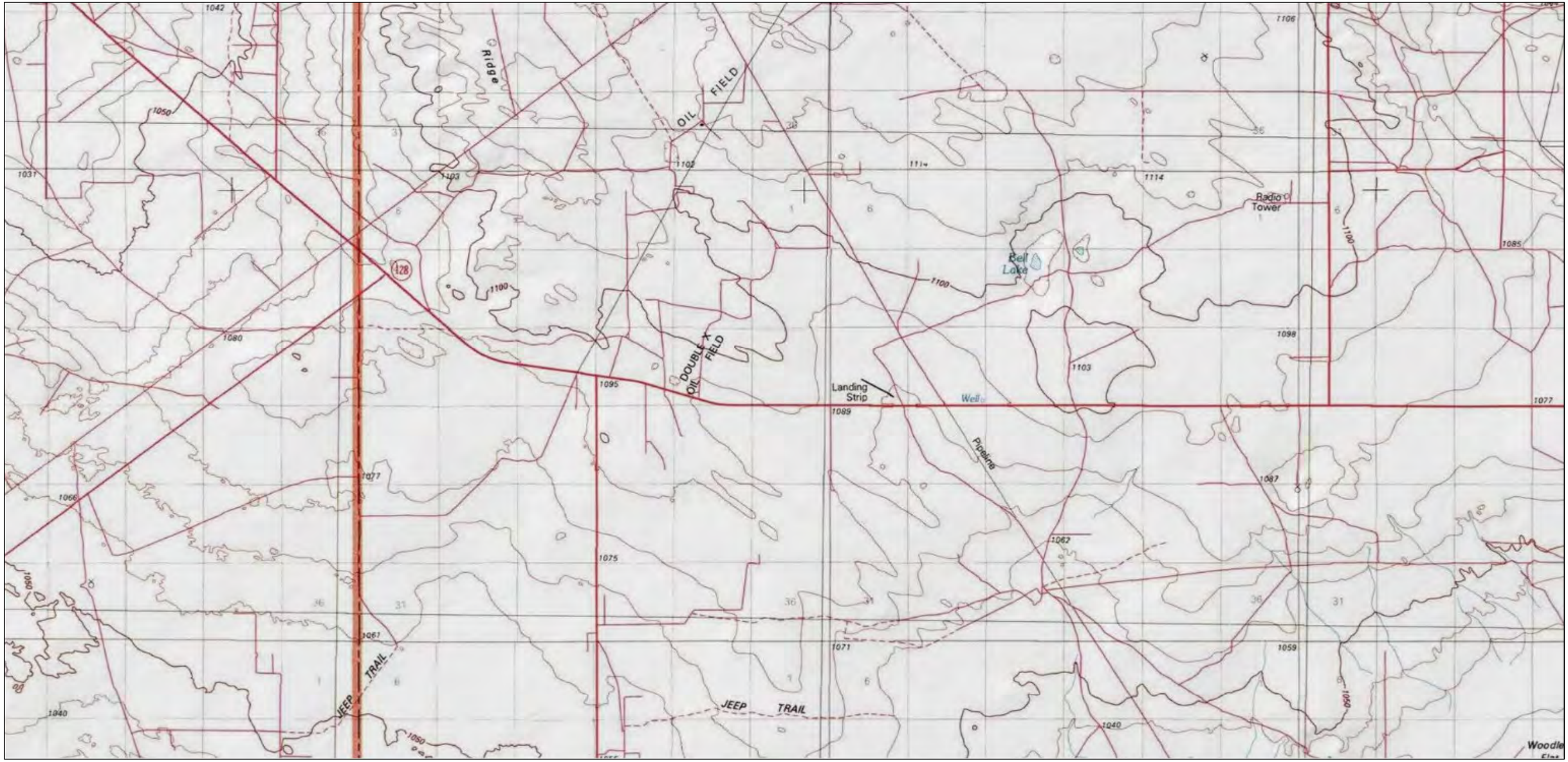
Data: November 2014 database query, Mining & Minerals Division, Mine Registration, Reporting & Safeguarding Program.
Basemap: Esri ArcGIS Online, National Geographic.
Map: Linda S. DeLay, GISP

NAD 83 UTM NM Zone13

N
W
E
S

0 5 10 20
Miles

Active Mines in New Mexico



December 4, 2017

1:93,455

0 0.75 1.5 3 mi

0 0.75 1.5 3 km

Copyright:© 2013 National Geographic Society, i-cubed

NM EMNRD ITO GIS

BLM and RGIS, of course | RGIS, CadNSDI, TRD, J R Jenks | Copyright:© 2013 National Geographic Society, i-cubed |

