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

South Red Hills Reuse Water Recycling Facility and Containment Pit

NMOCD Submittal – C147 Registration Application

March 8, 2017

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.

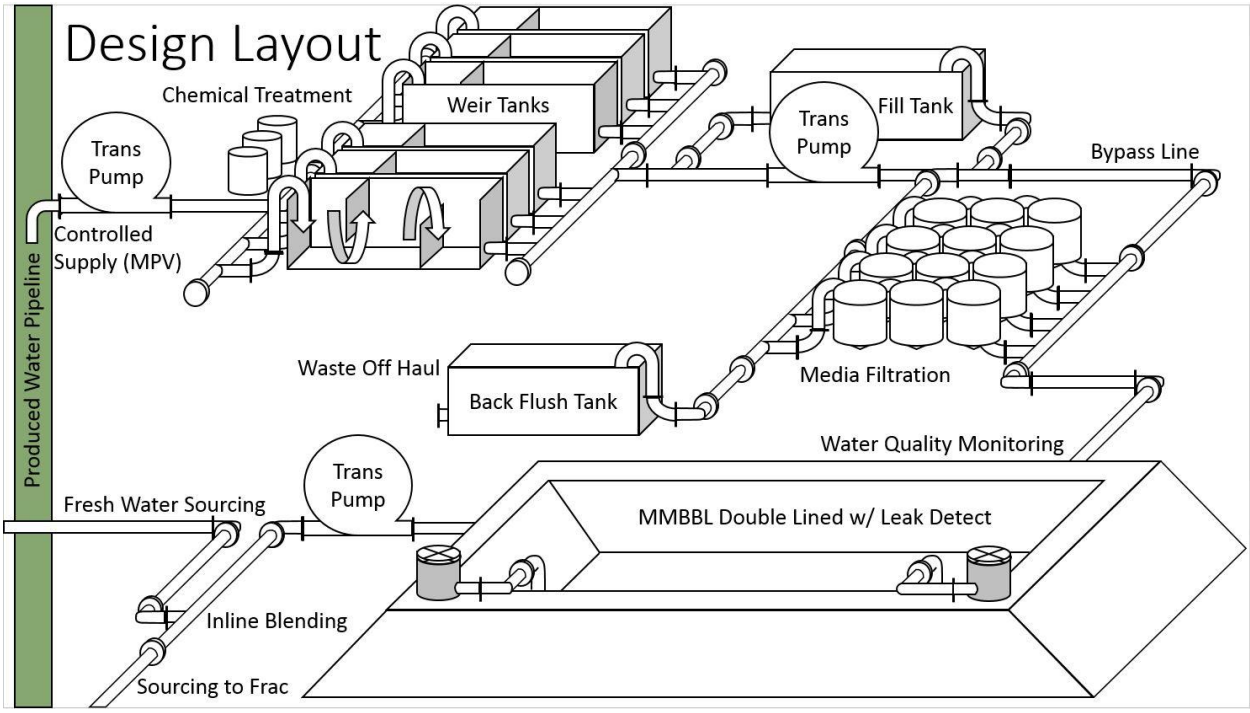
C-147 Detail

Operator and Facility / Location Detail

The proposed reuse water containment facility & containment pit, referred to as the South Red Hills Reuse Water Recycling Facility and Containment Pit, will be owned and operated by EOG resources and located in Township 26 South, Range 33 East in southwestern Lea County.

Recycling Facility Detail

The proposed containment pit will be located adjacent to the South Red Hills 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, *Red_Hills_Reuse_Pit_Final*, 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 530 x 530 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 a 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 shall 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, *Red_Hills_Reuse_Pit_Final,* 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 *Red_Hills_Reuse_Pit_Final,* will be installed to prevent any liner damage from water entrance velocity or hose installation. The entire containment pit will be covered by a suspended bird net consisting of +/- 800 x 80 netting segments with 1.5" openings bound together and suspended by cables traversing the pit approximately 5' above the top of berm.

Bonding

EOG Resources will source and distribute reuse water for the South Red Hills Reuse Water 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

The South Red hills Reuse Facility and Containment Pit perimeter will be completed with fencing consisting of 6 ft galvanized chain link with 3 strand 45 degree barbed wire arms toppers.

Signage

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

Variances

EOG Resources is seeking no variances for the South Redhills Reuse Water Facility and Containment Pit.

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 on the attached C147 form, all the required attachments have been included on the submittal and certification of C147 delivery to the landowner is acknowledged.

List of Attachments

Attachments and Supporting Documents

- C-147 Form
- Goshawk Environmental Report
    - Siting Criteria Detail
- LRE Hydrogeologic Report
    - Site Specific Groundwater Data
- Containment Pit Design Plan
    - Stamped Engineered Drawings of Containment Pit and Site
- Souder Miller Siting Criteria Report
    - Siting Criteria Detail
- Liner Detail – Mustang Energy Services
- Signage Example
- Closure Plan
- Operating Plan
- Bond Detail
- C147 Landowner Delivery

10 February 2017

Mr. Robert Crain
EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706

Re: Comprehensive Resource Review – Red Hills South Water Reuse Site
Lea County, New Mexico

Dear Mr. Crain:

Goshawk Environmental Consulting, Inc. (Goshawk) conducted a comprehensive desktop resource review and limited field investigations for the Red Hills South 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 evaluated the probability for significant cultural resources and made recommendations for further investigations, if applicable. All figures are in Appendix A.

INTRODUCTION

The Red Hills South 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 1,200 feet long (east to west) and 860 feet wide (north to south) and encompasses approximately 23.69 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 Red Hills South 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 Paduca Breaks East, 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 eastern portion of the Red Hills South Water Reuse Site is within grasslands (white background) and the western portion is within shrublands (green stipple pattern). The terrain is relatively flat, with elevations at approximately 3,260 feet above mean sea level. Drainage occurs by overland sheet flow toward the southwest. The headwaters of a mapped unnamed tributary (dot-dash blue line) is indicated approximately 2,300 feet to the southwest. This tributary flows approximately 0.6 mile west and joins another tributary. The tributary continues to flow 1.6 miles southwest before it dissipates or flows underground. The Red Hills South Water Reuse Site is within the Lower Pecos River Watershed. The nearest direct line point to the Pecos River is approximately 19 miles southwest. There are no improvements 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 Red Hills South Water Reuse Site is within relatively open shrublands. There are several caliche oil/gas pads immediately to the west of the site. A caliche pit, several caliche roads, and other oil/gas development (pads and pipelines) are apparent in the surrounding areas. 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 Red Hills South Water Reuse Site are (by prevalence): Simona-Upton association (SR), Pyote and Maljamar fines sands (PU), and Kimbrough loam (Kc). The primary soil components of these maps units are Simona fine sandy loam, Upton gravelly loam, Pyote fine sand, Maljamar fine sands, and Kimbrough loam. None of the primary components of these soils are listed as hydric soils.

FIELD INVESTIGATION

A field investigation was conducted on 26 January 2017 in order to determine the presence of potential WATERS within the Red Hills South 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 very flat. Vegetation within the site consists of broom snakeweed (*Gutierrezia sarothrae*), honey mesquite (*Prosopis glandulosa*), prickly pear (*Opuntia* sp.), soapweed yucca (*Yucca glauca*) dove weed (*Croton texensis*), and desert peony (*Acourtia nana*) 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 Red Hills South 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 Red Hills South 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 Red Hills South Water Reuse Site or immediate vicinity.

The state-listed T/E species on NMDGF BISON-M County List for Lea County dated 24 January 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 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 archeological sites, standing structures, or other historic resources listed on or eligible for listing on the National Register of Historic Places (NRHP). Privately funded projects on privately owned land that do not require federal permits, funding, approvals etc. are not currently regulated by federal law. Frequently, individual municipalities or state agencies will have cultural resource review and protection requirements; however, there are no known requirements for the proposed site.

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 Red Hills South 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.

ARCHIVAL REVIEW

Nearby Archeological Sites

According to NMCRIS, there are no previously recorded archeological sites within the Red Hills South Reuse Site. There nearest recorded archeological site is LA# 45969 located approximately 1,400 feet east of the Red Hills South Reuse Site. The archeological site was documented in 1983 during NMCRIS Activity# 10289 and was revisited in 1999 during NMCRIS Activity# 63533. The site was documented as a multicomponent unspecified prehistoric and historic ranching site. The prehistoric artifact assemblage consisted of lithic debitage and ground stone tools but no diagnostic aboriginal artifacts were identified. The historic component consisted of a corral, a windmill, two tanks, glass, metal, and non-diagnostic historic ceramics. In 2004, the site was deemed eligible for listing on the National Register of Historic Places by the recorder and assigned an unevaluated status during state agency review.

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 Kimbrough loam, Pyote/Maljamar fine sands, and Simona-Upton Association soils. The Kimbrough series is a shallow loamy alluvium associated with playa lake formation. This series exhibits a moderate potential for the presence of significant cultural sites. The Pyote/Maljimar series are deep, wind-blown sands or loams that exhibit a moderate probability for containing significant cultural deposits in some settings. The Simona-Upton series are shallow, gravelly sands derived from eroded sedimentary rock. This series has a low potential for containing temporally stratified deposits. Considering the soils present, there is a moderate probability for the presence of cultural resources within the proposed Red Hills South Reuse Site.

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 is based on the number of significant prehistoric sites present in the vicinity, the soils present, and the topographic relief and natural water resources near the site.

SUMMARY

Based on the results of the Desktop Resource Review, it is Goshawk's opinion that the construction of the Red Hills South Water Reuse Site is unlikely to impact any sensitive natural resources, including WATERS and T/E species. Based on topographic location, underlying soils, and documented prehistoric sites in the vicinity, it is Goshawk's opinion that the site has a moderate probability to contain significant

prehistoric resources. If any federal permits are required, notification and subsequent consultation with the lead federal agency may be necessary. However, if no federal permit is required, a cultural resources survey is not required and construction may proceed as planned. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be immediately halted and a qualified archeologist should be notified. If you have any questions or desire additional information, please contract our office.

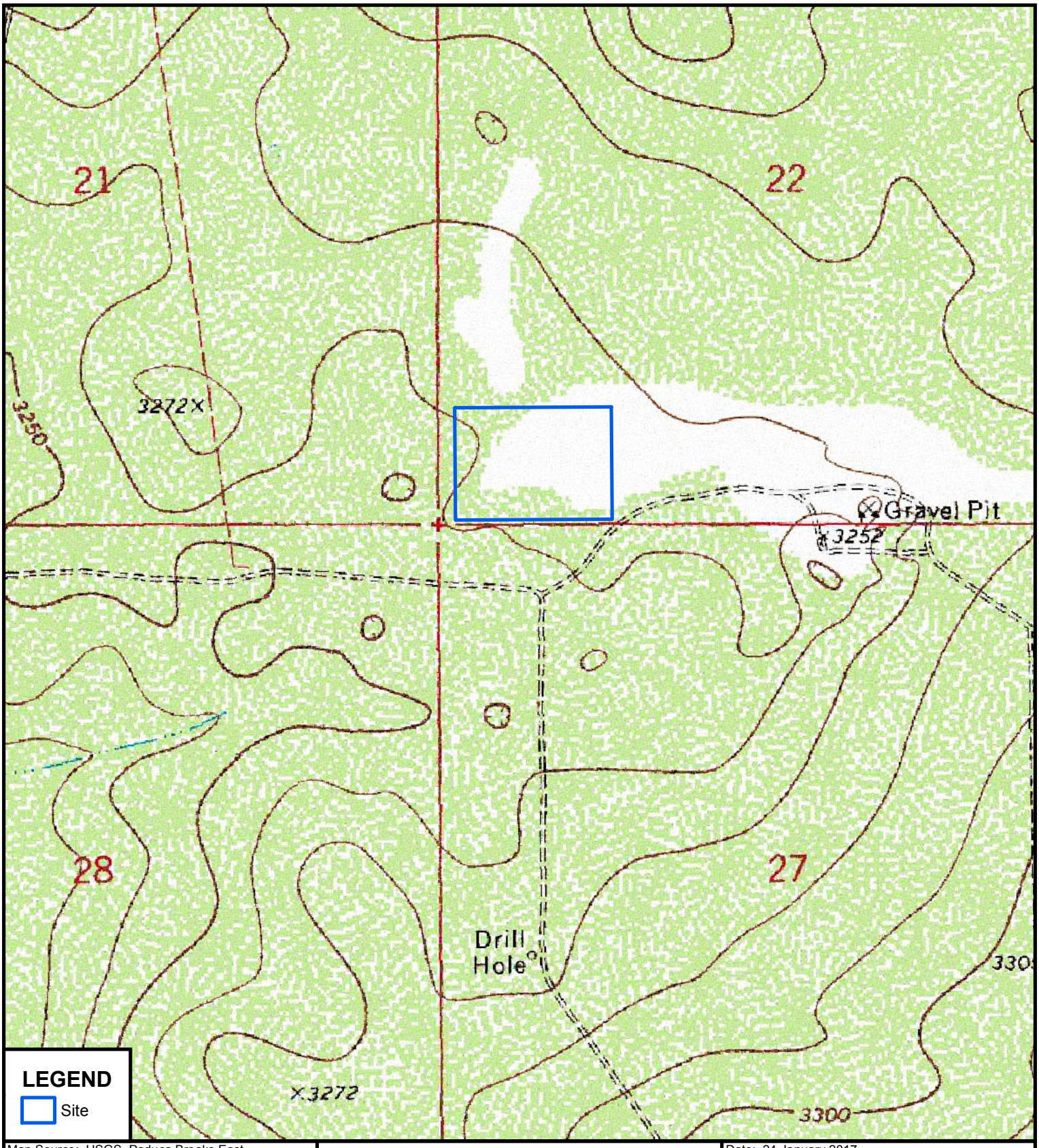
Sincerely,

Zane N. Homesley
President

Reign Clark
Cultural Resources Director

Cc: James Barwis, EOG Resources, Inc.
Jeremy Smith, EOG Resources, Inc.

APPENDIX A
FIGURES



Map Source: USGS, Paduca Breaks East, New Mexico Quadrangle.