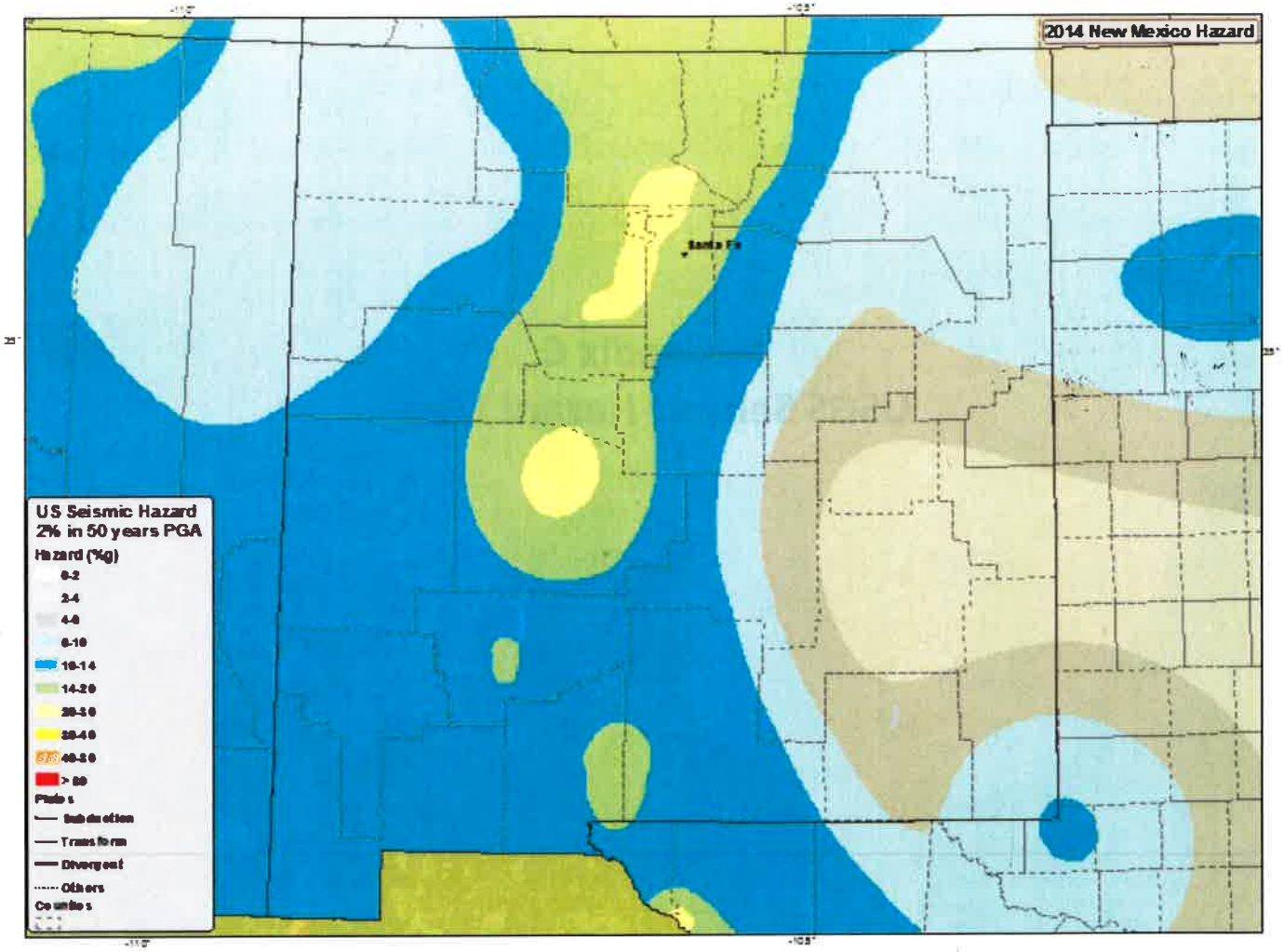
Souder, Miller & Associates ♦ 3451 Candelaria Road NE, Suite D
Albuquerque, NM 87107-1948 ♦ (505) 299-0942 ♦ (877) 299-0942 ♦ fax (505) 293-3430