0 500 1,000 Feet

GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 1
USGS Topographic Map
Lea County, New Mexico

Red Hills South Reuse Site

T26S; R33E; Sections 22 & 27

Date: 24 January 2017

N

eog resources

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

0 500 1,000 Feet

GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 2
Aerial Orthoimagery
Lea County, New Mexico

Red Hills South Reuse Site

T26S; R33E; Sections 22 & 27

Date: 24 January 2017

N

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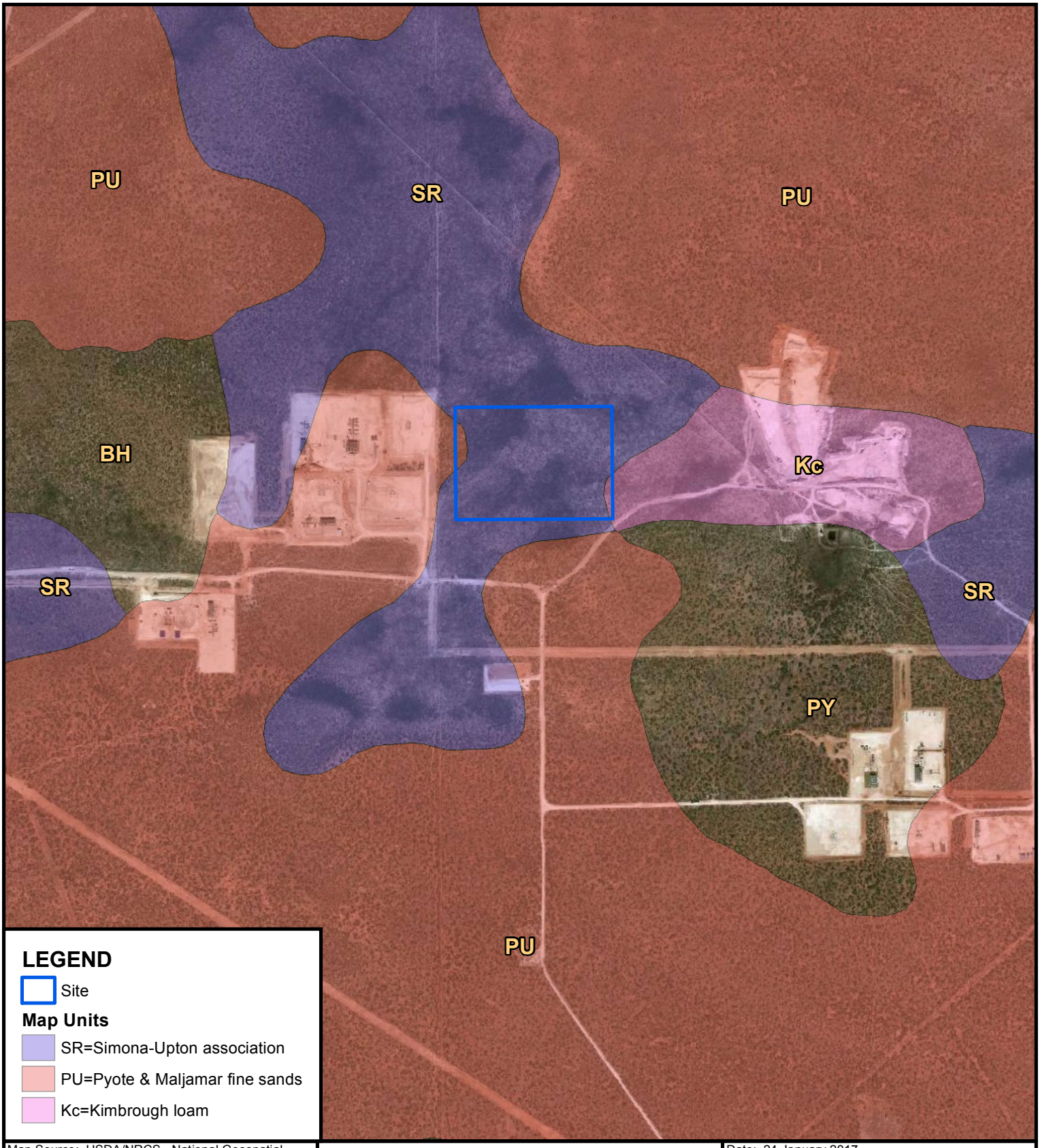

LEGEND

Site

Map Units

SR=Simona-Upton association

PU=Pyote & Maljamar fine sands

Kc=Kimbrough loam

Map Source: USDA/NRCS - National Geospatial Center of Excellence. Soil Survey Geographic (SSURGO) database, Lea County, NM. EOG's Spatial on Demand. Global:Imagery: DigitalGlobe Most Recent.

0 500 1,000 Feet

GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 3
NRCS SSURGO Soils Map
Lea County, New Mexico

Red Hills South Reuse Site

T26S; R33E; Sections 22 & 27

Date: 24 January 2017

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TECHNICAL MEMORANDUM

TO:	Mr. Robert Crain, Water Resources Manager – San Antonio & Midland EOG Resources, Inc.
FROM:	Michael Keester, PG and Jordan Furnans, PhD, PE, PG, CFM
SUBJECT:	Hydrogeologic Evaluation of the Red Hills South Reuse Pit Area, New Mexico
DATE:	February 17, 2017

LRE Water, LLC (LRE) conducted a hydrogeologic evaluation of the local groundwater conditions beneath the Red Hills South Reuse Pit Area in Lea county, New Mexico. Our evaluations focused on addressing the hydrogeologic questions presented on State of New Mexico, Energy Minerals and Natural Resources Department, Oil Conservation Division, Form C-147. During our assessment, we compiled records from the New Mexico Office of the State Engineer (NM OSE Information Technology Systems Bureau GIS 2017), Resource Geographic Information System (Earth Data Analysis Center, University of New Mexico 2015), and New Mexico Bureau of Geology and Mineral Resources (New Mexico Bureau of Geology & Mineral Resources 2015).

According to available surface geology data, the proposed reuse pit is located atop outcrop of the Ogallala Formation. Nearly surrounding the proposed pit area are younger eolian (that is, windblown) and Piedmont deposits. Figure 1 illustrates the local surface geology near the proposed reuse pit.

Based on reported depths of nearby wells (NM OSE Information Technology Systems Bureau GIS 2017) and the High Plains Aquifer System Groundwater Availability Model (Deeds, et al. 2015), the base of the Ogallala is approximately 150 to 200 feet below ground level at the proposed reuse pit site. Beneath the Ogallala are the rocks of the Upper Chinle Group which are several hundred feet thick. The closest well to the property (POD 3577 – approximately 1,300 feet east) is reportedly completed in these deeper rocks at a depth of 750 feet.

Other wells in the area, with reported depths, are completed in the Ogallala formation. Reported water levels in these wells are more than 75 feet below ground level (NM OSE Information Technology Systems Bureau GIS 2017, U.S. Geological Survey 2016). Figure 2 shows the locations of nearby wells along with each well's identification number. Table 1 provides measured depth to water and other details for each well shown.

There are no springs in the area and the site is not within a mapped 100-year floodplain. The nearest mapped wetland is a freshwater pond approximately 1,500 feet east of the proposed reuse pit. The only other mapped surface water feature is an ephemeral stream more than 2,000 feet southwest of the reuse pit. Figure 3 shows the mapped wetlands near the proposed reuse pit.

Figure 1. Local Surface Geology per New Mexico Bureau of Geology & Mineral Resources (2015).

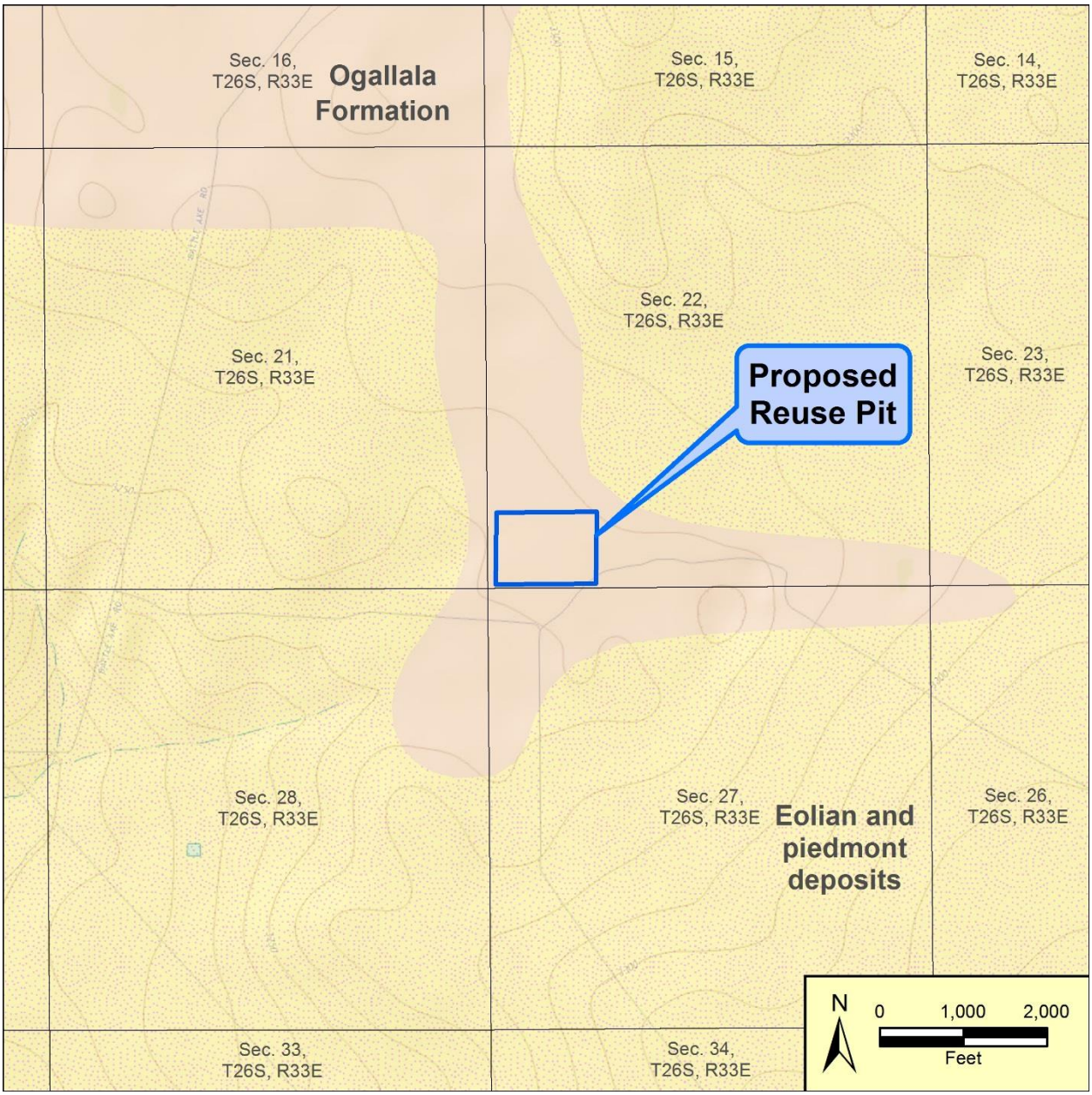


Figure 2. Local Reported Well Locations.

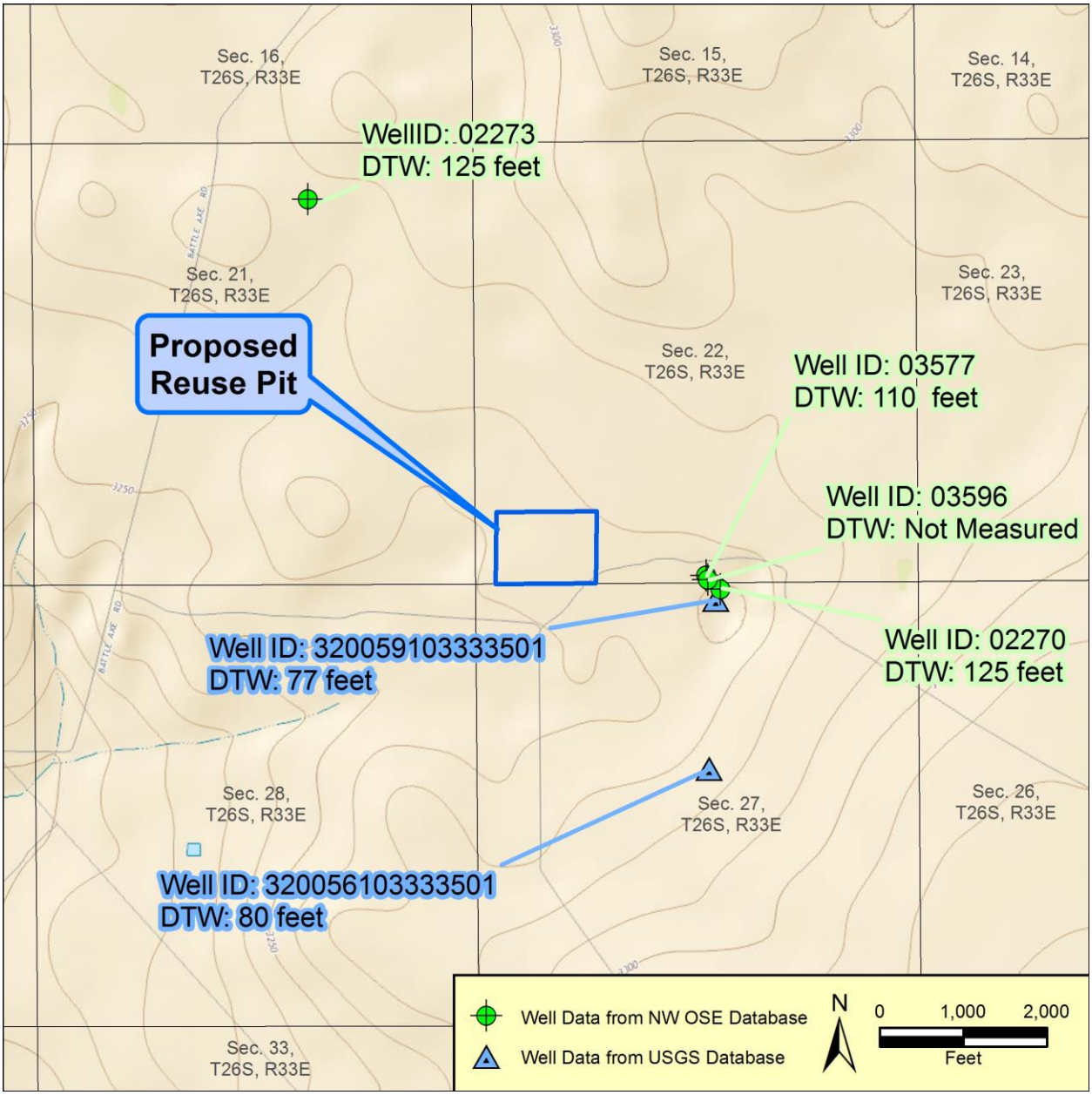
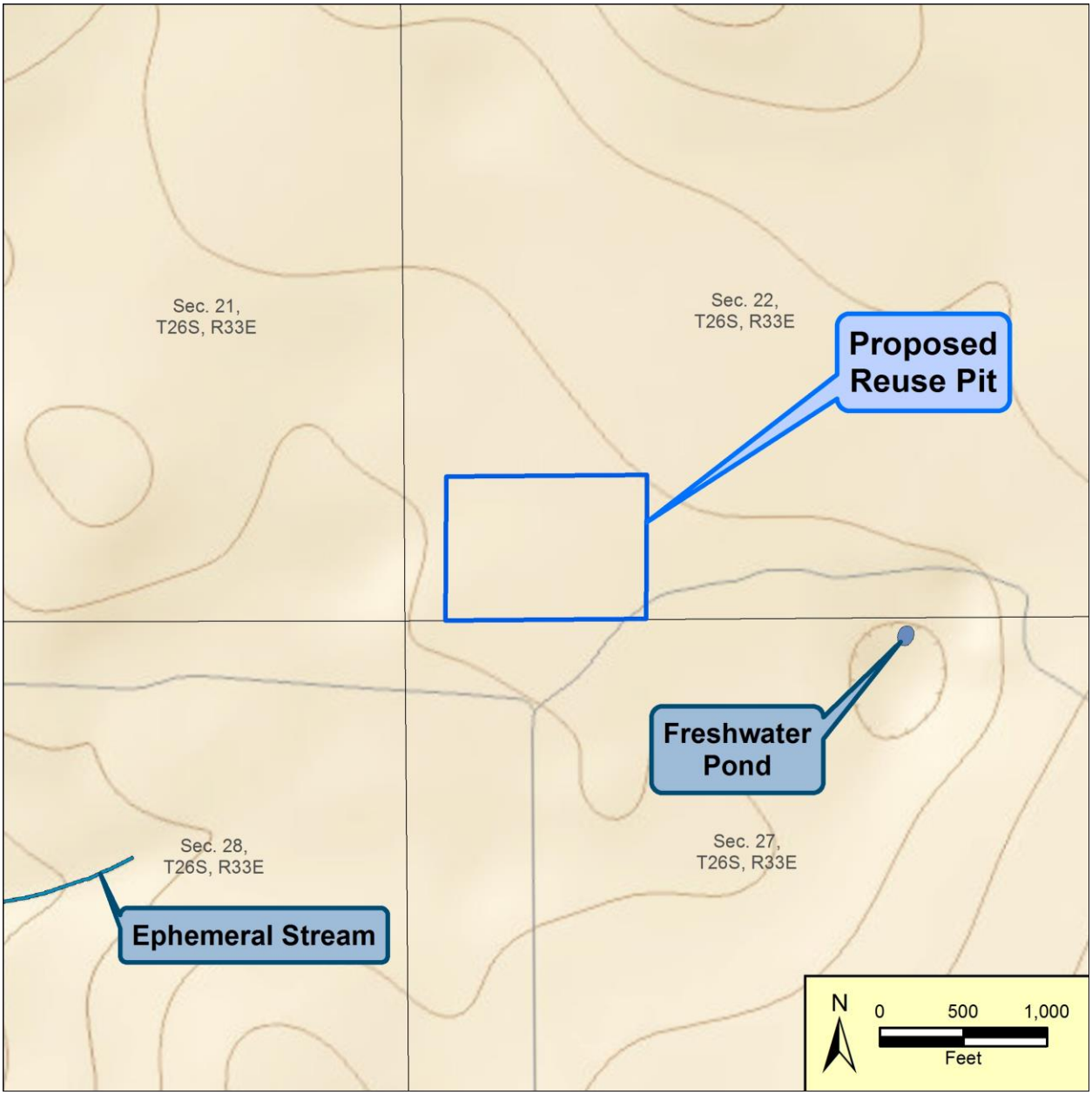