Appendix C
USGS Seismic Hazard Map

U.S. Geological Survey - Earthquake Hazards Program

Information by Region - New Mexico

2014 Seismic Hazard Map



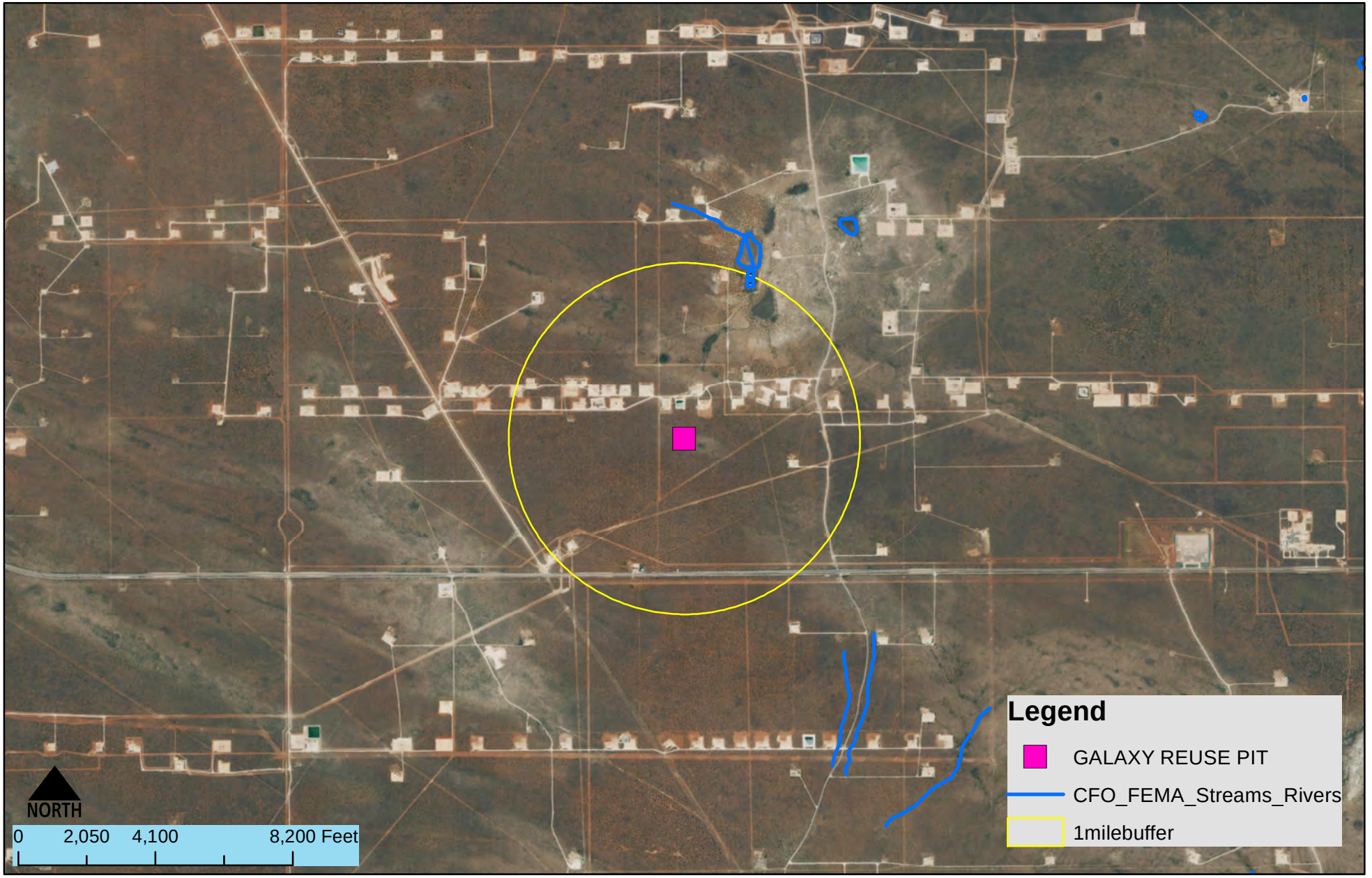
USGS National Seismic Hazard Maps

Souder, Miller & Associates ♦ 3451 Candelaria Road NE, Suite D
Albuquerque, NM 87107-1948 ♦ (505) 299-0942 ♦ (877) 299-0942 ♦ fax (505) 293-3430

Appendix D
FEMA Floodplain Information

FEMA's National Flood Hazard Layer (Official)

Data from Flood Insurance Rate Maps (FIRMs) where available digitally. New NFHL FIRMette Print app available: http://tinyurl.com/j4xwp5e



Site Map
EOG Galaxy Recycling Facility
S16 R33E T24S, Lea County, NM.