Table 1. Local Well Data.

Well ID*	Well Depth	Depth to Water	Year Measured	Distance to Pit
02270	150 feet	125 feet	1992	1,490 feet
02273	160 feet	125 feet	1930	4,370 feet
03577	750 feet	110 feet	2012	1,315 feet
03596	225 feet	Not Measured	—	1,350 feet
320056103333501	Unknown	80 feet	1981	2,600 feet
320059103333501	200 feet	77 feet	2001	1,440 feet

*5-Digit Well ID is the POD number from the New Mexico Office of the State Engineer (OSE). Other Well ID numbers are from the U.S. Geological Survey.

Figure 3. Mapped Wetlands per U.S. Fish and Wildlife Service (2016).



Summary

Table 2 summarizes our responses, based on available data, to the hydrogeologic questions presented in Section 8 of the State of New Mexico, Energy Minerals and Natural Resources Department, Oil Conservation Division, Form C-147.

Table 2. Responses to Hydrogeologic Questions in Section 8 of Form C-147.

Question	Response
Ground water is less than 50 feet below the bottom of the Recycling Containment	No
Within a 100-year floodplain	No
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake	No
Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes	No
Within 500 feet of a wetland	No

References

Deeds, Neil E., Jevon J. Harding, Toya L. Jones, Abhishek Singh, Scott Hamlin, Robert R. Reedy, Tingting Yan, et al. 2015. *Final Conceptual Model for the High Plains Aquifer System Groundwater Availability Model.* Austin: Texas Water Development Board. http://www.twdb.state.tx.us/groundwater/models/gam/hpas/HPAS_GAM_DRAFT_CM.pdf.

Earth Data Analysis Center, University of New Mexico . 2015. *NM Resource Geographic Information System.* Accessed February 13, 2017. http://rgis.unm.edu/.

New Mexico Bureau of Geology & Mineral Resources. 2015. *Geologic_Map_Unit Shapefile.* New Mexico, February 9. Accessed February 14, 2017. http://rgis.unm.edu/getdata/.

NM OSE Information Technology Systems Bureau GIS. 2017. *OSE_Wells Shapefile.* Santa Fe, New Mexico, February 3. Accessed February 13, 2017. http://gisdata-ose.opendata.arcgis.com/datasets?q=wells.

U.S. Fish and Wildlife Service. 2016. *National Wetlands Inventory - Version 2 - Surface Waters and Wetlands Inventory*. Web Mapping Service. Washington, D.C., May. Accessed February 14, 2017. https://www.fws.gov/wetlands/arcgis/services/Wetlands/MapServer/WMSServer?

U.S. Geological Survey. 2016. *National Water Information System data available on the World Wide Web (USGS Water Data for the Nation).* Accessed February 13, 2017. doi:10.5066/F7955KJN.

(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

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(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

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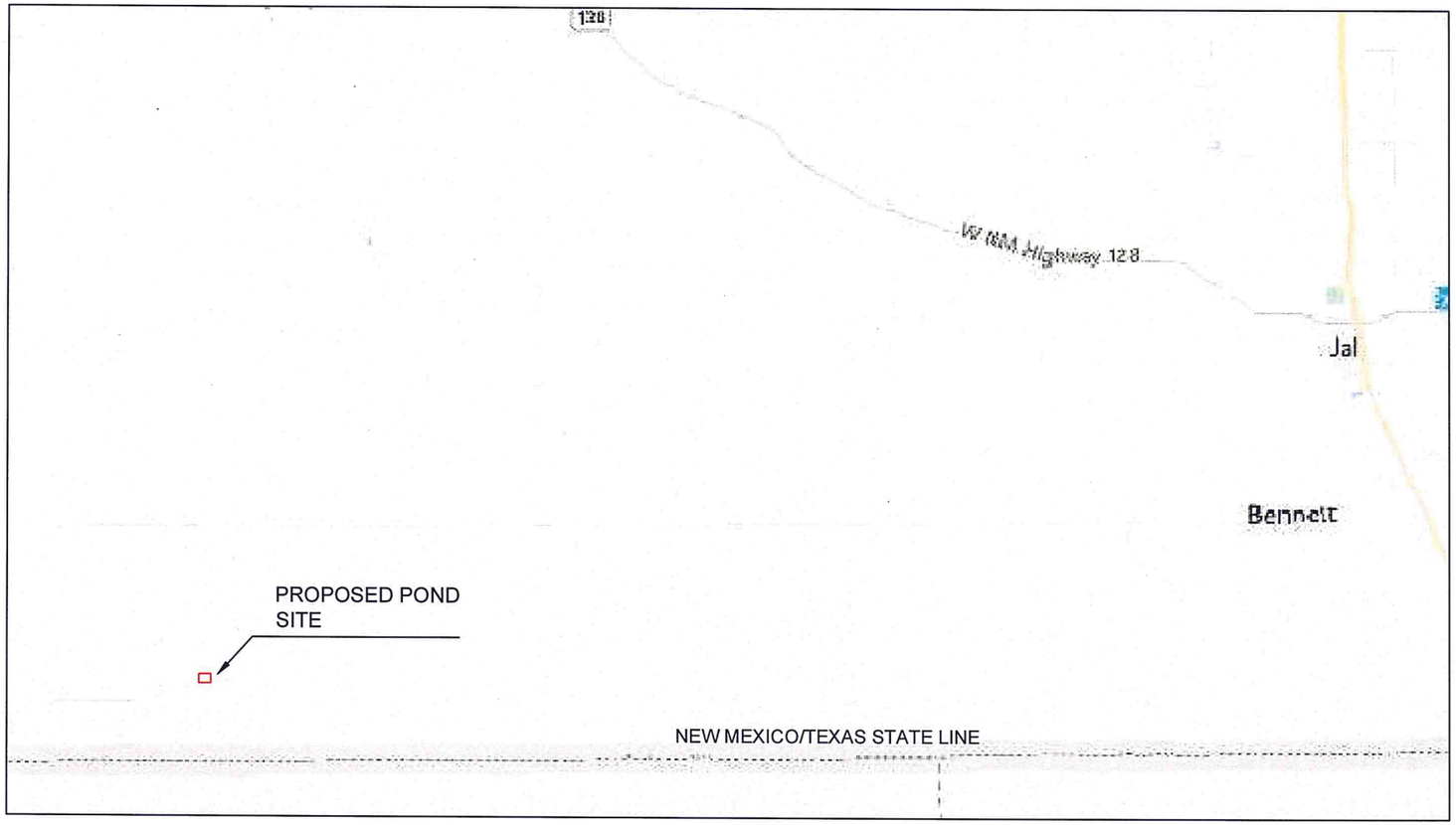

SHEET INDEX	
#	DESCRIPTION
1	COVER
2	SITE LAYOUT, GRADING, AND YARD PIPING PLAN
3	ENLARGED SITE LAYOUT, GRADING, AND YARD PIPING PLAN
4	SITE DETAILS AND SECTIONS (1 OF 2)
5	SITE DETAILS AND SECTIONS (2 OF 2)

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NEW MEXICO
12482
REGISTERED PROFESSIONAL ENGINEER
3/8/17

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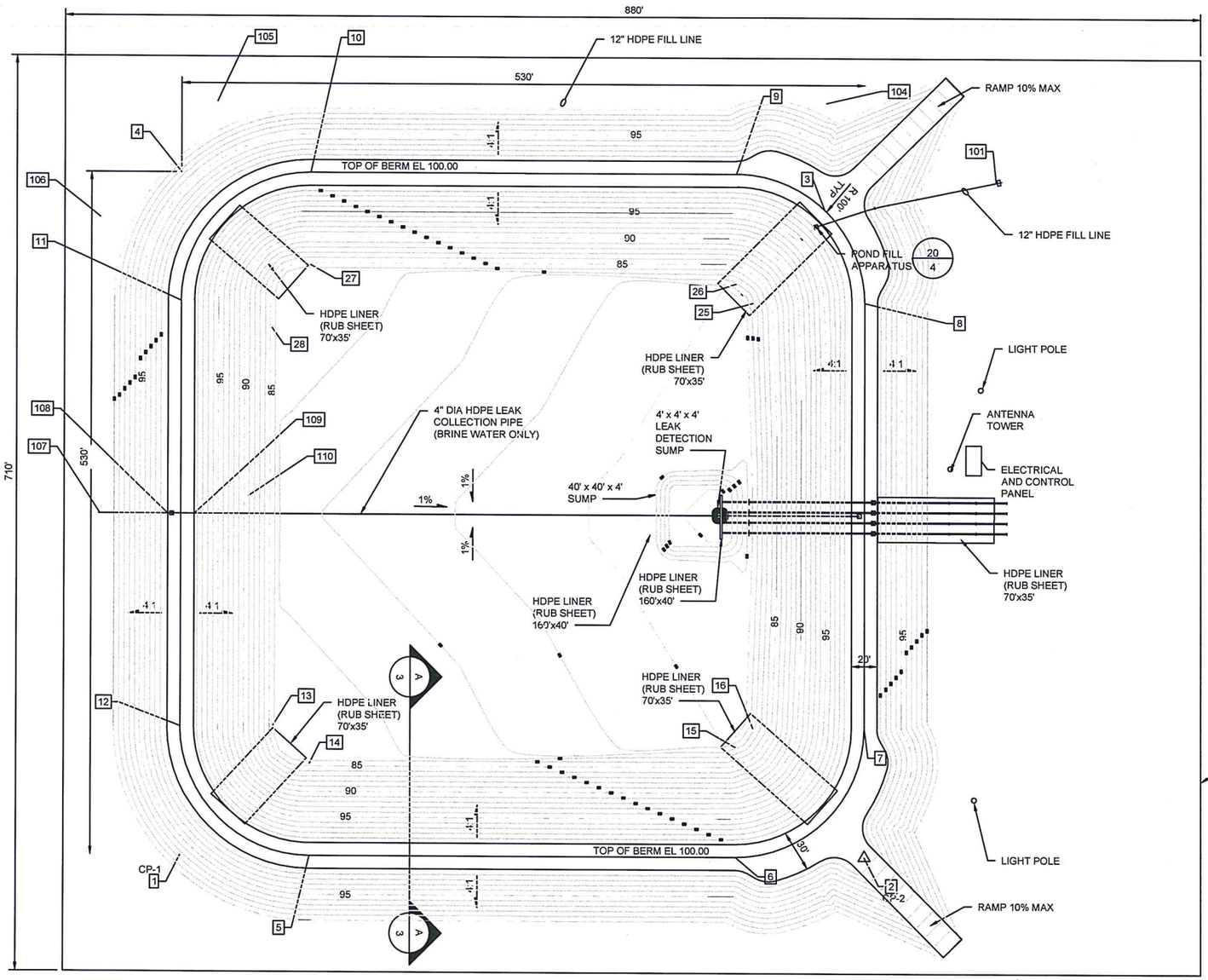

NOTES

1. LINER SYSTEM NOT SHOWN FOR CLARITY.
2. ORIENTATION OF POND COMPONENTS AND TRUCK FILL STATIONS MAY VARY DEPENDING ON SITE CONDITIONS.
3. GRADE SITE TO CONVEY DRAINAGE AWAY FROM BERM AND OFF OF THE SITE. IMPLEMENT EROSION CONTROL DEVICES AS REQUIRED BY SWPPP PERMIT.
4. COORDINATES SHOWN BASED ON A LOCAL PLANT COORDINATES SYSTEM AND TIE IN TO NEW MEXICO STATE PLANE WILL VARY BY SITE.

   PLANT

   CP-1 N 5000.000 E 1,000.000

   CP-2 N 5000.000 E 1,490.000

   CP-3 N 5333.000 E 1,632.000 EL. #####.###

   STATE PLANE

   CP-1 N #,###,###.#### E #,###,###.####

   CP-2 N #,###,###.#### E #,###,###.####

   CP-3 N #,###,###.#### E #,###,###.#### EL. #####.###

   SCALE FACTOR : #

   ROTATION: ##°,##'##.##"
5. 1.0 FOOT CONTOUR INTERVAL SHOWN.

[#] CONTROL POINT TABLE - SEE DWG C-2

CONTROL POINT TABLE

POINT NUMBER	NORTHING	EASTING	ASSUMED ELEVATION	DESCRIPTION
1	4950.00	1010.00	0.00	CP-1, PI BERM ROAD
2	4950.00	1540.00	0.00	CP-2, PI BERM ROAD
3	5480.00	1540.00	0.00	PI BERM ROAD
4	5480.00	1010.00	0.00	PI BERM ROAD
5	4950.00	1110.00	100.00	PT BERM ROAD
6	4950.00	1440.00	100.00	PC BERM ROAD
7	5050.00	1540.00	100.00	PT BERM ROAD
8	5380.00	1540.00	100.00	PC BERM ROAD
9	5480.00	1440.00	100.00	PT BERM ROAD
10	5480.00	1110.00	100.00	PC BERM ROAD
11	5380.00	1010.00	100.00	PT BERM ROAD
12	5050.00	1010.00	100.00	PC BERM ROAD
13	5050.00	1081.54	84.59	PC POND BOTTOM
14	5021.54	1110.00	84.59	PT POND BOTTOM
15	5035.29	1440.00	81.31	PC POND BOTTOM
16	5050.00	1453.58	80.92	PT POND BOTTOM
17	5179.00	1450.00	80.00	PI POND BOTTOM, TOP OF SUMP
18	5179.00	1378.00	80.00	PI TOP OF SUMP
19	5251.00	1378.00	80.00	PI TOP OF SUMP
20	5251.00	1450.00	80.00	PI POND BOTTOM, TOP OF SUMP
21	5209.00	1434.00	76.00	PI TOP LEAK SUMP
22	5209.00	1422.00	76.00	PI TOP LEAK SUMP
23	5221.00	1422.00	76.00	PI TOP LEAK SUMP
24	5221.00	1434.00	76.00	PI TOP LEAK SUMP
25	5380.00	1453.58	80.92	PC POND BOTTOM
26	5394.71	1440.00	81.31	PT POND BOTTOM
27	5408.46	1110.00	84.59	PC POND BOTTOM
28	5380.00	1081.54	84.59	PT POND BOTTOM

PLANT N

0 50 100 150

SCALE IN FEET

ROBERT G. EDENS NEW MEXICO 12467 REGISTERED PROFESSIONAL ENGINEER 3/8/17

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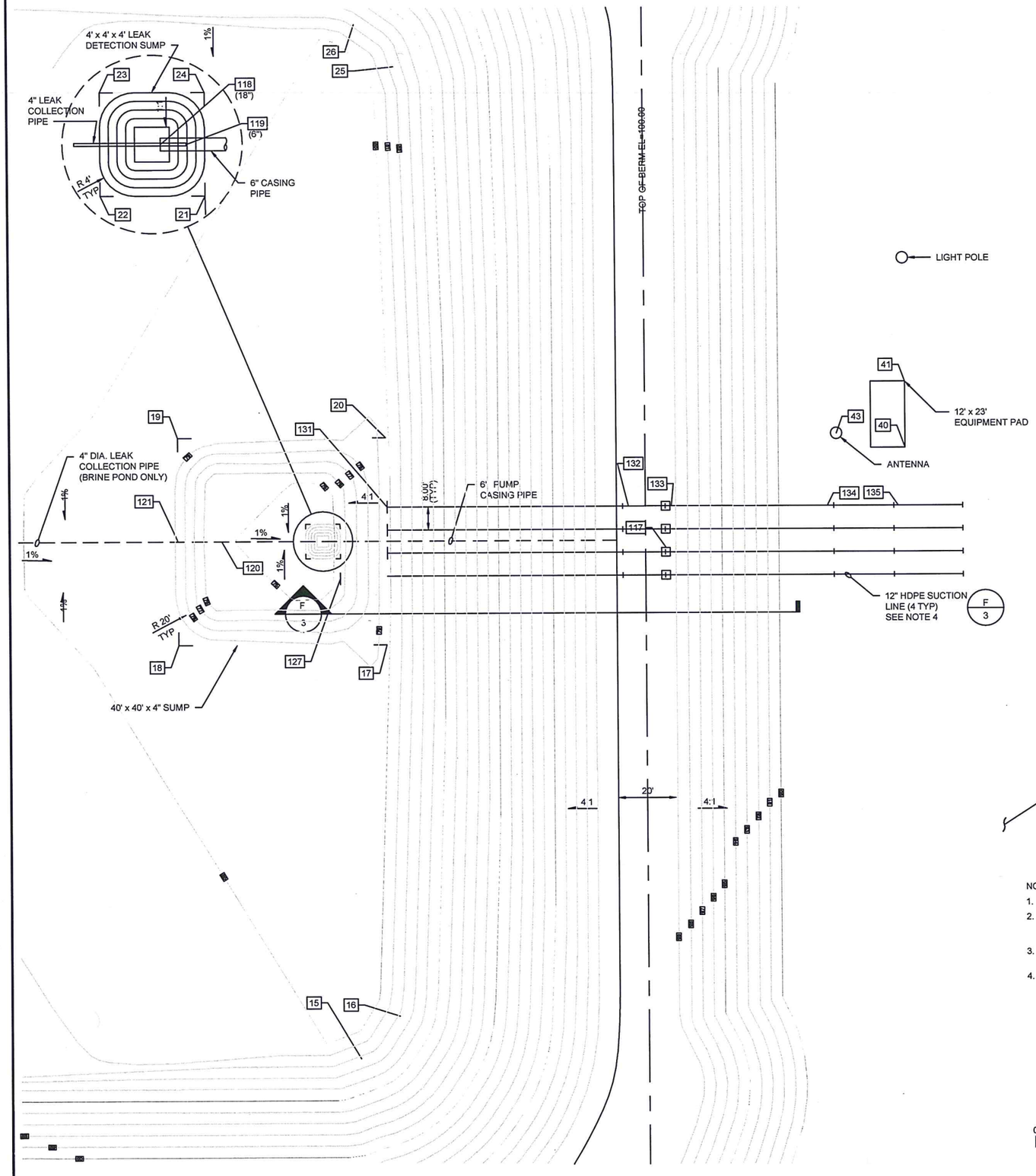
RED HILLS REUSE POND

SITE LAYOUT, GRADING AND YARD PIPING PLAN

REVISION:	DATE:
	03/7/2017

DATE: 2/10/17
FILE: RED_HILLS_RECYCLE_POND
DRAWN BY: CMM
REVIEWED BY: CCC
SCALE: 1" = 100'
SHEET : 2 OF 5



NOTES:

1. LINER NOT SHOWN FOR CLARITY.
2. ASSUMED ELEVATIONS BASED ON TOP OF BERM ELEVATION 100.00. ADJUST TO LOCAL SITE DATUM FOR SUBSYSTEM PACKAGES.
3. CURB STOPS TO BE 8FT PRECAST CONCRETE, STAKED INTO GROUND.
4. CONTRACTOR TO PROVIDE IDENTIFICATION MARKERS ON ABOVE GROUND PIPING TO DIFFERENTIATE BETWEEN THE FOUR (4) SUCTION LINE.

PLANT N

0 20 40 60

SCALE IN FEET

ROBERT G. EDENS
NEW MEXICO
12467
REGISTERED PROFESSIONAL ENGINEER
3/8/17

CONTROL POINT TABLE				
POINT NUMBER	NORTHING	EASTING	ASSUMED ELEVATION	DESCRIPTION
40	5247.00	1630.50	NA	CORNER OF SLAB
41	5270.00	1630.50	NA	CORNER OF SLAB
42	5313.00	1630.00	NA	LIGHT POLE
43	5252.00	1606.50	NA	ANTENNA TOWER
50	4885.00	1813.00	TBD	PC ROAD, MATCH EXIST
51	4905.00	1793.00	TBD	PT ROAD
52	4905.00	1715.00	TBD	PI ROAD
53	4975.00	1715.00	TBD	PC ROAD, MATCH EXIST
54	4995.00	1635.00	TBD	PT ROAD
55	4995.00	1635.00	TBD	PI ROAD
56	5135.00	1635.00	TBD	PI ROAD
57	5135.00	1695.00	TBD	PC ROAD, MATCH EXIST
58	5155.00	1715.00	TBD	PT ROAD
59	5185.00	1715.00	TBD	PC ROAD, MATCH EXIST
60	5205.00	1695.00	TBD	PT ROAD
61	5205.00	1580.00	TBD	PC ROAD, MATCH EXIST
62	5185.00	1560.00	TBD	PT ROAD, END GRAVEL SURFACING
63	5165.00	1560.00	TBD	PI ROAD
64	5145.00	1550.00	TBD	PI ROAD
65	5275.00	1550.00	TBD	PI ROAD
66	5255.00	1560.00	TBD	PI ROAD
67	5245.00	1560.00	TBD	PC ROAD, END GRAVEL SURFACING
68	5225.00	1580.00	TBD	PT ROAD
69	5225.00	1695.00	TBD	PC ROAD
70	5245.00	1715.00	TBD	PT ROAD
71	5252.75	1715.00	TBD	PC ROAD
72	5272.75	1695.00	TBD	PT ROAD
73	5272.75	1635.00	TBD	PI ROAD
77	5384.00	1695.00	TBD	PC ROAD
78	5404.00	1715.00	TBD	PT ROAD
79	5450.00	1715.00	TBD	PI ROAD
80	5450.00	1793.00	TBD	PC ROAD
81	5470.00	1813.00	TBD	PT ROAD, MATCH EXIST
82	5370.00	1813.00	TBD	PC ROAD, MATCH EXIST
83	5370.00	1793.00	TBD	PT ROAD
84	4985.00	1793.00	TBD	PC ROAD
85	4985.00	1813.00	TBD	PT ROAD, MATCH EXIST
100	5327.00	1686.70	TBD	CP-3, TIE-IN
101	5327.00	1647.70	TBD	BEGIN FILL LINE PI 90 DEG BEND
102	5327.00	1600.00	TBD	PI 90 DEG BEND
103	5445.00	1600.00	TBD	PI 45 DEG BEND
104	5535.00	1540.00	TBD	PI 45 DEG BEND
105	5535.00	1036.75	TBD	PI 45 DEG BEND
106	5445.00	946.75	TBD	PI 45 DEG BEND
107	5215.00	946.75	TBD	90 DEG BEND
108	5215.00	1000.97	TBD	14 DEG VERTICAL MITERED BEND
109	5215.00	1020.06	TBD	14 DEG VERTICAL MITERED BEND
110	5215.01	1079.02	TBD	22.50 DEG ELBOW - END FILL LINE
111	5066.40	1625.52	TBD	TEE - BEGIN SUCTION PIPE
112	5005.00	1625.50	TBD	90 DEG BEND - TRUCK FILL
117	5215.00	1536.16	TBD	CAP, BEGIN CASING PIPE
118	5215.00	1427.63	TBD	PERFORATED CAP, END CASING PIPE
119	5215.00	1431.73	TBD	BEGIN 4" LEAK COLLECTION PIPE
120	5215.00	1392.83	TBD	14 DEG VERTICAL MITERED BEND
121	5215.00	1378.00	TBD	14 DEG VERTICAL MITERED BEND
122	5215.00	1088.42	TBD	CAP, END LEAK COLLECTION PIPE
123	5066.42	1450.40	TBD	TEE - END SUCTION LINE
124	5066.42	1529.93	TBD	14 DEG VERTICAL MITERED BEND
125	5066.42	1549.03	TBD	14 DEG VERTICAL MITERED BEND
126	5066.42	1603.28	TBD	14 DEG VERTICAL MITERED BEND
127	5202.00	1433.91	TBD	TEE - END DRAIN LINE
128	5202.00	1529.83	TBD	14 DEG VERTICAL MITERED BEND
129	5202.00	1540.50	TBD	BLIND FLANGE- BEG DRAIN LINE
130	5245.00	1450.00	TBD	END - POND LEVEL LINE
131	5305.00	1450.40	TBD	TEE - END SUCTION LINE
132	5305.00	1529.93	TBD	14 DEG VERTICAL MITERED BEND
133	5305.00	1549.03	TBD	14 DEG VERTICAL MITERED BEND
134	5305.00	1603.28	TBD	14 DEG VERTICAL MITERED BEND
135	5305.00	1628.00	TBD	BEGIN SUCTION PIPE
136	5373.10	1470.98	TBD	22.50 DEG ELBOW - END WELL WATER
137	5373.00	1529.94	TBD	14 DEG VERTICAL MITERED BEND
138	5373.00	1549.03	TBD	14 DEG VERTICAL MITERED BEND
139	5373.00	1586.73	TBD	14 DEG VERTICAL MITERED BEND
140	5373.00	1595.00	TBD	JOIN - BEGIN WELL WATER

eog resources

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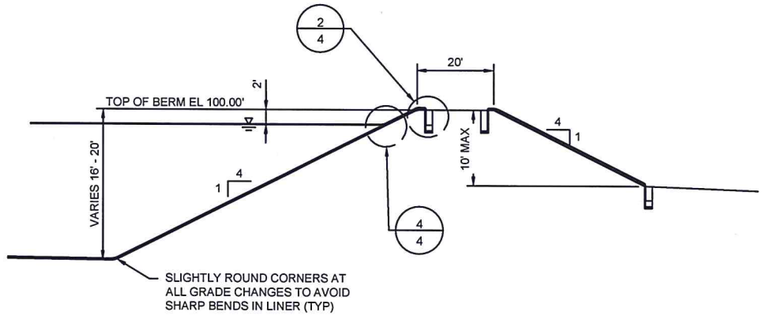
RED HILLS RECYCLE POND