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

Date Saved: 12/6/2017

Copyright 2015 Souder, Miller & Associates - All Rights Reserved

Drawn Curtis Pattillo
Checked
Approved

SMA
201 South Halaguena Street
Carlsbad, New Mexico 88221
(575) 689.7040
www.soudermiller.com
Serving the Southwest & Rocky Mountains

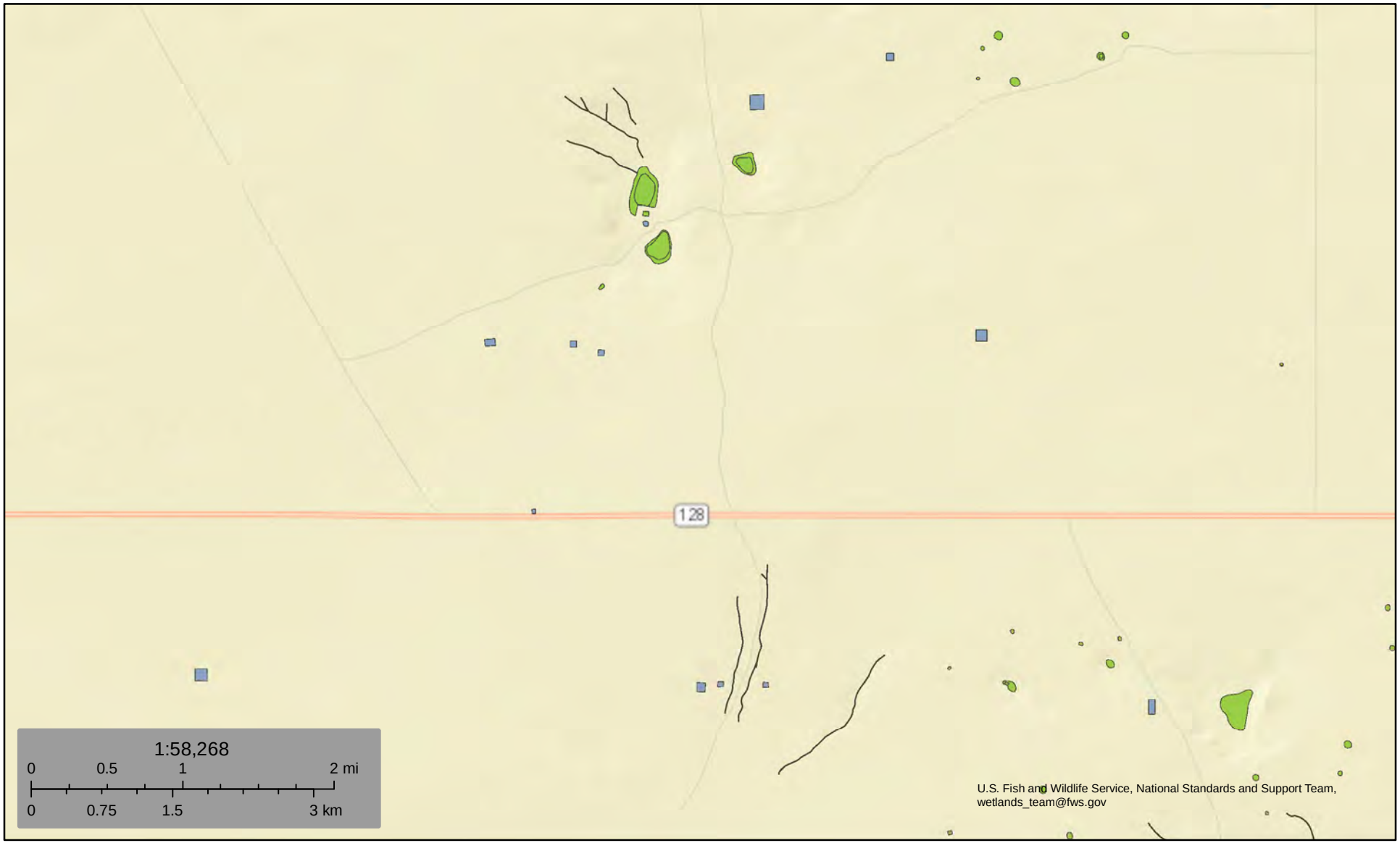
Document: P:\5-EOG Reuse Pits\BG1 - Mars\MINES.mxd

Souder, Miller & Associates ♦ 3451 Candelaria Road NE, Suite D
Albuquerque, NM 87107-1948 ♦ (505) 299-0942 ♦ (877) 299-0942 ♦ fax (505) 293-3430

Appendix E
Wetlands & Critical Habitat Map (US FWS)

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands/Riparian Areas within 1,000 feet



December 4, 2017

Wetlands

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