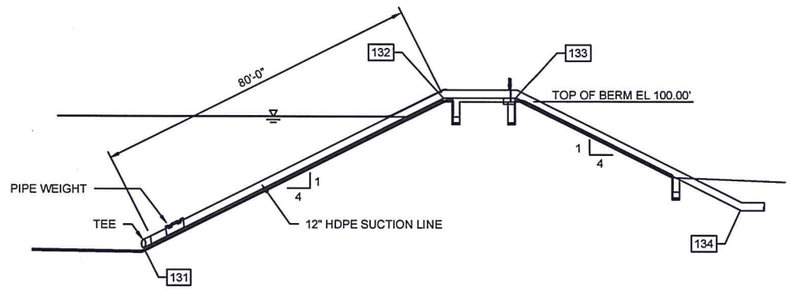
ENLARGED SITE LAYOUT, GRADING AND YARD PIPING PLAN

REVISION:		
DATE:	02/28/2017	
DATE:	03/7/2017	

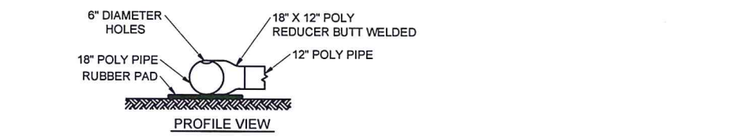
DATE: 2/10/17
FILE: RED_HILLS_RECYCLE_POND
DRAWN BY: CMM
REVIEWED BY: CCC
SCALE: 1" = 40'
SHEET: 3 OF 5

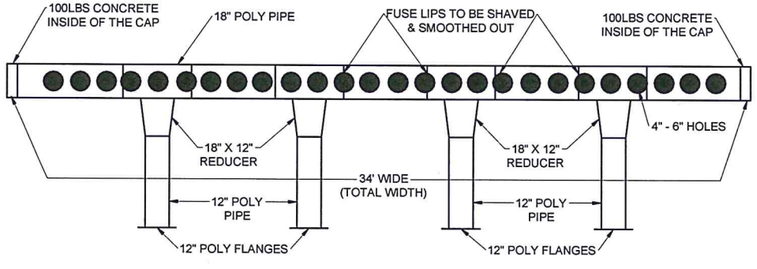


A TYPICAL BERM SECTION
NTS



F SUCTION PIPE SECTION
NTS
SHEET 2

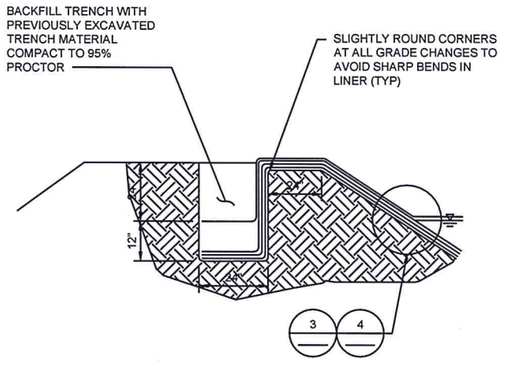




NOTES:

1. ALL JOINTS SHALL BE BUTT WELDED
2. ALL WELDS SHALL BE SHAVED AND SMOOTHED.

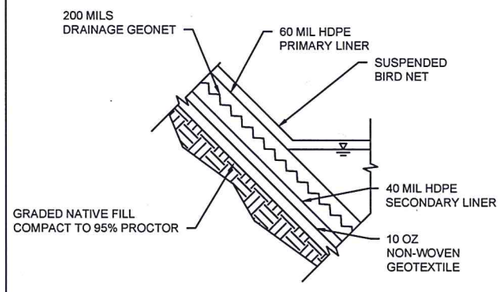
G SUCTION INLET MANIFOLD
NTS



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

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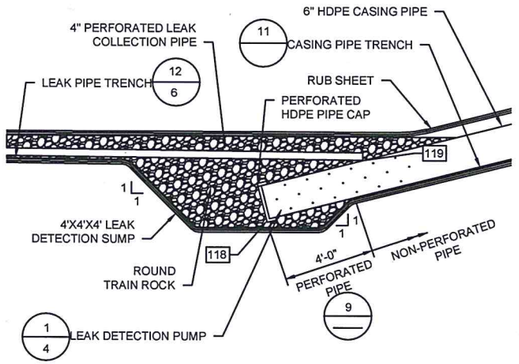
ROBERT G. EDEN
NEW MEXICO
12467
REGISTERED PROFESSIONAL ENGINEER
5/18/17

RED HILLS REUSE POND

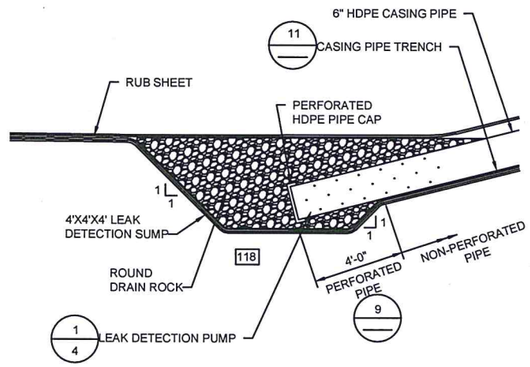
SITE DETAILS AND SECTIONS (1 OF 2)

REVISION:	
DATE:	02/28/2017
DATE:	03/7/2017

DATE: 2/10/17
FILE: RED_HILLS_RECYCLE_POND
DRAWN BY: CMM
REVIEWED BY: CCC
SCALE: NTS
SHEET : 4 OF 5

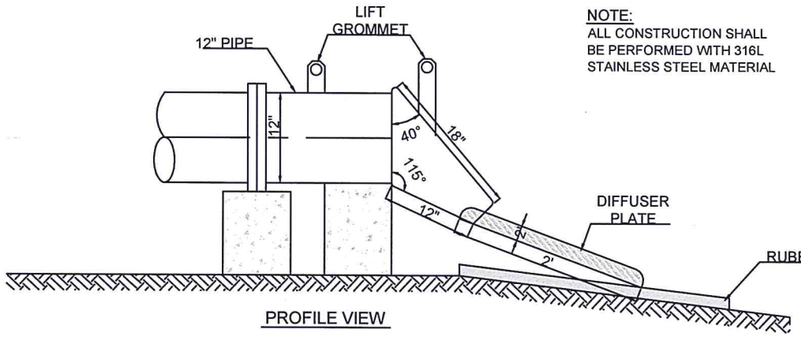


BRINE WATER SECTION



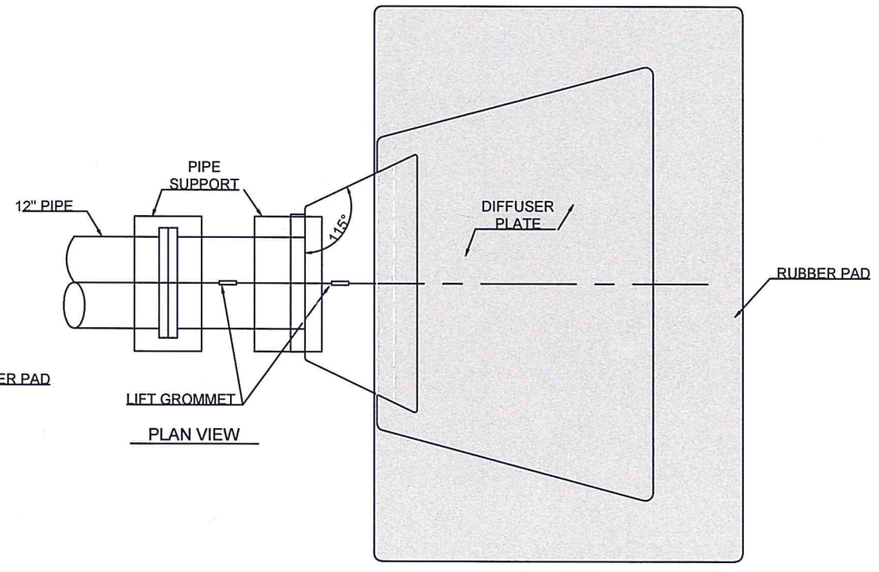
FRESH WATER SECTION

10 LEAK DETECTION SUMP
NTS

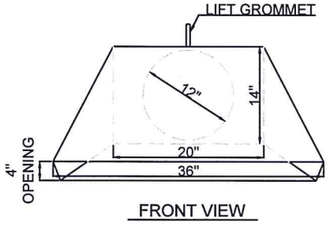


PROFILE VIEW

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



PLAN VIEW



FRONT VIEW

20 POND FILL APPARATUS
NTS

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NEW MEXICO
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3/8/17
REGISTERED PROFESSIONAL ENGINEER

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RED HILLS REUSE POND

SITE DETAILS AND SECTIONS (2 OF 2)

REVISION:	
DATE:	02/28/2017
DATE:	03/7/2017

DATE: 2/10/17
FILE: RED_HILLS_RECYCLE_POND
DRAWN BY: CMM
REVIEWED BY: CCC
SCALE: NTS
SHEET : 5 OF 5

EOG RESOURCES - 4'X4'

Notes

Will measure approx. 48" (w) x 48" (h)
Artwork produced by: RF

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 March 31, 2015

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 (For multiple operators attach page with information) OGRID #7377

Address: 5509 Champions Dr Midland, TX 79706

Facility or well name (include API# if associated with a well): South Red Hills Reuse Water Recycling Facility and Containment Pit

OCD Permit Number: _____ (For new facilities the permit number will be assigned by the district office)

U/L or Qtr/Qtr: SW of SW Section 22 Township 26 South Range 33 East County: Lea

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

2.

☒ **Recycling Facility:**

Location of recycling facility (if applicable): Latitude 32 deg 1' 18.51" N Longitude 102 deg 34' 0.41" W NAD: ☐ 1927 ☒ 1983

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 deg 01' 19.59" N Longitude 103 deg 33' 58.03" W NAD: ☐ 1927 ☒ 1983

☐ 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: 930,000 bbls Dimensions: L 530 x W 530 x D 15 (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. Six foot chain link with 3 strand 45 degree barbed wire arm topper

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): Title: Robert Crain Water Resource Manager

Signature: _____ Date:

e-mail address: Robert_crain@eogresources.com Telephone: 210-289-9647

11.

OCD Representative Signature: _____ **Approval Date:** 05/25/2017

Title: Hydrologist **OCD Permit Number:** 12

☐ OCD Conditions

☐ Additional OCD Conditions on Attachment

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

February 23, 2017 #5E25872

Mr. Courtney Coates, PE, CFM
Engineering Project Manager
Topographic Land Surveyors
1400 Everman Parkway, Suite 197
Fort Worth, TX 46140

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

Dear Mr. Coates:

Souder, Miller & Associates (SMA) is pleased to submit the enclosed C-147 Siting Criteria Explanation and supporting documentations for the proposed Red Hills 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 26S, Range 33E, Section 22 near Battleax road.

Below are details on the siting criteria in Section 8 of the C-147 permit. Supporting documentation are included in the Appendices indicated in each siting criteria explanation. Information obtained from the supporting documentation was confirmed during a site visit by Austin Weyant with SMA on February 22, 2017.

8.1 Groundwater is less than 50 feet below the bottom of the recycling containment
Groundwater, as indicted in measurements obtained from a USGS monitoring well located approximately 0.25 miles to the east of the proposed facility at a similar elevation, has been recorded at elevations ranging from 76 to 77.5 feet below ground surface from measurements collected from 1970 to 2003; using the elevation of the well, this corresponds to a maximum groundwater elevation of 3,176 feet above mean sea level (amsl). As the proposed facility is located at an elevation of approximately 3,260 ft amsl, with the base of the containment pond being less than 20 feet below surrounding grade at an elevation of approximately 3,240 ft amsl, the depth to groundwater will be 64 feet, which is 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 and the United States Geological Society (USGS) monitoring wells is included as Appendix A.

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 are present within the facility boundaries. The nearest quarry is a gravel pit located approximately 0.2 miles to the east of the proposed facility boundary. 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 0.4 miles to the southwest of the proposed facility. No lakebeds, sinkholes, or playa lakes within 200 feet of the facility are indicated on the USGS topographic map or aerial photos of the proposed facility area. 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 February 22, 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 an existing oil field tank battery and pad located adjacent and to the west. 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 February 22, 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 resisted with the NMOSE or USGS is located approximately 1,200 feet to the east 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 the well 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 February 22, 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 1,500 feet to the east 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 February 22, 2017.

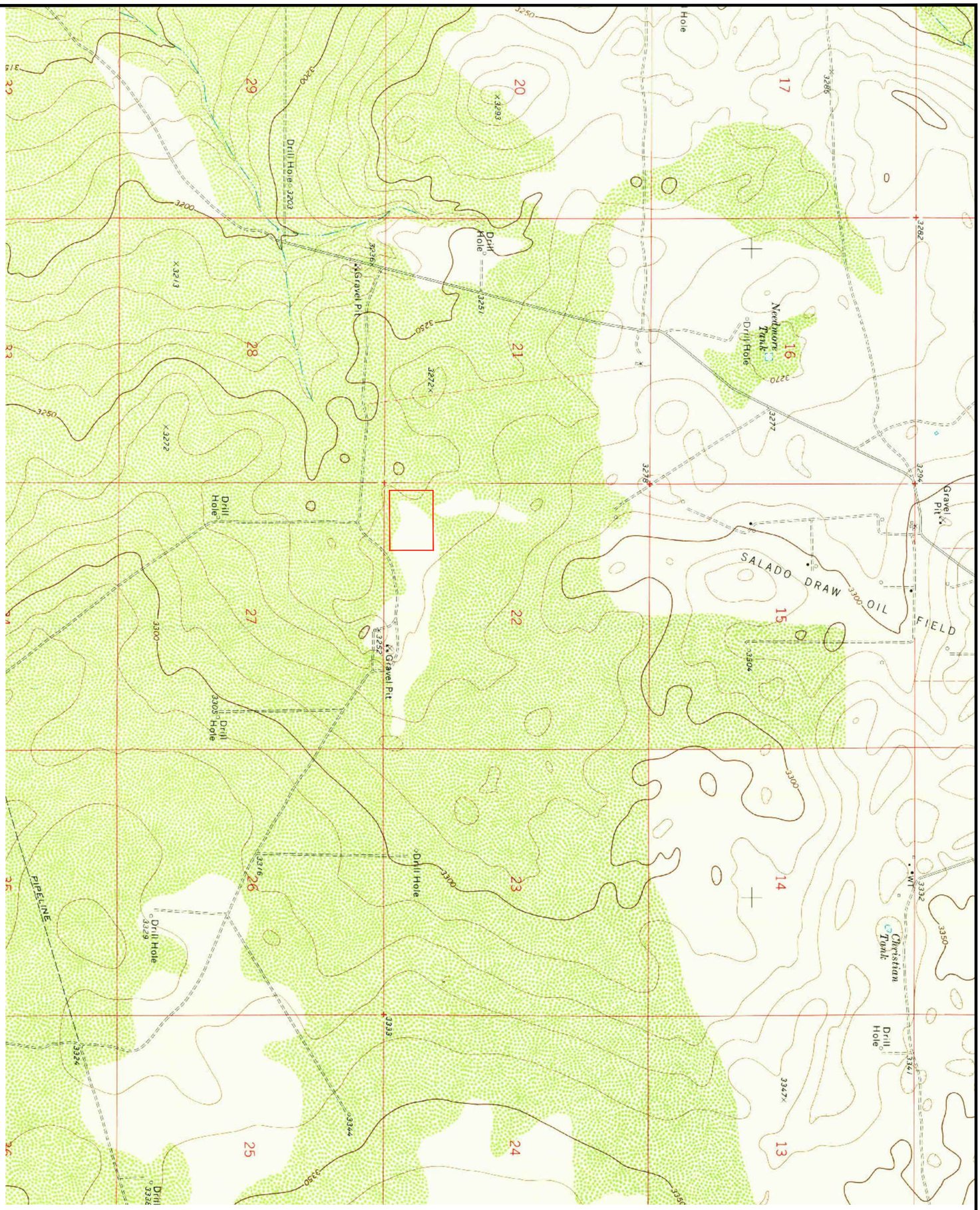
If you have any questions, please do not hesitate to call me at 505-299-0942 or to e-mail me at matthew.earthman@soudermiller.com .

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



Basemap from Paduca Break East USGS Quadrangle (1973)

SOUDER, MILLER & ASSOCIATES
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Albuquerque, NM 87107
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TOPOGRAPHIC VICINITY MAP
RED HILLS RECYCLING C-147 APPLICATION
LEA COUNTY, NEW MEXICO

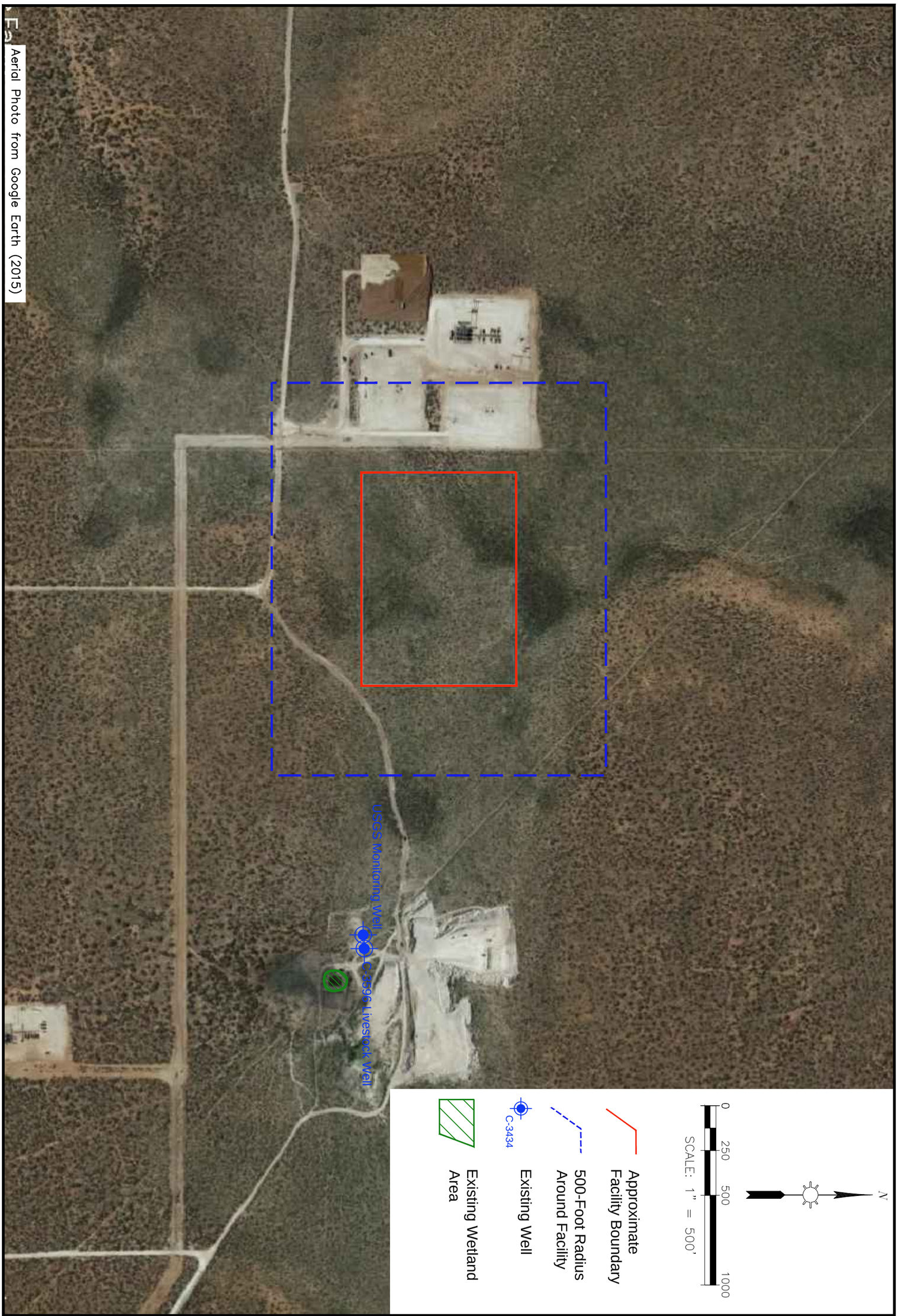
Drawn	Checked	Approved
MAE	SAM	SAM

Date: FEBRUARY, 2017
Scale: Horiz:1"=2000'
Vert:
Project No: 5E25872
Sheet: FIGURE 1

P:\5-Red Hills Recycling Facility (5E25872)\CAD\2017-02 Red Hills Recycling Figures.dwg, 2/22/2017 9:12:08 AM mae

Figure 2

Aerial Photo from Google Earth (2015)



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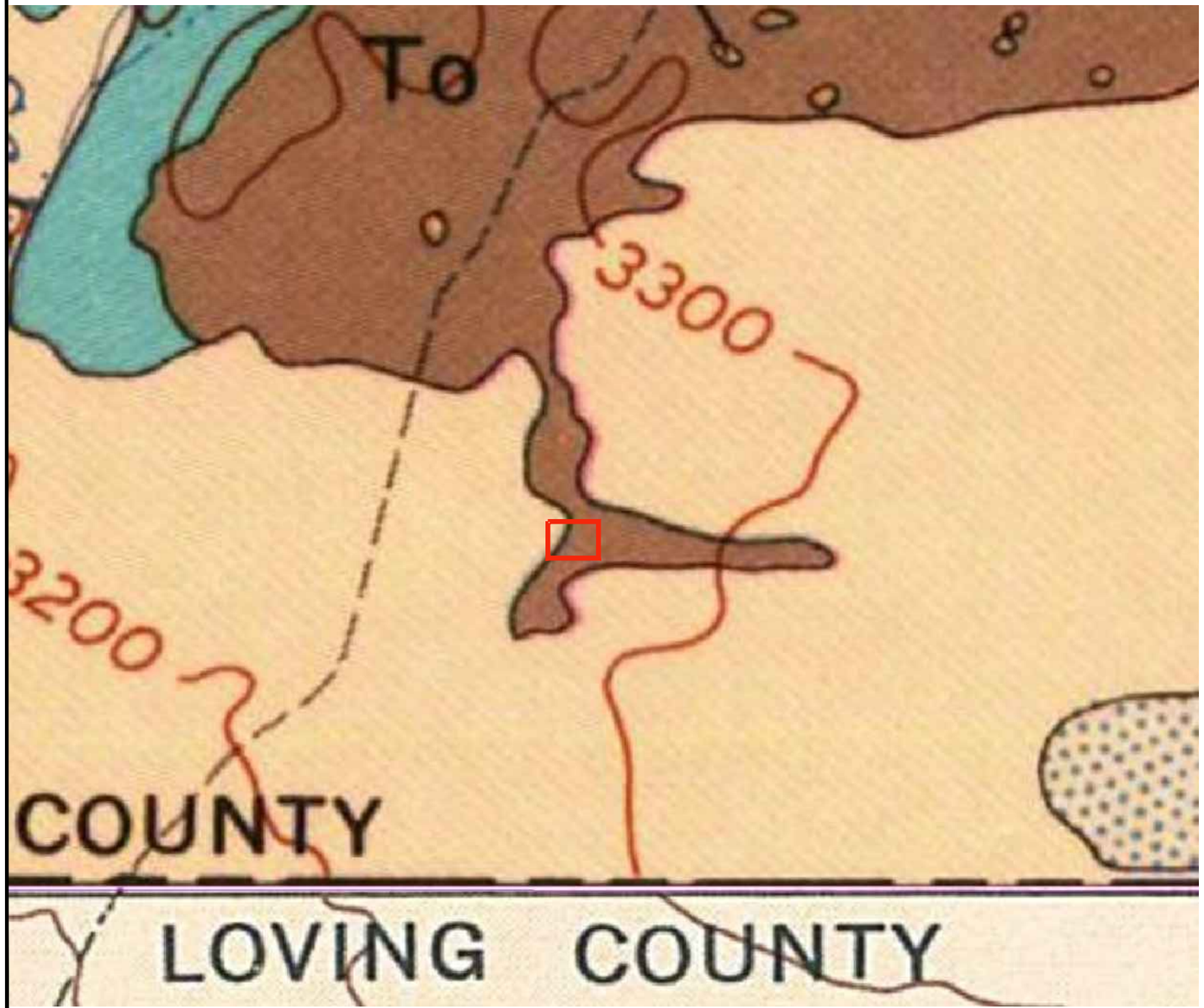
SITE MAP - PROPOSED RECYCLING CONTAINMENT POND
RED HILLS RECYCLING C-147 PERMIT APPLICATION
LEA COUNTY, NEW MEXICO

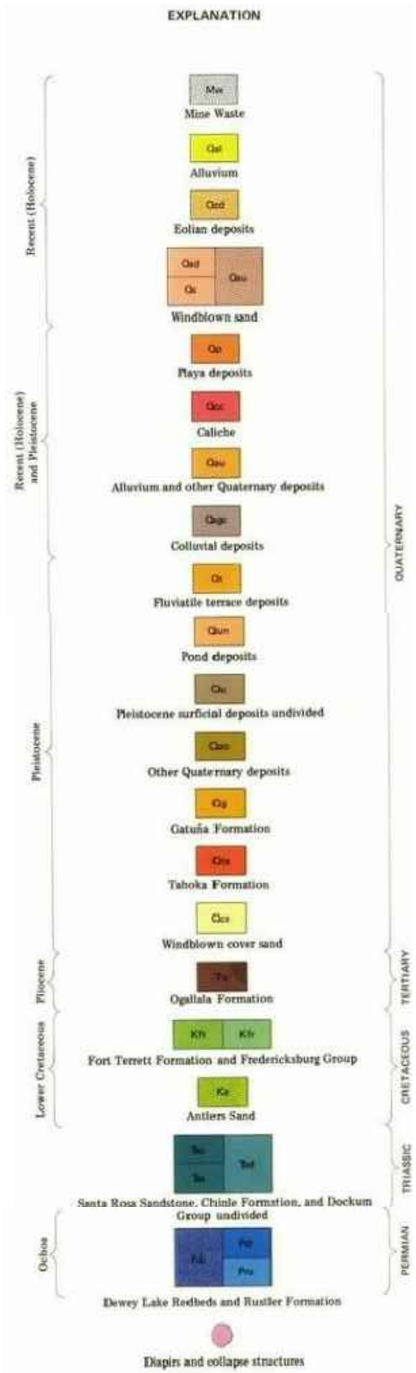
Drawn	Checked	Approved
MAE	SAM	SAM

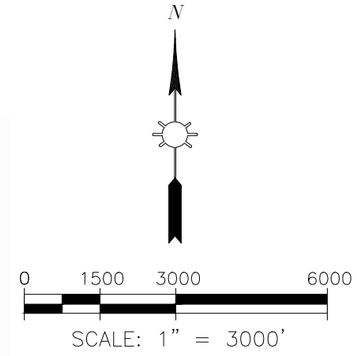
Date: FEBRUARY, 2017
Scale: Horiz:1"=500'
Vert:
Project No: 5E25872
Sheet: FIGURE 2

P:\5-Red Hills Recycling Facility (5E25872)\CAD\2017-02 Red Hills Recycling Figures.dwg, 2/22/2017 9:12:08 AM mae



Geologic Map from Geologic Atlas of Texas, Hobbs Sheet prepared by Barnes, V.E., et al. (1976).
From Economic Geology Geologic Atlas of Texas 17





Drawn MAE | Checked SAM | Approved SAM
Date: FEBRUARY, 2017
Scale: Horiz.1"=3000' Vert:
Project No: 5E25872
Sheet: FIGURE 3

GEOLOGIC MAP OF PROPOSED FACILTY AREA
RED HILLS RECYCLING C-147 APPLICATION
LEA COUNTY, NEW MEXICO

SOUDER, MILLER & ASSOCIATES
3451 Candelaria Rd. NE, Suite D
Albuquerque, NM 87107
Phone (505) 299-0942 Fax (505) 293-0942
www.soudermiller.com
Serving the Southwest & Rocky Mountains
Albuquerque, Farmington, Las Cruces, Roswell, Santa Fe, NM
Cortez - Grand Junction, CO - Safford, AZ - Moab, UT; El Paso, TX

P:\5-Red Hills Recycling Facility (5E25872)\CAD\2017-02 Red Hills Recycling Figures.dwg, 2/22/2017 9:12:11 AM mae

Appendix A
Groundwater & Well Information (NMOSE & USGS)

OSE Well Locations

February 14, 2017

1:9,028

0 0.075 0.15 0.3 mi

0 0.075 0.15 0.3 km

WATERS_PODs_linked

- ACT

OSE District Boundary

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO

2012 DEC 11 A 11:07

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): C-03577-POD1	OSE FILE NUMBER(S): C-03577
WELL OWNER NAME(S): Oliver D Kiehne	PHONE (OPTIONAL):
WELL OWNER MAILING ADDRESS: Box 453	CITY: Orla STATE: TX ZIP:

WELL LOCATION (FROM GPS): DEGREES / MINUTES / SECONDS

LATITUDE: 32 01 18.91 N

LONGITUDE: 103 33 35.21 W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

Cty Rd 1 to Battle Ax Rd – 10 miles EAST on Battle Ax Rd

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1654	John Sirman	Sirman Drilling & Const. LLC

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/19/12	11/20/12	750'-0	750'-0	110'-0

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☑ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): 92'-0

DRILLING FLUID: ☑ AIR ☐ MUD ☐ ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☑ HAMMER ☐ CABLE TOOL ☐ OTHER – SPECIFY:

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	180	8"	PVC	Carta-Lok	6"	DR-21	Blank
180	200	8"	PVC	" "	6"	DR-21	.032 Screen
200	690	8"	PVC	" "	6"	DR-21	Blank
690	750	8"	PVC	" "	6"	DR-21	.032 Screen

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	20	10"	3/8 hole plug	10 BAGS	gravity
20	600	10	3/8 pea gravel pack	4½ yds	gravity
600	750	10"	8-12 silica sand	1½ yd	gravity

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	POD NUMBER	TRN NUMBER
C-3577	1	513907

LOCATION: Expl 26S.33E.22.333

PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	20	20	caliche	☐ Y ☑ ~~N~~	
20	40	20	Red sandstone	☐ Y ☑ ~~N~~	
40	45	25	Brown cemented sand	☐ Y ☑ ~~N~~	
45	55	10	Yellow shale	☐ Y ☑ ~~N~~	
55	95	40	Brown sandstone	☐ Y ☑ ~~N~~	
95	150	55	DARK red sandstone	☑ Y ☐ ~~N~~	20
150	200	50	Red clay	☐ Y ☑ ~~N~~	
200	710	510	Red sandstone	☑ Y ☐ ~~N~~	10-15
710	720	10	Red clay	☐ Y ☑ ~~N~~	
720	750	30	Red sandstone	☐ Y ☐ N	
				☐ Y ☐ N	
	750			☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: ☐ PUMP ☑ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 30-35

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

none

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

none

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

John Simon — John Simon
SIGNATURE OF DRILLER / PRINT SIGNEE NAME

11/21/12
DATE

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER C-3577 | POD NUMBER 1 | TRN NUMBER 513907

LOCATION Expl

PAGE 2 OF 2

Attention Owner: Confidentiality Privilege Notice on reverse side of owner's copy.

Texas Department of License and Regulation

Water Well Driller/Pump Installer Program
P.O. Box 12157 Austin, Texas 78711 (512) 463-7880 FAX (512) 463-8616
Toll free (800) 803-9202
Email address: water.well@license.state.tx.us

This form must be completed and filed with the department and owner within 60 days upon completion of the well.

WELL REPORT

A. WELL IDENTIFICATION AND LOCATION DATA

1) OWNER

Name	Address	City	State	Zip
Kiehne Ranch and Cattle	2107 Cactus	Pecos	Texas	79772

2) WELL LOCATION

County	Physical Address	City	State	Zip
Loving	Cotton Place Replacement well			

3) Type of Work	Lat.	Long.	Grid #
☒ New Well ☐ Deepening ☐ Reconditioning	32* 01' 18.50"	103* 33' 31.98"	

4) Proposed Use (check) ☐ Monitor ☐ Environmental Soil Boring ☐ Domestic ☐ Industrial ☒ Irrigation ☐ Injection ☐ Public Supply ☐ De-watering ☐ Testwell

If Public Supply well, were plans submitted to the TNRCC? ☐ Yes ☐ No

5) NT

6) Drilling Date

Started 7-21-10

Completed 7-21-10

Diameter of Hole

Dia. (in)	From (ft)	To (ft)
7 7/8	0	225

7) Drilling Method (check) ☐ Driven X Air Rotary ☐ Mud Rotary ☐ Bored ☐ Air Hammer ☐ Cable Tool ☐ Jetted ☐ Other

From (ft)	To (ft)	Description and color of formation material
0	5	Surface sand
5	12	caliche
12	21	Tan sand
21	27	Brown sand stone
27	31	Yellow sandy clay
31	220	Redsandy clay with Sandstone stringers
220	225	Red Bed

(Use reverse side of Well Owner's copy, if necessary)

8) Borehole Completion ☐ Open Hole ☐ Straight Wall ☐ Under-reamed ☒ Gravel Packed ☐ Other

If Gravel Packed give the interval from 225 ft. to 10 ft.

Casing, Blank Pipe, and Well Screen Data

Dia. (in.)	New Or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft) From	Setting (ft) To	Gage Casing Screen
5	N	Pvc .035mil slot w/bc	225	165	.035
5	N	Pvc sch 40 blank	165	+2	

9) Cementing Data

Cementing from 10 ft. to 0 ft. # of sacks used 15

ft. to ft. # of sacks used

Method Used Slurry

Cementing By DDI

Distance to septic system field or other concentrated contamination ft.

Method of verification of above distance

13) Plugged ☐ Well plugged within 48 hours

Casing left in well: Cement/Bentonite placed in well:

From (ft)	To (ft)	From (ft)	To (ft)	Sacks used

10) Surface Completion

☐ Specified Surface Slab Installed

☒ Specified Surface Sleeve Installed

☐ Pitless Adapter Used

☐ Approved Alternative Procedure Used

14) Type pump

☐ Turbine ☐ Jet ☒ Submersible ☐ Cylinder ☐ Other

Depth to pump bowls, cylinder, jet, etc., Ft.

11) Water Level

Static level ft. below Date

Artesian Flow gpm. Date / /

15) Water Test

Typetest X Pump ☐ Bailer ☐ Jetted ☐ Estimated

Yield: 30 gpm with ft. drawdown after hrs.

16) Water Quality

Did you knowingly penetrate any strata which contain undesirable constituents?

☐ Yes ☒ NO If yes, did you submit a REPORT OF UNDESIRABLE WATER?

Type of water Depth of Strata

Was a chemical analysis made? ☐ Yes ☐ No

12) Packers

Type	Depth

Company or Individual's Name (type or print)	Dubose Drilling, Inc.	Lic# 3161A1
Address 5407 N. Golder	City Odessa	State TX Zip 79764

Signature	7-30-10	Signature	/ /
Licensed Driller/Pump Installer	Date	Apprentice	Date

TDLR FORM 004WWD Copies to TDLR - Owner - Driller/Pump Installer

C-3596
C-1754

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

Click to hideNews Bulletins

- **Dec 14, 2016 - HTTPS/SSL has been implemented for Water Data for the Nation.**
  Please see news on new formats
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 320059103333501

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

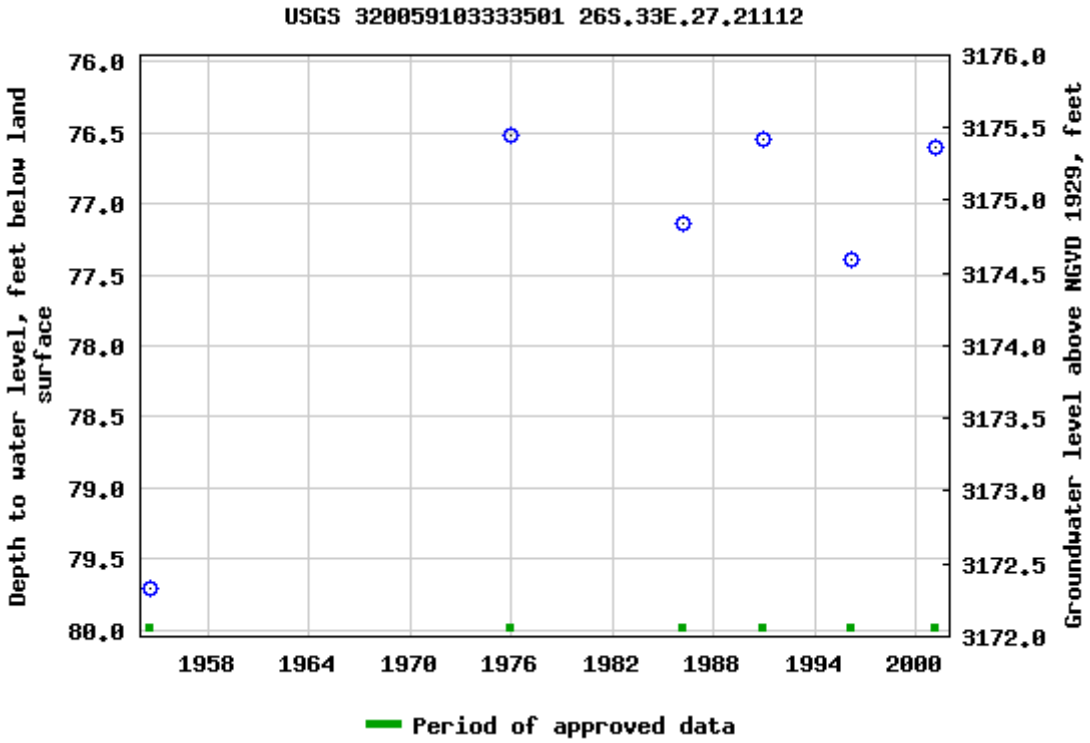
USGS 320059103333501 26S.33E.27.21112

Available data for this site | Groundwater: Field measurements | GO

Lea County, New Mexico
Hydrologic Unit Code 13070001
Latitude 32°01'16.0", Longitude 103°33'33.9" NAD83
Land-surface elevation 3,252.00 feet above NGVD29
The depth of the well is 200 feet below land surface.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2017-02-14 16:15:20 EST
0.67 0.57 nadww01

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

Click to hideNews Bulletins

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  Please see news on new formats
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 320056103333501

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

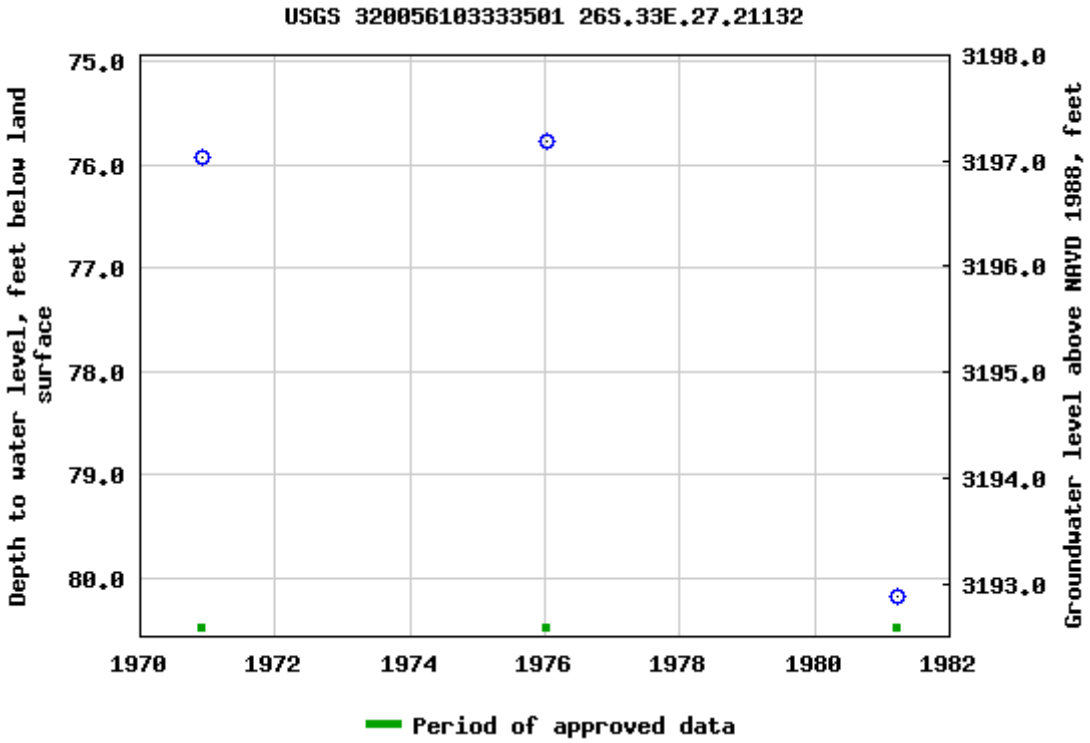
USGS 320056103333501 26S.33E.27.21132

Available data for this site | Groundwater: Field measurements | GO

Lea County, New Mexico
Hydrologic Unit Code 13070001
Latitude 32°00'56", Longitude 103°33'35" NAD27
Land-surface elevation 3,273 feet above NAVD88
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
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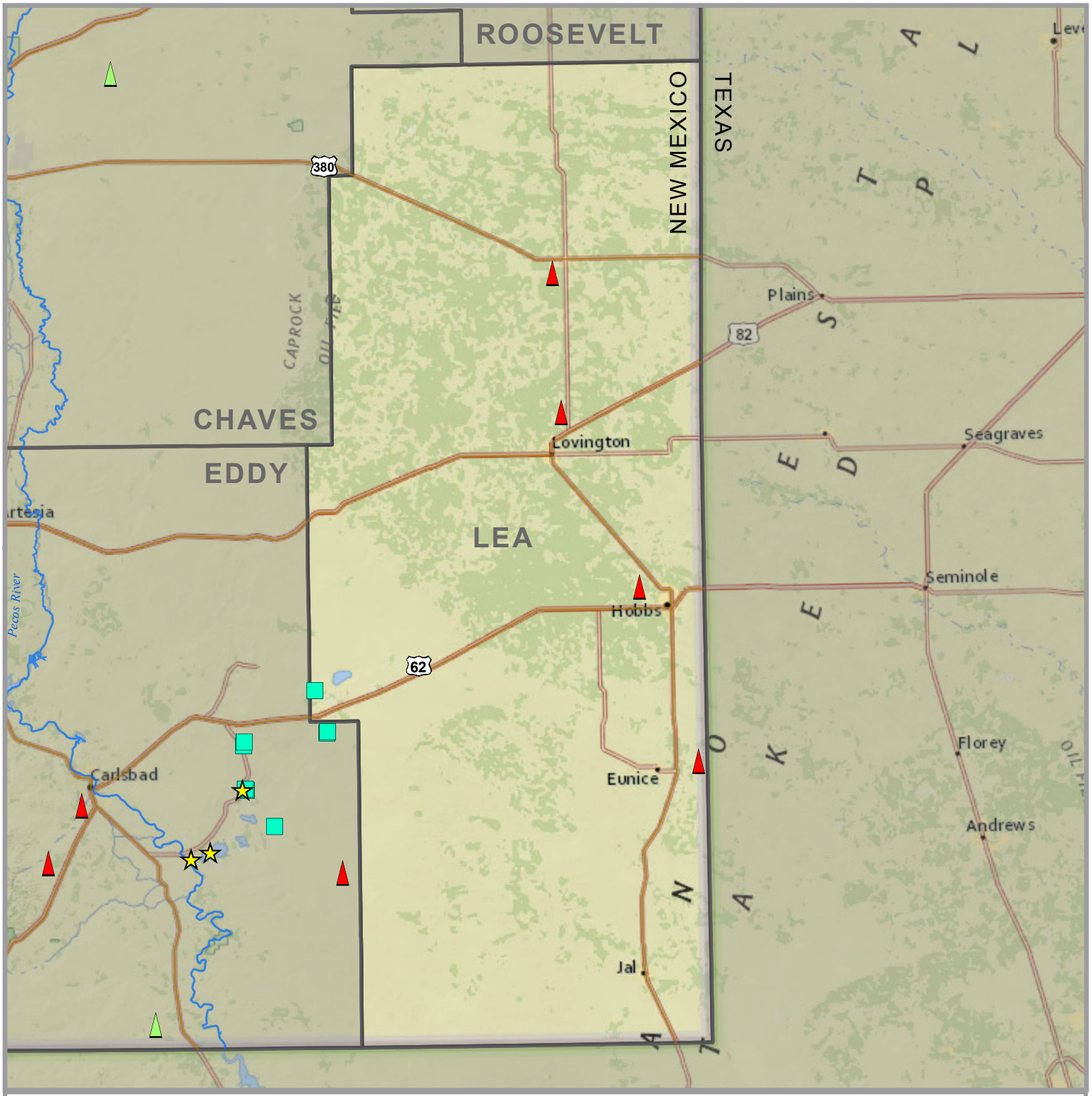
News

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

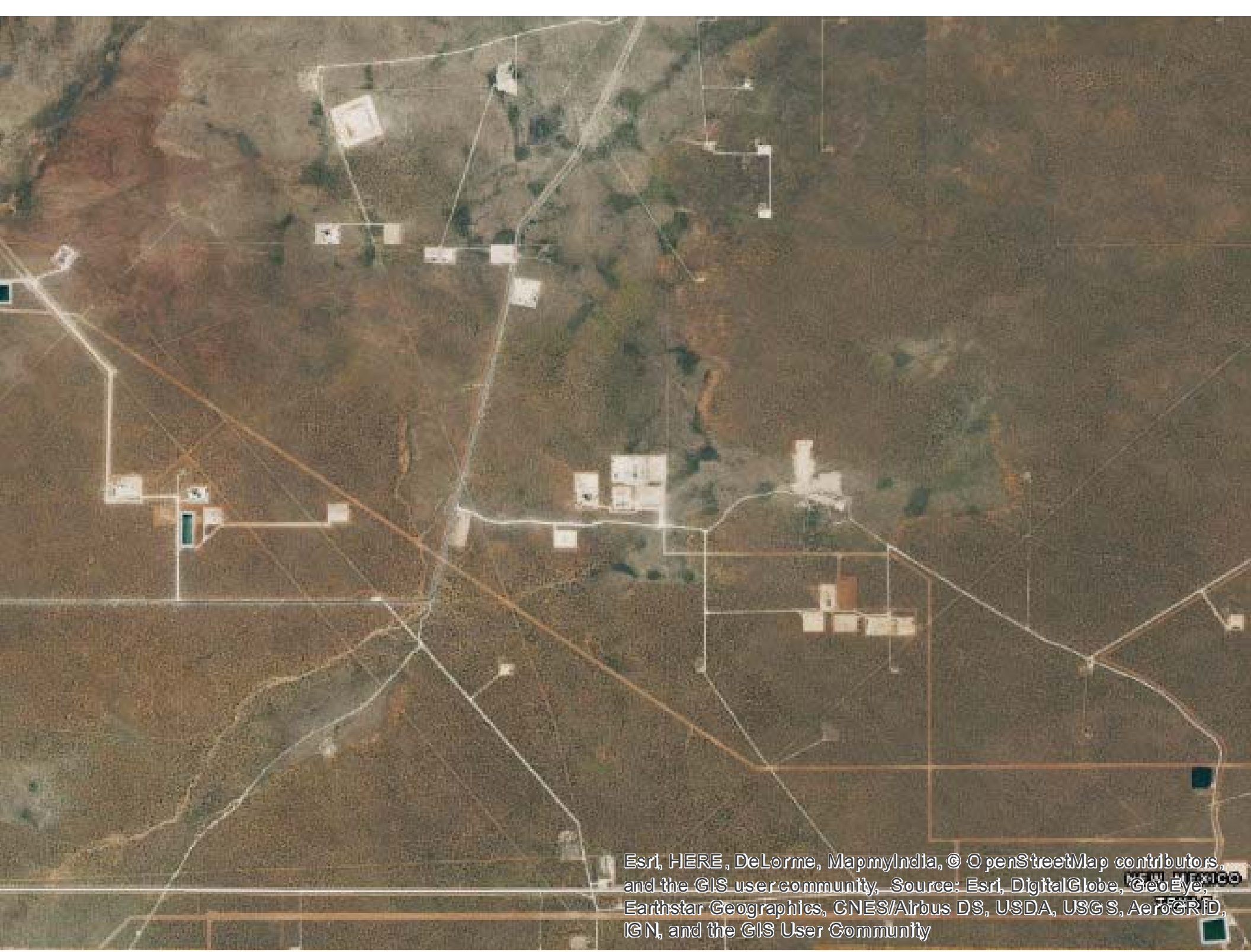
Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2017-02-14 16:15:27 EST
0.68 0.5 nadww01

Appendix B
Active Mine/Quarry Map (NM EMNRD)

Active Mines in Lea County, New Mexico, November 2014



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

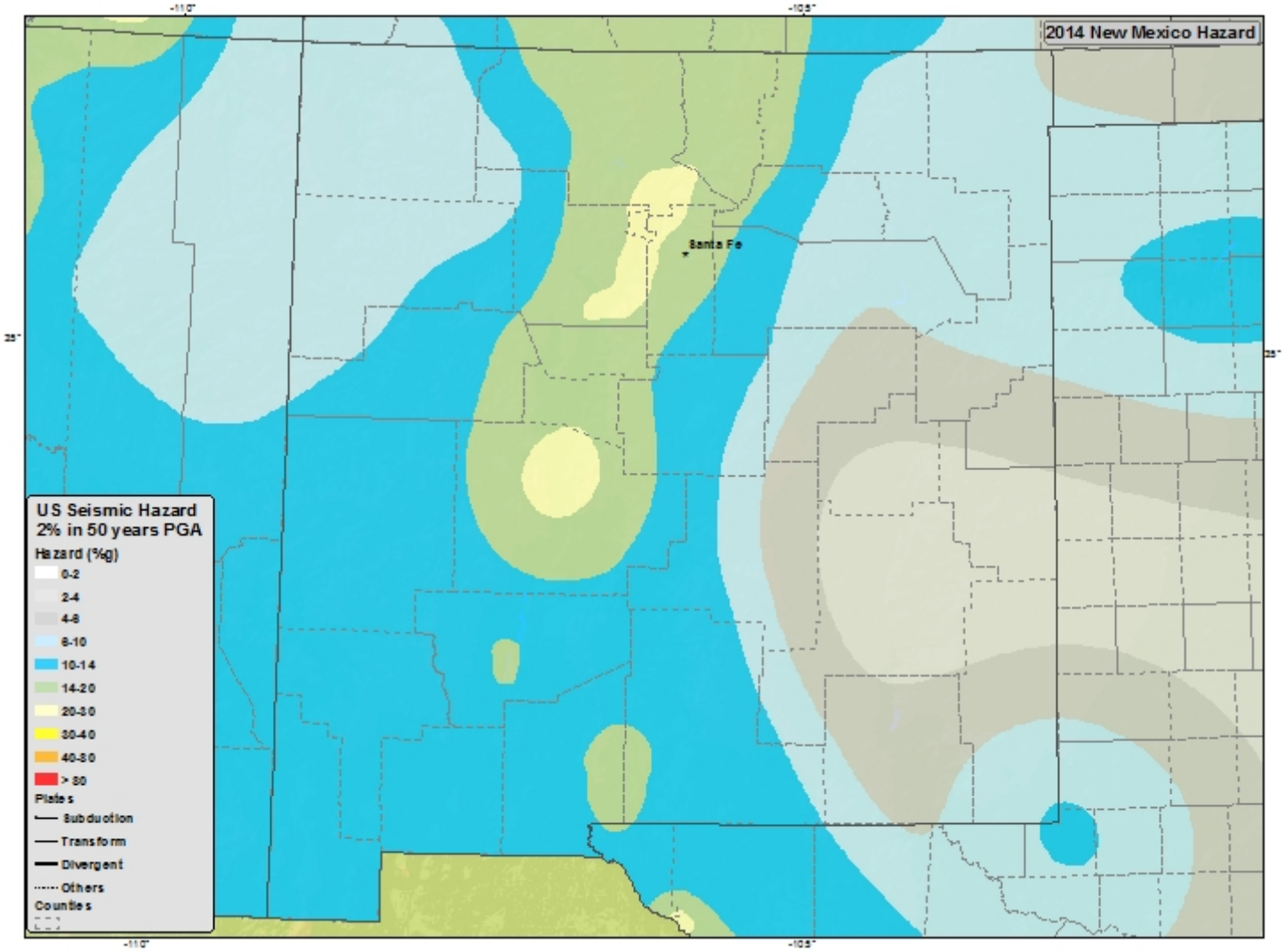

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
NEW MEXICO
TEXAS

Appendix C
USGS Seismic Hazard Map

U.S. Geological Survey - Earthquake Hazards Program

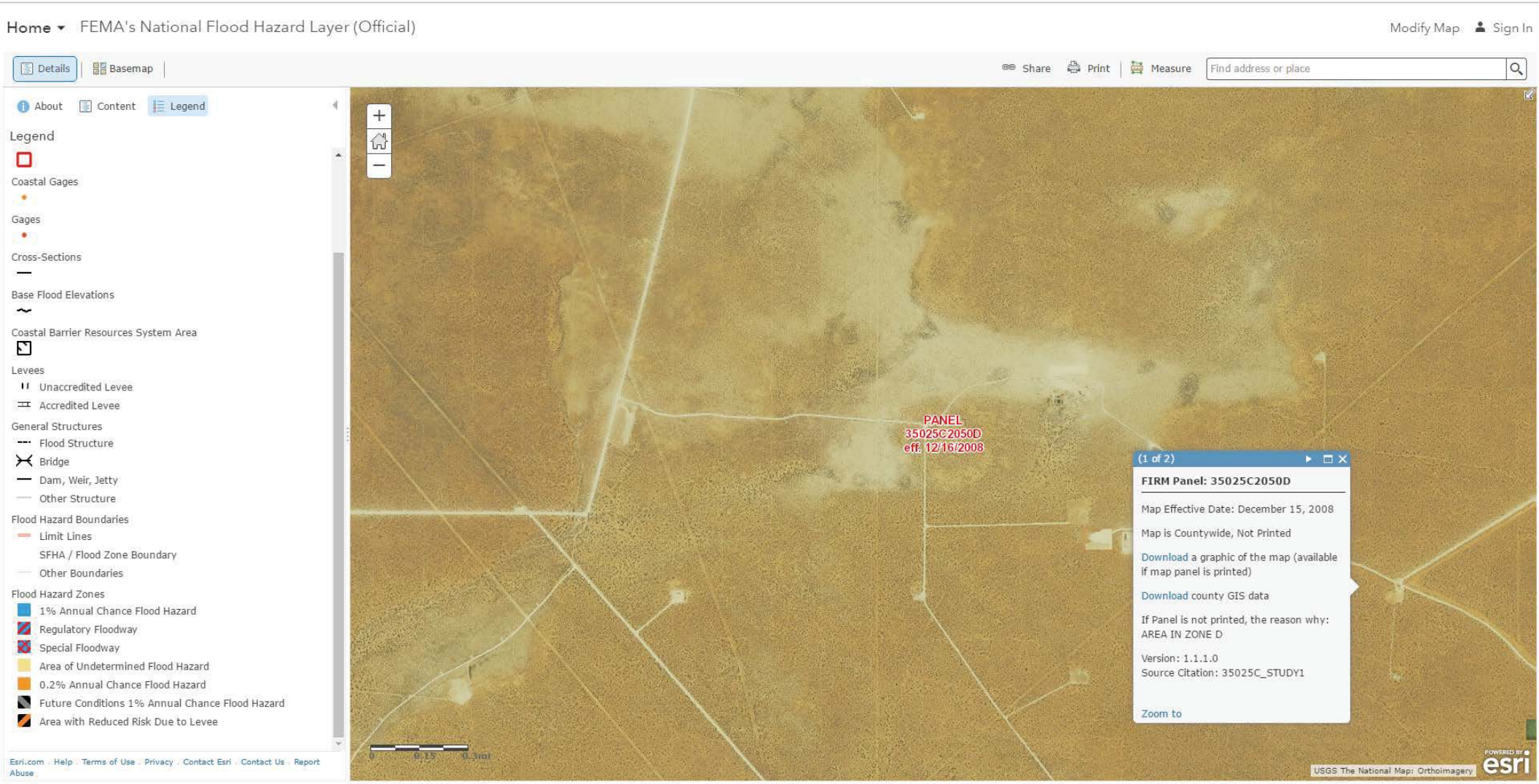
Information by Region–New Mexico

2014 Seismic Hazard Map



[USGS National Seismic Hazard Maps]

Appendix D
FEMA Floodplain Information


Home
FEMA's National Flood Hazard Layer (Official)
Modify Map
Sign In
Details
Basemap
Share
Print
Measure
Find address or place
About
Content
Legend
Legend
Coastal Gages
Gages
Cross-Sections
Base Flood Elevations
Coastal Barrier Resources System Area
Levees
Unaccredited Levee
Accredited Levee
General Structures
Flood Structure
Bridge
Dam, Weir, Jetty
Other Structure
Flood Hazard Boundaries
Limit Lines
SFHA / Flood Zone Boundary
Other Boundaries
Flood Hazard Zones
1% Annual Chance Flood Hazard
Regulatory Floodway
Special Floodway
Area of Undetermined Flood Hazard
0.2% Annual Chance Flood Hazard
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Risk Due to Levee
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PANEL
35025C2050D
eff. 12/16/2008
(1 of 2)
FIRM Panel: 35025C2050D
Map Effective Date: December 15, 2008
Map is Countywide, Not Printed
Download a graphic of the map (available if map panel is printed)
Download county GIS data
If Panel is not printed, the reason why: AREA IN ZONE D
Version: 1.1.1.0
Source Citation: 35025C_STUDY1
Zoom to
0
0.15
0.3mi
USGS The National Map: Orthoimagery
POWERED BY esri

Appendix E
Wetlands & Critical Habitat Map (US FWS)

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands/Riparian Areas within 1,000 feet

February 14, 2017

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

SOUTH REDHILLS REUSE WATER CONTAINMENT PIT CLOSURE PLAN

February 16, 2017

1. Overview

The attached plan details the requirements regarding the closure of the South Red hills 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

SOUTH REDHILLS REUSE WATER CONTAINMENT PIT OPERATING PLAN

February 16, 2017

1. Overview

The attached plan details the operational requirements regarding the South Red hills 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; the hi level alarm emergency shutdown (ESD) shall be programmed to not allow any flow to exit the recycle facility once the pit level has reached the 3ft freeboard level
- 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 containment pit operations
    - Daily Volume Reporting Form
    - Daily Site and Containment Pit Inspection Form
    - Daily Leak Detection Testing Form